

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

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O
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

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.4 Other Sectors - Biomass	CH ₄
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.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 Solid Waste	CH ₄
5.B Biological Treatment of Solid 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.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 (Gg eq-CO ₂)	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	0.112	26%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.078	34%
3.A Enteric Fermentation	CH ₄	2,121.150	0.068	40%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	0.067	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	1,240.239	0.040	67%
2.A.1 Cement Production	CO ₂	1,093.483	0.035	70%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	0.034	74%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.024	76%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.024	79%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.019	80%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	0.019	82%
2.B.1 Ammonia Production	CO ₂	558.672	0.018	84%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.017	86%
3.B Manure Management	CH ₄	427.105	0.014	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.014	89%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	0.011	90%
3.B Manure Management	N ₂ O	329.052	0.010	91%
5.A Solid Waste Disposal	CH ₄	326.422	0.010	92%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.010	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	0.007	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	174.107	0.006	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.006	95%
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.A.3.c Railways	CO ₂	140.079	0.004	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	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%

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.003	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.002	99%
1.A.3.b Road Transportation	N ₂ O	53.527	0.002	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.002	99%
3.H Urea Application	CO ₂	50.020	0.002	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.3.b Road Transportation	CH ₄	40.650	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.001	100%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
1.A.3.c Railways	N ₂ O	13.248	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.000	100%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
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	0.317	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	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.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 Solid Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	0.000	100%
TOTAL		31,387.293		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2019

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.266	27%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.083	35%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.069	42%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.055	47%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.051	52%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.050	57%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.044	62%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.042	66%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.042	70%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.039	74%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.035	78%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.026	80%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.025	83%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.023	85%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.019	87%
3.B Manure Management	CH ₄	427.105	386.193	0.016	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.015	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.014	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.011	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.007	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.007	94%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.007	95%
3.B Manure Management	N ₂ O	329.052	147.161	0.006	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.005	96%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.004	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.004	96%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.004	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.004	97%
3.H Urea Application	CO ₂	50.020	73.592	0.003	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.003	98%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.002	98%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.002	99%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.002	99%
1.A.3.c Railways	CO ₂	140.079	45.257	0.002	99%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.002	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	100%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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	5.447	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	3.899	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	1,240.239	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		31,387.293	23,605.021		

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 (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	0.172	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.117	29%
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	2,121.150	0.054	50%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	0.054	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	0.040	64%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.039	68%
2.C.3 Aluminium Production	PFCs	1,240.239	0.032	71%
2.A.1 Cement Production	CO ₂	1,093.483	0.028	74%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	0.028	76%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.019	78%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.019	80%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.015	82%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	0.015	83%
2.B.1 Ammonia Production	CO ₂	558.672	0.014	85%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.013	86%
3.B Manure Management	CH ₄	427.105	0.011	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.011	88%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	0.009	89%
3.B Manure Management	N ₂ O	329.052	0.008	90%
5.A Solid Waste Disposal	CH ₄	326.422	0.008	91%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.008	92%
4.G Harvested Wood Products	CO ₂	301.544	0.008	92%
4.E.2 Land Converted to Settlements	CO ₂	250.713	0.006	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	0.006	94%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	0.005	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.005	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	0.004	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.004	96%
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.A.3.c Railways	CO ₂	140.079	0.004	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	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	98%

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.002	98%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.002	98%
1.A.3.b Road Transportation	N ₂ O	53.527	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	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.3.b Road Transportation	CH ₄	40.650	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	0.001	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	0.001	100%
4(V) Biomass Burning	CO ₂	14.979	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	0.000	100%
4.C.2 Land Converted to Grassland	CO ₂	9.952	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	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	0.317	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	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.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		39,081.632		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2019

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.198	20%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	5,553.748	0.175	37%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.062	43%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.051	49%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.041	53%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.038	56%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.037	60%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.032	63%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.031	67%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.031	70%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.029	73%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.026	75%
4.G Harvested Wood Products	CO ₂	301.544	722.257	0.023	77%
4.E.2 Land Converted to Settlements	CO ₂	250.713	678.963	0.021	80%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.019	82%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.019	83%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.017	85%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.014	86%
3.B Manure Management	CH ₄	427.105	386.193	0.012	88%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	378.967	0.012	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.011	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.010	91%
4.C.2 Land Converted to Grassland	CO ₂	9.952	308.857	0.010	92%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.631	0.008	93%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.008	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.005	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.005	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.005	95%
3.B Manure Management	N ₂ O	329.052	147.161	0.005	96%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	121.020	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.003	96%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.003	97%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.003	98%
3.H Urea Application	CO ₂	50.020	73.592	0.002	98%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.002	98%
4.B.2 Land Converted to Cropland	CO ₂	23.135	67.539	0.002	98%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.002	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.002	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.002	99%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.002	99%
1.A.3.c Railways	CO ₂	140.079	45.257	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.001	99%
4(V) Biomass Burning	CO ₂	14.979	31.269	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.001	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.001	100%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	12.428	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	2.617	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	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 - Liquid Fuels	N ₂ O	4.815	1.894	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	1.845	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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	5.447	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	3.899	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	1,240.239	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		39,081.632	31,755.232		

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 (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.205	0.207	21%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.160	0.161	37%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.060	0.060	43%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.054	0.054	48%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.053	0.053	53%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.048	0.049	58%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.046	0.046	63%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.045	0.045	67%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.037	0.038	71%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.034	0.034	75%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.031	0.031	78%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.030	0.031	81%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.029	0.029	84%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.022	0.022	86%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.020	0.020	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.011	0.011	89%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.010	0.010	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.009	0.009	91%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.009	0.009	92%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.008	0.008	93%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.007	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.006	0.006	94%
3.B Manure Management	N ₂ O	329.052	147.161	0.006	0.006	95%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.005	0.005	95%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.005	0.005	95%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.005	0.005	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.004	0.004	96%
3.B Manure Management	CH ₄	427.105	386.193	0.004	0.004	97%
1.A.3.c Railways	CO ₂	140.079	45.257	0.003	0.003	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.003	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.003	0.003	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.002	0.002	98%
3.H Urea Application	CO ₂	50.020	73.592	0.002	0.002	98%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.002	0.002	98%

Tier 1 Analysis - Trend Assessment

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.002	0.002	98%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.002	0.002	99%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.001	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.001	0.001	99%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.001	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.001	0.001	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	0.000	99%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	0.000	100%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.000	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	0.000	100%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	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.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	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	0.006	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		31,387.293	23,605.021			

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 (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.133	0.169	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.121	0.153	32%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.039	0.050	37%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.039	0.050	42%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.037	0.047	47%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.036	0.046	52%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.035	0.044	56%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.032	0.040	60%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.031	0.039	64%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.028	0.036	68%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.022	0.028	70%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.021	0.027	73%
4.G Harvested Wood Products	CO ₂	301.544	722.257	0.018	0.024	75%
4.E.2 Land Converted to Settlements	CO ₂	250.713	678.963	0.018	0.023	78%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.017	0.021	80%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.016	0.021	82%
4.C.2 Land Converted to Grassland	CO ₂	9.952	308.857	0.012	0.015	83%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.011	0.015	85%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.011	0.014	86%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.631	0.010	0.012	87%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	378.967	0.008	0.011	88%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.007	0.009	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.006	0.008	90%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.006	0.008	91%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.005	0.007	92%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.005	0.007	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.005	0.006	93%
3.B Manure Management	N ₂ O	329.052	147.161	0.005	0.006	93%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.004	0.005	94%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.003	0.004	94%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	5,553.748	0.003	0.004	95%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	121.020	0.003	0.004	95%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.003	0.004	96%
1.A.3.c Railways	CO ₂	140.079	45.257	0.003	0.003	96%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.002	0.003	96%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	12.428	0.002	0.003	97%
4.B.2 Land Converted to Cropland	CO ₂	23.135	67.539	0.002	0.002	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.002	0.002	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.002	0.002	97%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.002	0.002	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.002	0.002	98%
3.B Manure Management	CH ₄	427.105	386.193	0.002	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.001	0.002	98%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.001	0.002	98%
3.H Urea Application	CO ₂	50.020	73.592	0.001	0.002	98%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.001	0.002	99%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.001	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.001	0.001	99%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.001	0.001	99%
4(V) Biomass Burning	CO ₂	14.979	31.269	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.001	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.000	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.000	0.000	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	0.000	100%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.000	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	2.617	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	1.845	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	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	0.559	0.861	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	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	0.006	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%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
TOTAL		39,081.632	31,755.232			

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 (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
2.C.3 Aluminium Production	PFCs	1,240.239	0.165	17%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	0.155	32%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	0.124	44%
3.A Enteric Fermentation	CH ₄	2,121.150	0.059	50%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.047	55%
2.A.1 Cement Production	CO ₂	1,093.483	0.037	59%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.036	62%
5.A Solid Waste Disposal	CH ₄	326.422	0.028	65%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.028	68%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	0.025	70%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	0.022	73%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.020	75%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.020	77%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.018	78%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	0.017	80%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.017	82%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.015	83%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.014	85%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.013	86%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.013	87%
1.A.3.b Road Transportation	N ₂ O	53.527	0.012	88%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	0.012	90%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.012	91%
3.B Manure Management	N ₂ O	329.052	0.011	92%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	0.009	93%
3.B Manure Management	CH ₄	427.105	0.008	94%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.007	94%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.006	95%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.006	96%
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	97%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.004	97%
1.A.3.c Railways	N ₂ O	13.248	0.003	97%
1.A.3.b Road Transportation	CH ₄	40.650	0.002	97%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
2.G Other Product Manufacture and Use	N ₂ O	33.376	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	6.806	0.002	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	5.737	0.001	99%
1.A.3.c Railways	CO ₂	140.079	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	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 - Biomass	N ₂ O	4.291	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	0.001	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.001	100%
2.A.2 Lime Production	CO ₂	156.820	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	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	0.703	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	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	0.317	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.3.c Railways	CH ₄	0.174	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	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.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 Solid Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	0.000	100%
TOTAL		31,387.293		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2019

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.184	18%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.152	34%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.148	48%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.075	56%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.044	60%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.028	63%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.027	66%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.027	69%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.027	71%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.024	74%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.024	76%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.023	78%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.021	80%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.019	82%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.018	84%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.016	86%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.013	87%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.012	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.012	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.011	91%
3.B Manure Management	CH ₄	427.105	386.193	0.010	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.009	92%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.009	93%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.007	94%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.007	95%
3.B Manure Management	N ₂ O	329.052	147.161	0.006	95%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.006	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.004	96%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.004	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.003	97%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.003	98%
3.H Urea Application	CO ₂	50.020	73.592	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.002	98%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.002	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.001	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.001	99%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.001	99%
1.A.3.c Railways	CO ₂	140.079	45.257	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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	5.447	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	3.899	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	1,240.239	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		31,387.293	23,605.021		

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 (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	0.423	42%
2.C.3 Aluminium Production	PFCs	1,240.239	0.068	49%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	0.064	56%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	0.054	61%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	0.051	66%
4.E.2 Land Converted to Settlements	CO ₂	250.713	0.027	69%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	0.026	71%
3.A Enteric Fermentation	CH ₄	2,121.150	0.025	74%
4.C.2 Land Converted to Grassland	CO ₂	9.952	0.021	76%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	0.019	78%
2.A.1 Cement Production	CO ₂	1,093.483	0.015	79%
4.B.2 Land Converted to Cropland	CO ₂	23.135	0.015	81%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	0.015	82%
4.G Harvested Wood Products	CO ₂	301.544	0.014	84%
5.A Solid Waste Disposal	CH ₄	326.422	0.012	85%
1.A.3.b Road Transportation	CO ₂	3,505.880	0.012	86%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	0.010	87%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	0.009	88%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.008	89%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	0.008	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.007	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	0.007	91%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.007	92%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	0.006	92%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.006	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	0.005	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	0.005	94%
1.A.3.b Road Transportation	N ₂ O	53.527	0.005	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	0.005	95%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.005	95%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	0.005	96%
3.B Manure Management	N ₂ O	329.052	0.005	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	0.004	97%
3.B Manure Management	CH ₄	427.105	0.003	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.003	97%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	0.003	98%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.002	98%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.002	99%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.002	99%
1.A.3.c Railways	N ₂ O	13.248	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.650	0.001	99%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	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	6.806	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	5.737	0.001	99%
1.A.3.c Railways	CO ₂	140.079	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	0.000	100%
3.H Urea Application	CO ₂	50.020	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	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	2.851	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4(V) Biomass Burning	CH ₄	1.230	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	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	0.703	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	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	0.317	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	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.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 Solid Waste	CH ₄	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	0.000	100%
TOTAL		39,081.632		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2019

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	5,553.748	0.477	48%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	378.967	0.054	53%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.049	58%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	121.020	0.048	63%
4.G Harvested Wood Products	CO ₂	301.544	722.257	0.043	67%
4.E.2 Land Converted to Settlements	CO ₂	250.713	678.963	0.042	71%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.040	75%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.039	79%
4.C.2 Land Converted to Grassland	CO ₂	9.952	308.857	0.027	82%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.631	0.022	84%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.020	86%
4.B.2 Land Converted to Cropland	CO ₂	23.135	67.539	0.016	88%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.012	89%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.007	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.007	90%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.007	91%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.007	92%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.006	92%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.006	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.006	94%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.006	94%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.005	95%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.005	95%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.004	96%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.003	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.003	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.003	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.003	97%
3.B Manure Management	CH ₄	427.105	386.193	0.003	97%
4(V) Biomass Burning	CO ₂	14.979	31.269	0.003	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.002	98%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	12.428	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.002	98%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.002	99%
3.B Manure Management	N ₂ O	329.052	147.161	0.002	99%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.002	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.001	99%
3.H Urea Application	CO ₂	50.020	73.592	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	2.617	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	1.845	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	100%
1.A.3.c Railways	CO ₂	140.079	45.257	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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	5.447	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	3.899	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	1,240.239	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		39,081.632	31,755.232		

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 (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.040	0.267	27%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.015	0.097	36%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.015	0.097	46%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.011	0.076	54%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.009	0.058	59%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.006	0.037	63%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.005	0.036	67%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.004	0.028	70%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.003	0.023	72%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.003	0.022	74%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.003	0.021	76%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.003	0.018	78%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.002	0.016	79%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.002	0.015	81%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.002	0.015	83%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.002	0.015	84%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.002	0.012	85%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.002	0.012	86%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.002	0.010	87%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.002	0.010	88%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.001	0.010	89%
3.B Manure Management	N ₂ O	329.052	147.161	0.001	0.009	90%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.001	0.008	91%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.001	0.006	92%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.001	0.005	92%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.001	0.005	93%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.001	0.005	93%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.001	0.004	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.001	0.004	94%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.001	0.004	95%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.001	0.004	95%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.001	0.004	95%
3.B Manure Management	CH ₄	427.105	386.193	0.001	0.004	96%

Tier 2 Analysis - Trend Assessment Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	0.003	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	0.003	96%
3.H Urea Application	CO ₂	50.020	73.592	0.000	0.003	97%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	0.003	97%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	0.002	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	0.002	97%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.000	0.002	97%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	0.002	98%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.000	0.002	98%
1.A.3.c Railways	CO ₂	140.079	45.257	0.000	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.000	0.001	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.000	0.001	98%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	0.001	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	0.001	99%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	0.001	99%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.000	0.001	99%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	0.001	99%
3.G Liming	CO ₂	0.000	3.381	0.000	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.000	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	0.001	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.163	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.000	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%
TOTAL		31,387.293	23,605.021			

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF) – 2019

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	47.233	121.020	0.028	0.100	10%
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380	0.027	0.096	20%
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	378.967	0.027	0.095	29%
4.E.2 Land Converted to Settlements	CO ₂	250.713	678.963	0.025	0.090	38%
4.G Harvested Wood Products	CO ₂	301.544	722.257	0.024	0.087	47%
4.C.2 Land Converted to Grassland	CO ₂	9.952	308.857	0.023	0.080	55%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	268.631	0.017	0.061	61%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	538.623	0.010	0.036	64%
4.B.2 Land Converted to Cropland	CO ₂	23.135	67.539	0.010	0.036	68%
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	0.009	0.034	71%
4.D.2 Land Converted to Wetlands	CO ₂	83.466	12.428	0.009	0.032	75%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,590.624	617.408	0.009	0.031	78%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357	0.007	0.025	80%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,730.631	5,553.748	0.006	0.022	82%
3.A Enteric Fermentation	CH ₄	2,121.150	994.693	0.005	0.017	84%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787	0.004	0.015	85%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	0.003	0.010	86%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	0.003	0.010	87%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	349.801	264.044	0.003	0.009	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	0.002	0.009	89%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,075.891	829.037	0.002	0.008	90%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	0.002	0.008	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	0.002	0.008	92%
2.G Other Product Manufacture and Use	N ₂ O	33.376	106.124	0.002	0.005	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301	0.001	0.005	93%
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	0.001	0.005	93%
4(V) Biomass Burning	CO ₂	14.979	31.269	0.001	0.005	94%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	0.001	0.004	94%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	0.001	0.004	94%
3.B Manure Management	N ₂ O	329.052	147.161	0.001	0.004	95%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	91.362	0.001	0.004	95%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	0.001	0.004	96%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	10.811	0.001	0.003	96%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	0.001	0.003	96%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	0.001	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414	0.001	0.003	97%
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	0.001	0.002	97%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	0.001	0.002	97%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	0.001	0.002	97%
1.A.3.b Road Transportation	CH ₄	40.650	9.566	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	161.433	0.000	0.002	98%
1.A.3.c Railways	N ₂ O	13.248	5.205	0.000	0.002	98%
5.D Wastewater Treatment and Discharge	CH ₄	588.877	450.926	0.000	0.001	98%
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	0.000	0.001	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	0.000	0.001	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	0.000	0.001	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	0.000	0.001	98%
2.F.4 Aerosols	Aggregate F-gases	0.000	8.568	0.000	0.001	99%
3.H Urea Application	CO ₂	50.020	73.592	0.000	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	4.961	0.000	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530	0.000	0.001	99%
3.B Manure Management	CH ₄	427.105	386.193	0.000	0.001	99%
4(V) Biomass Burning	CH ₄	1.230	2.617	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	0.000	0.001	99%
1.A.3.c Railways	CO ₂	140.079	45.257	0.000	0.001	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	3.548	0.000	0.001	99%
4(V) Biomass Burning	N ₂ O	0.858	1.845	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	0.000	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	594.603	0.000	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	0.000	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	6.823	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.411	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	10.450	5.376	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	1.346	0.000	0.000	100%
3.G Liming	CO ₂	0.000	3.381	0.000	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	92.741	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.040	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.847	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	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	0.630	0.163	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	29.404	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.051	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	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	59.644	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%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.447	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2019) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
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%
TOTAL		39,081.632	31,755.232			

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2021, 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	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	Yes	L1e, L2e	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	
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		
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	
2.B.8 Petrochemical and Carbon Black Production	CO ₂	Yes	L1e	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		
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	L1i	
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(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	Yes		L2i	
4.A.1 Forest Land Remaining Forest Land	CO ₂	Yes		L1i, L2i	
4.B.1 Cropland Remaining Cropland	CO ₂	Yes		L1i, L2i	
4.B.2 Land Converted to Cropland	CO ₂	Yes		L2i	
4.C.2 Land Converted to Grassland	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, L2i	
5.D Wastewater Treatment and Discharge	CH ₄	Yes	L1e, L2e	L1i, L2i	

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 2021, year t=2019)

Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year = 2019)							
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	T1i	
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	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	Yes	L1e, L2e	T1e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e	T1e, T2e	L1i	T1i	
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	T2e			
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	Yes	L1e				
1.A.4 Other Sectors - Biomass	CH ₄	Yes	L1e, L2e	T2e	L1i		
1.A.4 Other Sectors - Biomass	N ₂ O	Yes	L2e	T2e			
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		T1i	
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				
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
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	L1e	T1e	L1i	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.F.1 Refrigeration and Air conditioning	F-gases	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
2.G Other Product Manufacture and Use	N ₂ O	Yes		T2e			
3. Agriculture							
3.A Enteric Fermentation	CH ₄	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
3.B Manure Management	CH ₄	Yes	L1e		L1i		
3.B Manure Management	N ₂ O	Yes		T1e		T1i	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e	T2e	L1i, L2i		
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e		L1i, L2i	T2i	
4. Land use, land use change and forestry							
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	Yes			L2i	T2i	
4.A.1 Forest Land Remaining Forest Land	CO ₂	Yes			L1i, L2i	T1i, 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			L1i, L2i	T1i, T2i	
4.B.2 Land Converted to Cropland	CO ₂	Yes			L2i	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		L1i		
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 23,605.02 kt CO₂-eq for the year 2019 and 31,387.29 kt CO₂-eq for the year 1990 without removals from LULUCF.

Fit Comparison for SUM_Ex / Emission Distribution year 2019 CO2...

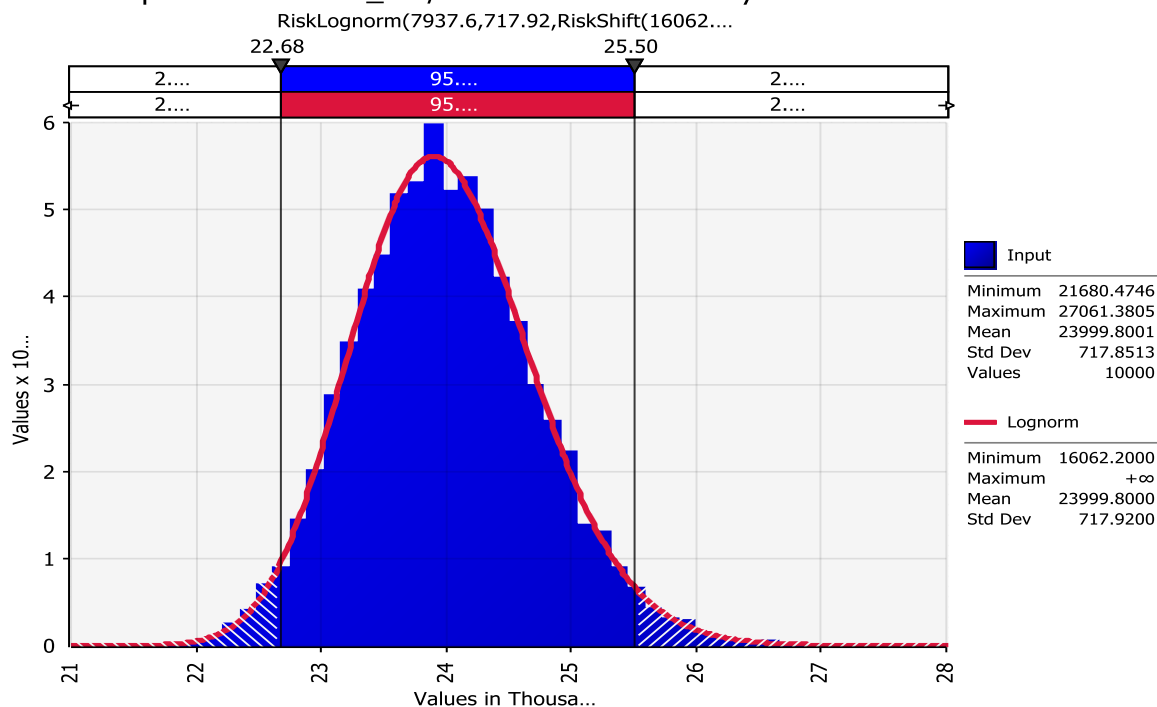


Figure A2.2-1: Distribution of the total CO₂ emissions for year 2019 excluding LULUCF

Monte Carlo analysis shows that with a certainty of 95% total emissions of all categories for the year 2019 (23999.80 kt CO₂eq) according to simulation varies between 22,683.48 kt CO₂-eq (2.5 percentile) and 25,502.96 kt CO₂eq (97.5 percentile). Figure A2.2-1 shows the distribution of total CO₂ emission for year 2019 with a corresponding probability density function (red line) that best matches the simulation results.

Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories excluding LULUCF for the year 1990 (32,299.21 kt CO₂-eq) varies between 30,490.82 kt CO₂eq (2.5 percentile) and 34,339.78 kt CO₂eq (97.5 percentile).

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

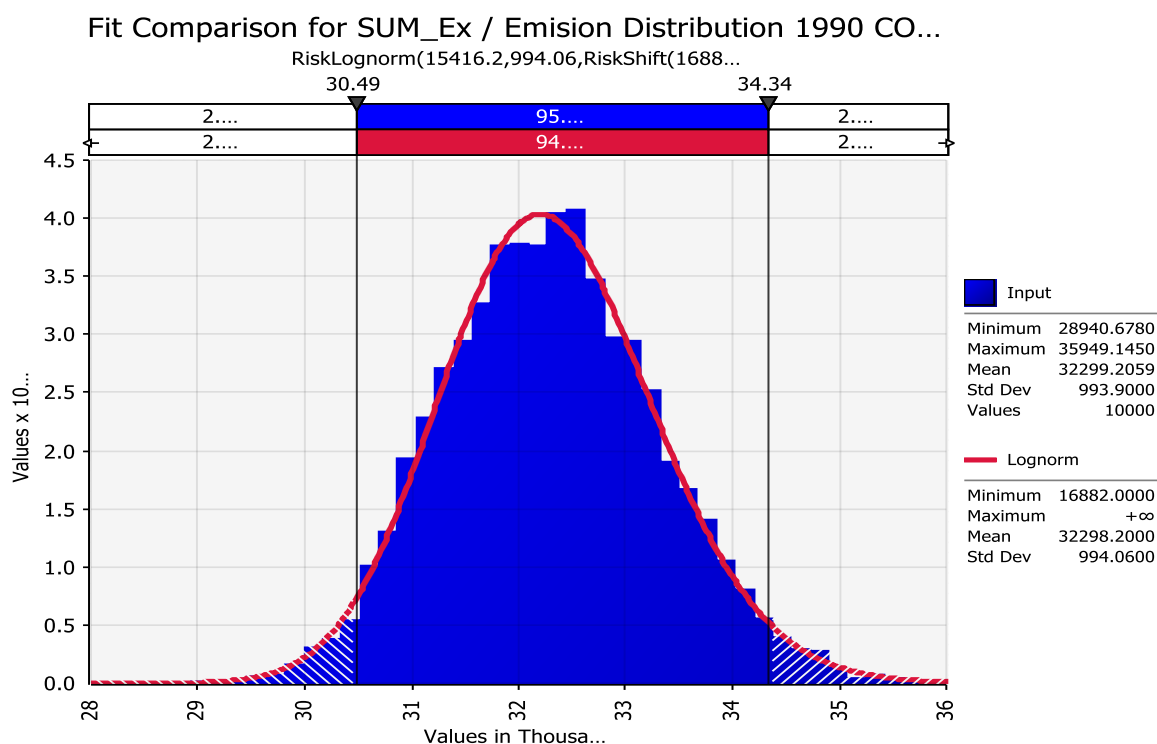


Figure A2.2-2 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

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:

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

The Inventory trend excluding LULUCF is -24.79%, simulated trend is -25.62% and the 95% probability range of the trend is -31.66% (2,5 percentile) to -19.11% (97.5 percentile).

Figure A2.2-3: Distribution of trend for year 2019 with the respect to year 1990

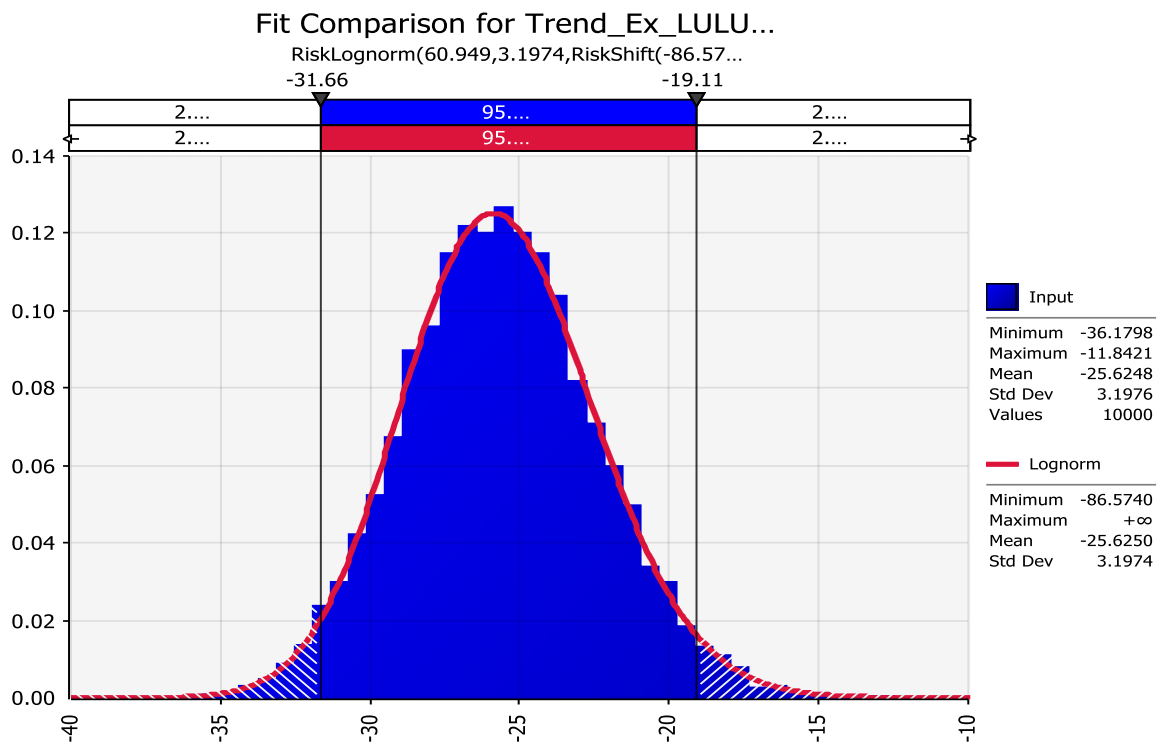


Figure A2.2-3: shows the distribution of trend for year 2019 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2.4. Uncertainty including LULUCF sector

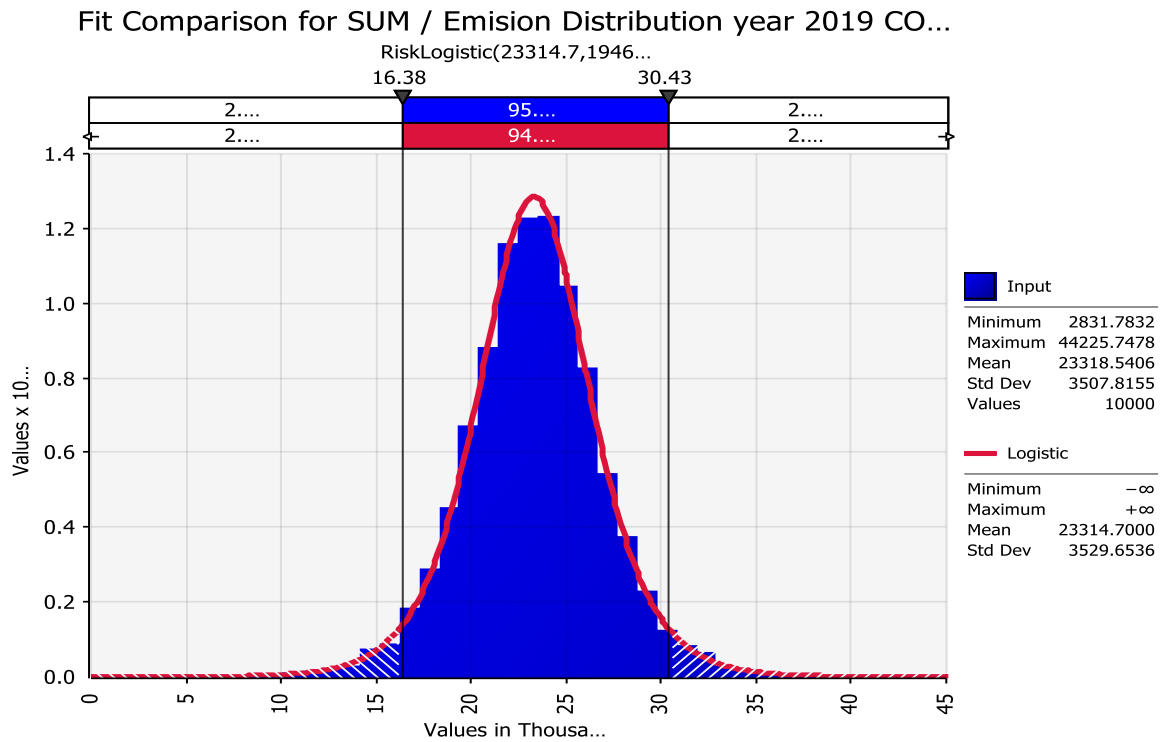
2.2.4.1. Uncertainty in the emissions including LULUCF

The estimations of CO₂eq emissions were 18,048.25 kt CO₂-eq for the year 2019 and 24,939.60 kt CO₂eq for the year 1990 with removals from LULUCF included.

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2019 (23,318.54 kt CO₂eq) according to simulation varies between 16,378.19 kt CO₂eq (2.5 percentile) and 30,425.79 kt CO₂eq (97.5 percentile).

Figure A2.2-4 shows the distribution of total CO₂ emission including LULUCF for year 2019 with a corresponding probability density function (red line) that best matches the simulation results.

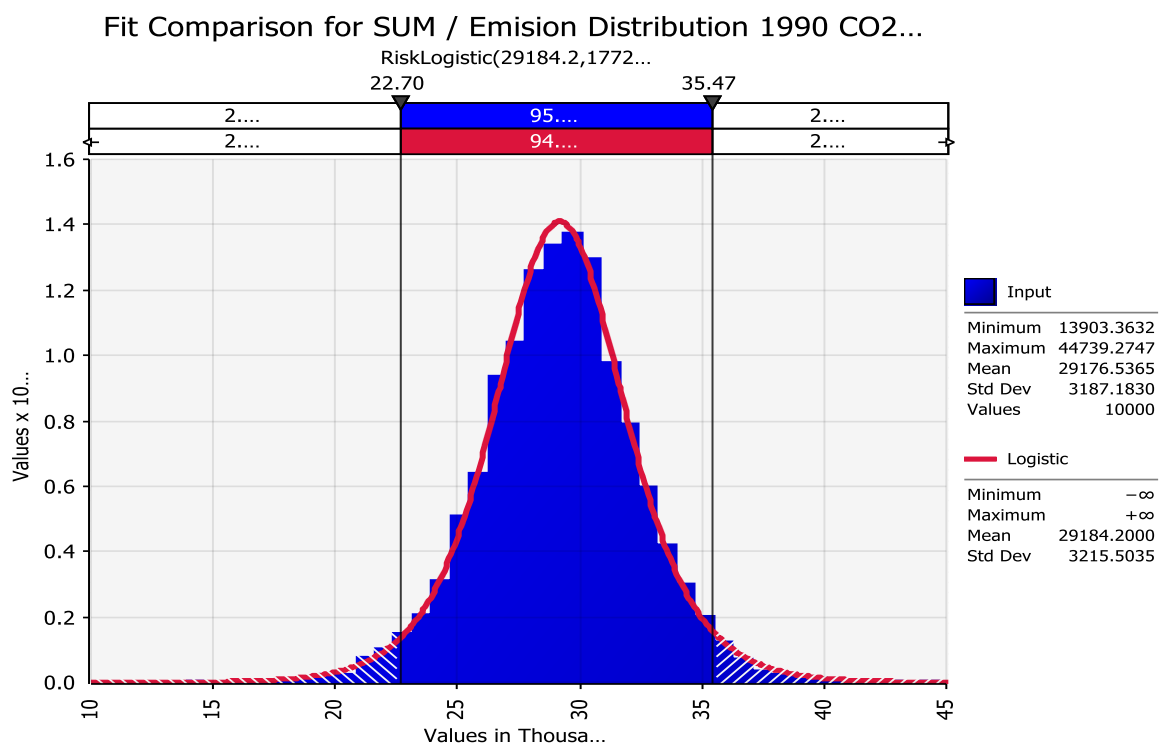
Figure A2.2-4: Distribution of total CO₂ emission for year 2019 including LULUCF



Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (29,176.54 kt CO₂eq) varies between 22,702.38 kt CO₂-eq (2.5 percentile) and 35,471.77 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

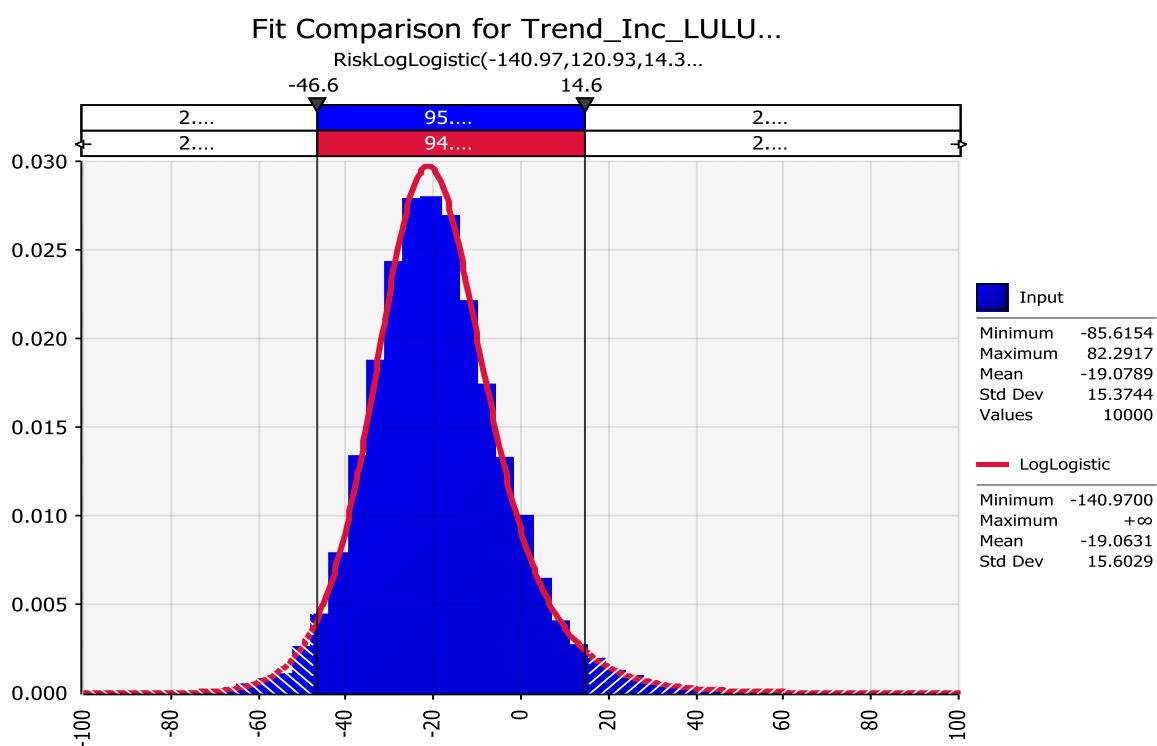
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following formula:

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

The Inventory trend including LULUCF is -27.63%, simulated trend is -19.08% and the 95% probability range of the trend is -46.59% (2.5 percentile) to 14.58% (97.5 percentile), so the uncertainty introduced in trend varies from -18.96% to 42.21% with respect to the base year emissions.

Figure A2.2-6: shows the distribution of trend for year 2019 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 2019 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=2019 (IPCC 2006 Table 3.3)

A IPCC category	B Gas	C	D	E		F		G		H	I	J		K
		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	617.408	-5	5	-5	5	-7.02	7.17	0.000041	-86.55	-1.28	1.41	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.696	0.381	-5	5	-50	50	-50.34	50.32	0.000000	-89.69	-5.60	12.47	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.815	0.981	-5	5	-200	200	-91.70	209.03	0.000000	-88.87	-10.44	160.02	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,305.720	-5	5	-5	5	-7.01	7.12	0.000181	119.40	-21.29	22.94	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.352	-5	5	-50	50	-50.30	50.60	0.000000	120.72	-121.84	269.67	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	6.293	-5	5	-200	200	-91.65	207.91	0.000002	120.72	-207.32	3266.56	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,880.045	1,957.316	-5	5	-5	5	-7.05	7.20	0.000411	4.11	-10.09	10.95	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.573	2.286	-5	5	-50	50	-50.08	50.86	0.000000	45.34	-79.73	177.45	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.737	7.443	-5	5	-200	200	-91.71	206.71	0.000003	29.73	-121.62	1924.10	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄		6.823	-5	5	-50	50	-49.87	50.11	0.000000				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O		10.811	-5	5	-200	200	-91.75	208.98	0.000006				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,096.390	913.037	-5	5	-5	5	-7.07	7.18	0.000090	-56.45	-4.20	4.54	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.029	0.800	-5	5	-50	50	-49.86	50.17	0.000000	-60.57	-21.71	49.24	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.815	1.894	-5	5	-200	200	-91.70	207.09	0.000000	-60.66	-36.71	518.73	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,536.292	357.692	-5	5	-5	5	-7.04	7.02	0.000014	-76.72	-2.26	2.41	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	3.807	0.913	-5	5	-50	50	-50.07	50.49	0.000000	-76.02	-13.16	29.22	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	6.806	1.632	-5	5	-200	200	-91.68	207.50	0.000000	-76.02	-22.49	353.35	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,575.900	988.947	-5	5	-5	5	-6.80	7.18	0.000102	-37.25	-5.94	6.46	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.703	0.441	-5	5	-50	50	-50.28	50.48	0.000000	-37.29	-33.90	76.41	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.838	0.525	-5	5	-200	200	-91.72	207.76	0.000000	-37.29	-58.70	919.90	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂		161.433	-5	5	-5	5	-7.04	7.21	0.000003				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄		0.847	-5	5	-50	50	-50.10	50.65	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O		1.346	-5	5	-200	200	-91.70	208.95	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.011	-5	5	-50	50	-49.71	50.18	0.000000	-62.57	-20.58	46.87	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.606	-5	5	-200	200	-91.70	208.38	0.000000	-62.57	-34.96	576.73	
1.A.3.a Domestic Aviation	CO ₂	6.601	32.051	-5	5	-5	5	-7.04	7.16	0.000000	385.55	-45.22	50.42	
1.A.3.a Domestic Aviation	CH ₄	0.001	0.006	-5	5	-50	50	-50.36	50.01	0.000000	385.24	-269.89	585.46	
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.267	-5	5	-200	200	-91.63	209.13	0.000000	385.24	-454.30	7663.72	
1.A.3.b Road Transportation	CO ₂	3,505.880	6,284.049	-5	5	-5	5	-7.02	7.10	0.004212	79.24	-17.08	18.72	
1.A.3.b Road Transportation	CH ₄	40.650	9.566	-5	5	-50	50	-50.30	50.30	0.000000	-76.47	-13.06	29.15	
1.A.3.b Road Transportation	N ₂ O	53.527	60.255	-5	5	-200	200	-91.72	208.34	0.000193	12.57	-105.02	1692.37	
1.A.3.c Railways	CO ₂	140.079	45.257	-5	5	-5	5	-6.91	7.14	0.000000	-67.69	-3.02	3.45	
1.A.3.c Railways	CH ₄	0.174	0.051	-5	5	-50	50	-50.12	50.57	0.000000	-70.92	-15.95	37.20	
1.A.3.c Railways	N ₂ O	13.248	5.205	-5	5	-200	200	-91.72	208.98	0.000001	-60.71	-36.76	618.71	
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.498	155.512	-5	5	-5	5	-7.05	7.13	0.000003	15.62	-11.20	12.00	

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 CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.367	-5	5	-50	50	-50.11	50.50	0.000000	15.85	-63.00	143.80	
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.080	1.251	-5	5	-200	200	-91.79	210.41	0.000000	15.84	-108.22	1691.83	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.506	1,028.995	-5	5	-5	5	-7.08	7.38	0.000113	-58.01	-4.13	4.38	
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.079	-5	5	-50	50	-50.08	50.19	0.000000	-67.16	-18.06	39.50	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	68.188	-5	5	-200	200	-91.73	208.50	0.000247	-22.65	-72.36	1158.04	
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.208	-5	5	-5	5	-6.94	7.17	0.000000	-98.24	-0.17	0.19	
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.696	-5	5	-50	50	-50.22	50.54	0.000000	-97.92	-1.14	2.59	
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.041	-5	5	-200	200	-91.63	208.35	0.000000	-98.26	-1.64	27.03	
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,620.716	-5	5	-5	5	-7.03	7.09	0.000275	117.82	-20.63	23.08	
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.611	-5	5	-50	50	-50.13	50.36	0.000000	116.25	-118.47	266.17	
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.861	-5	5	-200	200	-91.78	207.86	0.000000	53.97	-143.86	2169.85	
1.A.4 Other Sectors - Biomass	CH ₄	316.275	320.390	-5	5	-50	50	-50.17	50.24	0.000550	1.30	-56.06	124.94	
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	50.922	-5	5	-200	200	-91.71	208.05	0.000138	1.30	-94.97	1552.49	
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644												2
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	41.301											
1. Exploration	CO ₂	28.536	7.469	-5	5	-50	50	-50.09	50.29	0.000000	-73.83	-14.45	31.91	
2. Production(7)	CO ₂	129.245	33.829	-5	5	-50	50	-49.86	50.42	0.000006	-73.83	-14.30	32.01	
3. Transport	CO ₂	0.005	0.003	-5	5	-50	50	-49.91	50.42	0.000000	-30.19	-38.57	85.48	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.427	58.787											
1. Exploration	CH ₄	15.205	3.980	-5	5	-100	100	-84.24	101.46	0.000000	-73.83	-22.35	151.02	
2. Production(7)	CH ₄	199.531	52.225	-5	5	-100	100	-83.98	101.47	0.000051	-73.83	-22.43	147.75	
3. Transport	CH ₄	1.343	0.938	-5	5	-100	100	-84.35	101.02	0.000000	-30.19	-59.27	435.71	
4. Refining/storage	CH ₄	4.348	1.644	-5	5	-100	100	-84.33	101.19	0.000000	-62.18	-32.26	223.12	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	-5	5	-10	1000	-81.41	1113.30	0.000000	-73.83	-25.06	574.66	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	424.729	162.357											
2. Production(7)	CO ₂	418.423	159.045	-5	5	-100	100	-84.22	100.40	0.000474	-61.99	-32.75	233.15	
3. Processing	CO ₂	6.276	3.257	-5	5	-100	100	-84.35	100.50	0.000000	-48.10	-44.35	301.54	
4. Transmission and storage	CO ₂	0.011	0.012	-5	5	-100	100	-84.29	100.45	0.000000	8.24	-92.31	617.15	
5. Distribution	CO ₂	0.019	0.043	-5	5	-20	500	-88.90	545.37	0.000000	119.72	-209.69	4624.88	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	138.453	107.530											
2. Production(7)	CH ₄	66.445	34.488	-5	5	-100	100	-84.23	100.59	0.000022	-48.10	-44.59	309.85	
3. Processing	CH ₄	29.338	15.228	-5	5	-100	100	-84.18	101.21	0.000004	-48.10	-44.34	299.96	
4. Transmission and storage	CH ₄	32.239	34.896	-5	5	-100	100	-84.15	100.76	0.000023	8.24	-92.46	644.26	
5. Distribution	CH ₄	10.431	22.919	-5	5	-20	500	-88.94	543.70	0.000128	119.72	-210.45	4723.24	
1.B.2.c Venting and flaring	CO ₂	0.002	0.000											
1. Venting - Oil	CO ₂	0.002	0.000	-5	5	-100	100	-84.27	100.72	0.000000	-93.22	-5.77	38.69	
1.B.2.c Venting and flaring	CH ₄	0.590	0.040											
1. Venting - Oil	CH ₄	0.590	0.040	-5	5	-100	100	-84.21	100.70	0.000000	-93.22	-5.81	42.00	
1.B.2.c Venting and flaring	N ₂ O	0.630	0.163											
2. Flaring - Oil	N ₂ O	0.598	0.157	-5	5	-100	100	-84.16	100.34	0.000000	-73.83	-22.44	148.10	
2. Flaring - Gas	N ₂ O	0.032	0.006	-5	5	-100	100	-84.25	100.08	0.000000	-79.81	-17.26	113.08	
2.A.1 Cement Production	CO ₂	1,093.483	1,184.111	-2	2	-2	2	-2.83	2.80	0.000023	8.29	-25.32	46.88	
2.A.2 Lime Production	CO ₂	156.820	92.741	-2	2	-2	2	-2.82	2.81	0.000000	-40.86	-2.33	2.38	

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.A.3 Glass Production	CO ₂	43.216	29.404	-2	2	-2	2	-2.84	2.83	0.000000	-31.96	-2.73	2.74	
2.A.4 Other Process Uses of Carbonates	CO ₂	9.146	18.683											
2.A.4.a Ceramics	CO ₂	9.146	4.219	-2	2	-3	3	-3.52	3.62	0.000000	-53.87	-2.31	2.36	
2.A.4.d Other	CO ₂		14.464	-2	2	-3	3	-3.59	3.65	0.000000				
2.B.1 Ammonia Production	CO ₂	558.672	594.603	-2	2	-2	2	-2.84	2.84	0.000006	6.43	-4.19	4.39	5
2.B.2 Nitric Acid Production	N ₂ O	754.265	50.099	-2	2	-2	2	-2.83	2.86	0.000000	-93.36	-1.12	1.68	
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	-											
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	5.447												
2.B.8.b Ethylene	CH ₄	5.447												
2.C.1 Iron and Steel Production	CO ₂	43.808	4.912											
2.C.1.a Steel	CO ₂	19.505	4.530	-5	5	-5	5	-7.04	7.15	0.000000	-76.78	-3.38	4.11	
2.C.2 Ferroalloys Production	CO ₂	173.798												
2.C.2 Ferroalloys Production	CH ₄	3.899												
2.C.2 Ferroalloys Production	CO ₂	173.798												2
2.C.2 Ferroalloys Production	CH ₄	3.899												2
2.C.3 Aluminium Production	CO ₂	118.797												
2.C.3.a CO2 Emissions	CO ₂	118.797												2
2.C.3 Aluminium Production	PFCs	1,240.239												
2.C.3.b By-Product Emission\CF4	PFCs	877.908												2
2.C.3.b By-Product Emission\C2F6	PFCs	362.330												2
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	174.107	96.414											
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO ₂	31.217	17.269	-5	5	-50	50	-50.12	49.80	0.000002	-44.68	-30.25	66.30	
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO ₂	10.374	3.537	-5	5	-50	50	-50.00	50.28	0.000000	-65.91	-18.62	40.79	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use	CO ₂	132.492	68.560	NA	NA	-50	50	-40.78	58.47	0.000025	-48.25	-26.31	51.54	4
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt	CO ₂	0.015	0.065	-10	10	-50	50	-50.20	51.95	0.000000	340.97	-247.40	549.61	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC	CO ₂		6.976	-5	5	-5	5	-7.00	7.27	0.000000				
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing	CO ₂	0.009	0.007	-10	10	-50	50	-50.22	51.56	0.000000	-22.89	-42.52	94.96	
2.F.1 Refrigeration and Air conditioning	F-gases		538.623											
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a		86.781	-50	50	-50	50	-71.17	39.07	0.000049				2
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125		58.026	-50	50	-50	50	-71.35	39.27	0.000022				2
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a		7.308	-50	50	-50	50	-71.27	40.74	0.000000				2
2.F.1.a Commercial Refrigeration\HFC-32	HFC-32	-	0.090	-50	50	-50	50	-70.50	38.59	0.000000				2
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a		0.213	-50	50	-50	50	-62.91	80.39	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a		3.807	-50	50	-50	50	-73.33	25.89	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125		27.477	-50	50	-50	50	-72.95	27.18	0.000004				2
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a		31.295	-50	50	-50	50	-73.39	24.57	0.000005				2
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32		1.192	-50	50	-50	50	-73.78	26.85	0.000000				2
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a		10.773	-50	50	-50	50	-61.71	80.38	0.000001				2

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.F.1.d Transport Refrigeration\HFC-125	HFC-125	-	37.522	-50	50	-50	50	-62.17	79.89	0.000016				2
2.F.1.d Transport Refrigeration\HFC-143a	HFC-143a	-	56.634	-50	50	-50	50	-62.33	80.95	0.000036				2
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a		120.053	-50	50	-50	50	-62.00	79.17	0.000156				2
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32		14.461	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125		76.062	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a		6.321	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-143a	HFC-143a	-	0.608	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-152a	HFC-152a	-	0.000	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.3 Fire Protection	F-gases		5.411											
2.F.3 Fire Protection\HFC-125	HFC-125		0.526	-50	50	-50	50	-62.36	79.43	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-227ea		4.002	-50	50	-50	50	-62.00	79.27	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-236fa		0.883	-50	50	-50	50	-62.58	80.70	0.000000				2
2.F.4 Aerosols	F-gases		8.568											
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a	HFC-134a		8.568	-50	50	-50	50	-62.35	80.59	0.000001				2
2.G Other Product Manufacture and Use	N₂O	33.376	106.124											
2.G.3 N ₂ O from Product Uses\2.G.3.a Medical Applications	N ₂ O	32.780	106.088	-50	50	-1	1	-50.02	50.07	0.000060	223.64	-180.28	403.81	
2.G.3 N ₂ O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products	N ₂ O	0.596	0.036	-50	50	-1	1	-49.94	50.00	0.000000	-94.00	-3.30	7.12	2
2.G Other Product Manufacture and Use	F-gases	10.450	5.376											
2.G.1 Electrical Equipment\SF ₆	SF ₆	10.450	5.376	-50	50	-50	50	-96.12	-82.02	0.000000	-48.55	-34.73	107.13	
3.A Enteric Fermentation	CH₄	2,121.150	994.693											
Mature dairy cattle	CH ₄	1,353.450	362.678	-30	30	-20	20	-34.29	37.86	0.000365	-73.20	-11.04	18.71	
Other mature cattle	CH ₄	64.266	49.909	-10	10	-20	20	-21.53	22.89	0.000003	-22.34	-21.02	28.97	
Growing cattle	CH ₄	450.021	388.608	-10	10	-20	20	-22.00	23.00	0.000160	-13.65	-23.81	32.75	
Sheep	CH ₄	150.200	131.439	-10	10	-20	20	-22.12	22.95	0.000018	-12.49	-24.27	32.86	
Market swine	CH ₄	50.288	33.556	-10	10	-20	20	-86.04	-78.00	0.000000	-33.27	-58.09	-50.30	
Breeding swine	CH ₄	8.700	6.001	-10	10	-20	20	337.57	587.94	0.000001	-31.03	211.56	462.24	
Goats	CH ₄	21.500	10.193	-10	10	-20	20	-21.84	22.85	0.000000	-52.59	-13.11	17.85	
Horses	CH ₄	17.550	11.115	-30	30	-20	20	-33.92	38.14	0.000000	-36.67	-26.35	42.94	
Mules and Asses	CH ₄	4.250	1.025	-30	30	-20	20	-34.61	37.78	0.000000	-75.88	-9.86	16.32	
Rabbits	CH ₄	0.926	0.169	-30	30	-20	20	-33.62	39.22	0.000000	-81.79	-7.44	12.67	
3.B Manure Management	CH₄	427.105	386.193											
Mature dairy cattle	CH ₄	160.320	122.516	-30	30	-20	20	-34.09	37.94	0.000042	-23.58	-30.99	52.65	
Other mature cattle	CH ₄	7.652	8.251	-10	10	-20	20	-21.96	23.12	0.000000	7.82	-29.68	40.37	
Growing cattle	CH ₄	55.644	66.715	-10	10	-20	20	-21.91	22.85	0.000005	19.90	-32.94	44.71	
Sheep	CH ₄	4.013	3.603	-10	10	-20	20	-21.68	23.09	0.000000	-10.21	-24.83	33.39	
Market swine	CH ₄	29.919	33.935	-10	10	-20	20	-21.67	22.86	0.000001	13.43	-31.21	42.37	
Breeding swine	CH ₄	137.244	137.761	-10	10	-20	20	-21.87	23.01	0.000020	0.38	-27.13	38.34	
Goats	CH ₄	0.585	0.283	-10	10	-20	20	-21.72	22.80	0.000000	-51.67	-13.58	18.55	
Horses	CH ₄	1.981	1.254	-30	30	-20	20	-33.91	37.63	0.000000	-36.67	-26.03	43.74	
Mules and Asses	CH ₄	0.355	0.086	-30	30	-20	20	-33.84	37.90	0.000000	-75.88	-9.88	17.40	
Poultry	CH ₄	28.468	11.621	-10	10	-20	20	-21.80	22.81	0.000000	-59.18	-11.25	15.56	
Rabbits	CH ₄	0.926	0.169	-30	30	-20	20	-34.04	38.75	0.000000	-81.79	-7.42	12.42	

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3.B Manure Management	N ₂ O	329.052	147.161											
Mature dairy cattle	N ₂ O	74.123	11.316	-30	30	-50	100	-84.42	112.77	0.000003	-84.73	-13.21	93.96	
Other mature cattle	N ₂ O	5.047	2.283	-10	10	-50	100	-84.11	101.58	0.000000	-54.77	-38.64	273.59	
Growing cattle	N ₂ O	20.149	10.524	-10	10	-50	100	-84.36	102.93	0.000002	-47.77	-44.83	307.14	
Sheep	N ₂ O	3.969	4.168	-10	10	-50	100	-84.36	100.08	0.000000	5.01	-89.49	628.55	
Market swine	N ₂ O	9.563	1.838	-10	10	-50	100	-84.41	102.30	0.000000	-80.78	-16.58	108.55	
Breeding swine	N ₂ O	14.028	1.509	-10	10	-50	100	-84.29	102.17	0.000000	-89.25	-9.18	65.43	
Goats	N ₂ O	0.217	0.172	-10	10	-50	100	-84.44	101.74	0.000000	-20.99	-67.42	475.32	
Horses	N ₂ O	0.980	0.621	-30	30	-50	100	-84.45	113.41	0.000000	-36.67	-54.44	403.21	
Mules and Asses	N ₂ O	0.049	0.012	-30	30	-50	100	-84.90	112.25	0.000000	-75.88	-20.90	156.42	
Poultry	N ₂ O	22.856	14.173	-10	10	-50	100	-84.18	102.67	0.000004	-37.99	-52.89	377.42	
Rabbits	N ₂ O	8.782	8.782	-30	30	-50	100	-84.70	113.96	0.000002	0.00	-86.26	595.00	
Indirect N2O emission	N ₂ O	169.289	91.764											
Total N volatilised as NH3 and NOx	N ₂ O	169.289	91.764	-10	10	-30	30	-32.54	29.23	0.000017	-45.79	-19.85	31.92	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,075.891	829.037											
Inorganic N fertilizers	N ₂ O	503.002	456.670	-20	20	-70	200	-91.76	213.80	0.011492	-9.21	-85.50	1461.71	
Organic N fertilizers	N ₂ O	238.484	123.512	-10	10	-30	30	-30.81	32.04	0.000033	-48.21	-36.36	573.99	
Urine and dung deposited by grazing animals	N ₂ O	136.971	56.901	-10	10	-50	150	-90.64	154.39	0.000112	-58.46	-38.26	472.95	
Crop residues	N ₂ O	187.207	172.204	-20	20	-70	200	-91.70	214.60	0.001633	-8.01	-86.23	1365.03	
Mineralization/immobilization associated with loss/gain of soil organic matter	N ₂ O	0.167	9.689	-20	20	-30	30	-34.28	38.67	0.000000	5700.61	-4153.26	62908.33	
Cultivation of organic soils	N ₂ O	10.061	10.061	-10	10	-500	500	-88.86	546.14	0.000025	0.00	-95.71	2150.16	
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	349.801	264.044											
Atmospheric deposition	N ₂ O	118.143	80.820	-20	20	-250	250	-91.74	269.51	0.000507	-31.59	-64.77	1153.74	
Nitrogen leaching and run-off	N ₂ O	231.658	183.224	-20	20	-400	400	-90.51	447.16	0.005731	-20.91	-75.21	1560.32	
3.G Liming	CO ₂		3.381	-50	50	-50	50	-62.22	81.15	0.000000				
3.H Urea Application	CO ₂	50.020	73.592	-20	20	-50	0	-20.01	19.98	0.000005	47.13	-37.10	50.86	
4.A.1 Forest Land Remaining Forest Land	CO ₂	- 6,730.631	- 5,553.748					-48.68	191.78	0.894107	-17.49	-746.81	650.78	1, 3
4.A.2 Land Converted to Forest Land	CO ₂	- 28.890	- 268.631					-179.82	170.65	0.004439	829.85	-2206.85	3357.40	1, 3
4.B.1 Cropland Remaining Cropland	CO ₂	199.640	378.967					-319.61	243.44	0.022803	89.83	-1460.23	1113.05	1, 3
4.B.2 Land Converted to Cropland	CO ₂	23.135	67.539					-531.59	386.33	0.001921	191.94	-1775.81	1020.74	1, 3
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069					-95.82	95.69	0.000000	0.00	-146.20	426.81	1, 3
4.C.2 Land Converted to Grassland	CO ₂	- 9.952	- 308.857					-61.03	193.38	0.003089	3003.49	-4499.47	-1625.37	1, 3
4.D.2 Land Converted to Wetlands	CO ₂	83.466	12.428					-192.89	423.81	0.000029	-85.11	-140.60	239.44	1, 3
4.E.2 Land Converted to Settlements	CO ₂	250.713	678.963					-93.40	137.45	0.012286	170.81	-259.42	1090.39	1, 3
4.G Harvested Wood Products	CO ₂	- 301.544	- 722.257					-87.07	132.10	0.000529	139.52	-456.59	-162.37	1, 3
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	47.233	121.020					-882.64	704.69	0.018465	156.22	-2856.57	2143.49	1, 3
4(V) Biomass Burning	CO ₂	14.979	31.269					58.97	182.49	0.000007	108.76	293.01	1003.44	1, 3
4(V) Biomass Burning	CH ₄	1.230	2.617					-148.69	363.34	0.000000	112.72	150.93	2546.30	1, 3
4(V) Biomass Burning	N ₂ O	0.858	1.845					-140.28	383.39	0.000000	114.99	221.32	1604.09	1, 3
5.A Solid Waste Disposal	CH ₄	326.422	1,203.380											
5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH ₄	16.160	1,127.729	-50	50	-50	50	-62.45	79.67	0.013806	6878.74	-4720.71	14413.79	
5.A.2 Unmanaged Waste Disposal Sites	CH ₄	310.262	75.650	-50	50	-50	50	-62.71	80.64	0.000063	-75.62	-16.47	51.56	
5.B Biological Treatment of Solid Waste	CH ₄		4.961											

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 CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
5.B Biological Treatment of Soild Waste\5.B.1 Composting	CH ₄		4.961	-50	50	-100	100	-85.85	130.93	0.000001				2
5.B Biological Treatment of Soild Waste	N₂O		3.548											
5.B Biological Treatment of Soild Waste\5.B.1 Composting	N ₂ O		3.548	-50	50	-110	110	-87.49	136.66	0.000000				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.D Wastewater Treatment and Discharge	CH₄	588.877	450.926											
5.D.1 Domestic wastewater	CH ₄	492.336	333.662	-30	30	-30	30	-39.13	45.27	0.000427	-32.23	-31.13	58.28	
5.D.2 Industrial wastewater	CH ₄	96.541	117.263	-30	30	-30	30	-39.47	44.91	0.000053	21.46	-56.51	101.68	
5.D Wastewater Treatment and Discharge	N₂O	66.884	91.362											
5.D.1 Domestic wastewater	N ₂ O	66.884	91.362	-50	50	-50	50	-62.33	80.78	0.000093	36.60	-91.32	283.88	
TOTAL	CO2eq	24,939.598	18,048.246					-9.25	68.58	1.000002	-27.63	-18.96	42.21	

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 emissions

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	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fuel consumption	UNIT													
Hard coal	1000 t	253.70	569.80	887.50	915.60	957.10	855.50	932.60	919.00	872.90	973.90	526.90	492.10	579.80
Fuel oil	1000 t	570.40	283.40	284.00	15.10	58.50	60.10	18.90	1.60	10.60	0.00	0.00	0.00	0.00
Light heating oil	1000 t	0.30	0.20	3.00	0.90	0.90	1.20	0.90	1.00	2.10	1.10	1.20	0.90	0.80
Natural gas	1000000 m3	201.70	155.80	36.30	24.00	27.00	14.00	2.70	0.60	52.50	66.10	5.30	0.50	0.50
Coke oven gas	1000000 m3	24.50												
Biogas	PJ			0.11	0.02	0.00	0.01	0.17	0.39	0.25	0.26	0.31	0.31	0.35
Other biomass	PJ				0.00	0.00	0.00	0.00	0.00	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	24.25	24.35	24.96	24.64	25.00	24.95	24.85	25.00	24.28
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	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	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64
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	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass														
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EF CO2 t/TJ	t/TJ													
EF CO2 -Hard coal	t/TJ	93.31	93.31	93.31	93.31	93.31	93.31	93.74	93.96	92.69	93.39	92.76	92.70	92.75
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	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	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.28	55.28	55.28	55.28	55.28	55.28	55.00	55.10	55.56	55.43	55.32	55.41	55.49
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	4.00	4.00	4.00	4.00	4.00

Table A3-2: 1A1aii - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fuel consumption	UNIT													
Hard coal	1000 t													
Fuel oil	1000 t	118.00	108.60	162.00	108.30	90.90	49.60	27.40	26.80	35.80	0.00	34.10	0.00	0.00
Light heating oil	1000 t	0.00	0.90	1.50	0.10	0.00	0.60	0.00	0.00	0.00	0.00	0.50	0.00	0.20
Natural gas	1000000 m3	315.50	363.40	479.00	649.90	652.10	673.90	580.40	352.10	343.70	407.90	745.60	583.00	636.10
Coke oven gas	1000000 m3													
Biogas	PJ				0.14	0.17	0.34	0.41	0.48	1.07	1.50	2.22	2.64	2.94
Other biomass	TJ				1.90	803.20	1003.50	1146.10	1190.30	2189.00	3730.20	4244.80	7004.10	8984.20
Net calorific values														
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	24.35	24.96	24.64	25.00	24.95	24.85	25.00	24.28
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	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	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64
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	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	1.00	1.00	1.00	1.00	1.00
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	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	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	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.26	55.26	55.26	55.26	55.26	55.26	55.26	55.16	55.25	55.32	55.33	55.43	55.43
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	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	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	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	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	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	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	3.67	2.73	2.87	3.67	3.58	3.51	3.24	2.25	2.42	2.81	3.55	2.61	3.56
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	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	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	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	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	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	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	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	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	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	4.00	4.00	4.00	4.00	4.00

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

ACTIVITY DATA		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fuel consumption	UNIT														
Hard coal	1000 t					0.00	0.00	0.00	0.00						
Fuel oil	1000 t	0.00	35.60	#REF!	39.00	23.20	23.50	13.70	4.50	2.90	3.70	3.70	2.60	2.50	1.90
Light heating oil	1000 t	0.00	6.00	4.40	6.70	4.90	5.30	3.10	3.70	3.10	3.90	3.70	4.20	2.90	2.30
Natural gas	1000000 m3	0.00	36.20	53.00	71.30	86.50	76.00	76.60	85.90	71.60	72.40	71.00	54.80	53.80	51.80
Coke oven gas	1000000 m3														
Biogas	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
Other biomass	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0028
Gas works gas	1000000 m3				1.46										
Liquified petroleum gas	1000 t	0.00	1.50												
Net calorific values															
NCV for hard coal	MJ/kg	25.14	27.63	25.58	25.10	24.13	24.25	24.35	24.96						
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	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	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	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64
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	1000.00	1000.00
NCV for other biomass	TJ/PJ					1000.00	1000.00	1000.00	1000.00	1000.00	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	46.89												
EMISSION FACTORS															
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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0.10	0.10	0.10	0.10	0.10	0.10

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

Refining - transformation		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Fuel consumption											
Fuel oil (1000 t)	1000 t	355.04	300.70	239.40	254.00	244.30	134.10	131.60	114.10	102.00	70.30
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	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	35.00	2.20	9.50	0.00	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	46.89	46.89
Petroleum coke (1000 t)	1000 t	53.69	42.60	63.00	70.70	55.90	31.30	35.60	37.90	24.00	19.70
NCV for petroleum coke (MJ/kg)	MJ/kg	29.31	29.31	29.31	31.00	31.00	31.00	31.00	31.00	31.00	31.00
Refinery gas (1000 t)	1000 t	405.94	224.20	262.40	241.10	161.50	208.10	155.30	184.70	187.00	129.20
NCV for refinery gas (MJ/kg)	MJ/kg	48.57	48.57	48.57	48.57	48.57	42.60	42.60	42.60	42.60	42.60
Natural gas (1000000 m3)	1000 t	7.31	7.10	0.20	1.20	27.10	183.30	199.80	214.10	237.50	200.50
NCV for natural gas (MJ/m3)	MJ/kg	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64
Total fuel consumption (TJ)	TJ	35844.4	26105.7	24322.7	24596.4	20316.8	21567.0	19961.4	21058.1	21036.6	15885.3
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	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	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	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	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	56.10	56.10
CO2 Emission (Gg)	Gg	2,424.74	1,813.32	1,683.27	1,729.54	1,448.87	1,387.39	1,298.59	1,350.64	1,317.29	990.69
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	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	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	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	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	1.00	1.00
CH4 Emission (Mg)	Mg	64.38	50.28	43.57	45.01	39.95	32.35	30.54	30.23	29.24	21.54
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	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	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	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	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	0.10	0.10
N2O Emission (Mg)	Mg	12.92	10.40	9.83	10.63	9.37	6.21	6.19	6.04	5.19	3.86

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
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)		0.10								
NCV for light heating oil (MJ/kg)		42.71								
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	4.27	0.00	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	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	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	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	56.10	56.10
CO2 Emission (Gg)	85.40	0.32	0.00	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	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	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	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	1.00	1.00
CH4 Emission (Mg)	1.92	0.01	0.00	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	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	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	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	0.10	0.10
N2O Emission (Mg)	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Fuel consumption										
LPG (1000 t)	11.87	0.00	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	0.70	7.10	5.50						
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71						
Natural gas (1000000 m3)	413.80	229.70	164.50	175.50	241.70	121.30	102.90	112.20	105.60	125.90
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Total fuel consumption (TJ)	14,657.46	7,839.70	5,943.13	6,201.91	8,217.80	4,196.98	3,580.92	3,893.34	3,657.98	4,361.18
Emissions										
EF CO2 - LPG (t/TJ)	63.10	63.10	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	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	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	56.10	56.10
CO2 Emission (Gg)	826.75	440.35	339.20	352.16	461.02	235.45	200.89	218.42	205.21	244.66
EF CH4 - LPG (kg/TJ)	1.00	1.00	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	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	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	1.00	1.00
CH4 Emission (Mg)	14.72	7.90	6.55	6.67	8.22	4.20	3.58	3.89	3.66	4.36
EF N2O - LPG (kg/TJ)	0.10	0.10	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	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	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	0.10	0.10
N2O Emission (Mg)	1.48	0.80	0.75	0.74	0.82	0.42	0.36	0.39	0.37	0.44

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
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	0.40							
NCV for light heating oil (MJ/kg)		42.71	42.71							
Natural gas (1000000 m3)		1.10	0.50							
NCV for natural gas (MJ/m3)		34.00	34.00							
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Biogas						26.54	26.93	27.50	19.40	20.71
NCV for biogas (TJ/TJ)						1.00	1.00	1.00	1.00	1.00
Total fuel consumption (TJ)	0.00	54.48	34.08	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	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	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	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	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	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	54.60	54.60
CO2 Emission (Gg)	0.00	3.36	2.22	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	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	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	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	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	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	1.00	1.00
CH4 Emission (Mg)	0.00	0.09	0.07	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	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	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	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	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	0.10	0.10
N2O Emission (Mg)	0.00	0.01	0.01	0.00	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	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	7.474	0	0	0	0.6	0.9	0.1	0	3.1	1.6
Coking coal (kameni ugljen)	10 ³ t	0	0	0	1	0	1.8	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	18.248	0.9	0	0	0	0	0	0	0	0
Lignite	10 ³ t	9.349	1.5	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	119.957	53.1	25.2	22.9	35	17.5	13	13.8	18.1	16.3
Wood	10 ³ m ³	0	0	0		0.8	0.5	0.4	0.3	0.4	0.2
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	3.2	3.1	2.2
Briketi ugljena	10 ³ t	0	0	0							
Coke oven coke	10 ³ t	179.937	16.4	11.8	4.3	3.7	0.6	0.3	0.3	1	0.3
Liquified petroleum gas	10 ³ t	3.554	1.5	2.1	4.2	1.4	0.8	0.8	1.1	0.9	0.7
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	12.907	4	4	2.7	0.9	0.6	0.5	0.7	0.7	0.6
Residual fuel oil	10 ³ t	42.516	6.1	1.5	2.7	1.2	1.1	1	0.9	0.4	0
Petroleum coke	10 ³ t	8.602	0	0	0	0.7	0.3	0.1	0.3	0.3	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	418.079	0	0							
Koksnji plin	10 ³ m ³	0	0	0							
Gas works gas	10 ³ m ³	0	1.62	0	0.031	0	0	0	0	0	0

1A2b Non-Ferrous metals											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	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	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0.2	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	0	0	5	1	0.4	2.6	2.6	9.4	12	12.5
Wood	10 ³ m ³	0	0	0		0.6	0.2	0.4	0.4	0.3	0.3
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	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	0.2	0	0	0
Liquified petroleum gas	10 ³ t	1.534	0.5	1.1	2.1	3.1	0.8	0.5	0.6	0.8	0.7
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0
Petroleum	10 ³ t						0.2	0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	2.818	2.2	1	0.2	0.1	0.9	1.1	0.2	0.1	0.2
Residual fuel oil	10 ³ t	1.077	0.7	0.3	4	1.2	0	0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0.3	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksnji plin	10 ³ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2c Chemicals											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	0	0	0.2	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	1.2	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	43.77	21.9	1.2	0	0	0	0	0	0	0
Lignite	10 ³ t	27.507	25.3	0.6	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	181.214	152.2	186.5	183.1	227.6	146.9	145.8	166.2	138.5	147
Wood	10 ³ m ³	0	0	0		0.1	0	0	0	0	0
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0	0.2
Briketi ugljena	10 ³ t	0	0	0							
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0.724	8.8	6.9	0	0.1	0	0	0	0	0
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0
Petroleum	10 ³ t						2.4	3.5	2.6	2.9	1.6
Diesel	10 ³ t	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	3.868	2.3	2	0.5	0.4	0.5	0.2	0.2	0.4	0.4
Residual fuel oil	10 ³ t	89.079	89.3	102.8	73	3.6	0	0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0.7	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ³ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0	0	0

1A2d Pulp, paper and print											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	0	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	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	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	92.536	74.4	75	69.2	68.8	27.6	45.6	46.6	46.4	55.5
Wood	10 ³ m ³	0	0	0		13.2	0.1	0	3.1	0	0
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	81.9	0	1.4	169.4	151.8	20	1.2	22.4	97.5	79.3
Briketi ugljena	10 ³ t	0	0	0							
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0	0	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	0.405	1.2	0.9	1.6	0.1	0	0	0	0	0
Residual fuel oil	10 ³ t	18.364	12.2	2.4	11.9	9.5	5.2	5.2	1.8	0.7	0.7
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ³ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	0	0	0.031	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2e Food Processing, Beverages and Tobacco											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	0	0	0	0.7	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0.426	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	89.92	65.4	23.9	47.7	39.9	34	39.8	37.8	28.1	22.8
Lignite	10 ³ t	35.745	29	11.2	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	92.34	100.7	101.6	173	166.6	114.7	120.9	114.3	113.2	121.4
Wood	10 ³ m ³	0	0	0		0.5	13.5	10.9	2.7	2.4	2.1
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	149.4	219.4	253.7
Briketi ugljena	10 ³ t	0.16	0	0							
Coke oven coke	10 ³ t	6.841	4.4	2.3	9.6	6.4	4	4.5	4.7	3.5	2.4
Liquified petroleum gas	10 ³ t	1.09	0.8	0.8	1.6	1.3	1.4	1.2	1.2	1.1	0.9
Motor Gasoline	10 ³ t	0	0	0		0		0	0	0	0
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	36.196	18.3	15.2	13.3	10	8.7	7.1	6.5	6.3	6.4
Residual fuel oil	10 ³ t	72.165	53.1	40.3	32.4	22.9	9.1	11.4	8.3	9.2	8.9
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ⁶ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	6.1	0	0	0.1099	0	0	0	0	0	0

1A2f Non-Metallic Minerals											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	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	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	121.384	66.7	52.6	73.4	56.4	41.8	47.8	53.4	51.3	50.5
Wood	10 ³ m ³	0	0	0		0	0	0	0	0	0
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0.7	0.9	0.6
Briketi ugljena	10 ³ t	0	0	0							
Coke oven coke	10 ³ t	6.804	6.8	7.2	7.7	0.1	0	0	0	0	0
Liquified petroleum gas	10 ³ t	6.567	3.1	3	2.2	0.2	0.2	0.2	0.2	0.3	0.2
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	0.1	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	1.627	0.4	0.4	2.7	0	0	0	0	0	0
Residual fuel oil	10 ³ t	6.093	5.3	2.3	3.8	2.2	0	0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	5.4	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ⁶ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	1.01	3.3	0.923	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	99.727	5	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	40.732	40.9	53.2	168.3	193.4	74.7	46.3	57.2	53.4	76.9
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	18.129	5.7	3	5	1.1	2.7	2.7	1.9	1	1.1
Lignite	10 ³ t	0.065	0.1	2.5	0	0	0	0	0.1	0.1	0
Natural gas	10 ⁶ m ³	137.217	111.6	178.9	124.4	76.4	40.7	38.4	52	56.8	58
Wood	10 ³ m ³	0	0	0		0.3	0.9	2.3	1.9	9.7	4.6
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	0	0	57.8	0	370.6	289	31.9	70.5	67.8	72.5
Briketi ugljena	10 ³ t	2.829	0	0							
Coke oven coke	10 ³ t	3.64	2.6	16.1	0	17.3	20.6	24.2	26.6	26.2	28.7
Liquified petroleum gas	10 ³ t	0	0.1	3.3	4.6	3.2	1.6	1.4	1.4	1.3	1.2
Motor Gasoline	10 ³ t	0	0	0		0	0	0	0	0	0.1
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	15	14.3	11.1	10.4	11.5	12.3	13.1
Gas/Diesel oil	10 ³ t	17.142	12	34	7	4.3	2.7	2.8	3.4	3	2.7
Residual fuel oil	10 ³ t	127.115	73.3	135	53.1	7.3	3.9	3	3.1	2.8	3
Petroleum coke	10 ³ t	0	0	0	171.6	115.3	167.2	169.8	202	195.3	142.5
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	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ³ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	0	0	0	0	0	0	0	0	0
Industrial waste-non ren.	TJ					319.1	390	413.4	482.7	817.7	1128.9

1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo)											
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	10 ³ t	0	0	0	0	0	0	0	0.3	0	0
Coking coal (kameni ugljen)	10 ³ t	0.794	1	0	0	0	0	0	0	0.3	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	48.369	1.9	0.1	4.2	0	0	0	0	0	0
Lignite	10 ³ t	0.431	0.4	0.1	0.2	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	79.309	74.2	55	65.3	54.4	44.2	42.5	47.4	48.6	47.7
Wood	10 ³ m ³	0	0	0		39.4	27.4	31.7	33.8	35.5	32.8
Biogas	TJ	0	0	0		0	0	0	0	0	0
Wood waste	TJ	3518.1	2450	2224.4	2087.5	1456.677	579	371.5	715.3	590.7	579
Briketi ugljena	10 ³ t	0.311	0	0							
Coke oven coke	10 ³ t	2.549	1.2	0.3	1	0.1	0	0	0	0	0
Liquified petroleum gas	10 ³ t	3.317	2.2	3.2	8	6.8	5.7	5.5	6.4	6.4	6
Motor Gasoline	10 ³ t	0	0	0	6.9	5.1	4	4.1	3.8	3.2	3.6
Petroleum	10 ³ t						0	0	0	0	0
Diesel	10 ³ t	0	0	0	110.6	102.2	79.2	76.9	76.2	83.9	89.1
Gas/Diesel oil	10 ³ t	17.87	7.1	7.6	23	12.2	8.7	8.3	9.8	9.4	10
Residual fuel oil	10 ³ t	59.519	29.7	19.4	17.7	8.4	3.8	3.5	2.4	3	3.1
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10 ³ t	0	0	0		0	0	0	0	0	0
Visokopećni plin	10 ⁶ m ³	0	0	0							
Koksni plin	10 ³ m ³	0	0	0							
Gas works gas	10 ⁶ m ³	0	7.21	3.5	2.456	0	0	0	0	0	0

1A2g vii Off-road vehicles and other machinery											
Fuel consumption	Jedinica	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Motor gasoline	10 ³ t	0.2	8.5	7.6	6.9	5.1	4	4.1	3.8	3.2	3.7
Diesel	10 ³ t	137.1	43.6	66.1	125.7	116.5	90.3	87.3	87.7	96.2	102.2

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

Net Calorific Value		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Anthracite	MJ/kg	29.29	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31
Coking coal (kameni ugljen)	MJ/kg	25.14	28.12	26.15	25.1	24.77332	26.7	27.39	27.28	26	29
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	16.74	17.8	17.8	18.5	17.6	17	17	19.6	19	19
Lignite	MJ/kg	10.9	12	12	12.1		0	0	11.8	11.85	0
Natural gas	MJ/m3	34	34	34	34.0	34.0	34.6	34.8	34.7	34.64	34.64
Wood	MJ/m3	9	9	9	9.0	9.0	9	9	9	9	9
Biogas	TJ/TJ	1	1	1	1.0	1.0	1	1	1	1	1
Wood waste	TJ/TJ	1	1	1	1.0	1.0	1	1	1	1	1
Briketi ugljena	MJ/kg	16.74									
Coke oven coke	MJ/kg	29.31	29.31	29.31	29.3	29.3	29.31	29.31	29.31	29.31	29.31
Liquified petroleum gas	MJ/kg	46.89	46.89	46.89	46.9	46.9	46.89	46.89	46.89	46.89	46.89
Motor Gasoline	MJ/kg	44.59	44.59	44.59	44.6	44.6	44.59	44.59	44.59	44.59	44.59
Petroleum	MJ/kg	43.94	43.96	43.96			43.96	43.96	43.96	43.96	43.96
Diesel	MJ/kg	42.71	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71	42.71
Gas/Diesel oil	MJ/kg	42.71	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71	42.71
Residual fuel oil	MJ/kg	40.19	40.19	40.19	40.2	40.2	40.19	40.19	40.19	40.19	40.19
Petroleum coke	MJ/kg	29.31	29.31	31	31.0	31.0	31	31	31	31	31
Refinery gas	MJ/kg						0	0	0	0	0
Other oil derivatives	MJ/kg						0	0	0	0	0
Visokoplačni plin	MJ/m3										
Koksni plin	MJ/m3	17.91									
Gas works gas	MJ/m3	15.82	15.8	15.8	21.47		0	0	0	0	0
Industrial waste-non ren.	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1	1	1	1	1

Table A3-9: 1A2a-g –emission factors

Fuel type	EF CO ₂ , t/TJ	EF CH ₄ , kg/TJ	EF N ₂ O, 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 derivatives	0	3	0.6
Gas works gas	44.4	1	0.1
Other fossil fuels	143	30	4

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

		1990	1995	2000	2010	2015	2016	2017	2018	2019
Domestic aviation										
Fuel consumption										
Aviation gasoline	1000 t	0.00	0.00	0.00	1.00	0.30	0.40	0.40	0.40	0.40
NCV for gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Jet kerosene	1000 t	2.00	7.00	8.00	9.00	9.50	9.50	9.60	9.70	9.80
NCV for jet kerosene	MJ/kg	44.00	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96
Motor gasoline	1000 t	0.10	0.30	0.10						
NCV motor gasoline	MJ/kg	44.59	44.59	44.59						
Total fuel consumption	TJ	92.46	321.10	356.14	440.23	431.00	435.46	439.85	444.25	448.64
Emissions										
EF CO ₂ - aviation gasoline	t/TJ	70.00	70.00	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	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	69.30	69.30
CO₂ Emission	Gg	6.60	22.93	25.45	31.41	30.80	31.11	31.42	31.74	32.05
EF CH ₄ - gasoline	kg/TJ	0.50	0.50	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	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	0.50	0.50
CH₄ Emission	Mg	0.05	0.16	0.18	0.22	0.22	0.22	0.22	0.22	0.22
EF N ₂ O - gasoline	kg/TJ	2.00	2.00	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	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	2.00	2.00
N₂O Emission	Mg	0.18	0.64	0.71	0.88	0.86	0.87	0.88	0.89	0.90

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

1A3bi	CARS		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
	FUEL CONSUMPTION											
	Gasoline	TJ	31326.39	23418.38	31854.20	28975.93	26546.03	21717.61	21808.27	20938.26	20283.53	19361.96
	Diesel oil	TJ	1629.64	6013.36	8696.11	18916.12	24285.29	30510.23	33676.20	34490.13	32991.60	34510.54
	LPG	TJ	#DIV/0!	642.39	459.52	1036.27	2752.44	3141.63	3315.12	3315.12	3301.06	3094.74
	CNG	TJ					2.40	3.77	8.76	9.93	11.10	15.06
	Biodiesel	TJ					59.130177	598.4200945	739.4358402	12.99218188	701.000401	1627.32236
	NCV											
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	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	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	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	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	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	70.8	70.8

1A3bii	LIGHT DUTY TRUCKS		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
	FUEL CONSUMPTION											
	Gasoline	TJ	1968.3648	1082.66	1493.7195	969.51371	628.46808	352.6406558	354.8346688	361.6492871	417.844316	331.37529
	Diesel oil	TJ	3434.7595	3457.478	5750.4421	10481.673	9672.5246	6714.006532	6776.39	9122.021855	8471.19935	6915.55513
	LPG	TJ	0	0	0	0	0	0	0	0	0	0
	CNG	TJ										
	Biodiesel	TJ					23.550799	131.6868794	148.7907168	3.436199293	138.562794	321.66363
	NCV											
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	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	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	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	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	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	70.8	70.8

Table A3-12: 1A3b – fuel consumption, NCV and emission factors (cont.)

1A3biii	HEAVY DUTY TRUCKS+BUSSES		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
	FUEL CONSUMPTION											
	Gasoline	TJ	146.7125	58.4823	53.1843	52.8947	25.7183	29.6229	24.2703	19.5782	10.5285	17.0133
	Diesel oil	TJ	10576.0050	8057.3496	9377.0853	11415.8853	13023.1221	14787.6885	14198.8307	18090.4795	17681.5095	21079.3311
	LPG	TJ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	CNG	TJ					85.9977	134.6284	143.4822	167.0354	165.5631	151.2121
	Biodiesel	TJ					31.7089	290.0421	311.7669	6.8146	281.7630	654.0926
	NCV											
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	0	1	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	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	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	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	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	70.8	70.8

1A3biv	MOTORCYCLES		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
	FUEL CONSUMPTION											
	Gasoline	TJ	424.634	317.236	674.574	924.829	1185.775	1086.927	1084.143	1064.689	1043.563	1032.916
	Diesel oil	TJ	0.000	0.000	0.000	0.000	0.059	0.317	0.297	0.504	0.500	0.662
	LPG	TJ										
	CNG	TJ										
	Biodiesel	TJ					0.0001431	0.006221066	0.006529847	0.000189743	9.03383809	20.9714098
	NCV											
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	0	1	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	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	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	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	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	70.8	70.8

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

Rail transport															
		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	30.70	27.20	30.50	28.50	26.40	24.80	23.40	21.20	17.50	18.30	17.60	14.70	14.30
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	0.20	1.50												
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19												
Light heating oil (1000 t)	1000 t	1.10	1.70												
NCV for light heating oil (MJ/kg)	MJ/kg	42.71	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	1,448.49	1,166.17	1,302.66	1,217.24	1,127.54	1,059.21	999.41	905.45	747.43	781.59	751.70	627.84	610.75
Emissions															
EF CO2 - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	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	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	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	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	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	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	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	107.21	86.39	96.53	90.20	83.55	78.49	74.06	67.09	55.38	57.92	55.70	46.52	45.26
EF CH4 - gasoline (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	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	4.15	3.32	3.32	3.32	3.32	3.32	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	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - light heating oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	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	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	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	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	5.84	3.87	4.32	4.04	3.74	3.52	3.32	3.01	2.48	2.59	2.50	2.08	2.03
EF N2O - gasoline (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	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	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	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - light heating oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	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	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	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	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	37.58	33.23	37.26	34.81	32.25	30.29	28.58	25.90	21.38	22.35	21.50	17.96	17.47

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

National navigation		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Fuel consumption											
Gasoline (1000 t)		0.10	0.60	0.30							
NCV for gasoline (MJ/kg)		44.59	44.59	44.59							
Diesel (1000 t)		38.70	23.20	25.70	31.80	34.80	41.20	41.80	44.30	47.20	49.10
NCV for diesel (MJ/kg)		42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)		2.10	6.20	1.40		2.00					
NCV for fuel oil (MJ/kg)		40.19	40.19	40.19		40.19					
Light heating oil (1000 t)		1.60	1.50								
NCV for light heating oil (MJ/kg)		42.71	42.71								
Total fuel consumption (TJ)		1,810.07	1,330.87	1,167.29	1,358.18	1,566.69	1,759.65	1,785.28	1,892.05	2,015.91	2,097.06
Emissions											
EF CO ₂ - gasoline (t/TJ)		69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO ₂ - diesel (t/TJ)		74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO ₂ - fuel oil (t/TJ)		77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO ₂ - light heating oil (t/TJ)		74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO₂ Emission (Gg)		134.38	99.31	86.62	100.64	116.36	130.39	132.29	140.20	149.38	155.39
EF CH ₄ - gasoline (kg/TJ)		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - diesel (kg/TJ)		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - fuel oil (kg/TJ)		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH ₄ - light heating oil (kg/TJ)		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
CH₄ Emission (Mg)		12.67	9.32	8.17	9.51	10.97	12.32	12.50	13.24	14.11	14.68
EF N ₂ O - gasoline (kg/TJ)		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - diesel (kg/TJ)		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - fuel oil (kg/TJ)		2.00	2.00	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)		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N₂O Emission (Mg)		3.48	2.53	2.33	2.72	3.13	3.52	3.57	3.78	4.03	4.19

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

Commercial/Institutional	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Fuel consumption										
Petroleum (1000 t)	3.80	0.20								
NCV for jet kerosene (MJ/kg)	43.94									
Light heating oil (1000 t)	90.30	106.30	120.50	131.60	73.80	44.60	44.30	43.50	37.20	26.80
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	67.60	2.50	3.90	6.60	8.00	2.70	1.50	0.80	0.00	0.20
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.30	13.80	13.90	20.10	12.90	12.30	12.60	12.10	11.70	12.20
NCV for LPG (MJ/kg)	46.89	46.89	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	12.70	9.50	0.20	2.20		0.10	0.10	0.00	0.00
NCV for brown coal (MJ/kg)	16.74	17.30	17.80	18.50	17.60	16.89	17.00	19.60	19.00	19.00
Lignite (1000 t)	40.00	1.60	1.20	0.60	0.30	0.10	0.00	0.20	0.10	0.00
NCV for lignite (MJ/kg)	10.90	10.10	12.00	12.10	11.60	10.50	10.50	11.80	11.85	11.85
Briquettes (1000 t)	2.90									
NCV for briquettes (MJ/kg)	16.74									
Gas work gas (1000000 m3)	4.90	1.43	1.50	3.43	2.84	0.39				
NCV for gas work gas (MJ/m3)	15.82	15.91	19.49	21.47	18.72	17.10				
Natural gas (1000000 m3)	124.30	132.60	98.20	151.20	192.70	204.80	217.90	231.30	244.30	252.40
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64
Gasoline (1000 t)		0.33								
NCV for gasoline (MJ/kg)		44.60								
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	0.00	129.80	213.50	176.90	346.60	422.80	517.70
Bio gass (TJ)					102.26	116.59	119.11	118.13	114.74	137.07
Total fuel consumption (TJ)	12,190.9	10,069.4	9,506.6	12,053.9	10,957.7	10,014.1	10,423.8	10,952.6	11,138.7	11,122.6
Commercial/Institutional										
Emissions										
EF CO2 - petroleum (t/TJ)	73.30	73.30	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	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	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	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	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	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	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	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	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	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	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	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	54.60	54.60
CO2 Emission (Gg)	854.65	661.70	640.93	789.25	690.73	614.15	634.03	671.92	680.84	677.49

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	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	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	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	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	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	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	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	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	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	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	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	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	5.00	5.00
CH4 Emission (Mg)	99.38	74.66	74.97	89.75	110.66	123.12	114.07	166.48	188.37	214.10
EF N2O - petroleum (kg/TJ)	0.60	0.60	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	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	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	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	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	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	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	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	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	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	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	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	0.10	0.10
N2O Emission (Mg)	5.87	3.66	3.86	4.16	3.40	2.84	2.71	3.40	3.56	3.71

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

Residential	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fuel consumption												
Fuel consumption - mobile												
Gasoline (1000 t)	4.00	12.10	8.20	8.20	7.70	7.40	7.50	7.50	7.40	7.40	7.60	7.70
NCV for gasoline (MJ/kg)	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Fuel consumption - stationary												
Petroleum (1000 t)		1.60	0.90	1.00	0.90	0.80	0.20					
NCV for petroleum (MJ/kg)		43.96	43.96	43.96	43.96	43.96	43.96	43.96				
Light heating oil (1000 t)	215.90	231.50	138.80	122.00	94.50	83.50	68.30	84.50	84.00	83.40	70.60	50.80
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	48.70	8.10	10.40	11.90	12.30	7.10	5.10	4.30	2.40	1.30	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	40.19	40.19	40.19	40.19
LPG (1000 t)	97.90	51.90	72.20	74.40	56.90	54.20	47.40	47.60	48.80	46.50	42.40	43.50
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Brown coal (1000 t)	123.10	12.00	6.10	2.30	4.10	2.60	2.00	1.20	3.20	1.90	1.30	1.70
NCV for brown coal (MJ/kg)	16.74	17.80	17.60	17.10	17.80	18.00	16.89	17.00	17.00	19.60	19.00	19.00
Lignite (1000 t)	207.30	15.00	9.40	9.00	4.80	11.50	7.40	7.00	4.10	7.00	5.00	5.10
NCV for lignite (MJ/kg)	10.90	12.00	11.60	11.60	10.70	10.50	10.50	10.50	10.50	11.80	11.85	11.85
Hard coal (1000 t)					0.20							
NCV for hard coal (MJ/kg)					26.46							
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	4.98	3.75		1.06	0.19				
NCV for gas work gas (MJ/m3)	15.82	19.49	17.20	17.20	17.10		17.10	17.10				
Natural gas (1000000 m3)	230.00	496.60	732.90	670.20	630.20	601.30	524.10	540.00	560.50	578.10	564.70	554.90
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64
Solid Biomass-Wood (TJ)	42,170.0	39,690.0	49,539.0	48,344.0	48,329.0	48,003.0	42,254.0	48,622.7	47,220.8	45,674.2	43,542.9	42,198.7
Charcoal (TJ)	0.00	0.00	154.00	139.26	83.74	139.00	139.89					
Total fuel consumption (TJ)	70,745.6	70,417.3	85,088.7	81,086.5	77,614.7	75,512.0	66,345.2	73,752.1	73,125.9	71,978.7	68,530.4	66,065.9
Residential												
Emissions i+ii												
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	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	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	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	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	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	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	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	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	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	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	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	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	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	112.00	112.00	112.00	112.00	112.00

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	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	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	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	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	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	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	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	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	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	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	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	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	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	200.00	200.00	200.00	200.00	200.00
CH4 Emission (Mg)	14,155.3	12,230.9	15,167.1	14,767.0	14,724.3	14,636.1	12,874.1	14,760.7	14,344.6	13,888.9	13,229.3	12,818.9
EF N2O - gasoline (kg/TJ)	0.60	0.60	0.60	0.60	0.60	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	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	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	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	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	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	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	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	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	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	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	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	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	1.00	1.00	1.00	1.00	1.00
N2O Emission (Mg)	183.95	168.07	205.70	200.15	199.05	197.23	173.47	199.20	193.62	187.47	178.46	172.57

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

Agriculture/forestry/fishing	1990	2000	2005	2010	2015	2016	2017	2018	2019
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	180.90	180.90	185.90	185.30
NCV for diesel (MJ/kg)	42.71	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	7,726.2	7,726.2	7,939.8	7,914.2
Fuel oil (1000 t)	12.30	13.40	4.70	4.40	2.10	1.20	0.80	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	40.19
LPG (1000 t)	4.40	2.60	2.70	2.70	2.50	2.50	2.50	2.60	2.60
NCV for LPG (MJ/kg)	46.89	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	27.80	24.00	23.50	26.70
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64
Fuel consumption - stationary (TJ)	1,550.7	1,153.5	1,104.3	1,058.2	942.1	1,132.9	982.2	936.0	1,046.8
Total fuel consumption (TJ)	11,489.4	11,301.4	9,535.3	9,604.5	8,740.9	8,859.1	8,708.4	8,875.7	8,961.0
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	69.30
EF CO2 - other kerosene (t/TJ)	71.90	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	74.10
CO2 emission (Gg) - mobile	736.45	751.96	624.73	633.28	577.89	572.51	572.51	588.34	586.44
EF CO2 - fuel oil (t/TJ)	77.40	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	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	44.40
EF CO2 - natural gas (t/TJ)	56.10	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	65.40	56.61	53.36	59.58
Total CO2 emission (Gg)	835.42	828.99	691.59	697.30	633.36	637.92	629.12	641.70	646.02
EF CH4 - gasoline (kg/TJ)	140.00	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	140.00
EF CH4 - diesel (kg/TJ)	4.15	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	32.06	32.06	32.95	32.84
EF CH4 - fuel oil (kg/TJ)	10.00	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	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	5.00
EF CH4 - natural gas (kg/TJ)	5.00	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	5.91	5.07	4.68	5.23
Total CH4 emission (Mg)	52.07	50.57	41.45	41.64	37.50	37.97	37.14	37.63	38.08
EF N2O - gasoline (kg/TJ)	0.40	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	0.40
EF N2O - diesel (kg/TJ)	28.60	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	220.97	220.97	227.08	226.35
EF N2O - fuel oil (kg/TJ)	0.60	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	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	0.10
EF N2O - natural gas (kg/TJ)	0.10	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	0.14	0.11	0.09	0.10
Total N2O emission (Mg)	284.53	290.61	241.33	244.62	223.18	221.11	221.08	227.17	226.45

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

		STEP 1										
		A	B	C	D	E						
		Amount of Coal	Emission Factor	Methane	Conversion	Methane						
		Produced		Emissions	Factors	Emissions						
		(millions t)	(m ³ CH ₄ / t)	(millions m ³)	(0.67 Gg CH ₄ /million m ³)	(Gg CH ₄)						
				C=(AxB)		E=(Cx D)						
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	1995	2000	2005	2010	2015	2016	2017	2018	2019
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	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
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	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	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	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	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	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	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	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	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	ND	ND
EMISSIONS													
CO2													
Well Drilling	Gg			0.314	0.174	0.141	0.110	0.084	0.078	0.086	0.087	0.085	0.082
Well Testing	Gg			28.216	15.701	12.704	9.900	7.539	7.014	7.714	7.791	7.662	7.385
Well Servicing	Gg			0.006	0.003	0.003	0.002	0.002	0.001	0.002	0.002	0.002	0.002
CH4													
Well Drilling	Gg			0.103	0.058	0.047	0.036	0.028	0.026	0.028	0.029	0.028	0.027
Well Testing	Gg			0.160	0.089	0.072	0.056	0.043	0.040	0.044	0.044	0.043	0.042
Well Servicing	Gg			0.345	0.192	0.155	0.121	0.092	0.086	0.094	0.095	0.094	0.090
N2O													
Well Drilling	Gg			NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Well Testing	Gg			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Well Servicing	Gg			NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
TOTAL CO2	Gg	Flaring and Venting	1.B.2.a.ii	28.536	15.879	12.847	10.012	7.624	7.093	7.801	7.879	7.748	7.469
TOTAL CH4	Gg	Flaring and Venting	1.B.2.a.ii	0.608	0.338	0.274	0.213	0.163	0.151	0.166	0.168	0.165	0.159
TOTAL N2O	Gg	Flaring and Venting	1.B.2.a.ii	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2. Production													
ACTIVITY DATA													
Conventional oil	10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
Conventional oil	10 ³ m ³ total oil production	Venting	1.B.2.a.i	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
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	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	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	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	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	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	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	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	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	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	3593.02	5552.33	8244.19	7454.65	7217.44	8019.77	9008.14	9943.02	6945.35
Tanker Trucks and Rail	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	255.18	275.30	273.51	124.13	50.01066	95.35354	57.04444	68.20106	63.94465
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	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	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	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	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	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	NA	NA
4. Refining/Storage													
ACTIVITY DATA													
Oil Refining	10 ³ m ³ oil refined	All	1.B.2.a.iii.4	7977.5581	6321.5116	6120.6977	5803.6047	3769.186	3328.372	3748.953	4050.349	4174.535	3016.977
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	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	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	ND	ND

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

1. B. 2. b. Natural Gas				1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
1. Exploration	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Well Drilling	10 ⁶ m ³ total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
Well Testing	10 ⁶ m ³ total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
Well Servicing	10 ⁶ m ³ total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
EMISSION FACTOR													
CO ₂													
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	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	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	IE	IE
CH ₄													
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	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	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	IE	IE
N ₂ O													
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	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	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	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	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
EMISSION FACTOR													
CO ₂													
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	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	1.20E-03	1.20E-03
CH ₄													
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	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	7.60E-07	7.60E-07
N ₂ O													
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	NA	NA	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	2.10E-08	2.10E-08
3. Processing	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Default weighted	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
Default weighted	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90
EMISSION FACTOR													
CO ₂													
Default weighted	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	1.66E-04	1.66E-04
Default weighted	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	3.00E-03	3.00E-03
CH ₄													
Default weighted	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	5.90E-04	5.90E-04
Default weighted	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	2.00E-06	2.00E-06
Default weighted	Gg/10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N ₂ O													
Default weighted	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Default weighted	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	3.30E-08	3.30E-08
Default weighted	Gg/10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	NA	NA	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	2367.9	2704.8	2909.9	3241.5	2519.2	2611.4	3008.3	2770.5	2908
Transmission	10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	2686.6	2367.9	2704.8	2909.9	3241.5	2519.2	2611.4	3008.3	2770.5	2908
Storage	10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2686.6	2367.9	2704.8	2909.9	3241.5	2519.2	2611.4	3008.3	2770.5	2908
EMISSION FACTOR													
CO ₂													
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	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	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	1.10E-07	1.10E-07
CH ₄													
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	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	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	2.50E-05	2.50E-05
N ₂ O													
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	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	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	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	529.4	609.3	862.2	944.6	766.2	806.2	833.4	832.5	833.4
EMISSION FACTOR													
CO ₂													
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	5.10E-05	5.10E-05
CH ₄													
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	1.10E-03	1.10E-03
N ₂ O													
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	ND	ND
EMISSIONS													
CO ₂	Gg	All	1.B.2.a.iii.5	0.019	0.027	0.031	0.044	0.048	0.039	0.041	0.043	0.042	0.043
CH ₄	Gg	All	1.B.2.a.iii.5	0.417	0.582	0.670	0.948	1.039	0.843	0.887	0.917	0.916	0.917
N ₂ O	Gg	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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

1. B. 2. a. Oil				1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
2. Production	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58
EMISSION FACTOR													
N ₂ O													
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	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	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	6.40E-07	6.40E-07
3. Transport	Unit	mission source	IPCC Code									2018	2019
ACTIVITY DATA													
Pipelines	10 ³ m ³ total oil transported by pipelines	All	1.B.2.a.iii.3	9948.84	3593.02	5552.33	8244.19	7454.65	7217.44	8019.77	9008.14	9943.02	6945.35
Tanker Trucks and Rail Cars	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	255.18	275.30	273.51	124.13	50.01	95.35	57.04	68.20	63.94
Natural gas liquids transport-LPG	10 ³ m ³ LPG	All	1.B.2.a.iii.3										
EMISSION FACTOR													
CO ₂													
Tanker Trucks and Rail Cars	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	2.30E-06	2.30E-06
CH ₄													
Tanker Trucks and Rail Cars	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	2.50E-05	2.50E-05
N ₂ O													
Tanker Trucks and Rail Cars	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1. B. 2. c. 2 ii Venting and Flaring - Gas				1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
2. Production	Unit	mission source	IPCC Code												
ACTIVITY DATA															
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50	1230.10	1028.90
EMISSION FACTOR															
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	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	1.B.2.b.ii	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50	1230.10	1028.90
EMISSION FACTOR															
N ₂ O															
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.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	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	1.B.2.b.iii.4	2686.6	2704.8	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4	3008.3	2770.5	2908
EMISSION FACTOR															
N ₂ O															
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	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	1.B.2.a.iii.5	379.3	609.3	944.6	865.2	812.9	788.3	705.6	766.2	806.2	833.4	832.5	833.4
EMISSION FACTOR															
N ₂ O															
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	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

1. 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.
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)
Application of the IPCC Tier 2 method for the estimation of the greenhouse gases emissions from forest fires	Ongoing	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	Planned	The aim of the project is a development of harmonized land monitoring data 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.
HWP project	Planned	The aim of the project is to defined 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.
LULUCF 3	Ongoing	The aim of the project is 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.
Tier 3 application for CSC in dead wood in deforested areas	Planned	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.
LULUCF projections project	Planned	The aim of the project is to define the basic settings and preconditions on national level for the preparation of projections of emissions / removals in the LULUCF sector (period up to 2030, 2050) and related activities.

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.

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Subject:	AutomaticQA result for file HRV_2021_1_04032021_1525494777527459380447287.xml: GHG crf QA v1.9
Posted automatically on:	15 Mar 2021 09:35
Task:	Automatic quality assessment
Referred file:	HRV_2021_1_04032021_1525494777527459380447287.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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Subject:	AutomaticQA result for file HRV_2021_1_04032021_1525494777527459380447287.xml: XML Schema validation
Posted automatically on:	15 Mar 2021 09:30
Task:	Automatic quality assessment
Referred file:	HRV_2021_1_04032021_1525494777527459380447287.xml
Feedback status:	INFO
Feedback message:	XML Schema validation passed without errors.

XML Schema validation

 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/ew/mmr/art07_inventory/ghg_inventory/envye8xdq/HRV_2021_1_04032021_1525494777527459380447287.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 2019, natural units

ENERGY BALANCE 2019 natural units	Anthracite 103 t	Hard coal 103 t	Brown coal 103 t	Lignite 103 t	Crude oil 103 t	Natural gas 106 m3
Production					705.7	1028.9
Import	1.6	711.0	25.6	5.1	2006.0	2003.4
Export		3.1			121.6	72.3
Import-processing						
Export-processing						
Stock change		-51.2			46.2	-52.0
Bunkers						
Energy supplied	1.6	656.7	25.6	5.1	2636.3	2908.0
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						
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		579.8				0.5
public cogeneration plants						636.1
public heating plants						51.8
industrial cogeneration plants			22.8			319.8
– in refineries						65.3
– in gas production						57.2
Industrial heating plants						70.6
Petroleum refineries					2594.6	79.9
NGL-plant					41.7	13.4
Coke plant						
Gas works						
Total transformation sector		579.8	22.8		2636.3	1172.1
Energy sector own use						
Oil and gas extraction						18.7
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						52.2
NGL-plant						50.0
Gas works						
Total energy sector own use						120.9
Losses						31.5
Final energy demand	1.6	76.9	2.8	5.1		1583.5
Non energy use						500.6
Energy sector						
Petrochemical industry						500.6
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	1.6	76.9	2.8	5.1		1082.9
Industry	1.6	76.9	1.1			244.7
Iron and steel	1.6					15.6
Non-ferrous metals						12.5
Non-metallic minerals						50.2
Chemical						12.2
Construction materials		76.9	1.1			58.0
Pulp and paper						8.2
Food production						47.9
Not elsewhere specified						40.1
Transport						4.8
Rail						
Road						0.2
Air						
– international						
– domestic						
Sea and River						
Public transport						4.6
Not elsewhere specified						
Other sectors			1.7	5.1		833.4
Households			1.7	5.1		554.9
Services						251.8
Agriculture						26.7
Construction						

Table A4-1: National Energy balance for 2019, natural units, cont.

ENERGY BALANCE 2019 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	51535.8	4936.3	12746.3	1368.7	1942.7	192093.3	0.3	18368.1
Import		59.0					73.0	1617.7
Export		548.9						5553.7
Import-processing								
Export-processing								
Stock change							-1.8	-269.9
Bunkers								
Energy supplied	51535.8	4446.4	12746.3	1368.7	1942.7	192093.3	71.5	14162.2
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	51535.8							
– small HPP	999.0							
Wind power plants			12746.3					
Solar power plants				721.9				
Geothermal power plants					1641.9			
thermal power plants						20175.1		
public cogeneration plants						164161.2		8984.2
public heating plants								2.8
industrial cogeneration plants						7757.0		
– in refineries								
– in gas production								
Industrial heating plants								232.1
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	51535.8		12746.3	721.9	1641.9	192093.3		9219.1
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		4446.4		646.8	300.8	0.0	71.5	4943.1
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		4446.4		646.8	300.8	0.0	71.5	4943.1
Industry		40.0						1884.3
Iron and steel		0.2						2.2
Non-ferrous metals		0.3						
Non-metallic minerals								0.6
Chemical								0.2
Construction materials		4.6						1201.4
Pulp and paper								72.5
Food production		2.1						188.8
Not elsewhere specified		32.8						418.6
Transport							71.5	
Rail								
Road							71.5	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		4406.4		646.8	300.8			3058.8
Households		4394.4		452.8				2649.1
Services		12.0		194.0	162.7			409.7
Agriculture					138.1			
Construction								

Table A4-1: National Energy balance for 2019, natural units, cont.

ENERGY BALANCE 2019 natural units	Coke oven coke	Liquefied petroleum	Unleaded 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		195.9	711.5			158.3	1069.5	169.5	31.3	365.9
Import	29.5	74.5	154.5	0.5	1.6	47.2	1895.4	28.1	41.0	
Export	1.5	135.4	425.0			15.9	1037.7	85.1	20.5	329.8
Import-processing										
Export-processing										
Stock change	3.4	-0.8	35.6			10.2	-102.3	-1.9	-1.8	6.8
Bunkers							19.9			4.8
Energy supplied	31.4	134.2	476.6	0.5	1.6	199.8	1805.0	110.6	50.0	38.1
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		156.2	711.5			158.3	1069.5	169.5	31.3	365.9
NGL-plant		39.7								
Coke plant										
Gas works										
Total production		195.9	711.5			158.3	1069.5	169.5	31.3	365.9
Transformation sector										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								0.8		
public cogeneration plants								0.2		
public heating plants								2.3	1.9	
industrial cogeneration plants									31.3	
– in refineries									31.3	
– in gas production										
Industrial heating plants									6.4	34.0
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								3.3	39.6	34.0
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									6.8	
NGL-plant										
Gas works										
Total energy sector own use									6.8	
Losses										
Final energy demand	31.4	134.2	476.6	0.5	1.6	199.8	1805.0	107.3	3.6	4.1
Non energy use										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	31.4	134.2	476.6	0.5	1.6	199.8	1805.0	107.3	3.6	4.1
Industry	31.4	7.7	0.2		1.6		13.1	15.3	3.6	4.1
Iron and steel	0.3	0.7						0.6		
Non-ferrous metals		0.7						0.2		
Non-metallic minerals		0.2								
Chemical					1.6			0.4		
Construction materials	28.7	1.2	0.1				13.1	2.7	2.1	0.7
Pulp and paper		0.2								
Food production	2.4	0.9						6.4	1.2	3.2
Not elsewhere specified		3.8	0.1					5.0	0.3	0.2
Transport		66.0	465.2	0.5		199.8	1526.9			
Rail							14.3			
Road		66.0	465.2				1439.0			
Air				0.5		199.8				
– international				0.1		190.0				
– domestic				0.4		9.8				
Sea and River							49.1			
Public transport							24.5			
Not elsewhere specified										
Other sectors		60.5	11.2				265.0	92.0		
Households		43.5						50.8		
Services		12.2						26.8		
Agriculture		2.6	7.7				175.9	9.4		
Construction		2.2	3.5				89.1	5.0		

Table A4-1: National Energy balance for 2019, natural units, cont.

ENERGY BALANCE 2019 natural units	Naphta 103 t	White spirit 103 t	Bitumen 103 t	Other oils 103 t	Lubricants 103 t	Petroleum coke 103 t	Etan 103 t	Other derivates 103 t
Production	33.2			10.4		67.2		24.6
Import		3.3	134.9	33.8	6.2	119.6		
Export	12.9	0.2	0.9	8.9	0.2	19.9		74.1
Import-processing								
Export-processing								
Stock change	-7.1					-4.7		57.3
Bunkers								
Energy supplied	13.2	3.1	134.0	35.3	6.0	162.2		7.8
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			10.4		67.2		24.6
NGL-plant	19.2							
Coke plant								
Gas works								
Total production	33.2			10.4		67.2		24.6
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	13.2							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	13.2							
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	3.1	134.0	35.3	6.0	142.5		7.8
Non energy use		3.1	134.0	35.3	6.0			7.8
Energy sector				2.4				
Petrochemical industry								7.8
Other industry		3.1	14.1	6.8	6.0			
Construction			119.9	1.5				
Transport				23.2				
Agriculture				1.4				
Energy consumption	0.0					142.5		
Industry						142.5		
Iron and steel								
Non-ferrous metals								
Non-metallic minerals								
Chemical								
Construction materials						142.5		
Pulp and paper								
Food production								
Not elsewhere specified								
Transport								
Rail								
Road								
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors								
Households								
Services								
Agriculture								
Construction								

Table A4-1: National Energy balance for 2019, natural units, cont.

ENERGY BALANCE 2019 natural units	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
Production	129.2				12760.3	27120.0	1128.9
Import		226.6	40.7		9158.3		
Export					3025.3		
Import-processing							
Export-processing							
Stock change		2.8	0.5				
Bunkers							
Energy supplied	129.2	229.4	41.2		18893.3	27120.0	1128.9
Production							
hydro power plants					5932.6		
– small HPP					115.0		
Wind power plants					1467.3		
Solar power plants					83.1		
Geothermal power plants					91.9		
thermal power plants					1666.6		
public cogeneration plants					3149.3	11526.5	
public heating plants						1655.1	
industrial cogeneration plants					369.5	9114.0	
– in refineries					83.8	2800.0	
– in gas production					147.3	637.0	
Industrial heating plants						4218.6	
Petroleum refineries	129.2						
NGL-plant							
Coke plant							
Gas works							
Total production	129.2				12760.3	26514.2	
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	6.5						
– in refineries	6.5						
– in gas production							
Industrial heating plants	17.0						
Petroleum refineries		229.4	41.2				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	23.5	229.4	41.2				
Energy sector own use							
Oil and gas extraction					132.3	451.0	
Coal production						297.5	
Electric energy supply industry					61.5		
hydro power plants					230.6		
thermal power plants					152.6		
public cogeneration plants					236.3	1186.1	
industrial cogeneration plants							
Wind power					24.3		
Petroleum refineries	105.7				246.7	4583.4	
NGL-plant					49.2	186.0	
Gas works							
Total energy sector own use	105.7				1133.5	6704.0	
Losses					1659.0	1700.3	
Final energy demand					16100.8	18715.7	1128.9
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption					16100.8	18715.7	1128.9
Industry					3539.8	11683.8	1128.9
Iron and steel					322.9	164.2	
Non-ferrous metals					101.9		
Non-metallic minerals					156.1	8.5	
Chemical					322.7	4547.4	
Construction materials					563.5	5.6	1128.9
Pulp and paper					190.5	1196.0	
Food production					666.9	3011.6	
Not elsewhere specified					1215.3	2750.5	
Transport					332.3		
Rail					179.1		
Road					1.6		
Air					37.4		
– international							
– domestic					37.4		
Sea and River					22.0		
Public transport					60.7		
Not elsewhere specified					31.5		
Other sectors					12228.7	7031.9	
Households					6205.9	5195.6	
Services					5880.0	1567.4	
Agriculture					64.0	268.9	
Construction					78.8		

Table A4-2: National Energy balance for 2019, energy units

<i>PI</i>	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production	-	-	-	-	30.13	36.128
Import	0.05	17.66	0.49	0.06	85.66	69.398
Export	-	0.08	-	-	5.19	2.504
Import-processing	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-
Stock change	-	- 1.27	-	-	1.97	- 1.801
Bunkers	-	-	-	-	-	-
Energy supplied	0.05	16.31	0.49	0.06	112.57	101.22
<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	0.05	16.31	0.49	0.06	112.57	101.22
<i>Transformation sector</i>	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
– small HPP	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-
thermal power plants	-	14.08	-	-	-	0.02
public cogeneration plants	-	-	-	-	-	22.03
public heating plants	-	-	-	-	-	1.79
industrial cogeneration plants	-	-	0.43	-	-	11.08
– in refineries	-	-	-	-	-	2.26
– in gas production	-	-	-	-	-	1.98
Industrial heating plants	-	-	-	-	-	2.45
Petroleum refineries	-	-	-	-	110.79	2.77
NGL-plant	-	-	-	-	1.78	0.95
Coke plant	-	-	-	-	-	-
Gas works	-	-	-	-	-	-
Total transformation sector	-	14.08	0.43	-	112.57	41.09
<i>Energy sector own use</i>	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	0.65
Coal production	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	1.81
NGL-plant	-	-	-	-	-	1.73
Gas works	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	4.19
Losses	-	-	-	-	-	1.09
Final energy demand	0.05	2.23	0.05	0.06	0.00	54.85
Non energy use	-	-	-	-	-	17.34
Energy sector	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	17.34
Other industry	-	-	-	-	-	-
Construction	-	-	-	-	-	-
Transport	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-
Energy consumption	0.05	2.23	0.05	0.06	0.00	37.51
Industry	0.05	2.23	0.02	-	-	8.48
Iron and steel	0.05	-	-	-	-	0.54
Non-ferrous metals	-	-	-	-	-	0.43
Non-metallic minerals	-	-	-	-	-	1.74
Chemical	-	-	-	-	-	0.42
Construction materials	-	2.23	0.02	-	-	2.01
Pulp and paper	-	-	-	-	-	0.28
Food production	-	-	-	-	-	1.66
Not elsewhere specified	-	-	-	-	-	1.39
Transport	-	-	-	-	-	0.17
Rail	-	-	-	-	-	-
Road	-	-	-	-	-	0.01
Air	-	-	-	-	-	-
– international	-	-	-	-	-	-
– domestic	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-
Public transport	-	-	-	-	-	0.16
Not elsewhere specified	-	-	-	-	-	-
Other sectors	-	-	0.03	0.06	-	28.87
Households	-	-	0.03	0.06	-	19.22
Services	-	-	-	-	-	8.72
Agriculture	-	-	-	-	-	0.92
Construction	-	-	-	-	-	-

Table A4-2: National Energy balance for 2019, energy units, cont.

<i>PI</i>	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
Production	51.54	44.427	12.746	1.369	1.943	3.4418	0.011	18.368
Import	-	0.53	-	-	-	-	2.68	1.62
Export	-	4.94	-	-	-	-	-	5.55
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	-	-	-	-	-	-	0.07	0.27
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	51.54	40.02	12.75	1.37	1.94	3.4418	2.62	14.16
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	-	-	-	-	-	-	-	-
Gross production	51.54	40.02	12.75	1.37	1.94	3.4418	2.62	14.16
Transformation sector	-	-	-	-	-	-	-	-
hydro power plants	51.54	-	-	-	-	-	-	-
– small HPP	1.00	-	-	-	-	-	-	-
Wind power plants	-	-	12.75	-	-	-	-	-
Solar power plants	-	-	-	0.72	-	-	-	-
Geothermal power plants	-	-	-	-	1.64	-	-	-
thermal power plants	-	-	-	-	-	0.3485	-	-
public cogeneration plants	-	-	-	-	-	2.9355	-	8.98
public heating plants	-	-	-	-	-	-	-	0.00
industrial cogeneration plants	-	-	-	-	-	0.1578	-	-
– in refineries	-	-	-	-	-	-	-	-
– in gas production	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	0.23
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	51.54	-	12.75	0.72	1.64	3.4418	-	9.22
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	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	-	-	-
Losses	-	-	-	-	-	-	-	-
Final energy demand	-	40.02	-	0.65	0.30	-	2.62	4.94
Non energy use	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-
Energy consumption	-	40.02	-	0.65	0.30	-	2.62	4.94
Industry	-	0.36	-	-	-	-	-	1.88
Iron and steel	-	0.00	-	-	-	-	-	0.00
Non-ferrous metals	-	0.00	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	0.00
Chemical	-	-	-	-	-	-	-	0.00
Construction materials	-	0.04	-	-	-	-	-	1.20
Pulp and paper	-	-	-	-	-	-	-	0.07
Food production	-	0.02	-	-	-	-	-	0.19
Not elsewhere specified	-	0.30	-	-	-	-	-	0.42
Transport	-	-	-	-	-	-	2.62	-
Rail	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	2.62	-
Air	-	-	-	-	-	-	-	-
– international	-	-	-	-	-	-	-	-
– domestic	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
Other sectors	-	39.66	-	0.65	0.30	-	-	3.06
Households	-	39.55	-	0.45	-	-	-	2.65
Services	-	0.11	-	0.19	0.16	-	-	0.41
Agriculture	-	-	-	-	0.14	-	-	-
Construction	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2019, 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	200.10	-	-	-	-	-	-	-	-	-
Import	178.13	0.86	3.49	6.89	0.02	0.07	2.07	80.95	1.20	1.65
Export	18.27	0.04	6.35	18.95	-	-	0.70	44.32	3.63	0.82
Import-processing	-	-	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-	-	-
Stock change	- 1.44	0.10	0.04	1.59	-	-	0.45	4.37	0.08	0.07
Bunkers	-	-	-	-	-	-	-	0.85	-	-
Energy supplied	358.53	0.92	2.89	10.47	0.02	0.07	1.82	31.41	2.52	0.75
<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	-	-	7.32	31.73	-	-	6.96	45.68	7.24	1.26
NGL-plant	-	-	1.86	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total production	-	-	9.19	31.73	-	-	6.96	45.68	7.24	1.26
Gross production	358.53	0.92	6.29	21.25	0.02	0.07	8.78	77.09	4.72	2.01
<i>Transformation sector</i>	-	-	-	-	-	-	-	-	-	-
hydro power plants	51.54	-	-	-	-	-	-	-	-	-
– small HPP	1.00	-	-	-	-	-	-	-	-	-
Wind power plants	12.75	-	-	-	-	-	-	-	-	-
Solar power plants	0.72	-	-	-	-	-	-	-	-	-
Geothermal power plants	1.64	-	-	-	-	-	-	-	-	-
thermal power plants	14.44	-	-	-	-	-	-	-	0.03	-
public cogeneration plants	33.95	-	-	-	-	-	-	-	0.01	-
public heating plants	1.80	-	-	-	-	-	-	-	0.10	0.08
industrial cogeneration plants	11.67	-	-	-	-	-	-	-	-	1.26
– in refineries	2.26	-	-	-	-	-	-	-	-	1.26
– in gas production	1.98	-	-	-	-	-	-	-	-	-
Industrial heating plants	2.68	-	-	-	-	-	-	-	-	0.26
Petroleum refineries	113.56	-	-	-	-	-	-	-	-	-
NGL-plant	2.73	-	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total transformation sector	247.48	-	-	-	-	-	-	-	0.14	1.59
<i>Energy sector own use</i>	-	-	-	-	-	-	-	-	-	-
Oil and gas extraction	0.65	-	-	-	-	-	-	-	-	-
Coal production	-	-	-	-	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-	-	-
Petroleum refineries	1.81	-	-	-	-	-	-	-	-	0.27
NGL-plant	1.73	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total energy sector own use	4.19	-	-	-	-	-	-	-	-	0.27
Losses	1.09	-	-	-	-	-	-	-	-	-
Final energy demand	105.78	0.92	6.29	21.25	0.02	0.07	8.78	77.09	4.58	0.14
Non energy use	17.34	-	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-	-	-
Petrochemical industry	17.34	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-
Energy consumption	88.43	0.92	6.29	21.25	0.02	0.07	8.78	77.09	4.58	0.14
Industry	13.02	0.92	0.36	0.01	-	0.07	-	0.56	0.65	0.14
Iron and steel	0.59	0.01	0.03	-	-	-	-	-	0.03	-
Non-ferrous metals	0.44	-	0.03	-	-	-	-	-	0.01	-
Non-metallic minerals	1.74	-	0.01	-	-	-	-	-	-	-
Chemical	0.42	-	-	-	-	0.07	-	-	0.02	-
Construction materials	5.50	0.84	0.06	0.00	-	-	-	0.56	0.12	0.08
Pulp and paper	0.36	-	0.01	-	-	-	-	-	-	-
Food production	1.87	0.07	0.04	-	-	-	-	-	0.27	0.05
Not elsewhere specified	2.10	-	0.18	0.00	-	-	-	-	0.21	0.01
Transport	2.79	-	3.09	20.74	0.02	-	8.78	65.21	-	-
Rail	-	-	-	-	-	-	-	0.61	-	-
Road	2.63	-	3.09	20.74	-	-	-	61.46	-	-
Air	-	-	-	-	0.02	-	8.78	-	-	-
– international	-	-	-	-	0.00	-	8.35	-	-	-
– domestic	-	-	-	-	0.02	-	0.43	-	-	-
Sea and River	-	-	-	-	-	-	-	2.10	-	-
Public transport	0.16	-	-	-	-	-	-	1.05	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Other sectors	72.63	-	2.84	0.50	-	-	-	11.32	3.93	-
Households	61.97	-	2.04	-	-	-	-	-	2.17	-
Services	9.60	-	0.57	-	-	-	-	-	1.14	-
Agriculture	1.06	-	0.12	0.34	-	-	-	7.51	0.40	-
Construction	-	-	0.10	0.16	-	-	-	3.81	0.21	-

Table A4-2: National Energy balance for 2019, energy units, cont.

<i>PI</i>	Naphta	White spirit	Bitumen	Lubricants	Paraffin and wax	Petroleum coke	Etan	Other derivatives
Production	-	-	-	-	-	-	-	-
Import	-	-	0.11	4.52	1.13	0.21	3.71	-
Export	13.25	0.58	0.01	0.03	0.30	0.01	0.62	-
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	0.27	- 0.32	-	-	-	-	- 0.15	-
Bunkers	0.19	-	-	-	-	-	-	-
Energy supplied	- 13.17	- 0.89	0.10	4.49	0.83	0.20	2.95	-
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	14.71	0.62	-	-	0.35	-	2.08	-
NGL-plant	-	0.86	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total production	14.71	1.48	-	-	0.35	-	2.08	-
Gross production	1.53	0.59	0.10	4.49	1.18	0.20	5.03	-
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	1.37	-	-	-	-	-	-	-
Petroleum refineries	-	0.59	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	1.37	0.59	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	-	0.61	-
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	-	0.61	-
Losses	-	-	-	-	-	-	-	-
Final energy demand	0.16	-	0.10	4.49	1.18	0.20	4.42	-
Non energy use	-	-	0.1039	4.4890	1.1826	0.2010	-	-
Energy sector	-	-	-	-	0.08	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	-	0.10	0.47	0.23	0.20	-	-
Construction	-	-	-	4.02	0.05	-	-	-
Transport	-	-	-	-	0.78	-	-	-
Agriculture	-	-	-	-	0.05	-	-	-
Energy consumption	0.16	-	-	-	-	-	4.42	-
Industry	0.16	-	-	-	-	-	4.42	-
Iron and steel	-	-	-	-	-	-	-	-
Non-ferrous metals	-	-	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	-	-	-	-
Construction materials	0.03	-	-	-	-	-	4.42	-
Pulp and paper	-	-	-	-	-	-	-	-
Food production	0.13	-	-	-	-	-	-	-
Not elsewhere specified	0.01	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-
Rail	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	-	-
Air	-	-	-	-	-	-	-	-
- international	-	-	-	-	-	-	-	-
- domestic	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
Other sectors	-	-	-	-	-	-	-	-
Households	-	-	-	-	-	-	-	-
Services	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2019, energy units, cont.

<i>PI</i>	Refinery gas	Refinery semiproduc ts	Aditives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production	-	-	-	-	-	-	0.61
Import	-	-	9.68	1.74	-	32.97	-
Export	2.98	-	-	-	-	10.89	-
Import-processing	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-
Stock change	2.30	-	0.12	0.02	-	-	-
Bunkers	-	-	-	-	-	-	-
Energy supplied	- 0.68	-	9.80	1.76	-	22.08	0.61
Production	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	21.36	-
– small HPP	-	-	-	-	-	0.41	-
Wind power plants	-	-	-	-	-	5.28	-
Solar power plants	-	-	-	-	-	0.30	-
Geothermal power plants	-	-	-	-	-	0.33	-
thermal power plants	-	-	-	-	-	6.00	-
public cogeneration plants	-	-	-	-	-	11.34	11.53
public heating plants	-	-	-	-	-	-	1.66
industrial cogeneration plants	-	-	-	-	-	1.33	9.11
– in refineries	-	-	-	-	-	0.30	2.80
– in gas production	-	-	-	-	-	0.53	0.64
Industrial heating plants	-	-	-	-	-	-	4.22
Petroleum refineries	0.99	5.50	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total production	0.99	5.50	-	-	-	45.94	26.51
Gross production	0.31	5.50	9.80	1.76	-	68.02	27.12
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	-	0.28	-	-	-	-	-
– in refineries	-	0.28	-	-	-	-	-
– in gas production	-	-	-	-	-	-	-
Industrial heating plants	-	0.72	-	-	-	-	-
Petroleum refineries	-	-	9.80	1.76	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total transformation sector	-	1.00	9.80	1.76	-	-	-
Energy sector own use	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	0.48	0.45
Coal production	-	-	-	-	-	-	0.30
Electric energy supply industry	-	-	-	-	-	0.22	-
hydro power plants	-	-	-	-	-	0.83	-
thermal power plants	-	-	-	-	-	0.55	-
public cogeneration plants	-	-	-	-	-	0.85	1.19
industrial cogeneration plants	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	0.09	-
Petroleum refineries	-	4.50	-	-	-	0.89	4.58
NGL-plant	-	-	-	-	-	0.18	0.19
Gas works	-	-	-	-	-	-	-
Total energy sector own use	-	4.50	-	-	-	4.08	6.70
Losses	-	-	-	-	-	5.97	1.70
Final energy demand	0.31	-	0.00	0.00	-	57.96	18.72
Non energy use	0.31	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-
Petrochemical industry	0.31	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-
Energy consumption	-	-	0.00	0.00	-	57.96	18.72
Industry	-	-	-	-	-	12.74	11.68
Iron and steel	-	-	-	-	-	1.16	0.16
Non-ferrous metals	-	-	-	-	-	0.37	-
Non-metallic minerals	-	-	-	-	-	0.56	0.01
Chemical	-	-	-	-	-	1.16	4.55
Construction materials	-	-	-	-	-	2.03	0.01
Pulp and paper	-	-	-	-	-	0.69	1.20
Food production	-	-	-	-	-	2.40	3.01
Not elsewhere specified	-	-	-	-	-	4.38	2.75
Transport	-	-	-	-	-	1.20	-
Rail	-	-	-	-	-	0.64	-
Road	-	-	-	-	-	0.01	-
Air	-	-	-	-	-	0.13	-
– international	-	-	-	-	-	-	-
– domestic	-	-	-	-	-	0.13	-
Sea and River	-	-	-	-	-	0.08	-
Public transport	-	-	-	-	-	0.22	-
Not elsewhere specified	-	-	-	-	-	0.11	-
Other sectors	-	-	-	-	-	44.02	7.03
Households	-	-	-	-	-	22.34	5.20
Services	-	-	-	-	-	21.17	1.57
Agriculture	-	-	-	-	-	0.23	0.27
Construction	-	-	-	-	-	0.28	-

Table A4-3 Industry analysis balance for 2019, energy units, cont.

1. STANDARD ENERGY BALANCE																		
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	10 ³ t				0.0					1.6	1.6	0	0	0	0	0	0	0.0
Coking coal (kameni ugljen)	10 ³ t				0.0					76.9	0.0	0	0	0	76.9	0	0	0.0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t			22.8	22.8					1.1	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Lignite	10 ³ t				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural gas	10 ⁶ m ³	65.3	57.2	197.3	319.8	70.6	68.7	52.2		244.7	15.6	12.5	50.2	12.2	58.0	8.2	47.9	251.8
Wood	10 ³ m ³				0.0					40.0	0.2	0.3	0.0	0.0	4.6	0.0	2.1	12.0
Biogas	TJ			157.8	157.8				0.0	0.0								0.0
Wood waste	TJ				0.0					0.0								194.0
Briketi ugljena	TJ				0.0					0.0								162.7
Coke oven coke	TJ			0.0	0.0	232.1				755.4	2.2	0.0	0.6	0.2	72.5	72.5	188.8	409.7
Liquified petroleum gas	TJ				0.0					1128.9					1128.9			0.0
Motor Gasoline	10 ³ t				0.0					31.4	0.3	0.0	0.0	0.0	28.7	0.0	2.4	0.0
Petroleum	10 ³ t	0			0.0	0.0		0.0		7.7	0.7	0.7	0.2	0.0	1.2	0.2	0.9	12.2
Diesel	10 ³ t				0.0					0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Gas/Diesel oil	10 ³ t				0.0					1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0
Residual fuel oil	10 ³ t				0.0					13.1	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0
Petroleum coke	10 ³ t				0.0	0.0				15.3	0.6	0.2	0.0	0.4	2.7	0.0	6.4	26.8
Refinery gas	10 ³ t	31.3		0.0	31.3	40.4		6.8		7.7	0.0	0.0	0.0	0.0	2.8	0.0	4.4	0.0
Other oil derivatives	10 ³ t	0			0.0			19.7		142.5	0.0	0.0	0.0	0.0	142.5	0.0	0.0	0.0
Visokoplačni plin	10 ³ t	6.5			6.5	17.0		105.7		0.0								0.0
Koksni plin	10 ³ t				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
Electricity	GWh				0.0		181.5	246.7	0.0	3539.8	322.9	101.9	156.1	322.7	563.5	190.5	666.9	5880.0
Steam and hot water	TJ				0.0		637.0	4583.4	297.5	11683.8	164.2	0.0	8.5	4547.4	5.6	1196.0	3011.6	1567.4

3. ENERGY BALANCE WITHOUT IND. COGENERATIONS AND IND. HEAT PL

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					1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coking coal (kameni ugljen)	10 ³ t				0.0					76.9	0.0	0.0	0.0	0.0	76.9	0.0	0.0	0.0	0.0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t				0.0					23.9	0.0	0.0	0.0	0.0	1.1	0.0	22.8	0.0	0.0
Lignite	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
Natural gas	10 ⁶ m ³				0.0		125.9	120.6		508.9	16.3	12.5	50.5	147.0	58.0	55.5	121.4	47.7	252.4
Wood	10 ³ m ³				0.0					40.0	0.2	0.3	0.0	0.0	4.6	0.0	2.1	32.8	12.0
Biogas	TJ				0.0				20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	137.1
Wood waste	TJ				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	194.0
Briketi ugljena	TJ				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	162.7
Coke oven coke	TJ				0.0					987.5	2.2	0.0	0.6	0.2	72.5	79.3	253.7	579.0	409.7
Liquified petroleum gas	TJ				0.0					1128.9	0.0	0.0	0.0	0.0	1128.9	0.0	0.0	0.0	0.0
Motor Gasoline	10 ³ t				0.0					31.4	0.3	0.0	0.0	0.0	28.7	0.0	2.4	0.0	0.0
Petroleum	10 ³ t				0.0			0.0		7.7	0.7	0.7	0.2	0.0	1.2	0.2	0.9	3.8	12.2
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					1.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Residual fuel oil	10 ³ t				0.0					13.1	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0	0.0
Petroleum coke	10 ³ t				0.0			0.0		15.3	0.6	0.2	0.0	0.4	2.7	0.0	6.4	5.0	26.8
Refinery gas	10 ³ t				0.0			70.3		15.7	0.0	0.0	0.0	0.0	3.0	0.7	8.9	3.1	0.2
Other oil derivatives	10 ³ t				0.0			19.7		142.5	0.0	0.0	0.0	0.0	142.5	0.0	0.0	0.0	0.0
Visokopećni plin	10 ³ t				0.0			129.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Koksni 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		34.2	162.9	0.0	3418.7	322.9	101.9	156.1	282.6	563.5	141.6	634.8	1215.3	5862.7
Steam and hot water	TJ				0.0				280.4	3616.6	144.4	0.0	0.0	679.2	0.0	0.0	478.6	2314.4	1539.5

Annex 5: Any additional information

Annex 5-1: Archiving, inventory data record sheet

5.1.1. Inventory data record sheet

Year: 2019

MODULE: ENERGY	
SUBMODULE: CO ₂ from Fuel Combustion by Source Categories	
WORKSHEET: 1_1A1A_PUBLIC_ELE_HEAT_199 0-2019	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 2019; Annual Energy Report: "Energy in Croatia 2019" 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.	

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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 2021 v1
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⁾	16480.71	4306.72	2901.48	NO	1240.24	10.45	NO	NO	24939.60
1. Energy	20362.90	832.59	244.11						21439.60
A. Fuel combustion (sectoral approach)	19780.38	413.48	243.42						20437.27
1. Energy industries	7065.79	5.43	17.40						7088.62
2. Manufacturing industries and construction	5208.58	9.24	16.75						5234.57
3. Transport	3787.06	41.14	67.91						3896.11
4. Other sectors	3718.95	357.67	141.35						4217.97
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	582.52	419.11	0.69						1002.32
1. Solid fuels	NO	59.64	NO,NA						59.64
2. Oil and natural gas	582.52	359.47	0.69						942.68
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2564.27	9.35	787.64	NO	1240.24	10.45	NO	NO	4611.95
A. Mineral industry	1302.67								1302.67
B. Chemical industry	751.10	5.45	754.27	NO	NO	NO	NO	NO	1510.81
C. Metal industry	336.40	3.90	NO	NO	1240.24	NO	NO	NO	1580.54
D. Non-energy products from fuels and solvent use	174.11	NA	NA						174.11
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	33.38	NO	NO	10.45	NO	NO	43.83
H. Other	NA	NA	NA						NA
3. Agriculture	50.02	2548.26	1754.74						4353.02
A. Enteric fermentation		2121.15							2121.15
B. Manure management		427.11	329.05						756.16
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1425.69						1425.69
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⁾	-6497.02	1.23	48.09						-6447.69
A. Forest land	-6744.54	1.12	0.74						-6742.68
B. Cropland	222.77	NO	3.95						226.73
C. Grassland	-7.88	0.11	0.12						-7.66
D. Wetlands	83.47	NO	11.11						94.58
E. Settlements	250.71	NO	32.17						282.88
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-301.54								-301.54
H. Other	NO	NO	NO						NO
5. Waste	0.54	915.30	66.89						982.73
A. Solid waste disposal	NA,NO	326.42							326.42
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		588.88	66.88						655.76
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	0.43	5.29						649.57
Aviation	496.62	0.09	4.14						500.84
Navigation	147.23	0.34	1.15						148.72
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	183.17								183.17
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31387.29
Total CO₂ equivalent emissions with land use, land-use change and forestry									24939.60
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 2021 v1

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⁾	9230.01	4153.13	2743.19	NO	850.75	10.33	NO	NO	16987.42
1. Energy	15017.89	783.46	208.26						16009.61
A. Fuel combustion (sectoral approach)	14440.98	442.12	207.75						15090.85
1. Energy industries	4742.10	3.98	11.99						4758.07
2. Manufacturing industries and construction	3769.57	6.88	12.20						3788.65
3. Transport	2866.99	31.12	53.01						2951.12
4. Other sectors	3062.32	400.14	130.55						3593.01
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	576.92	341.34	0.50						918.76
1. Solid fuels	NO	53.15	NO,NA						53.15
2. Oil and natural gas	576.92	288.19	0.50						865.61
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1916.82	8.74	696.16	NO	850.75	10.33	NO	NO	3482.80
A. Mineral industry	863.03								863.03
B. Chemical industry	665.95	5.02	662.78	NO	NO	NO	NO	NO	1333.74
C. Metal industry	270.10	3.73	NO	NO	850.75	NO	NO	NO	1124.58
D. Non-energy products from fuels and solvent use	117.74	NA	NA						117.74
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	33.38	NO	NO	10.33	NO	NO	43.71
H. Other	NA	NA	NA						NA
3. Agriculture	50.95	2428.07	1727.18						4206.20
A. Enteric fermentation		1992.20							1992.20
B. Manure management		435.87	313.75						749.63
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1413.42						1413.42
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⁾	-7756.18	3.18	48.32						-7704.67
A. Forest land	-8514.27	3.00	1.98						-8509.29
B. Cropland	208.65	NO	4.36						213.01
C. Grassland	39.65	0.18	0.19						40.03
D. Wetlands	68.30	NO	10.63						78.92
E. Settlements	219.11	NO	31.17						250.28
F. Other land	NO	NO	NO						NO
G. Harvested wood products	222.39								222.39
H. Other	NO	NO	NO						NO
5. Waste	0.54	929.68	63.27						993.49
A. Solid waste disposal	NA,NO	345.16							345.16
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		584.52	63.27						647.78
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	94.29	0.02	0.79						95.10
Aviation	94.29	0.02	0.79						95.10
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6091.91								6091.91
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	191.12								191.12
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24692.09
Total CO₂ equivalent emissions with land use, land-use change and forestry									16987.42
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 2021 v1

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⁾	8474.49	3699.08	2761.89	NO	NO	10.42	NO	NO	14945.87
1. Energy	14347.02	818.85	187.16						15353.03
A. Fuel combustion (sectoral approach)	13759.23	376.91	186.70						14322.84
1. Energy industries	5342.75	4.51	15.27						5362.52
2. Manufacturing industries and construction	3079.37	5.43	9.59						3094.39
3. Transport	2776.79	27.62	45.73						2850.14
4. Other sectors	2560.33	339.34	116.12						3015.79
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	587.79	441.94	0.46						1030.18
1. Solid fuels	NO	41.30	NO,NA						41.30
2. Oil and natural gas	587.79	400.64	0.46						988.89
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1958.36	7.57	898.60	NO	NO	10.42	NO	NO	2874.95
A. Mineral industry	933.89								933.89
B. Chemical industry	832.68	5.12	865.22	NO	NO	NO	NO	NO	1703.03
C. Metal industry	121.11	2.45	NO	NO	NO	NO	NO	NO	123.56
D. Non-energy products from fuels and solvent use	70.68	NA	NA						70.68
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	33.38	NO	NO	10.42	NO	NO	43.79
H. Other	NA	NA	NA						NA
3. Agriculture	65.51	1913.34	1556.78						3535.63
A. Enteric fermentation		1562.96							1562.96
B. Manure management		350.38	245.46						595.84
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1311.32						1311.32
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⁾	-7896.94	15.15	55.70						-7826.09
A. Forest land	-8751.46	13.64	9.00						-8728.82
B. Cropland	217.48	NO	4.76						222.24
C. Grassland	34.68	1.51	1.64						37.83
D. Wetlands	65.25	NO	10.14						75.39
E. Settlements	212.56	NO	30.17						242.73
F. Other land	NO	NO	NO						NO
G. Harvested wood products	324.54								324.54
H. Other	NO	NO	NO						NO
5. Waste	0.54	944.17	63.65						1008.35
A. Solid waste disposal	NA,NO	362.94							362.94
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		581.23	63.64						644.87
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	72.29	0.01	0.60						72.91
Aviation	72.29	0.01	0.60						72.91
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5308.28								5308.28
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	199.10								199.10
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22771.96
Total CO₂ equivalent emissions with land use, land-use change and forestry									14945.87
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 A5.2-4: GHG emission in Croatia, 1993

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1993

Submission 2021 v1

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⁾	8622.48	3629.60	2375.62	NO	NO	10.53	NO	NO	14638.23
1. Energy	15117.22	718.33	195.92						16031.47
A. Fuel combustion (sectoral approach)	14330.95	393.96	195.47						14920.37
1. Energy industries	5940.22	4.89	17.15						5962.26
2. Manufacturing industries and construction	2917.23	5.13	9.03						2931.39
3. Transport	2925.16	27.72	48.83						3001.71
4. Other sectors	2548.34	356.21	120.46						3025.01
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	786.27	324.37	0.46						1111.10
1. Solid fuels	NO	39.52	NO,NA						39.52
2. Oil and natural gas	786.27	284.85	0.46						1071.58
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1638.09	6.25	685.59	NO	NO	10.53	NO	NO	2340.45
A. Mineral industry	797.34								797.34
B. Chemical industry	715.96	5.15	652.21	NO	NO	NO	NO	NO	1373.32
C. Metal industry	57.46	1.10	NO	NO	NO	NO	NO	NO	58.56
D. Non-energy products from fuels and solvent use	67.32	NA	NA						67.32
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	33.38	NO	NO	10.53	NO	NO	43.91
H. Other	NA	NA	NA						NA
3. Agriculture	52.14	1911.58	1362.90						3326.63
A. Enteric fermentation		1540.48							1540.48
B. Manure management		371.10	243.74						614.84
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1119.17						1119.17
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⁾	-8185.50	34.39	67.34						-8083.76
A. Forest land	-8805.78	32.81	21.64						-8751.34
B. Cropland	207.18	NO	5.16						212.34
C. Grassland	33.64	1.58	1.72						36.94
D. Wetlands	62.21	NO	9.65						71.86
E. Settlements	206.01	NO	29.17						235.18
F. Other land	NO	NO	NO						NO
G. Harvested wood products	111.24								111.24
H. Other	NO	NO	NO						NO
5. Waste	0.54	959.05	63.86						1023.45
A. Solid waste disposal	NA,NO	380.16							380.16
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		578.89	63.86						642.75
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	0.03	1.52						183.85
Aviation	182.30	0.03	1.52						183.85
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5583.98								5583.98
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	207.13								207.13
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22722.00
Total CO₂ equivalent emissions with land use, land-use change and forestry									14638.23
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 A5.2-6: GHG emission in Croatia, 1994

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1994

Submission 2021 v1

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⁾	7616.60	3419.73	2397.91	NO	NO	10.64	NO	NO	13444.88
1. Energy	14179.93	653.92	190.71						15024.56
A. Fuel combustion (sectoral approach)	13474.85	360.34	190.30						14025.49
1. Energy industries	4658.42	3.29	12.07						4673.79
2. Manufacturing industries and construction	3077.51	4.76	8.47						3090.74
3. Transport	3102.93	30.08	51.23						3184.24
4. Other sectors	2635.99	322.22	118.52						3076.73
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	705.07	293.58	0.42						999.07
1. Solid fuels	NO	35.44	NO,NA						35.44
2. Oil and natural gas	705.07	258.14	0.42						963.63
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1824.74	6.53	739.64	NO	NO	10.64	NO	NO	2581.55
A. Mineral industry	957.92								957.92
B. Chemical industry	715.58	4.90	706.26	NO	NO	NO	NO	NO	1426.74
C. Metal industry	81.17	1.63	NO	NO	NO	NO	NO	NO	82.80
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	33.38	NO	NO	10.64	NO	NO	44.02
H. Other	NA	NA	NA						NA
3. Agriculture	47.57	1768.71	1350.33						3166.61
A. Enteric fermentation		1392.68							1392.68
B. Manure management		376.03	230.65						606.68
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1119.68						1119.68
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⁾	-8436.17	11.51	50.83						-8373.84
A. Forest land	-8930.68	10.68	7.04						-8912.95
B. Cropland	224.80	NO	5.56						230.36
C. Grassland	28.15	0.82	0.90						29.87
D. Wetlands	59.17	NO	9.17						68.34
E. Settlements	198.80	NO	28.16						226.97
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-16.42								-16.42
H. Other	NO	NO	NO						NO
5. Waste	0.54	979.07	66.39						1045.99
A. Solid waste disposal	NA,NO	398.14							398.14
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		580.93	66.38						647.31
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	403.81	0.37	3.29						407.47
Aviation	264.02	0.05	2.20						266.27
Navigation	139.78	0.32	1.09						141.20
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	4999.29								4999.29
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	215.32								215.32
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									21818.72
Total CO₂ equivalent emissions with land use, land-use change and forestry									13444.88
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 A5.2-7: GHG emission in Croatia, 1995

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1995

Submission 2021 v1

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⁾	7820.52	3367.23	2316.31	30.73	NO	11.12	NO	NO	13545.92
1. Energy	15121.53	669.99	181.40						15972.92
A. Fuel combustion (sectoral approach)	14285.75	380.20	181.00						14846.95
1. Energy industries	5261.60	4.06	12.37						5278.03
2. Manufacturing industries and construction	2874.38	4.69	8.36						2887.43
3. Transport	3292.91	31.44	46.27						3370.62
4. Other sectors	2856.86	340.01	114.00						3310.87
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	835.78	289.79	0.40						1125.98
1. Solid fuels	NO	28.23	NO,NA						28.23
2. Oil and natural gas	835.78	261.57	0.40						1097.75
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1648.09	5.85	711.25	30.73	NO	11.12	NO	NO	2407.04
A. Mineral industry	741.72								741.72
B. Chemical industry	756.00	5.07	677.87	NO	NO	NO	NO	NO	1438.94
C. Metal industry	40.32	0.78	NO	NO	NO	NO	NO	NO	41.10
D. Non-energy products from fuels and solvent use	110.05	NA	NA						110.05
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				30.73	NO	NO	NO	NO	30.73
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.12	NO	NO	44.50
H. Other	NA	NA	NA						NA
3. Agriculture	46.29	1691.46	1304.60						3042.35
A. Enteric fermentation		1330.03							1330.03
B. Manure management		361.43	215.90						577.33
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1088.70						1088.70
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⁾	-8995.93	7.54	47.00						-8941.38
A. Forest land	-9445.47	7.03	4.63						-9433.81
B. Cropland	232.13	NO	5.96						238.09
C. Grassland	23.95	0.52	0.56						25.03
D. Wetlands	56.12	NO	8.68						64.81
E. Settlements	192.92	NO	27.16						220.08
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-55.59								-55.59
H. Other	NO	NO	NO						NO
5. Waste	0.54	992.39	72.06						1064.99
A. Solid waste disposal	NA,NO	417.74							417.74
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		574.65	72.05						646.70
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	0.28	2.85						351.38
Aviation	245.16	0.04	2.04						247.25
Navigation	103.08	0.24	0.81						104.13
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5288.54								5288.54
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	223.68								223.68
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22487.30
Total CO₂ equivalent emissions with land use, land-use change and forestry									13545.92
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 2021 v1

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⁾	8683.56	3337.62	2319.85	50.52	NO	11.57	NO	NO	14403.13
1. Energy	15640.05	702.21	231.16						16573.43
A. Fuel combustion (sectoral approach)	14829.75	423.15	230.77						15483.68
1. Energy industries	5085.53	4.08	12.94						5102.55
2. Manufacturing industries and construction	2866.98	4.60	8.19						2879.77
3. Transport	3620.22	34.03	73.87						3728.12
4. Other sectors	3257.02	380.45	135.78						3773.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	810.30	279.06	0.39						1089.75
1. Solid fuels	NO	22.77	NO,NA						22.77
2. Oil and natural gas	810.30	256.30	0.39						1066.99
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1650.98	5.18	665.11	50.52	NO	11.57	NO	NO	2383.36
A. Mineral industry	827.96								827.96
B. Chemical industry	701.63	4.86	631.73	NO	NO	NO	NO	NO	1338.22
C. Metal industry	19.17	0.32	NO	NO	NO	NO	NO	NO	19.49
D. Non-energy products from fuels and solvent use	102.22	NA	NA						102.22
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				50.52	NO	NO	NO	NO	50.52
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.57	NO	NO	44.95
H. Other	NA	NA	NA						NA
3. Agriculture	52.44	1608.30	1302.60						2963.35
A. Enteric fermentation		1245.87							1245.87
B. Manure management		362.44	203.95						566.39
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1098.65						1098.65
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⁾	-8660.44	16.53	52.22						-8591.69
A. Forest land	-9157.64	15.14	9.99						-9132.51
B. Cropland	231.22	NO	6.36						237.59
C. Grassland	21.07	1.39	1.51						23.97
D. Wetlands	53.08	NO	8.20						61.28
E. Settlements	186.47	NO	26.17						212.63
F. Other land	NO	NO	NO						NO
G. Harvested wood products	5.35								5.35
H. Other	NO	NO	NO						NO
5. Waste	0.54	1005.40	68.76						1074.69
A. Solid waste disposal	NA,NO	440.96							440.96
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		564.43	68.75						633.18
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	339.28	0.31	2.77						342.36
Aviation	223.16	0.04	1.86						225.06
Navigation	116.12	0.27	0.91						117.30
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	232.13								232.13
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22994.82
Total CO₂ equivalent emissions with land use, land-use change and forestry									14403.13
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 2021 v1

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⁾	10419.98	3313.11	2513.81	72.84	NO	11.43	NO	NO	16331.17
1. Energy	16674.29	669.36	228.74						17572.38
A. Fuel combustion (sectoral approach)	15911.94	396.13	228.34						16536.40
1. Energy industries	5557.16	4.46	15.10						5576.72
2. Manufacturing industries and construction	3080.25	5.20	9.17						3094.62
3. Transport	3966.11	36.05	85.47						4087.63
4. Other sectors	3308.41	350.42	118.60						3777.43
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.35	273.24	0.39						1035.98
1. Solid fuels	NO	16.65	NO,NA						16.65
2. Oil and natural gas	762.35	256.58	0.39						1019.33
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1812.70	5.51	698.44	72.84	NO	11.43	NO	NO	2600.92
A. Mineral industry	950.81								950.81
B. Chemical industry	743.07	4.77	665.06	NO	NO	NO	NO	NO	1412.90
C. Metal industry	40.82	0.74	NO	NO	NO	NO	NO	NO	41.56
D. Non-energy products from fuels and solvent use	77.99	NA	NA						77.99
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				72.84	NO	NO	NO	NO	72.84
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.43	NO	NO	44.80
H. Other	NA	NA	NA						NA
3. Agriculture	68.39	1587.46	1465.46						3121.31
A. Enteric fermentation		1219.73							1219.73
B. Manure management		367.74	199.91						567.65
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1265.55						1265.55
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⁾	-8137.21	17.63	51.83						-8067.75
A. Forest land	-8567.06	16.28	10.73						-8540.06
B. Cropland	250.39	NO	6.76						257.15
C. Grassland	14.45	1.35	1.47						17.27
D. Wetlands	50.04	NO	7.71						57.75
E. Settlements	177.79	NO	25.16						202.95
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-62.82								-62.82
H. Other	NO	NO	NO						NO
5. Waste	1.82	1033.15	69.34						1104.31
A. Solid waste disposal	NA,NO	466.29							466.29
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	1.82	NA,NO	0.03						1.86
D. Waste water treatment and discharge		566.86	69.30						636.17
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	0.21	2.55						312.90
Aviation	235.74	0.04	1.97						237.74
Navigation	74.41	0.17	0.58						75.16
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5526.07								5526.07
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	240.72								240.72
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24398.92
Total CO₂ equivalent emissions with land use, land-use change and forestry									16331.17
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 A5.2-10: GHG emission in Croatia, 1998

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1998
Submission 2021 v1
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⁾	11104.57	3316.87	2181.31	103.13	NO	11.99	NO	NO	16717.87
1. Energy	17247.97	657.24	212.39						18117.60
A. Fuel combustion (sectoral approach)	16570.51	399.70	212.03						17182.24
1. Energy industries	6238.88	5.20	16.84						6260.92
2. Manufacturing industries and construction	3065.07	5.00	8.93						3078.99
3. Transport	4098.78	36.80	61.16						4196.73
4. Other sectors	3167.79	352.70	125.11						3645.59
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	677.45	257.54	0.37						935.36
1. Solid fuels	NO	17.44	NO,NA						17.44
2. Oil and natural gas	677.45	240.10	0.37						917.92
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1715.94	4.89	534.06	103.13	NO	11.99	NO	NO	2370.00
A. Mineral industry	1016.67								1016.67
B. Chemical industry	592.72	4.51	500.68	NO	NO	NO	NO	NO	1097.92
C. Metal industry	29.65	0.38	NO	NO	NO	NO	NO	NO	30.03
D. Non-energy products from fuels and solvent use	76.89	NA	NA						76.89
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				103.13	NO	NO	NO	NO	103.13
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.99	NO	NO	45.37
H. Other	NA	NA	NA						NA
3. Agriculture	44.25	1557.76	1296.86						2898.87
A. Enteric fermentation		1185.49							1185.49
B. Manure management		372.27	193.35						565.63
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1103.51						1103.51
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-7907.28	45.11	70.55						-7791.61
A. Forest land	-8239.11	39.83	26.26						-8173.02
B. Cropland	265.31	NO	7.16						272.47
C. Grassland	11.77	5.29	5.75						22.81
D. Wetlands	47.00	NO	7.22						54.22
E. Settlements	172.93	NO	24.15						197.07
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-165.16								-165.16
H. Other	NO	NO	NO						NO
5. Waste	3.70	1051.87	67.45						1123.01
A. Solid waste disposal	NA,NO	494.72							494.72
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	3.70	NA,NO	0.06						3.76
D. Waste water treatment and discharge		557.15	67.38						624.53
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	0.23	2.77						339.44
Aviation	254.59	0.04	2.12						256.76
Navigation	81.85	0.19	0.64						82.68
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5535.75								5535.75
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	249.41								249.41
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24509.48
Total CO₂ equivalent emissions with land use, land-use change and forestry									16717.87
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 A5.2-11: GHG emission in Croatia, 1999

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1999

Submission 2021 v1

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⁾	11480.88	3331.80	2382.79	122.48	NO	11.99	NO	NO	17329.94
1. Energy	17896.52	633.81	269.23						18799.55
A. Fuel combustion (sectoral approach)	17234.65	394.50	268.88						17898.03
1. Energy industries	6459.12	5.47	17.41						6482.00
2. Manufacturing industries and construction	2867.36	4.18	7.52						2879.06
3. Transport	4329.18	37.52	108.73						4475.43
4. Other sectors	3578.99	347.33	135.23						4061.55
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	661.86	239.31	0.34						901.52
1. Solid fuels	NO	5.25	NO,NA						5.25
2. Oil and natural gas	661.86	234.06	0.34						896.26
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2071.57	4.95	623.59	122.48	NO	11.99	NO	NO	2834.57
A. Mineral industry	1270.90								1270.90
B. Chemical industry	701.41	4.52	590.21	NO	NO	NO	NO	NO	1296.14
C. Metal industry	27.67	0.42	NO	NO	NO	NO	NO	NO	28.10
D. Non-energy products from fuels and solvent use	71.59	NA	NA						71.59
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				122.48	NO	NO	NO	NO	122.48
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.99	NO	NO	45.37
H. Other	NA	NA	NA						NA
3. Agriculture	50.49	1600.60	1375.30						3026.38
A. Enteric fermentation		1190.78							1190.78
B. Manure management		409.81	200.90						610.71
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1174.40						1174.40
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⁾	-8542.07	5.91	42.06						-8494.10
A. Forest land	-8836.01	4.26	2.81						-8828.95
B. Cropland	258.59	NO	7.57						266.15
C. Grassland	9.71	1.65	1.80						13.17
D. Wetlands	43.95	NO	6.74						50.69
E. Settlements	167.38	NO	23.14						190.52
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-185.70								-185.70
H. Other	NO	NO	NO						NO
5. Waste	4.38	1086.54	72.62						1163.54
A. Solid waste disposal	NA,NO	524.20							524.20
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	4.38	NA,NO	0.08						4.46
D. Waste water treatment and discharge		562.34	72.54						634.88
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	311.54	0.20	2.57						314.30
Aviation	245.16	0.04	2.04						247.25
Navigation	66.37	0.15	0.53						67.05
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5328.01								5328.01
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	258.40								258.40
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25824.04
Total CO₂ equivalent emissions with land use, land-use change and forestry									17329.94
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 2021 v1
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⁾	12575.01	3379.39	2564.49	148.75	NO	11.62	NO	NO	18679.27
1. Energy	17356.75	583.67	274.63						18215.05
A. Fuel combustion (sectoral approach)	16645.33	353.38	274.30						17273.02
1. Energy industries	5810.87	3.95	18.59						5833.41
2. Manufacturing industries and construction	3061.67	4.47	8.11						3074.25
3. Transport	4354.38	36.05	109.77						4500.21
4. Other sectors	3418.41	308.91	137.84						3865.16
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	711.42	230.29	0.32						942.03
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	711.42	230.29	0.32						942.03
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2236.79	3.40	727.32	148.75	NO	11.62	NO	NO	3127.88
A. Mineral industry	1428.93								1428.93
B. Chemical industry	704.40	2.92	693.94	NO	NO	NO	NO	NO	1401.26
C. Metal industry	29.68	0.48	NO	NO	NO	NO	NO	NO	30.17
D. Non-energy products from fuels and solvent use	73.79	NA	NA						73.79
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				148.75	NO	NO	NO	NO	148.75
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.62	NO	NO	45.00
H. Other	NA	NA	NA						NA
3. Agriculture	60.87	1569.36	1388.07						3018.30
A. Enteric fermentation		1168.97							1168.97
B. Manure management		400.39	191.86						592.25
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1196.21						1196.21
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⁾	-7085.55	96.91	104.45						-6884.19
A. Forest land	-7457.89	87.11	57.44						-7313.34
B. Cropland	336.74	NO	7.97						344.71
C. Grassland	2.63	9.80	10.67						23.09
D. Wetlands	40.91	NO	6.25						47.16
E. Settlements	162.11	NO	22.12						184.23
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-170.05								-170.05
H. Other	NO	NO	NO						NO
5. Waste	6.15	1126.05	70.02						1202.22
A. Solid waste disposal	NA,NO	558.03							558.03
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	6.15	NA,NO	0.11						6.26
D. Waste water treatment and discharge		568.02	69.91						637.93
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	0.17	2.13						261.08
Aviation	201.16	0.04	1.68						202.87
Navigation	57.62	0.13	0.45						58.21
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	4771.83								4771.83
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	268.11								268.11
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25563.46
Total CO₂ equivalent emissions with land use, land-use change and forestry									18679.27
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 A5.2-13: GHG emission in Croatia, 2001

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2001

Submission 2021 v1

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⁾	12921.66	3373.75	2483.71	161.98	NO	11.69	NO	NO	18952.79
1. Energy	18358.84	622.90	266.37						19248.11
A. Fuel combustion (sectoral approach)	17596.69	378.50	266.07						18241.26
1. Energy industries	6343.85	4.46	20.96						6369.27
2. Manufacturing industries and construction	3196.99	4.39	8.06						3209.43
3. Transport	4420.07	30.91	99.43						4550.41
4. Other sectors	3635.78	338.75	137.61						4112.14
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.15	244.40	0.31						1006.85
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	762.15	244.40	0.31						1006.85
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2325.63	3.52	615.78	161.98	NO	11.69	NO	NO	3118.61
A. Mineral industry	1647.58								1647.58
B. Chemical industry	595.81	3.50	582.41	NO	NO	NO	NO	NO	1181.71
C. Metal industry	7.15	0.02	NO	NO	NO	NO	NO	NO	7.17
D. Non-energy products from fuels and solvent use	75.09	NA	NA						75.09
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				161.98	NO	NO	NO	NO	161.98
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.69	NO	NO	45.07
H. Other	NA	NA	NA						NA
3. Agriculture	92.09	1591.40	1470.97						3154.46
A. Enteric fermentation		1178.20							1178.20
B. Manure management		413.21	192.76						605.97
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1278.21						1278.21
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⁾	-7861.59	19.00	55.94						-7786.66
A. Forest land	-8427.82	16.02	10.56						-8401.23
B. Cropland	232.72	NO	8.37						241.09
C. Grassland	37.55	2.98	3.24						43.76
D. Wetlands	36.73	NO	5.73						42.46
E. Settlements	365.69	NO	28.04						393.72
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-106.47								-106.47
H. Other	NO	NO	NO						NO
5. Waste	6.68	1136.93	74.65						1218.26
A. Solid waste disposal	NA,NO	591.61							591.61
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	6.68	NA,NO	0.12						6.80
D. Waste water treatment and discharge		545.32	74.53						619.85
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	0.24	2.39						294.10
Aviation	201.16	0.04	1.68						202.87
Navigation	90.31	0.21	0.71						91.23
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5187.98								5187.98
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	278.22								278.22
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									26739.44
Total CO₂ equivalent emissions with land use, land-use change and forestry									18952.79
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 A5.2-14: GHG emission in Croatia, 2002

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2002
Submission 2021 v1
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⁾	13735.34	3369.08	2397.10	186.19	NO	12.01	NO	NO	19699.73
1. Energy	19511.40	613.36	227.66						20352.42
A. Fuel combustion (sectoral approach)	18735.04	364.25	227.35						19326.65
1. Energy industries	7225.52	4.90	24.91						7255.33
2. Manufacturing industries and construction	3057.13	4.32	7.93						3069.38
3. Transport	4729.32	29.91	65.03						4824.26
4. Other sectors	3723.08	325.12	129.48						4177.68
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	776.36	249.11	0.31						1025.77
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	776.36	249.11	0.31						1025.77
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2291.82	3.27	600.08	186.19	NO	12.01	NO	NO	3093.38
A. Mineral industry	1647.57								1647.57
B. Chemical industry	550.89	3.27	566.71	NO	NO	NO	NO	NO	1120.86
C. Metal industry	4.72	0.01	NO	NO	NO	NO	NO	NO	4.73
D. Non-energy products from fuels and solvent use	88.64	NA	NA						88.64
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				186.19	NO	NO	NO	NO	186.19
G. Other product manufacture and use	NO	NO	33.38	NO	NO	12.01	NO	NO	45.39
H. Other	NA	NA	NA						NA
3. Agriculture	80.76	1573.02	1438.32						3092.10
A. Enteric fermentation		1149.05							1149.05
B. Manure management		423.98	189.46						613.44
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1248.86						1248.86
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⁾	-8152.41	6.39	52.49						-8093.53
A. Forest land	-8678.43	5.62	3.70						-8669.11
B. Cropland	215.67	NO	8.77						224.44
C. Grassland	27.92	0.78	0.85						29.55
D. Wetlands	33.46	NO	5.21						38.67
E. Settlements	410.28	NO	33.96						444.24
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-161.32								-161.32
H. Other	NO	NO	NO						NO
5. Waste	3.78	1173.03	78.55						1255.36
A. Solid waste disposal	NA,NO	630.26							630.26
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	3.78	NA,NO	0.07						3.85
D. Waste water treatment and discharge		542.77	78.48						621.26
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	262.60	0.20	2.15						264.95
Aviation	188.59	0.03	1.57						190.19
Navigation	74.01	0.17	0.58						74.76
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	4975.57								4975.57
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	288.69								288.69
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27793.26
Total CO₂ equivalent emissions with land use, land-use change and forestry									19699.73
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 2021 v1

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⁾	15830.26	3570.45	2335.35	212.69	NO	12.28	NO	NO	21961.02
1. Energy	20816.14	663.89	242.06						21722.09
A. Fuel combustion (sectoral approach)	20087.34	413.75	241.76						20742.85
1. Energy industries	7871.16	5.83	25.89						7902.88
2. Manufacturing industries and construction	3136.78	4.94	8.93						3150.65
3. Transport	5126.76	28.94	67.20						5222.90
4. Other sectors	3952.65	374.04	139.74						4466.43
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	728.80	250.14	0.29						979.24
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	728.80	250.14	0.29						979.24
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2325.58	3.12	569.27	212.69	NO	12.28	NO	NO	3122.92
A. Mineral industry	1654.26								1654.26
B. Chemical industry	574.42	3.09	535.89	NO	NO	NO	NO	NO	1113.41
C. Metal industry	6.62	0.02	NO	NO	NO	NO	NO	NO	6.64
D. Non-energy products from fuels and solvent use	90.28	NA	NA						90.28
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				212.69	NO	NO	NO	NO	212.69
G. Other product manufacture and use	NO	NO	33.38	NO	NO	12.28	NO	NO	45.65
H. Other	NA	NA	NA						NA
3. Agriculture	71.79	1652.98	1364.68						3089.45
A. Enteric fermentation		1198.59							1198.59
B. Manure management		454.38	194.58						648.96
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1170.10						1170.10
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⁾	-7384.06	39.55	81.39						-7263.12
A. Forest land	-7996.11	35.95	23.70						-7936.46
B. Cropland	204.53	NO	9.17						213.70
C. Grassland	16.76	3.60	3.92						24.29
D. Wetlands	30.19	NO	4.69						34.88
E. Settlements	451.53	NO	39.90						491.44
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-90.96								-90.96
H. Other	NO	NO	NO						NO
5. Waste	0.80	1210.92	77.96						1289.68
A. Solid waste disposal	NA,NO	673.65							673.65
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.80	NA,NO	0.01						0.82
D. Waste water treatment and discharge		537.27	77.94						615.21
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	0.19	2.06						253.95
Aviation	182.30	0.03	1.52						183.85
Navigation	69.39	0.16	0.54						70.09
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5755.73								5755.73
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	299.49								299.49
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									29224.14
Total CO₂ equivalent emissions with land use, land-use change and forestry									21961.02
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 2021 v1

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⁾	15249.77	3626.85	2556.04	241.45	NO	12.57	NO	NO	21686.68
1. Energy	20272.16	650.70	276.21						21199.07
A. Fuel combustion (sectoral approach)	19494.24	402.35	275.93						20172.52
1. Energy industries	6784.01	4.86	23.51						6812.38
2. Manufacturing industries and construction	3583.00	5.99	10.74						3599.72
3. Transport	5262.21	27.10	109.12						5398.43
4. Other sectors	3865.02	364.40	132.57						4361.99
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	777.92	248.35	0.28						1026.55
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	777.92	248.35	0.28						1026.55
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2543.10	3.74	684.84	241.45	NO	12.57	NO	NO	3485.70
A. Mineral industry	1751.18								1751.18
B. Chemical industry	665.57	3.74	651.47	NO	NO	NO	NO	NO	1320.78
C. Metal industry	13.72	NA,NO	NO	NO	NO	NO	NO	NO	13.72
D. Non-energy products from fuels and solvent use	112.62	NA	NA						112.62
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				241.45	NO	NO	NO	NO	241.45
G. Other product manufacture and use	NO	NO	33.38	NO	NO	12.57	NO	NO	45.94
H. Other	NA	NA	NA						NA
3. Agriculture	75.94	1710.09	1455.47						3241.50
A. Enteric fermentation		1228.58							1228.58
B. Manure management		481.52	200.29						681.81
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1255.18						1255.18
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⁾	-7641.77	2.92	61.90						-7576.96
A. Forest land	-8259.71	1.95	1.29						-8256.47
B. Cropland	191.40	NO	9.57						200.97
C. Grassland	10.09	0.97	1.05						12.11
D. Wetlands	26.92	NO	4.16						31.09
E. Settlements	494.16	NO	45.82						539.98
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-104.64								-104.64
H. Other	NO	NO	NO						NO
5. Waste	0.35	1259.40	77.62						1337.37
A. Solid waste disposal	NA,NO	715.92							715.92
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.35	NA,NO	0.00						0.35
D. Waste water treatment and discharge		543.47	77.61						621.09
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	284.43	0.21	2.33						286.96
Aviation	210.59	0.04	1.76						212.38
Navigation	73.83	0.17	0.58						74.58
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5660.22								5660.22
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	310.58								310.58
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									29263.64
Total CO₂ equivalent emissions with land use, land-use change and forestry									21686.68
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 A5.2-17: GHG emission in Croatia, 2005

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2005

Submission 2021 v1

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⁾	15468.89	3649.22	2526.32	266.74	NO	13.03	NO	NO	21924.21
1. Energy	20656.65	669.84	237.30						21563.79
A. Fuel combustion (sectoral approach)	19899.91	421.09	237.03						20558.03
1. Energy industries	6810.03	4.61	22.86						6837.50
2. Manufacturing industries and construction	3724.02	5.41	9.91						3739.34
3. Transport	5467.69	24.85	68.54						5561.08
4. Other sectors	3898.16	386.23	135.72						4420.11
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	756.74	248.75	0.27						1005.76
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	756.74	248.75	0.27						1005.76
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2603.27	3.77	670.12	266.74	NO	13.03	NO	NO	3556.93
A. Mineral industry	1813.79								1813.79
B. Chemical industry	663.60	3.77	636.74	NO	NO	NO	NO	NO	1304.11
C. Metal industry	12.71	NA,NO	NO	NO	NO	NO	NO	NO	12.71
D. Non-energy products from fuels and solvent use	113.17	NA	NA						113.17
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				266.74	NO	NO	NO	NO	266.74
G. Other product manufacture and use	NO	NO	33.38	NO	NO	13.03	NO	NO	46.40
H. Other	NA	NA	NA						NA
3. Agriculture	85.46	1720.70	1470.88						3277.04
A. Enteric fermentation		1271.09							1271.09
B. Manure management		449.61	189.20						638.80
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1281.68						1281.68
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⁾	-7876.65	2.74	67.40						-7806.52
A. Forest land	-8313.80	2.16	1.43						-8310.21
B. Cropland	139.04	NO	9.97						149.01
C. Grassland	44.37	0.57	0.62						45.56
D. Wetlands	23.65	NO	3.64						27.29
E. Settlements	529.54	NO	51.74						581.27
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-299.45								-299.45
H. Other	NO	NO	NO						NO
5. Waste	0.16	1252.18	80.63						1332.97
A. Solid waste disposal	NA,NO	711.65							711.65
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.16	NA,NO	0.00						0.16
D. Waste water treatment and discharge		540.53	80.63						621.15
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	337.55	0.23	2.77						340.55
Aviation	257.74	0.05	2.15						259.93
Navigation	79.82	0.18	0.62						80.62
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5908.79								5908.79
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	321.95								321.95
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									29730.72
Total CO₂ equivalent emissions with land use, land-use change and forestry									21924.21
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 2021 v1

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⁾	15866.75	3757.39	2545.09	293.17	NO	13.01	NO	NO	22475.40
1. Energy	20732.16	653.72	238.18						21624.05
A. Fuel combustion (sectoral approach)	19966.19	388.39	237.91						20592.48
1. Energy industries	6631.42	4.82	22.56						6658.79
2. Manufacturing industries and construction	3855.12	5.75	10.53						3871.40
3. Transport	5820.94	23.71	72.18						5916.84
4. Other sectors	3658.71	354.11	132.63						4145.45
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	765.97	265.33	0.27						1031.57
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	765.97	265.33	0.27						1031.57
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2740.59	3.66	662.70	293.17	NO	13.01	NO	NO	3713.13
A. Mineral industry	1941.92								1941.92
B. Chemical industry	657.88	3.66	629.32	NO	NO	NO	NO	NO	1290.87
C. Metal industry	13.31	NA,NO	NO	NO	NO	NO	NO	NO	13.31
D. Non-energy products from fuels and solvent use	127.48	NA	NA						127.48
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				293.17	NO	NO	NO	NO	293.17
G. Other product manufacture and use	NO	NO	33.38	NO	NO	13.01	NO	NO	46.38
H. Other	NA	NA	NA						NA
3. Agriculture	80.67	1763.13	1485.72						3329.52
A. Enteric fermentation		1252.01							1252.01
B. Manure management		511.13	194.90						706.03
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1290.82						1290.82
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⁾	-7687.40	6.06	75.40						-7605.95
A. Forest land	-8123.08	5.46	3.60						-8114.02
B. Cropland	116.08	NO	10.38						126.46
C. Grassland	18.74	0.60	0.65						19.99
D. Wetlands	20.38	NO	3.12						23.50
E. Settlements	566.38	NO	57.65						624.03
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-285.91								-285.91
H. Other	NO	NO	NO						NO
5. Waste	0.74	1330.81	83.09						1414.65
A. Solid waste disposal	NA,NO	785.93							785.93
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.74	NA,NO	0.01						0.75
D. Waste water treatment and discharge		544.88	83.08						627.96
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	0.19	2.68						328.52
Aviation	264.02	0.05	2.20						266.27
Navigation	61.63	0.14	0.48						62.25
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5497.41								5497.41
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	333.65								333.65
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									30081.35
Total CO₂ equivalent emissions with land use, land-use change and forestry									22475.40
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 2021 v1

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⁾	17936.83	3787.69	2623.79	327.59	NO	13.05	NO	NO	24688.95
1. Energy	21965.25	650.45	244.24						22859.94
A. Fuel combustion (sectoral approach)	21237.66	374.95	243.98						21856.58
1. Energy industries	7815.15	5.57	27.11						7847.84
2. Manufacturing industries and construction	3853.05	5.80	10.51						3869.36
3. Transport	6242.17	22.86	75.86						6340.89
4. Other sectors	3327.29	340.71	130.51						3798.51
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	727.60	275.50	0.26						1003.36
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	727.60	275.50	0.26						1003.36
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2811.11	3.41	727.75	327.59	NO	13.05	NO	NO	3882.91
A. Mineral industry	1969.85								1969.85
B. Chemical industry	696.32	3.41	694.38	NO	NO	NO	NO	NO	1394.11
C. Metal industry	13.69	NA,NO	NO	NO	NO	NO	NO	NO	13.69
D. Non-energy products from fuels and solvent use	131.25	NA	NA						131.25
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				327.59	NO	NO	NO	NO	327.59
G. Other product manufacture and use	NO	NO	33.38	NO	NO	13.05	NO	NO	46.43
H. Other	NA	NA	NA						NA
3. Agriculture	89.32	1697.42	1465.60						3252.34
A. Enteric fermentation		1204.31							1204.31
B. Manure management		493.11	185.29						678.40
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1280.31						1280.31
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⁾	-6929.51	31.76	100.96						-6796.79
A. Forest land	-7305.12	29.59	19.51						-7256.02
B. Cropland	1.42	NO	12.89						14.31
C. Grassland	16.36	2.17	2.37						20.90
D. Wetlands	18.37	NO	2.64						21.01
E. Settlements	625.04	NO	63.56						688.60
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-285.59								-285.59
H. Other	NO	NO	NO						NO
5. Waste	0.65	1404.66	85.23						1490.54
A. Solid waste disposal	NA,NO	852.96							852.96
B. Biological treatment of solid waste		1.52	1.09						2.61
C. Incineration and open burning of waste	0.65	NA,NO	0.01						0.66
D. Waste water treatment and discharge		550.18	84.14						634.32
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	0.22	2.90						356.17
Aviation	276.60	0.05	2.31						278.95
Navigation	76.45	0.17	0.59						77.22
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5322.60								5322.60
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	346.01								346.01
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31485.74
Total CO₂ equivalent emissions with land use, land-use change and forestry									24688.95
Total CO₂ equivalent emissions, including indirect CO₂, without 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 2021 v1
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⁾	16307.98	3739.79	2920.69	338.29	NO	11.98	NO	NO	23318.72
1. Energy	20802.16	637.72	240.28						21680.15
A. Fuel combustion (sectoral approach)	20165.34	373.31	240.03						20778.68
1. Energy industries	6771.62	4.79	24.21						6800.63
2. Manufacturing industries and construction	3872.78	5.59	10.17						3888.55
3. Transport	6079.11	20.97	70.74						6170.82
4. Other sectors	3441.83	341.95	134.90						3918.68
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	636.82	264.40	0.25						901.47
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	636.82	264.40	0.25						901.47
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2699.24	3.23	743.16	338.29	NO	11.98	NO	NO	3795.90
A. Mineral industry	1868.94								1868.94
B. Chemical industry	676.64	3.23	709.79	NO	NO	NO	NO	NO	1389.66
C. Metal industry	23.41	NA,NO	NO	NO	NO	NO	NO	NO	23.41
D. Non-energy products from fuels and solvent use	130.25	NA	NA						130.25
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				338.29	NO	NO	NO	NO	338.29
G. Other product manufacture and use	NO	NO	33.38	NO	NO	11.98	NO	NO	45.35
H. Other	NA	NA	NA						NA
3. Agriculture	96.60	1610.80	1757.26						3464.66
A. Enteric fermentation		1155.97							1155.97
B. Manure management		454.83	172.82						627.65
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1584.44						1584.44
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⁾	-7290.69	9.58	93.72						-7187.39
A. Forest land	-7638.14	8.64	5.70						-7623.80
B. Cropland	13.27	NO	15.39						28.66
C. Grassland	-47.13	0.94	1.02						-45.16
D. Wetlands	15.36	NO	2.16						17.51
E. Settlements	661.90	NO	69.44						731.34
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-295.95								-295.95
H. Other	NO	NO	NO						NO
5. Waste	0.67	1478.47	86.28						1565.41
A. Solid waste disposal	NA,NO	933.47							933.47
B. Biological treatment of solid waste		1.49	1.06						2.55
C. Incineration and open burning of waste	0.67	NA,NO	0.01						0.68
D. Waste water treatment and discharge		543.51	85.21						628.72
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	384.96	0.21	3.17						388.33
Aviation	317.46	0.06	2.65						320.16
Navigation	67.50	0.15	0.52						68.17
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5298.65								5298.65
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	358.75								358.75
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									30506.12
Total CO₂ equivalent emissions with land use, land-use change and forestry									23318.72
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 2021 v1

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⁾	14561.98	3808.72	2287.41	341.63	0.26	8.03	NO	NO	21008.03
1. Energy	19642.09	642.38	234.11						20518.58
A. Fuel combustion (sectoral approach)	19068.23	385.90	233.88						19688.01
1. Energy industries	6365.42	4.77	21.01						6391.20
2. Manufacturing industries and construction	3157.36	5.28	9.34						3171.98
3. Transport	6091.06	19.85	69.86						6180.76
4. Other sectors	3454.39	356.00	133.68						3944.07
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	573.86	256.47	0.23						830.57
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	573.86	256.47	0.23						830.57
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2089.33	2.91	625.49	341.63	0.26	8.03	NO	NO	3067.65
A. Mineral industry	1454.55								1454.55
B. Chemical industry	529.27	2.91	593.20	NO	NO	NO	NO	NO	1125.38
C. Metal industry	4.84	NA,NO	NO	NO	NO	NO	NO	NO	4.84
D. Non-energy products from fuels and solvent use	100.67	NA	NA						100.67
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				341.63	0.26	NO	NO	NO	341.89
G. Other product manufacture and use	NO	NO	32.29	NO	NO	8.03	NO	NO	40.32
H. Other	NA	NA	NA						NA
3. Agriculture	76.96	1633.18	1241.86						2952.00
A. Enteric fermentation		1146.02							1146.02
B. Manure management		487.16	174.81						661.97
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1067.06						1067.06
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⁾	-7246.57	5.10	98.38						-7143.09
A. Forest land	-7844.88	4.87	3.21						-7836.79
B. Cropland	3.80	NO	17.90						21.71
C. Grassland	-5.35	0.22	0.24						-4.89
D. Wetlands	12.34	NO	1.68						14.02
E. Settlements	752.52	NO	75.35						827.87
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-165.01								-165.01
H. Other	NO	NO	NO						NO
5. Waste	0.16	1525.16	87.56						1612.89
A. Solid waste disposal	NA,NO	1014.25							1014.25
B. Biological treatment of solid waste		1.25	0.89						2.14
C. Incineration and open burning of waste	0.16	NA,NO	NA,NO,IE						0.16
D. Waste water treatment and discharge		509.66	86.67						596.33
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	292.16	0.10	2.42						294.68
Aviation	270.31	0.05	2.25						272.61
Navigation	21.85	0.05	0.17						22.07
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	371.79								371.79
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									28151.12
Total CO₂ equivalent emissions with land use, land-use change and forestry									21008.03
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 A5.2-22: GHG emission in Croatia, 2010

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2010

Submission 2021 v1

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⁾	13950.56	3868.79	2536.75	425.06	0.03	8.95	NO	NO	20790.14
1. Energy	18806.64	667.56	234.40						19708.60
A. Fuel combustion (sectoral approach)	18265.12	410.40	234.17						18909.69
1. Energy industries	5877.34	4.34	21.72						5903.40
2. Manufacturing industries and construction	3015.80	5.21	9.09						3030.11
3. Transport	5865.78	17.85	68.15						5951.78
4. Other sectors	3506.21	382.98	135.21						4024.40
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	541.52	257.16	0.22						798.91
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	541.52	257.16	0.22						798.91
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2124.47	2.72	794.86	425.06	0.03	8.95	NO	NO	3356.10
A. Mineral industry	1401.83								1401.83
B. Chemical industry	615.36	2.72	765.00	NO	NO	NO	NO	NO	1383.07
C. Metal industry	14.68	NA,NO	NO	NO	NO	NO	NO	NO	14.68
D. Non-energy products from fuels and solvent use	92.60	NA	NA						92.60
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				425.06	0.03	NO	NO	NO	425.10
G. Other product manufacture and use	NO	NO	29.86	NO	NO	8.95	NO	NO	38.81
H. Other	NA	NA	NA						NA
3. Agriculture	88.04	1622.43	1319.66						3030.12
A. Enteric fermentation		1135.00							1135.00
B. Manure management		487.42	168.52						655.94
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1151.14						1151.14
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⁾	-7068.64	1.76	104.06						-6962.82
A. Forest land	-7667.81	1.64	1.08						-7665.09
B. Cropland	102.82	NO	20.41						123.23
C. Grassland	-21.09	0.12	0.13						-20.84
D. Wetlands	9.32	NO	1.19						10.52
E. Settlements	745.54	NO	81.24						826.79
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-237.43								-237.43
H. Other	NO	NO	NO						NO
5. Waste	0.05	1574.32	83.77						1658.14
A. Solid waste disposal	NA,NO	1038.57							1038.57
B. Biological treatment of solid waste		1.35	0.96						2.31
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		534.41	82.81						617.22
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	0.10	2.61						317.80
Aviation	295.46	0.05	2.46						297.97
Navigation	19.64	0.04	0.15						19.83
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5940.55								5940.55
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	382.25								382.25
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27752.97
Total CO₂ equivalent emissions with land use, land-use change and forestry									20790.14
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 2021 v1

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⁾	14744.81	3838.33	2624.37	449.80	0.02	9.37	NO	NO	21666.68
1. Energy	18595.12	636.11	222.21						19453.44
A. Fuel combustion (sectoral approach)	18036.24	398.99	222.00						18657.23
1. Energy industries	6247.86	5.02	23.00						6275.88
2. Manufacturing industries and construction	2779.55	4.57	8.00						2792.12
3. Transport	5726.93	16.35	57.44						5800.72
4. Other sectors	3281.90	373.05	133.57						3788.51
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	558.89	237.12	0.20						796.21
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	558.89	237.12	0.20						796.21
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1951.64	1.75	789.27	449.80	0.02	9.37	NO	NO	3201.83
A. Mineral industry	1255.01								1255.01
B. Chemical industry	593.19	1.75	753.93	NO	NO	NO	NO	NO	1348.87
C. Metal industry	16.64	NA,NO	NO	NO	NO	NO	NO	NO	16.64
D. Non-energy products from fuels and solvent use	86.80	NA	NA						86.80
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				449.80	0.02	NO	NO	NO	449.81
G. Other product manufacture and use	NO	NO	35.33	NO	NO	9.37	NO	NO	44.70
H. Other	NA	NA	NA						NA
3. Agriculture	105.18	1576.01	1402.56						3083.75
A. Enteric fermentation		1107.21							1107.21
B. Manure management		468.80	160.01						628.81
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1242.55						1242.55
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⁾	-5907.18	18.63	125.63						-5762.92
A. Forest land	-6567.97	15.20	10.02						-6542.75
B. Cropland	133.81	NO	22.52						156.33
C. Grassland	-13.06	3.43	3.74						-5.89
D. Wetlands	9.35	NO	1.20						10.55
E. Settlements	790.33	NO	88.16						878.48
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-259.63								-259.63
H. Other	NO	NO	NO						NO
5. Waste	0.05	1605.83	84.70						1690.58
A. Solid waste disposal	NA,NO	1072.54							1072.54
B. Biological treatment of solid waste		1.40	1.00						2.40
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		531.88	83.70						615.58
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	0.23	3.18						390.55
Aviation	311.17	0.05	2.59						313.82
Navigation	75.97	0.17	0.59						76.73
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5834.09								5834.09
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	394.32								394.32
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27429.60
Total CO₂ equivalent emissions with land use, land-use change and forestry									21666.68
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 A5.2-24: GHG emission in Croatia, 2012

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2012

Submission 2021 v1

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⁾	13577.28	3814.09	2436.50	450.90	0.03	9.18	NO	NO	20287.98
1. Energy	17224.34	600.56	213.45						18038.35
A. Fuel combustion (sectoral approach)	16751.09	394.80	213.27						17359.17
1. Energy industries	5849.20	4.88	21.78						5875.87
2. Manufacturing industries and construction	2409.07	4.69	8.12						2421.88
3. Transport	5551.16	13.68	55.34						5620.18
4. Other sectors	2941.67	371.55	128.03						3441.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	473.24	205.76	0.18						679.18
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	473.24	205.76	0.18						679.18
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1762.89	NO,NE,IE,NA	701.69	450.90	0.03	9.18	NO	NO	2924.69
A. Mineral industry	1179.39								1179.39
B. Chemical industry	502.01	NO,NE,IE	652.37	NO	NO	NO	NO	NO	1154.37
C. Metal industry	1.43	NA,NO	NO	NO	NO	NO	NO	NO	1.43
D. Non-energy products from fuels and solvent use	80.06	NA	NA						80.06
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				450.90	0.03	NO	NO	NO	450.93
G. Other product manufacture and use	NO	NO	49.32	NO	NO	9.18	NO	NO	58.50
H. Other	NA	NA	NA						NA
3. Agriculture	101.23	1573.07	1286.47						2960.78
A. Enteric fermentation		1114.64							1114.64
B. Manure management		458.43	157.90						616.33
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1128.58						1128.58
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⁾	-5511.27	38.88	147.73						-5324.66
A. Forest land	-6189.88	36.09	23.80						-6129.99
B. Cropland	213.20	NO	24.63						237.83
C. Grassland	-60.49	2.79	3.04						-54.66
D. Wetlands	9.38	NO	1.20						10.58
E. Settlements	826.70	NO	95.06						921.76
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-310.18								-310.18
H. Other	NO	NO	NO						NO
5. Waste	0.08	1601.58	87.16						1688.82
A. Solid waste disposal	NA,NO	1101.99							1101.99
B. Biological treatment of solid waste		2.60	1.86						4.45
C. Incineration and open burning of waste	0.08	NA,NO	NA,NO,IE						0.08
D. Waste water treatment and discharge		496.99	85.30						582.29
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	342.53	0.09	2.85						345.46
Aviation	330.03	0.06	2.75						332.84
Navigation	12.50	0.03	0.10						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	408.78								408.78
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25612.64
Total CO₂ equivalent emissions with land use, land-use change and forestry									20287.98
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 2021 v1

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⁾	12202.56	3677.86	1814.02	521.33	NO	6.05	NO	NO	18221.83
1. Energy	16492.02	587.05	210.32						17289.39
A. Fuel combustion (sectoral approach)	16039.24	391.34	210.14						16640.71
1. Energy industries	5238.07	4.16	20.92						5263.15
2. Manufacturing industries and construction	2384.92	4.50	7.87						2397.29
3. Transport	5636.55	13.44	55.47						5705.46
4. Other sectors	2779.70	369.23	125.88						3274.81
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	452.78	195.72	0.18						648.68
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	452.78	195.72	0.18						648.68
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1868.95	NO,NE,IE,NA	275.15	521.33	NO	6.05	NO	NO	2671.48
A. Mineral industry	1271.22								1271.22
B. Chemical industry	509.33	NO,NE,IE	240.27	NO	NO	NO	NO	NO	749.60
C. Metal industry	13.93	NA,NO	NO	NO	NO	NO	NO	NO	13.93
D. Non-energy products from fuels and solvent use	74.47	NA	NA						74.47
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				521.33	NO	NO	NO	NO	521.33
G. Other product manufacture and use	NO	NO	34.88	NO	NO	6.05	NO	NO	40.93
H. Other	NA	NA	NA						NA
3. Agriculture	74.61	1501.41	1117.35						2693.37
A. Enteric fermentation		1067.33							1067.33
B. Manure management		434.08	149.82						583.91
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	967.52						967.52
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⁾	-6233.07	1.93	122.37						-6108.77
A. Forest land	-6721.09	1.46	0.96						-6718.67
B. Cropland	396.16	NO	24.08						420.24
C. Grassland	-124.51	0.47	0.51						-123.52
D. Wetlands	10.70	NO	1.25						11.95
E. Settlements	666.68	NO	95.57						762.25
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-461.02								-461.02
H. Other	NO	NO	NO						NO
5. Waste	0.04	1587.47	88.84						1676.35
A. Solid waste disposal	NA,NO	1096.80							1096.80
B. Biological treatment of solid waste		4.11	2.94						7.05
C. Incineration and open burning of waste	0.04	NA,NO	NA,NO,IE						0.04
D. Waste water treatment and discharge		486.56	85.90						572.45
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	379.01	0.09	3.11						382.22
Aviation	366.52	0.06	3.01						369.59
Navigation	12.50	0.03	0.10						12.62
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5975.40								5975.40
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	423.63								423.63
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24330.60
Total CO₂ equivalent emissions with land use, land-use change and forestry									18221.83
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 2021 v1
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⁾	11390.07	3639.58	1743.81	524.64	NO	6.77	NO	NO	17304.86
1. Energy	15619.10	527.68	198.85						16345.64
A. Fuel combustion (sectoral approach)	15179.55	344.94	198.68						15723.16
1. Energy industries	4743.91	3.23	17.95						4765.09
2. Manufacturing industries and construction	2324.33	3.84	6.79						2334.97
3. Transport	5580.73	12.54	55.18						5648.44
4. Other sectors	2530.59	325.33	118.76						2974.67
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	439.56	182.74	0.17						622.47
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	439.56	182.74	0.17						622.47
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1993.60	NO,NE,IE,NA	269.52	524.64	NO	6.77	NO	NO	2794.52
A. Mineral industry	1354.11								1354.11
B. Chemical industry	559.83	NO,NE,IE	266.19	NO	NO	NO	NO	NO	826.03
C. Metal industry	10.11	NA,NO	NO	NO	NO	NO	NO	NO	10.11
D. Non-energy products from fuels and solvent use	69.55	NA	NA						69.55
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				524.64	NO	NO	NO	NO	524.64
G. Other product manufacture and use	NO	NO	3.33	NO	NO	6.77	NO	NO	10.09
H. Other	NA	NA	NA						NA
3. Agriculture	69.47	1482.63	1065.81						2617.91
A. Enteric fermentation		1049.14							1049.14
B. Manure management		433.49	150.70						584.18
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	915.11						915.11
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⁾	-6292.15	0.32	121.14						-6170.68
A. Forest land	-6424.88	0.22	0.14						-6424.52
B. Cropland	237.21	0.08	23.59						260.87
C. Grassland	-122.29	0.03	0.03						-122.23
D. Wetlands	10.99	NO	1.29						12.29
E. Settlements	664.88	NO	96.09						760.98
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-658.07								-658.07
H. Other	NO	NO	NO						NO
5. Waste	0.04	1628.95	88.48						1717.47
A. Solid waste disposal	NA,NO	1139.35							1139.35
B. Biological treatment of solid waste		3.97	2.84						6.81
C. Incineration and open burning of waste	0.04	NA,NO	NA,NO,IE						0.04
D. Waste water treatment and discharge		485.63	85.64						571.27
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	0.10	3.15						387.01
Aviation	368.10	0.06	3.03						371.19
Navigation	15.66	0.04	0.12						15.82
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5245.05								5245.05
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	437.07								437.07
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23475.54
Total CO₂ equivalent emissions with land use, land-use change and forestry									17304.86
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 A5.2-27: GHG emission in Croatia, 2015

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2015

Submission 2021 v1

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⁾	12227.54	3751.73	1948.88	533.64	NO	5.22	NO	NO	18467.00
1. Energy	15788.59	586.08	209.69						16584.37
A. Fuel combustion (sectoral approach)	15549.11	392.55	209.50						16151.16
1. Energy industries	4718.82	4.13	19.62						4742.57
2. Manufacturing industries and construction	2222.70	3.33	5.98						2232.02
3. Transport	5887.78	12.05	57.18						5957.01
4. Other sectors	2719.81	373.03	126.72						3219.56
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	239.48	193.53	0.19						433.20
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	239.48	193.53	0.19						433.20
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1959.25	NO,NE,IE,NA	368.50	533.64	NO	5.22	NO	NO	2866.61
A. Mineral industry	1306.35								1306.35
B. Chemical industry	572.27	NO,NE,IE	311.35	NO	NO	NO	NO	NO	883.62
C. Metal industry	9.30	NA,NO	NO	NO	NO	NO	NO	NO	9.30
D. Non-energy products from fuels and solvent use	71.33	NA	NA						71.33
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				533.64	NO	NO	NO	NO	533.64
G. Other product manufacture and use	NO	NO	57.16	NO	NO	5.22	NO	NO	62.37
H. Other	NA	NA	NA						NA
3. Agriculture	69.34	1473.78	1146.73						2689.85
A. Enteric fermentation		1039.13							1039.13
B. Manure management		434.65	149.66						584.31
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	997.08						997.08
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⁾	-5589.69	13.96	130.81						-5444.92
A. Forest land	-5670.58	9.82	6.48						-5654.28
B. Cropland	386.31	2.58	24.69						413.58
C. Grassland	-190.66	1.57	1.70						-187.39
D. Wetlands	11.28	NO	1.34						12.62
E. Settlements	680.05	NO	96.60						776.65
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-806.10								-806.10
H. Other	NO	NO	NO						NO
5. Waste	0.05	1677.90	93.14						1771.09
A. Solid waste disposal	NA,NO	1185.04							1185.04
B. Biological treatment of solid waste		7.49	5.36						12.84
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		485.38	87.78						573.16
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	0.09	3.00						368.13
Aviation	354.08	0.06	2.91						357.05
Navigation	10.97	0.03	0.09						11.08
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6006.75								6006.75
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	453.01								453.01
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23911.92
Total CO₂ equivalent emissions with land use, land-use change and forestry									18467.00
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 2021 v1

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⁾	12424.18	3805.23	1706.86	534.73	NO	6.39	NO	NO	18477.40
1. Energy	16179.45	577.47	213.06						16969.98
A. Fuel combustion (sectoral approach)	15971.92	382.48	212.86						16567.25
1. Energy industries	4846.79	5.45	23.03						4875.27
2. Manufacturing industries and construction	2228.67	2.89	5.25						2236.81
3. Transport	6106.38	11.72	60.18						6178.28
4. Other sectors	2790.08	362.42	124.40						3276.89
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	207.53	194.99	0.21						402.73
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	207.53	194.99	0.21						402.73
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1827.39	NO,NE,IE,NA	164.24	534.73	NO	6.39	NO	NO	2532.76
A. Mineral industry	1201.30								1201.30
B. Chemical industry	547.86	NO,NE,IE	109.36	NO	NO	NO	NO	NO	657.22
C. Metal industry	1.05	NO,NA	NO	NO	NO	NO	NO	NO	1.05
D. Non-energy products from fuels and solvent use	77.17	NA	NA						77.17
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				534.73	NO	NO	NO	NO	534.73
G. Other product manufacture and use	NO	NO	54.89	NO	NO	6.39	NO	NO	61.28
H. Other	NA	NA	NA						NA
3. Agriculture	76.17	1516.75	1109.52						2702.43
A. Enteric fermentation		1091.03							1091.03
B. Manure management		425.72	156.72						582.44
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	952.80						952.80
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⁾	-5658.88	8.92	127.44						-5522.52
A. Forest land	-5785.43	7.42	4.89						-5773.11
B. Cropland	503.31	0.05	22.48						525.83
C. Grassland	-293.36	1.44	1.57						-290.34
D. Wetlands	11.57	NO	1.39						12.95
E. Settlements	668.45	NO	97.12						765.57
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-763.42								-763.42
H. Other	NO	NO	NO						NO
5. Waste	0.05	1702.10	92.59						1794.74
A. Solid waste disposal	NO,NA	1209.75							1209.75
B. Biological treatment of solid waste		3.75	2.68						6.43
C. Incineration and open burning of waste	0.05	NO,NA	NO,IE,NA						0.05
D. Waste water treatment and discharge		488.60	89.91						578.51
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	388.96	0.10	3.19						392.25
Aviation	375.75	0.06	3.09						378.91
Navigation	13.21	0.03	0.10						13.35
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	5970.35								5970.35
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	466.52								466.52
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23999.92
Total CO₂ equivalent emissions with land use, land-use change and forestry									18477.40
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, 2017

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2017

Submission 2021 v1

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⁾	13717.02	3827.11	1884.47	541.27	NO	5.75	NO	NO	19975.62
1. Energy	16568.52	567.53	215.63						17351.69
A. Fuel combustion (sectoral approach)	16286.19	374.08	215.43						16875.70
1. Energy industries	4464.77	6.91	21.55						4493.22
2. Manufacturing industries and construction	2429.58	3.52	6.29						2439.39
3. Transport	6570.29	11.34	64.82						6646.45
4. Other sectors	2821.56	352.31	122.76						3296.63
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	282.34	193.45	0.21						476.00
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	282.34	193.45	0.21						476.00
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2068.41	NO,NE,IE,NA	168.38	541.27	NO	5.75	NO	NO	2783.81
A. Mineral industry	1425.61								1425.61
B. Chemical industry	566.79	NO,NE,IE	98.60	NO	NO	NO	NO	NO	665.39
C. Metal industry	1.87	NO,NA	NO	NO	NO	NO	NO	NO	1.87
D. Non-energy products from fuels and solvent use	74.15	NA	NA						74.15
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				541.27	NO	NO	NO	NO	541.27
G. Other product manufacture and use	NO	NO	69.78	NO	NO	5.75	NO	NO	75.53
H. Other	NA	NA	NA						NA
3. Agriculture	81.13	1469.71	1238.38						2789.22
A. Enteric fermentation		1052.18							1052.18
B. Manure management		417.53	155.36						572.88
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1083.02						1083.02
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⁾	-5001.05	69.23	169.87						-4761.94
A. Forest land	-4824.58	61.21	40.36						-4723.00
B. Cropland	390.62	0.48	22.22						413.32
C. Grassland	-242.76	7.54	8.21						-227.01
D. Wetlands	11.85	NO	1.43						13.28
E. Settlements	672.06	NO	97.65						769.71
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-1008.25								-1008.25
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1720.63	92.21						1812.84
A. Solid waste disposal	NO,NA	1253.35							1253.35
B. Biological treatment of solid waste		4.24	3.04						7.28
C. Incineration and open burning of waste	NO	NO,NA	NO,NA						NO,NA
D. Waste water treatment and discharge		463.04	89.17						552.21
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	469.17	0.12	3.85						473.14
Aviation	449.06	0.08	3.69						452.82
Navigation	20.11	0.05	0.16						20.32
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	478.57								478.57
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24737.56
Total CO₂ equivalent emissions with land use, land-use change and forestry									19975.62
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 A5.2-27: GHG emission in Croatia, 2018

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2018

Submission 2021 v1

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⁾	12180.90	3615.03	1793.81	547.02	NO	5.56	NO	NO	18142.33
1. Energy	15662.10	535.99	213.38						16411.47
A. Fuel combustion (sectoral approach)	15406.72	358.44	213.19						15978.36
1. Energy industries	3907.81	7.84	22.22						3937.87
2. Manufacturing industries and construction	2411.05	3.74	6.63						2421.41
3. Transport	6340.78	10.48	62.40						6413.66
4. Other sectors	2747.08	336.38	121.94						3205.41
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	255.38	177.54	0.19						433.11
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	255.38	177.54	0.19						433.11
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1963.87	NO,NE,IE,NA	121.55	547.02	NO	5.56	NO	NO	2638.00
A. Mineral industry	1358.42								1358.42
B. Chemical industry	513.06	NO,NE,IE	50.11	NO	NO	NO	NO	NO	563.17
C. Metal industry	8.99	NO,NA	NO	NO	NO	NO	NO	NO	8.99
D. Non-energy products from fuels and solvent use	83.41	NA	NA						83.41
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				547.02	NO	NO	NO	NO	547.02
G. Other product manufacture and use	NO	NO	71.44	NO	NO	5.56	NO	NO	77.01
H. Other	NA	NA	NA						NA
3. Agriculture	72.24	1381.32	1243.06						2696.62
A. Enteric fermentation		988.79							988.79
B. Manure management		392.53	146.12						538.64
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1096.94						1096.94
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⁾	-5517.31	1.30	122.05						-5393.96
A. Forest land	-5578.19	0.84	0.56						-5576.79
B. Cropland	439.48	0.01	21.35						460.84
C. Grassland	-320.03	0.45	0.49						-319.09
D. Wetlands	12.14	NO	1.48						13.62
E. Settlements	675.29	NO	98.18						773.47
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-746.00								-746.00
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1696.43	93.77						1790.19
A. Solid waste disposal	NO,NA	1245.47							1245.47
B. Biological treatment of solid waste		4.76	3.40						8.16
C. Incineration and open burning of waste	NO	NO,NA	NO,NA						NO,NA
D. Waste water treatment and discharge		446.20	90.36						536.56
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	624.92	0.25	5.12						630.29
Aviation	559.65	0.10	4.60						564.35
Navigation	65.27	0.15	0.52						65.94
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6057.52								6057.52
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	490.42								490.42
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23536.28
Total CO₂ equivalent emissions with land use, land-use change and forestry									18142.33
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

Submission 2021 v1

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⁾	12096.58	3559.74	1833.94	552.60	NO	5.38	NO	NO	18048.25
1. Energy	15681.00	516.98	219.70						16417.68
A. Fuel combustion (sectoral approach)	15477.34	350.62	219.52						16047.48
1. Energy industries	3880.44	9.84	25.53						3915.81
2. Manufacturing industries and construction	2421.11	4.01	7.00						2432.12
3. Transport	6516.87	9.99	66.98						6593.84
4. Other sectors	2658.92	326.78	120.01						3105.71
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	203.66	166.36	0.18						370.19
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	203.66	166.36	0.18						370.19
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2020.87	NO,NE,IE,NA	156.22	552.60	NO	5.38	NO	NO	2735.07
A. Mineral industry	1324.94								1324.94
B. Chemical industry	594.60	NO,NE,IE	50.10	NO	NO	NO	NO	NO	644.70
C. Metal industry	4.91	NO,NA	NO	NO	NO	NO	NO	NO	4.91
D. Non-energy products from fuels and solvent use	96.41	NA	NA						96.41
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				552.60	NO	NO	NO	NO	552.60
G. Other product manufacture and use	NO	NO	106.12	NO	NO	5.38	NO	NO	111.50
H. Other	NA	NA	NA						NA
3. Agriculture	76.97	1380.89	1240.24						2698.10
A. Enteric fermentation		994.69							994.69
B. Manure management		386.19	147.16						533.35
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1093.08						1093.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	3.38								3.38
H. Urea application	73.59								73.59
I. Other carbon-containing fertilizers	NA								NA
J. Other									
4. Land use, land-use change and forestry⁽¹⁾	-5682.26	2.62	122.86						-5556.78
A. Forest land	-5791.63	2.30	1.52						-5787.81
B. Cropland	447.03	0.04	20.83						467.89
C. Grassland	-306.79	0.28	0.30						-306.21
D. Wetlands	12.43	NO	1.52						13.95
E. Settlements	678.96	NO	98.70						777.66
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-722.26								-722.26
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1659.27	94.91						1754.18
A. Solid waste disposal	NO,NA	1203.38							1203.38
B. Biological treatment of solid waste		4.96	3.55						8.51
C. Incineration and open burning of waste	NO	NO,NA	NO,NA						NO,NA
D. Waste water treatment and discharge		450.93	91.36						542.29
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	683.77	0.29	5.60						689.66
Aviation	605.86	0.10	4.98						610.95
Navigation	77.91	0.18	0.62						78.72
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	6228.14								6228.14
CO₂ capture d	NO								NO
Long-term storage of C in waste disposal sites	504.93								504.93
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23605.02
Total CO₂ equivalent emissions with land use, land-use change and forestry									18048.25
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

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 2019 (needed for monitoring and reporting on CO₂ emission)

Gorivo		DOV		CO ₂ Emisijski faktor (t CO ₂ /TJ)	Oksidacijski faktor (OF)
		Jedinica	2019		
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 loživno ulje (plinsko ulje)	Gas/Diesel Oil	GJ/t	42,7100	74,10	1
Loživno ulje i srednje loživno 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
Kameni ugljen- Industrija	Other bituminous coal Industry	GJ/t	29,0000	94,60	1
Kameni ugljen- Termoelektrane	Other bituminous coal Thermal power plant	GJ/t	24,2800	94,60	1
Ugljen za proizvodnju koksa (koksni ugljen)	Coking coal	GJ/t	<u>28,2000</u>	94,60	1
Mrki ugljen (smeđi ugljen) Industrija	Sub bituminous coal Industry	GJ/t	19,0000	96,10	1
Lignit	Lignite	GJ/t	11,8500	101,00	1
Briketi kamenog ugljena	Brown coal briquettes	GJ/t	<u>20,7000</u>	97,50	1
Koks	Coke oven coke	GJ/t	29,3100	107,00	1
Prirodni plin	Natural Gas	GJ/10 ³ m ³	34,6400	56,10	1
Gradski plin	Gas Works Gas	GJ/t	<u>38,7000</u>	44,40	1
Koksni plin	Coke Oven Gas	GJ/t	<u>38,7000</u>	44,40	1
Rafinerijski plin	Refinery Gas	GJ/t	42,6000	57,60	1

*Proračuna emisije CO₂ _ (Emisija = Potrošnja goriva*DOV*EF (CO₂)*OF)

Napomene:

- podcrtane vrijednosti za DOV su preuzete iz 2006 IPCC Vodiča jer u 2019. godini u Nacionalnoj energetskej bilanci nisu specificirane

Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2019.

Pollutant:	CO								
EMISSION CATEGORIES	Pollutant	Emissions in greenhouse gas (GHG) inventory (in kt)	Emissions reported under Directive 2001/81/EC (NEC) (in kt)	Absolute difference in kt (1)	Relative difference in % (2)	Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt)	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		NO	216.46	NO	NO	216.4605753	NO	NO	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy	CO	215.19	215.57	-0.39	0.00	215.57	0.39	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	CO	199.71	200.10	-0.39	0.00	200.10	0.39	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy industries	CO	1.48	1.48	0.00	0.00	1.48	0.00	0.00	
2. Manufacturing industries and construction	CO	11.84	11.84	0.00	0.00	11.84	0.00	0.00	
3. Transport	CO	25.94	26.33	-0.39	-0.01	26.33	0.39	0.01	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
4. Other sectors	CO	160.45	160.45	0.00	0.00	160.45	0.00	0.00	
5. Other	CO	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	CO	15.47	15.47	0.00	0.00	15.47	0.00	0.00	
1. Solid fuels	CO	NO	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas and other emissions from energy production	CO	15.47	15.47	0.00	0.00	15.47	0.00	0.00	
2. Industrial processes and product use	CO	0.12		0.12	#DIV/0!	0.12	0.00	0.00	
A. Mineral industry	CO	NO,NA		NO	NO	0.00	NO	NO	
B. Chemical industry	CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. Metal industry	CO	0.12	0.12	0.00	0.00	0.12	0.00	0.00	
D. Non-energy products from fuels and solvent use	CO	0.00	NO	NO	NO	NO	NO	NO	
G. Other product manufacture and use	CO	NO	NO	NO	NO	NO	NO	NO	
H. Other	CO	NE,NA	NE,NA	NO	NO	NE,NA	NO	NO	
3. Agriculture	CO	NO	NO	NO	NO	NO	NO	NO	
B. Manure management	CO	NO	NO	NO	NO	NO	NO	NO	
D. Agricultural soils	CO	NO	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	CO	NO	NO	NO	NO	NO	NO	NO	
J. Other	CO	NO	NO	NO	NO	NO	NO	NO	
5. Waste	CO	NO,NE,IE,NA		NO	NO	0.00	NO	NO	
A. Solid waste disposal	CO	NO,NE		NO	NO	0.00	NO	NO	
B. Biological treatment of solid waste	CO	NE,IE		NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	CO	NO	NO	NO	NO	NO	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	CO	NO,NA		NO	NO	0.00	NO	NO	
E. Other	CO	NO		NO	NO	0.00	NO	NO	
6. Other	CO	NO		NO	NO	0.00	NO	NO	

Pollutant:	SO2								
EMISSION CATEGORIES	Pollutant	Emissions in greenhouse gas (GHG) inventory (in kt)	Emissions reported under Directive 2001/81/EC (NEC) (in kt)	Absolute difference in kt (1)	Relative difference in % (2)	Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt)	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		NO	8.15	NO	NO	NO	NO	NO	In LRTAP report International aviation is reported in total country emisison while in GHG inventory those emissions are excluded
1. Energy	SO2	7.94	7.96	-0.03	0.00	7.94	0.39	4.88	In LRTAP report International aviation is reported in total country emisison while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	SO2	5.49	5.52	-0.03	-0.01	5.49	0.39	7.06	In LRTAP report International aviation is reported in total country emisison while in GHG inventory those emissions are excluded
1. Energy industries	SO2	2.02	2.02	0.00	0.00	2.02	0.00	0.00	
2. Manufacturing industries and construction	SO2	2.66	2.66	0.00	0.00	2.66	0.00	0.00	
3. Transport	SO2	0.01	0.04	-0.03	-0.67	0.01	0.00	0.00	In LRTAP report International aviation is reported in total country emisison while in GHG inventory those emissions are excluded
4. Other sectors	SO2	0.80	0.80	0.00	0.00	0.80	0.00	0.00	
5. Other	SO2	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	SO2	2.44	2.44	0.00	0.00	2.44	0.00	0.00	
1. Solid fuels	SO2	NO	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas and other emissions from energy production	SO2	2.44	2.44	0.00	0.00	2.44	0.00	0.00	
2. Industrial processes and product use	SO2	NO	NO	NO	NO	NO	NO	NO	
A. Mineral industry	SO2			NO	NO		NO	NO	
B. Chemical industry	SO2	NO	NO	NO	NO	NO	NO	NO	
C. Metal industry	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
D. Non-energy products from fuels and solvent use	SO2		NO	NO	NO		NO	NO	
G. Other product manufacture and use	SO2	NO	NO	NO	NO	NO	NO	NO	
H. Other	SO2		NE,NA	NO	NO		NO	NO	
3. Agriculture	SO2	NO	NO	NO	NO	NO	NO	NO	
B. Manure management	SO2	NO	NO	NO	NO	NO	NO	NO	
D. Agricultural soils	SO2	NO	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	SO2	NO	NO	NO	NO	NO	NO	NO	
J. Other	SO2	NO	NO	NO	NO	NO	NO	NO	
5. Waste	SO2	NO		NO	NO	NO	NO	NO	Data on Cremation are not included in GHG inventory
A. Solid waste disposal	SO2			NO	NO		NO	NO	
B. Biological treatment of solid waste	SO2			NO	NO		NO	NO	
C. Incineration and open burning of waste	SO2	NO	NO	NO	NO	NO	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	SO2			NO	NO		NO	NO	
E. Other	SO2	NO		NO	NO	NO	NO	NO	
6. Other	SO2	NO		NO	NO	NO	NO	NO	

Pollutant:	NOx								
EMISSION CATEGORIES	Pollutant	Emissions in greenhouse gas (GHG) inventory (in kt)	Emissions reported under Directive 2001/81/EC (NEC) (in kt)	Absolute difference in kt (1)	Relative difference in % (2)	Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		NO	53.93	NO	NO	53.93	NO	NO	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
1. Energy		45.59	45.80	-0.21	0.00	45.80	-0.21	0.00	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	NOx	45.47	45.68	-0.21	0.00	45.68	-0.21	0.00	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
1. Energy industries	NOx	4.14	4.14	0.00	0.00	4.14	0.00	0.00	
2. Manufacturing industries and construction	NOx	5.81	5.81	0.00	0.00	5.81	0.00	0.00	
3. Transport	NOx	27.87	28.08	-0.21	-0.01	28.08	-0.21	-0.01	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
4. Other sectors	NOx	7.65	7.65	0.00	0.00	7.65	0.00	0.00	
5. Other	NOx	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	NOx	0.11	0.11	0.00	0.00	0.11	0.00	0.00	
1. Solid fuels	NOx	NO,NA	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas and other emissions from energy production	NOx	0.11	0.11	0.00	0.00	0.11	0.00	0.00	
2. Industrial processes and product use	NOx	0.75	0.79	-0.04	-0.05	0.79	-0.04	-0.05	
A. Mineral industry	NOx	NO	NO	NO	NO	NO	NO	NO	
B. Chemical industry	NOx	0.74	0.76	-0.02	-0.02	0.76	-0.02	-0.02	
C. Metal industry	NOx	0.01	0.01	0.00	0.00	0.01	0.00	0.00	
D. Non-energy products from fuels and solvent use	NOx	NE,NA	0.00	NO	NO	0.00	NO	NO	
G. Other product manufacture and use	NOx	NO	NO	NO	NO	NO	NO	NO	
H. Other	NOx	NE,NA	NO	NO	NO	NE,NA	NO	NO	
3. Agriculture	NOx	2.43	7.33	-4.90	-0.67	7.33	-4.90	-0.67	data from 2016 are used. It will be corrected for march submission
B. Manure management	NOx		0.21	2.60	12.33	0.21	NO	NO	
D. Agricultural soils	NOx	2.43	2.54	-0.10	-0.04	2.54	-0.10	-0.04	
F. Field burning of agricultural residues	NOx	NO	NO	NO	NO	NO	NO	NO	
J. Other	NOx	NO	NO	NO	NO	NO	NO	NO	
5. Waste	NOx	NO	NO	NO	NO	NO	NO	NO	
A. Solid waste disposal	NOx	NO,NA		NO	NO	0.00	NO	NO	
B. Biological treatment of solid waste	NOx	NE,IE		NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NOx	NO	NO	NO	NO	NO	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NOx	NO,NA		NO	NO	0.00	NO	NO	
E. Other	NOx	NO		NO	NO	0.00	NO	NO	
6. Other	NOx	NO		NO	NO	0.00	NO	NO	

Pollutant:	NMVOC								
EMISSION CATEGORIES	Pollutant	Emissions in greenhouse gas (GHG) inventory (in kt)	Emissions reported under Directive 2001/81/EC (NEC) (in kt)	Absolute difference in kt (1)	Relative difference in % (2)	emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		73.35	75.22	-1.87	-2%	75.22	-1.87	-2%	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
1. Energy	NMVOC	28.02	28.95	-0.93	-0.03	28.95	-0.93	-0.03	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	NMVOC	24.99	25.91	-0.93	-0.04	25.91	-0.93	-0.04	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
1. Energy industries	NMVOC	0.45	0.45	0.00	0.00	0.45	0.00	0.00	
2. Manufacturing industries and construction	NMVOC	1.43	1.43	0.00	0.00	1.43	0.00	0.00	
3. Transport	NMVOC	3.88	4.81	-0.93	-0.19	4.81	-0.93	-0.19	In LRTAP report International aviation is reported in total country emisisions while in GHG inventory those emissions are excluded
4. Other sectors	NMVOC	19.23	19.23	0.00	0.00	19.23	0.00	0.00	
5. Other	NMVOC	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	NMVOC	3.03	3.03	0.00	0.00	3.03	0.00	0.00	
1. Solid fuels	NMVOC	NO,NA	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas and other emissions from energy production	NMVOC	3.03	3.03	0.00	0.00	3.03	0.00	0.00	
2. Industrial processes and product use	NMVOC	35.26	36.21	-0.95	-0.03	36.21	-0.95	-0.03	Error ocured in NIR and will be corrected in march version
A. Mineral industry	NMVOC	NO	0.02	NO	NO	0.02	NO	NO	
B. Chemical industry	NMVOC	0.04	0.04	0.00	0.00	0.04	0.00	0.00	
C. Metal industry	NMVOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
D. Non-energy products from fuels and solvent use	NMVOC	31.21	31.21	0.00	0.00	31.21	0.00	0.00	
G. Other product manufacture and use	NMVOC	NO	0.92	NO	NO	0.92	NO	NO	
H. Other	NMVOC	4.01	4.01	0.00	0.00	4.01	0.00	0.00	
3. Agriculture	NMVOC	9.30	9.30	0.00	0.00	9.30	0.00	0.00	data from 2016 are used. It will be corrected for march submission
B. Manure management	NMVOC	0.00	7.61	-7.61	-1.00	7.61	-7.61	-1.00	
D. Agricultural soils	NMVOC	1.69	NA	NO	NO	NA	NO	NO	
F. Field burning of agricultural residues	NMVOC	NO	NO	NO	NO	NO	NO	NO	
J. Other	NMVOC	NO	NO	NO	NO	NO	NO	NO	
5. Waste	NMVOC	0.77	0.77	0.00	0.00	0.77	0.00	0.00	
A. Solid waste disposal	NMVOC	0.76	0.77	0.00	-0.01	0.77	0.00	-0.01	
B. Biological treatment of solid waste	NMVOC	NE,IE		NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NMVOC	NO	NO	NO	NO	NO	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NMVOC	0.00		0.00	#DIV/0!	0.00	0.00	#DIV/0!	
E. Other	NMVOC	NO		NO	NO	0.00	NO	NO	
6. Other	NMVOC	NO		NO	NO	0.00	NO	NO	

Annex 5-5: Reporting on recalculations of the 2018 and 1990

Recalculated year	2018							
Greenhouse gas	CO2	Note: Replicate table below if more gases need reporting.						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO2, N2O, CH4	Previous submission (CO2-eq, kt)	Latest submission (CO2-eq, kt)	Difference (CO2-eq, kt)	Difference(1) %	Impact of recalculation on total emissions excluding	Impact of recalculation on total emissions including	Explanation for recalculations
Total National Emissions and Removals	CO2	12,501.06	12,180.90	-320.1593679	-3%	-1%	-2%	
1. Energy	CO2	15,672.91	15,662.10	-10.81308272	0%	0%	0%	
A. Fuel combustion activities	CO2	15,406.34	15,406.72	0.383164474	0%	0%	0%	
1. Energy industries	CO2	3,907.81	3,907.81	0	0%	0%	0%	0% changes due to the use of industry analysis project data
2. Manufacturing industries and construction	CO2	2,411.05	2,411.05	0	0%	0%	0%	0% changes due to the use of industry analysis project data
3. Transport	CO2	6,340.45	6,340.78	0.328638185	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
4. Other sectors	CO2	2,747.03	2,747.08	0.054526289	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
5. Other	CO2	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	CO2	266.57	255.38	-11.19624719	0%	0%	0%	
1. Solid fuels	CO2	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas	CO2	266.57	255.38	-11.19624719	0%	0%	0%	0% According to ESD review double counting noticed in 2B2b1 category
C. CO2 transport and storage	CO2	NO	NO	NO	NO	NO	NO	
2. Industrial processes and product use	CO2	1,969.77	1,963.87	-5.895499493	0%	0%	0%	
A. Mineral industry	CO2	1,364.80	1,358.42	-6.388808236	0%	0%	0%	0% Soda ash removed
B. Chemical industry	CO2	513.06	513.06	0	0%	0%	0%	
C. Metal industry	CO2	8.99	8.99	0	0%	0%	0%	
D. Non-energy products from fuels and solvent use	CO2	82.91	83.41	0.493308743	0%	0%	0%	0% Separately estimate emissions from lubricant use for two-stroke engines and report those emissions under the energy sector
G. Other product manufacture and use	CO2	NO	NO	NO	NO	NO	NO	
H. Other	CO2	NA	NA	NO	NO	NO	NO	
3. Agriculture	CO2	75.96	72.24	-3.721901632	0%	0%	0%	
A. Enteric fermentation	CO2			NO	NO	NO	NO	
B. Manure management	CO2			NO	NO	NO	NO	
C. Rice cultivation	CO2			NO	NO	NO	NO	
D. Agricultural soils	CO2			NO	NO	NO	NO	
E. Prescribed burning of savannahs	CO2			NO	NO	NO	NO	
F. Field burning of agricultural residues	CO2			NO	NO	NO	NO	
G. Liming	CO2	10.92	4.62	-6.296361432	0%	0%	0%	0% Activity data corrected
H. Urea application	CO2	65.05	67.62	2.5744598	0%	0%	0%	
I. Other carbon-containing fertilizer	CO2	NA	NA	NO	NO	NO	NO	
J. Other	CO2	NO	NO	NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	CO2	-5,217.58	-5,517.31	-299.728884	-2%	-1%	-2%	
A. Forestland	CO2	-5,384.61	-5,578.19	-193.580637	-2%	-1%	-1%	recalculation has been performed due to an error in NIR 2020 estimation and omitting to expand excel tables to areas recognized as converted to forest land before 1990
B. Cropland	CO2	448.97	439.48	-9.492739103	0%	0%	0%	
C. Grassland	CO2	-223.38	-320.03	-96.65528154	-1%	0%	-1%	Grassland areas has been redefined as explained in cell D12; Recalculatoin of GL areas led to the recalculation of emissions/removals in pools for all years in this category of land
D. Wetlands	CO2	12.14	12.14	4.51017E-12	0%	0%	0%	
E. Settlements	CO2	675.29	675.29	-0.00022634	0%	0%	0%	
F. Other land	CO2	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	CO2	-746.00	-746.00	0	0%	0%	0%	
H. Other	CO2	NO	NO	NO	NO	NO	NO	
5. Waste	CO2	NO,NA	NO,NA	NO	NO	NO	NO	
A. Solid waste disposal	CO2	NO,NA	NO,NA	NO	NO	NO	NO	
B. Biological treatment of solid waste	CO2			NO	NO	NO	NO	
C. Incineration and open burning of waste	CO2	NO	NO	NO	NO	NO	NO	
D. Waste water treatment and discharge	CO2			NO	NO	NO	NO	
E. Other	CO2	NO	NO	NO	NO	NO	NO	
6. Other (As specified in summary 1.A)	CO2	NO	NO	NO	NO	NO	NO	
Memo items:	CO2			0	0%	0%	0%	
International bunkers	CO2	624.92	624.92	0	0%	0%	0%	
Aviation	CO2	559.65	559.65	0	0%	0%	0%	
Navigation	CO2	65.27	65.27	0	0%	0%	0%	
Multilateral operations	CO2	C	C	NO	NO	NO	NO	
CO2 emissions from biomass	CO2	6,053.22	6,057.52	4.29852	0%	0%	0%	
CO2 captured	CO2	NO	NO	NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	CO2	4,597.68	490.42	-4107.260217	-34%	-17%	-23%	
Indirect N2O				NO	NO	NO	NO	
Indirect CO2			NO,NA	NO	NO	NO	NO	

Recalculated year	2018								
Greenhouse gas	CH4	Note: Replicate table below if more gases need reporting.							
	Gas (CO2, N2O, CH4)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	Difference (CO2- eq, kt)	Difference(1) %	Impact of recalculation on total emissions excluding LULUCF (2) %	Impact of recalculation on total emissions including LULUCF(3) %	Explanation for recalculations	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH4								
Total National Emissions and Removals	CH4	3,890.02	3,615.03	-274.9906171	-8%	-1%	-2%		
1. Energy	CH4	558.04	535.99	-22.05367309	-1%	0%	0%		
A. Fuel combustion activities	CH4	374.53	358.44	-16.08768809	0%	0%	0%		
1. Energy industries	CH4	7.84	7.84	0	0%	0%	0%	0% changes due to the use of industry analysis project data	
2. Manufacturing industries and construction	CH4	3.69	3.74	0.045765	0%	0%	0%	0% changes due to the use of industry analysis project data	
3. Transport	CH4	26.61	10.48	-16.13363905	0%	0%	0%	0% changes due to the use of Lubricant analysis project data	
4. Other sectors	CH4	336.38	336.38	0.00018597	0%	0%	0%	0% changes due to the use of Lubricant analysis project data	
5. Other	CH4	NO,IE	NO,IE	NO	NO	NO	NO		
B. Fugitive Emissions from Fuels	CH4	183.51	177.54	-5.965985	0%	0%	0%		
1. Solid fuels	CH4	NO	NO	NO	NO	NO	NO		
2. Oil and natural gas	CH4	183.51	177.54	-5.965985	0%	0%	0%	0% According to ESD review double counting noticed in 2B2b1 category	
C. CO2 transport and storage	CH4	NO	NO	NO	NO	NO	NO		
2. Industrial processes and product use	CH4	NO,NE,IE,NA	NO,NE,IE,NA	NO	NO	NO	NO		
A. Mineral industry	CH4			NO	NO	NO	NO		
B. Chemical industry	CH4	NO,NE,IE	NO,NE,IE	NO	NO	NO	NO		
C. Metal industry	CH4	NO,NA	NO,NA	NO	NO	NO	NO		
D. Non-energy products from fuels and solvent use	CH4	NA	NA	NO	NO	NO	NO		
G. Other product manufacture and use	CH4	NO	NO	NO	NO	NO	NO		
H. Other	CH4	NA	NA	NO	NO	NO	NO		
3. Agriculture	CH4	1,384.53	1,381.32	-3.21411221	0%	0%	0%		
A. Enteric fermentation	CH4	983.26	988.79	5.533745987	0%	0%	0%	0% Values in CRF corrected to correctly report 100% allocation.	
B. Manure management	CH4	401.27	392.53	-8.747858197	0%	0%	0%	0% Values in CRF corrected to correctly report 100% allocation., Estimate of CH4 and N2O from rabbit population	
C. Rice cultivation	CH4	NO	NO	NO	NO	NO	NO		
D. Agricultural soils	CH4	NE	NE	NO	NO	NO	NO		
E. Prescribed burning of savannahs	CH4	NO	NO	NO	NO	NO	NO		
F. Field burning of agricultural residues	CH4	NO	NO	NO	NO	NO	NO		
G. Liming	CH4			NO	NO	NO	NO		
H. Urea application	CH4			NO	NO	NO	NO		
I. Other carbon-containing fertilizer	CH4			NO	NO	NO	NO		
J. Other	CH4	NO	NO	NO	NO	NO	NO		
4. Land use, land-use change and forestry (net) (4)	CH4	1.30	1.30	0	0%	0%	0%		
A. Forestland	CH4	0.84	0.84	0	0%	0%	0%		
B. Cropland	CH4	0.01	0.01	0	0%	0%	0%		
C. Grassland	CH4	0.45	0.45	0	0%	0%	0%		
D. Wetlands	CH4	NO	NO	NO	NO	NO	NO		
E. Settlements	CH4	NO	NO	NO	NO	NO	NO		
F. Other land	CH4	NO	NO	NO	NO	NO	NO		
G. Harvested wood products	CH4			NO	NO	NO	NO		
H. Other	CH4	NO	NO	NO	NO	NO	NO		
5. Waste	CH4	1,946.15	1,696.43	-249.7228318	-7%	-1%	-1%		
A. Solid waste disposal	CH4	1,771.44	1,245.47	-525.9764848	-15%	-2%	-3%	usage of OX=0.1 for managed landfills and OX=0 for unmanaged landfills, usage of CS-value for DOC in industrial waste.	
B. Biological treatment of solid waste	CH4	4.76	4.76	0	0%	0%	0%		
C. Incineration and open burning of waste	CH4	NO,NA	NO,NA	NO	NO	NO	NO		
D. Waste water treatment and discharge	CH4	169.95	446.20	276.253653	8%	1%	2%	TERT advised that the TOW for a septic tank should not be corrected for the total amount of sludge and the inclusion of indirect methane emissions by direct discharge of untreated wastewater.	
E. Other	CH4	NO	NO	NO	NO	NO	NO		
6. Other (As specified in summary 1.A)	CH4	NO	NO	NO	NO	NO	NO		
Memo items:	CH4			0	0%	0%	0%		
International bunkers	CH4	0.10	0.25	0.152732475	0%	0%	0%		
Aviation	CH4	0.15	0.10	-0.056239488	0%	0%	0%		
Navigation	CH4	C	0.15	NO	NO	NO	NO		
Multilateral operations	CH4	C		NO	NO	NO	NO		
CO2 emissions from biomass	CH4	0.00		NO	NO	NO	NO		
CO2 captured	CH4	NO		NO	NO	NO	NO		
Long-term storage of C in waste disposal sites	CH4	NE		NO	NO	NO	NO		
Indirect N2O				NO	NO	NO	NO		
Indirect CO2				NO	NO	NO	NO		

Recalculated year	2018							
Greenhouse gas	N2O	Note: Replicate table below if more gases need reporting.						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO2	submission (CO2)	submission (CO2)	eq. kt)	Difference(1) %	recalculation of	recalculation of	Explanation for recalculations
Total National Emissions and Removals	N2O	1,807.90	1,793.81	-14.09337083	0%	0%	0%	
1. Energy	N2O	212.09	213.38	1.290152941	0%	0%	0%	
A. Fuel combustion activities	N2O	211.90	213.19	1.290152941	0%	0%	0%	
1. Energy industries	N2O	22.22	22.22	0	0%	0%	0%	0% changes due to the use of industry analysis project data
2. Manufacturing industries and construction	N2O	6.56	6.63	0.06869496	0%	0%	0%	0% changes due to the use of industry analysis project data
3. Transport	N2O	61.18	62.40	1.221324975	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
4. Other sectors	N2O	121.94	121.94	0.000133005	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
5. Other	N2O	NO,JE	NO,JE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	N2O	0.19	0.19	0	0%	0%	0%	
1. Solid fuels	N2O	NO,NA	NO,NA	NO	NO	NO	NO	
2. Oil and natural gas	N2O	0.19	0.19	0	0%	0%	0%	
C. CO2 transport and storage	N2O	NO		NO	NO	NO	NO	
2. Industrial processes and product use	N2O	121.55	121.55	0	0%	0%	0%	
A. Mineral industry	N2O			NO	NO	NO	NO	
B. Chemical industry	N2O	50.11	50.11	0	0%	0%	0%	
C. Metal industry	N2O	NO	NO	NO	NO	NO	NO	
D. Non-energy products from fuels and solvent use	N2O	NA	NA	NO	NO	NO	NO	
G. Other product manufacture and use	N2O	71.44	71.44	0	0%	0%	0%	
H. Other	N2O	NA	NA	NO	NO	NO	NO	
3. Agriculture	N2O	1,259.80	1,243.06	-16.74656662	0%	0%	0%	
A. Enteric fermentation	N2O			NO	NO	NO	NO	
B. Manure management	N2O	136.32	146.12	9.799545966	0%	0%	0%	0% Estimate calculation was revised, errors were corrected, Estimate of CH4 and N2O from rabbit population
C. Rice cultivation	N2O			NO	NO	NO	NO	
D. Agricultural soils	N2O	1,123.49	1,096.94	-26.54611259	-1%	0%	0%	0% The 11.0% dry matter data corrected to 3.89% and emissions recalculated.
E. Prescribed burning of savannahs	N2O	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	N2O	NO	NO	NO	NO	NO	NO	
G. Liming	N2O			NO	NO	NO	NO	
H. Urea application	N2O			NO	NO	NO	NO	
I. Other carbon-containing fertilizer	N2O			NO	NO	NO	NO	
J. Other	N2O	NO	NO	NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	N2O	122.05	122.05	4.88726E-10	0%	0%	0%	
A. Forestland	N2O	0.56	0.56	0	0%	0%	0%	
B. Cropland	N2O	21.35	21.35	1.1175E-09	0%	0%	0%	
C. Grassland	N2O	0.49	0.49	0	0%	0%	0%	
D. Wetlands	N2O	1.48	1.48	-2.98E-10	0%	0%	0%	
E. Settlements	N2O	98.18	98.18	-3.30786E-10	0%	0%	0%	
F. Other land	N2O	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	N2O			NO	NO	NO	NO	
H. Other	N2O	NO	NO	NO	NO	NO	NO	
5. Waste	N2O	92.40	93.77	1.363042848	0%	0%	0%	
A. Solid waste disposal	N2O			NO	NO	NO	NO	
B. Biological treatment of solid waste	N2O	3.40	3.40	0	0%	0%	0%	
C. Incineration and open burning of waste	N2O	NO,NA	NO,NA	NO	NO	NO	NO	
D. Waste water treatment and discharge	N2O	89.00	90.36	1.363042848	0%	0%	0%	
E. Other	N2O	NO	NO	NO	NO	NO	NO	
6. Other (As specified in summary 1.A)	N2O	NO	NO	NO	NO	NO	NO	
Memo items:	N2O			0	0%	0%	0%	
International bunkers	N2O	5.12	5.12	0	0%	0%	0%	
Aviation	N2O	4.60	4.60	0	0%	0%	0%	
Navigation	N2O	0.52	0.52	0	0%	0%	0%	
Multilateral operations	N2O	C	C	NO	NO	NO	NO	
CO2 emissions from biomass	N2O			NO	NO	NO	NO	
CO2 captured	N2O	NO		NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	N2O	NE		NO	NO	NO	NO	
Indirect N2O			NO,NA	NO	NO	NO	NO	
Indirect CO2				NO	NO	NO	NO	

Recalculated year	1990							
Greenhouse gas	CO2	Note: Replicate table below if more gases need reporting.						
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Gas (CO2, N2O, CH4)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	Difference (CO2- eq, kt)	Difference(1) %	recalculation on total emissions excluding LULUCF (2) %	recalculation on total emissions including LULUCF(3) %	Explanation for recalculations
Total National Emissions and Removals	CO2	16,858.48	16,480.71	-377.7718922	-2%	-1%	-2%	
1. Energy	CO2	20,656.67	20,362.90	-293.7781376	-2%	-1%	-1%	
A. Fuel combustion activities	CO2	20,056.11	19,780.38	-275.7354413	-2%	-1%	-1%	
1. Energy industries	CO2	7,048.59	7,065.79	17.19682819	0%	0%	0%	changes due to the use of industry analysis project data
2. Manufacturing industries and construction	CO2	5,501.67	5,208.58	-293.092171	-2%	-1%	-1%	changes due to the use of industry analysis project data
3. Transport	CO2	3,786.94	3,787.06	0.119467753	0%	0%	0%	changes due to the use of Lubricant analysis project data
4. Other sectors	CO2	3,718.91	3,718.95	0.040433772	0%	0%	0%	changes due to the use of Lubricant analysis project data
5. Other	CO2	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	CO2	600.56	582.52	-18.04269637	0%	0%	0%	
1. Solid fuels	CO2	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas	CO2	600.56	582.52	-18.04269637	0%	0%	0%	According to ESD review double counting noticed in 2B2b1 category
C. CO2 transport and storage	CO2	NO	NO	NO	NO	NO	NO	
2. Industrial processes and product use	CO2	2,622.02	2,564.27	-57.7457316	0%	0%	0%	
A. Mineral industry	CO2	1,306.59	1,302.67	-3.92680288	0%	0%	0%	Soda ash removed
B. Chemical industry	CO2	751.10	751.10	0	0%	0%	0%	
C. Metal industry	CO2	336.40	336.40	0	0%	0%	0%	
D. Non-energy products from fuels and solvent use	CO2	227.93	174.11	-53.81877028	0%	0%	0%	Separately estimate emissions from lubricant use for two-stroke engines and report those emissions under the energy sector
G. Other product manufacture and use	CO2	NO	NO	NO	NO	NO	NO	
H. Other	CO2	NA	NA	NO	NO	NO	NO	
3. Agriculture	CO2	50.02	50.02	0	0%	0%	0%	
A. Enteric fermentation	CO2			NO	NO	NO	NO	
B. Manure management	CO2			NO	NO	NO	NO	
C. Rice cultivation	CO2			NO	NO	NO	NO	
D. Agricultural soils	CO2			NO	NO	NO	NO	
E. Prescribed burning of savannahs	CO2			NO	NO	NO	NO	
F. Field burning of agricultural residues	CO2			NO	NO	NO	NO	
G. Liming	CO2	NO	NO	NO	NO	NO	NO	
H. Urea application	CO2	50.02	50.02	0	0%	0%	0%	
I. Other carbon-containing fertilizer	CO2	NA	NA	NO	NO	NO	NO	
J. Other	CO2	NO	NO	NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	CO2	-6,470.77	-6,497.02	-26.24818136	0%	0%	0%	
A. Forestland	CO2	-6,718.09	-6,744.54	-26.44859212	0%	0%	0%	recalculation has been performed due to an error in NIR 2020 estimation and omitting to expained excel tables to areas recognized as converted to forest land before 1990
B. Cropland	CO2	222.77	222.77	-2.09468E-11	0%	0%	0%	
C. Grassland	CO2	-8.08	-7.88	0.200410759	0%	0%	0%	Grassland areas has been redefined as explained in cell D12; Recalutaion of GL areas led to the recalculation of emissions/removals in pools for all years in this category of land
D. Wetlands	CO2	83.47	83.47	-4.06288E-11	0%	0%	0%	
E. Settlements	CO2	250.71	250.71	1.47509E-11	0%	0%	0%	
F. Other land	CO2	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	CO2	-301.54	-301.54	0	0%	0%	0%	
H. Other	CO2	NO	NO	NO	NO	NO	NO	
5. Waste	CO2	0.54	0.54	0	0%	0%	0%	
A. Solid waste disposal	CO2	NA,NO	NA,NO	NO	NO	NO	NO	
B. Biological treatment of solid waste	CO2			NO	NO	NO	NO	
C. Incineration and open burning of waste	CO2	0.54	0.54	0	0%	0%	0%	
D. Waste water treatment and discharge	CO2			NO	NO	NO	NO	
E. Other	CO2	NO	NO	NO	NO	NO	NO	
6. Other (As specified in summary 1.A)	CO2	NO	NO	NO	NO	NO	NO	
Memo items:	CO2			0	0%	0%	0%	
International bunkers	CO2	643.85	643.85	0	0%	0%	0%	
Aviation	CO2	496.62	496.62	0	0%	0%	0%	
Navigation	CO2	147.23	147.23	0	0%	0%	0%	
Multilateral operations	CO2	C	C	NO	NO	NO	NO	
CO2 emissions from biomass	CO2	5,126.24	5,237.84	111.6	1%	0%	0%	
CO2 captured	CO2	NO	NO	NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	CO2	1,717.23	183.17	-1534.059808	-9%	-5%	-6%	
Indirect N2O				NO	NO	NO	NO	
Indirect CO2		NA,NO	NA,NO	NO	NO	NO	NO	

Recalculated year	1990							
Greenhouse gas	CH4	Note: Replicate table below if more gases need reporting.						
	Gas (CO2, N2O, CH4)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	Difference (CO2- eq, kt)	Difference(1) %	recalculation on total emissions excluding LULUCF (2) %	recalculation on total emissions including LULUCF(3) %	Explanation for recalculations
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH4	eq, kt	eq, kt	eq, kt	%	%	%	
Total National Emissions and Removals	CH4	4,383.67	4,306.72	-76.949307	-2%	0%	0%	
1. Energy	CH4	842.68	832.59	-10.09009243	0%	0%	0%	
A. Fuel combustion activities	CH4	413.95	413.48	-0.475937428	0%	0%	0%	
1. Energy industries	CH4	5.42	5.43	0.011831027	0%	0%	0%	0% changes due to the use of industry analysis project data
2. Manufacturing industries and construction	CH4	9.73	9.24	-0.488196369	0%	0%	0%	0% changes due to the use of industry analysis project data
3. Transport	CH4	41.14	41.14	0.000290009	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
4. Other sectors	CH4	357.67	357.67	0.000137905	0%	0%	0%	0% changes due to the use of Lubricant analysis project data
5. Other	CH4	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	CH4	428.73	419.11	-9.614155	0%	0%	0%	
1. Solid fuels	CH4	59.64	59.64	0	0%	0%	0%	
2. Oil and natural gas	CH4	369.08	359.47	-9.614155	0%	0%	0%	0% According to ESD review double counting noticed in 2B2b1 category
C. CO2 transport and storage	CH4	NO		NO	NO	NO	NO	
2. Industrial processes and product use	CH4	9.35	9.35	0	0%	0%	0%	
A. Mineral industry	CH4			NO	NO	NO	NO	
B. Chemical industry	CH4	5.45	5.45	0	0%	0%	0%	
C. Metal industry	CH4	3.90	3.90	0	0%	0%	0%	
D. Non-energy products from fuels and solvent use	CH4	NA	NA	NO	NO	NO	NO	
G. Other product manufacture and use	CH4	NO	NO	NO	NO	NO	NO	
H. Other	CH4	NA	NA	NO	NO	NO	NO	
3. Agriculture	CH4	2,546.40	2,548.26	1.852232	0%	0%	0%	
A. Enteric fermentation	CH4	2,120.22	2,121.15	0.926116	0%	0%	0%	0% Values in CRF corrected to correctly report 100% allocation.
B. Manure management	CH4	426.18	427.11	0.926116	0%	0%	0%	0% Values in CRF corrected to correctly report 100% allocation., Estimate of CH4 and N2O from rabbit population
C. Rice cultivation	CH4	NO	NO	NO	NO	NO	NO	
D. Agricultural soils	CH4	NE	NE	NO	NO	NO	NO	
E. Prescribed burning of savannahs	CH4	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	CH4	NO	NO	NO	NO	NO	NO	
G. Liming	CH4			NO	NO	NO	NO	
H. Urea application	CH4			NO	NO	NO	NO	
I. Other carbon-containing fertilizer	CH4			NO	NO	NO	NO	
J. Other	CH4	NO	NO	NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	CH4	1.23	1.23	0	0%	0%	0%	
A. Forestland	CH4	1.12	1.12	0	0%	0%	0%	
B. Cropland	CH4	NO	NO	NO	NO	NO	NO	
C. Grassland	CH4	0.11	0.11	0	0%	0%	0%	
D. Wetlands	CH4	NO	NO	NO	NO	NO	NO	
E. Settlements	CH4	NO	NO	NO	NO	NO	NO	
F. Other land	CH4	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	CH4			NO	NO	NO	NO	
H. Other	CH4	NO	NO	NO	NO	NO	NO	
5. Waste	CH4	984.01	915.30	-68.71144657	-2%	0%	0%	
A. Solid waste disposal	CH4	539.01	326.42	-212.5882457	-5%	-1%	-1%	-1% usage of OX=0.1 for managed landfills and OX=0 for unmanaged landfills, usage of CS-value for DOC in industrial waste.
B. Biological treatment of solid waste	CH4	NO,NE,IE	NO,NE,IE	NO	NO	NO	NO	
C. Incineration and open burning of waste	CH4	NA,NO	NA,NO	NO	NO	NO	NO	
D. Waste water treatment and discharge	CH4	445.00	588.88	143.8767992	3%	0%	1%	TERT advised that the TOW for a septic tank should not be corrected for the total amount of sludge and the inclusion of indirect methane emissions by direct discharge of untreated wastewater.
E. Other	CH4	NO	NO	NO	NO	NO	NO	
6. Other (As specified in summary 1.A)	CH4	NO	NO	NO	NO	NO	NO	
Memo items:	CH4			0	0%	0%	0%	
International bunkers	CH4	0.43	0.43	0	0%	0%	0%	
Aviation	CH4	0.09	0.09	0	0%	0%	0%	
Navigation	CH4	0.34	0.34	0	0%	0%	0%	
Multilateral operations	CH4	C		NO	NO	NO	NO	
CO2 emissions from biomass	CH4	0.00		NO	NO	NO	NO	
CO2 captured	CH4	NO		NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	CH4	NE		NO	NO	NO	NO	
Indirect N2O				NO	NO	NO	NO	
Indirect CO2				NO	NO	NO	NO	

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Recalculated year	2018																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Greenhouse gas	HFC	<i>Note: Replicate table below if more gases need reporting.</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Recalculated year	2018	
Greenhouse gas	PFC	<i>Note: Replicate table below if more gases need reporting.</i>

Recalculated year	2018	
Greenhouse gas	SF6	Note: Replicate table below if more gases need reporting.
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Recalculated year	1990								
Greenhouse gas	PFC								
Note: Replicate table below if more gases need reporting.									
	Gas (PFC, HFC, NF3, SF6, HFC- PFC Mix)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	Difference (CO2- eq, kt)	Difference(1) %	Impact of recalculation on total emissions excluding	Impact of recalculation on total emissions including		
GREENHOUSE GAS SOURCE AND SINK CATEGORY						LULUCF (2) %	LULUCF(3) %	Explanation for recalculations	
F-gases: Total actual Emissions	PFC	1,240.24	1,240.24	NO	NO	NO	NO		
2.B.9. Flurochemical production	PFC	NO	NO	NO	NO	NO	NO		
2.B.10. Other	PFC	NO	NO	NO	NO	NO	NO		
2.C.3. Aluminium production	PFC	1,240.24	1,240.24	NO	NO	NO	NO		
2.C.4. Magnesium production	PFC	NO	NO	NO	NO	NO	NO		
2.C.7. Other	PFC	NO	NO	NO	NO	NO	NO		
2.E.1. Integrated circuit or semiconductor	PFC	NO	NO	NO	NO	NO	NO		
2.E.2. TFT flat panel display	PFC	NO	NO	NO	NO	NO	NO		
2.E.3. Photovoltaics	PFC	NO	NO	NO	NO	NO	NO		
2.E.4. Heat transfer fluid	PFC	NO	NO	NO	NO	NO	NO		
2.E.5. Other (as specified in table 2(II))	PFC	NO	NO	NO	NO	NO	NO		
2.F.1. Refrigeration and air conditioning	PFC	NO	NO	NO	NO	NO	NO		
2.F.2. Foam blowing agents	PFC	NO	NO	NO	NO	NO	NO		
2.F.3. Fire protection	PFC	NO	NO	NO	NO	NO	NO		
2.F.4. Aerosols	PFC	NO	NO	NO	NO	NO	NO		
2.F.5. Solvents	PFC	NO	NO	NO	NO	NO	NO		
2.F.6. Other applications	PFC	NO	NO	NO	NO	NO	NO		
2.G.1. Electrical equipment	PFC	NO	NO	NO	NO	NO	NO		
2.G.2. SF6 and PFCs from other product use	PFC	NO	NO	NO	NO	NO	NO		
2.G.4. Other	PFC	NO	NO	NO	NO	NO	NO		
2.H. Other (please specify)	PFC	NO	NO	NO	NO	NO	NO		

Recalculated year	1990							
Greenhouse gas	SF6							
Note: Replicate table below if more gases need reporting.								
	Gas (PFC, HFC, NF3, SF6, HFC- PFC Mix)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	Difference (CO2- eq, kt)	Difference(1) %	Impact of recalculation on total emissions excluding	Impact of recalculation on total emissions including	
GREENHOUSE GAS SOURCE AND SINK CATEGORY						LULUCF (2) %	LULUCF(3) %	Explanation for recalculations
F-gases: Total actual Emissions	SF6	0.000458337	0.000458337	0	0%	NO	0%	
2.B.9. Flurochemical production	SF6	NO	NO	NO	NO	NO	NO	
2.B.10. Other	SF6	NO	NO	NO	NO	NO	NO	
2.C.3. Aluminium production	SF6	NO	NO	NO	NO	NO	NO	
2.C.4. Magnesium production	SF6	NO	NO	NO	NO	NO	NO	
2.C.7. Other	SF6	NO	NO	NO	NO	NO	NO	
2.E.1. Integrated circuit or semiconductor	SF6	NO	NO	NO	NO	NO	NO	
2.E.2. TFT flat panel display	SF6	NO	NO	NO	NO	NO	NO	
2.E.3. Photovoltaics	SF6	NO	NO	NO	NO	NO	NO	
2.E.4. Heat transfer fluid	SF6	NO	NO	NO	NO	NO	NO	
2.E.5. Other (as specified in table 2(II))	SF6	NO	NO	NO	NO	NO	NO	
2.F.1. Refrigeration and air conditioning	SF6	NO	NO	NO	NO	NO	NO	
2.F.2. Foam blowing agents	SF6	NO	NO	NO	NO	NO	NO	
2.F.3. Fire protection	SF6	NO	NO	NO	NO	NO	NO	
2.F.4. Aerosols	SF6	NO	NO	NO	NO	NO	NO	
2.F.5. Solvents	SF6	NO	NO	NO	NO	NO	NO	
2.F.6. Other applications	SF6	NO	NO	NO	NO	NO	NO	
2.G.1. Electrical equipment	SF6	0.000458337	0.000458337	0	0%	NO	0%	
2.G.2. SF6 and PFCs from other product use	SF6	NO	NO	NO	NO	NO	NO	
2.G.4. Other	SF6	NO	NO	NO	NO	NO	NO	
2.H. Other (please specify)	SF6	NO	NO	NO	NO	NO	NO	

Annex 5-6: Reporting on consistency of reported emissions with data from the ETS

Reporting year:		2019			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,572.70	7,514.73	0.32	
	Total GHG	17,785.18	7,464.63	0.42	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/ inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2	6,505.21	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,301.55	5,548.58	88.05%	
1.A.1 Energy industries	CO2	3,880.44	3,739.51	96.37%	
1.A.1.a Public electricity and heat production	CO2	2,645.10	2,581.30	97.59%	
1.A.1.b Petroleum refining	CO2	990.69	1,016.92	102.65%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	244.66	141.29	57.75%	
1.A.2. Manufacturing industries and construction	CO2	2,421.11	1,809.06	74.72%	
1.A.2.a Iron and steel	CO2	41.20	6.35	15.41%	
1.A.2.b Non-ferrous metals	CO2	27.00	7.25	26.86%	
1.A.2.c Chemicals	CO2	292.01	0.02	0.01%	
1.A.2.d Pulp, paper and print	CO2	110.62	104.50	94.47%	
1.A.2.e Food processing, beverages and tobacco	CO2	335.68	118.19	35.21%	
1.A.2.f Non-metallic minerals	CO2	1,279.73	1,570.81	122.75%	
1.A.2.g Other	CO2	334.88	1.94	0.58%	
1.A.3. Transport	CO2	6,516.87	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,658.92	NO	NO	
1.A.4.a Commercial / Institutional	CO2	612.03	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,400.82	NO	NO	
1.B Fugitive emissions from Fuels	CO2	203.66	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,324.94	1,321.66	99.75%	
2.A.1 Cement Production	CO2	1,184.11	1,184.11	100.00%	
2.A.2. Lime production	CO2	92.74	92.74	100.00%	
2.A.3. Glass production	CO2	29.40	29.40	100.00%	
2.A.4. Other process uses of carbonates	CO2	18.68	15.40	82.43%	
2.B Chemical industry	CO2	594.60	587.15	98.75%	
2.B.1. Ammonia production	CO2	594.60	587.15	98.75%	
2.B.3. Adipic acid production (CO2)	CO2	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5. Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	4.91	7.24	147.49%	
2.C.1. Iron and steel production	CO2	4.91	7.24	147.49%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	50.0991891	50.10	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Reporting year:		2018			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,504.28	7,444.62	0.32	
	Total GHG	17,785.50	7,394.51	0.42	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/ inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2	6,574.23	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,318.86	5,527.44	87.48%	
1.A.1 Energy industries	CO2	3,907.81	3,735.90	95.60%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	2,385.31	2,284.87	95.79%	
1.A.1.b Petroleum refining	CO2	1,317.29	1,316.70	99.96%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	205.21	134.33	65.46%	
1.A.2 Manufacturing industries and construction	CO2	2,411.05	1,791.54	74.31%	
1.A.2.a Iron and steel	CO2	54.27	9.33	17.19%	
1.A.2.b Non-ferrous metals	CO2	26.91		NO	
					In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.c Chemicals	CO2	279.62	0.02	0.01%	
1.A.2.d Pulp, paper and print	CO2	92.94	90.31	97.17%	
1.A.2.e Food processing, beverages and tobacco	CO2	334.08	17.18	5.14%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f
1.A.2.f Non-metallic minerals	CO2	1,308.89	1,672.85	127.81%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	314.34	1.84	NO	
1.A.3. Transport	CO2	6,340.78	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,747.08	NO	NO	
1.A.4.a Commercial / Institutional	CO2	627.22	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,478.11	NO	NO	
1.B Fugitive emissions from Fuels	CO2	255.38	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,358.42	1,358.35	99.99%	
2.A.1 Cement Production	CO2	1,210.72	1,210.72	100.00%	
2.A.2. Lime production	CO2	88.95	93.92	105.59%	
2.A.3. Glass production	CO2	30.50	30.50	100.00%	
2.A.4. Other process uses of carbonates	CO2	28.25	23.21	82.16%	
2.B Chemical industry	CO2	513.06	494.95	96.47%	
2.B.1. Ammonia production	CO2	513.06	494.95	96.47%	
2.B.3. Adipic acid production (CO2)	CO2	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5. Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	8.99	13.77	153.16%	
2.C.1. Iron and steel production	CO2	8.99	13.77	153.16%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	50.10914065	50.11	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Reporting year: 2017					
Total emissions (CO2 -eq)					
Category[1]	Gas	Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	24,705.87	8,367.77	0.34	
CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	17,785.81	8,269.17	0.46	
CO2 emissions					
Category[1]		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/inventory emissions)[3]	Comment[2]
1.A Fuel combustion activities, total	CO2	7,176.68	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,894.34	6,261.51	90.82%	
1.A.1 Energy industries	CO2	4,464.77	4,268.40	95.60%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	2,895.71	2,792.92	96.45%	
1.A.1.b Petroleum refining	CO2	1,350.64	1,343.89	99.50%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	218.42	131.60	60.25%	
1.A.2. Manufacturing industries and construction	CO2	2,429.58	1,993.11	82.04%	
1.A.2.a Iron and steel	CO2	36.98	2.72	7.35%	
1.A.2.b Non-ferrous metals	CO2	20.71	NO	NO	
1.A.2.c Chemicals	CO2	332.42	2.71	0.82%	In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.d Pulp, paper and print	CO2	96.61	89.82	92.97%	
1.A.2.e Food processing, beverages and tobacco	CO2	358.38	176.62	49.28%	
1.A.2.f Non-metallic minerals	CO2	1,295.18	1,721.25	132.90%	In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	289.30	NO	NO	
1.A.3. Transport	CO2	6,570.29	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,821.56	NO	NO	
1.A.4.a Commercial / Institutional	CO2	626.65	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,565.73	NO	NO	
1.B Fugitive emissions from Fuels	CO2	282.34	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,425.61	1,425.54	100.00%	
2.A.1 Cement Production	CO2	1,287.25	1,287.25	100.00%	
2.A.2. Lime production	CO2	82.08	82.08	100.00%	
2.A.3. Glass production	CO2	31.90	31.90	100.00%	
2.A.4. Other process uses of carbonates	CO2	24.38	24.31	99.72%	
2.B Chemical industry	CO2	566.79	580.12	102.35%	
2.B.1. Ammonia production	CO2	566.79	580.12	102.35%	
2.B.3. Adipic acid production (CO2)	CO2	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5. Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	1.87	2.00	107.45%	
2.C.1. Iron and steel production	CO2	1.87	2.00	107.45%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
Category[1]	Gas	Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	Comment[2]
2.B.2. Nitric acid production	N2O	98.59885701	98.60	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Reporting year:		2016			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,968.54	8,267.11	0.34	
CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	17,786.12	8,157.76	0.46	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/ inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2	7,282.99	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	7,075.46	6,321.20	89.34%	
1.A.1 Energy industries	CO2	4,846.79	4,494.58	92.73%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,347.32	3,203.95	95.72%	
1.A.1.b Petroleum refining	CO2	1,298.59	1,177.66	90.69%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	200.89	112.97	56.23%	
1.A.2. Manufacturing industries and construction	CO2	2,228.67	1,826.62	81.96%	
1.A.2.a Iron and steel	CO2	33.97	5.60	16.50%	
1.A.2.b Non-ferrous metals	CO2	10.66		NO	
					In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.c Chemicals	CO2	296.38	3.21	1.08%	
1.A.2.d Pulp, paper and print	CO2	105.50	78.14	74.07%	
1.A.2.e Food processing, beverages and tobacco	CO2	376.65	19.85	5.27%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f
1.A.2.f Non-metallic minerals	CO2	1,116.55	1,719.81	154.03%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	288.96	NO	NO	
1.A.3. Transport	CO2	6,106.38	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,790.08	NO	NO	
1.A.4.a Commercial / Institutional	CO2	607.71	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,544.39	NO	NO	
1.B Fugitive emissions from Fuels	CO2	207.53	124.04	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,201.30	1,201.24	99.99%	
2.A.1 Cement Production	CO2	1,076.51	1,076.51	100.00%	
2.A.2. Lime production	CO2	63.79	63.79	100.00%	
2.A.3. Glass production	CO2	32.62	32.62	100.00%	
2.A.4. Other process uses of carbonates	CO2	28.39	28.32	99.78%	
2.B Chemical industry	CO2	547.86	510.22	NO	
2.B.1. Ammonia production	CO2	547.86	510.22	93.13%	
2.B.3. Adipic acid production (CO2)	CO2		NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5. Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	1.05	1.05	100.00%	
2.C.1. Iron and steel production	CO2	1.05	1.05	100.00%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	109.3585794	109.36	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Reporting year:		2015			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,880.86	8,386.21	0.35	
CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	17,786.44	8,074.87	0.45	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/ inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2		NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,941.52	6,652.45	95.84%	
1.A.1 Energy industries	CO2	4,718.82	4,293.86	90.99%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,095.98	2,969.98	95.93%	
1.A.1.b Petroleum refining	CO2	1,387.39	1,217.48	87.75%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	235.45	106.40	45.19%	
1.A.2. Manufacturing industries and construction	CO2	2,222.70	2,358.58	106.11%	
1.A.2.a Iron and steel	CO2	51.58	10.98	21.29%	
1.A.2.b Non-ferrous metals	CO2	10.90	NO	NO	
					In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.c Chemicals	CO2	294.34	2.99	1.02%	
1.A.2.d Pulp, paper and print	CO2	70.04	43.21	61.69%	
1.A.2.e Food processing, beverages and tobacco	CO2	350.71	20.75	5.92%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f
1.A.2.f Non-metallic minerals	CO2	1,146.98	2,280.65	198.84%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	298.14	NO	NO	
1.A.3. Transport	CO2	5,887.78	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,719.81	NO	NO	
1.A.4.a Commercial / Institutional	CO2	583.88	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,502.52	NO	NO	
1.B Fugitive emissions from Fuels	CO2	239.48	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,306.35	1,306.39	100.00%	
2.A.1 Cement Production	CO2	1,169.23	1,169.23	100.00%	
2.A.2. Lime production	CO2	73.40	73.40	100.00%	
2.A.3. Glass production	CO2	30.68	30.68	100.00%	
2.A.4. Other process uses of carbonates	CO2	33.04	33.07	100.10%	
2.B Chemical industry	CO2	572.27	102.48	NO	
2.B.1. Ammonia production	CO2	572.27	NO	NO	
2.B.3. Adipic acid production (CO2)	CO2		NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5. Carbide production	CO2		102.48	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	9.30	13.55	145.68%	
2.C.1. Iron and steel production	CO2	9.30	13.55	145.68%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	311.3476689	311.35	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, elvoxal and elvoxvlic acid production	N2O	NO	NO	NO	

Reporting year:		2014			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,444.81	8,387.46	0.36	
CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	17,651.49	8,121.27	0.46	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/ inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2		NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	7,068.24	6,751.28	95.52%	
1.A.1 Energy industries	CO2	4,743.91	4,276.80	90.15%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,049.69	2,969.30	97.36%	
1.A.1.b Petroleum refining	CO2	1,516.22	1,210.10	79.81%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	178.00	97.40	54.72%	
1.A.2 Manufacturing industries and construction	CO2	2,324.33	2,474.49	106.46%	
1.A.2.a Iron and steel	CO2	55.80	19.10	34.22%	
1.A.2.b Non-ferrous metals	CO2	18.68	NO	NO	
					In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.c Chemicals	CO2	288.09	1,219.60	423.34%	
1.A.2.d Pulp, paper and print	CO2	71.38	58.79	82.36%	
1.A.2.e Food processing, beverages and tobacco	CO2	399.58	188.06	47.06%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.f Non-metallic minerals	CO2	1,192.67	NO	NO	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	298.14	988.94	331.71%	
1.A.3 Transport	CO2	5,580.73	27.24	0.49%	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,530.59	NO	NO	
1.A.4.a Commercial / Institutional	CO2	471.32	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	1,425.29	NO	NO	
1.B Fugitive emissions from Fuels	CO2	439.56	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,354.11	1,354.10	100.00%	
2.A.1 Cement Production	CO2	1,225.09	1,225.09	100.00%	
2.A.2 Lime production	CO2	71.49	74.72	104.53%	
2.A.3 Glass production	CO2	30.48	43.31	142.06%	
2.A.4 Other process uses of carbonates	CO2	27.05	10.98	NO	
2.B Chemical industry	CO2	559.83	NO	NO	
2.B.1 Ammonia production	CO2	559.83	NO	NO	
2.B.3 Adipic acid production (CO2)	CO2	NO	NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5 Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	10.11	15.89	157.12%	
2.C.1 Iron and steel production	CO2	10.11	15.89	157.12%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/ inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	266.1946478	266.19	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Reporting year:		2013			
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	24,298.92	8,785.79	0.36	
CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	18,404.22	8,545.51	0.46	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2	14,856.25	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	9,219.70	7,259.43	78.74%	
1.A.1 Energy industries	CO2	5,238.07	4,918.89	93.91%	In inventory dana from ETS are not used for emission
1.A.1.a Public electricity and heat production	CO2	3,614.08	3,493.80	96.67%	
1.A.1.b Petroleum refining	CO2	1,394.72	1,328.74	95.27%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	229.27	96.35	42.02%	
1.A.2. Manufacturing industries and construction	CO2	2,384.92	2,340.54	98.14%	
1.A.2.a Iron and steel	CO2	58.36	19.83	33.98%	
1.A.2.b Non-ferrous metals	CO2	19.93	0.00	NO	
1.A.2.c Chemicals	CO2	253.20	1,157.79	457.27%	In Inventory emissions from consumption of natural gas as
1.A.2.d Pulp, paper and print	CO2	113.37	60.63	53.49%	
1.A.2.e Food processing, beverages and tobacco	CO2	388.01	170.55	43.96%	
1.A.2.f Non-metallic minerals	CO2	1,223.86	931.73	76.13%	In Inventory emissions from Construction sector are In Inventory emissions from Construction sector are
1.A.2.g Other	CO2	328.20	NO	NO	
1.A.3. Transport	CO2	5,636.55	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	1,143.93	NO	NO	
1.A.4.a Commercial / Institutional	CO2	508.91	NO	NO	
1.A.4.c Agriculture/ Forestry / Fisheries	CO2	635.02	NO	NO	
1.B Fugitive emissions from Fuels	CO2	452.78	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,271.22	1,270.28	99.93%	
2.A.1 Cement Production	CO2	1,141.03	1,141.03	100.00%	
2.A.2. Lime production	CO2	74.26	74.26	100.00%	
2.A.3. Glass production	CO2	29.48	49.87	169.17%	
2.A.4. Other process uses of carbonates	CO2	26.46	5.12	19.36%	
2.B Chemical industry	CO2	509.33	0.00	NO	
2.B.1. Ammonia production	CO2	509.33		NO	
2.B.3. Adipic acid production (CO2)	CO2	NO		NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	CO2	NO		NO	
2.B.5. Carbide production	CO2	NO		NO	
2.B.6 Titanium dioxide production	CO2	NO		NO	
2.B.7 Soda ash production	CO2	NO		NO	
2.B.8 Petrochemical and carbon black production	CO2	NO,IE		NO	
2.C Metal production	CO2	13.93	15.80	113.43%	
2.C.1. Iron and steel production	CO2	13.93	15.80	113.43%	
2.C.2 Ferroalloys production	CO2	NO		NO	
2.C.3 Aluminium production	CO2	NO		NO	
2.C.4 Magnesium production	CO2	NO		NO	
2.C.5 Lead production	CO2	NO		NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	240.2717276	240.27	100.00%	
2.B.3. Adipic acid production	N2O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N2O	NO	NO	NO	

Annex 5-7: Reporting on major changes to methodological descriptions

Member State:	Croatia		
Reporting year:	2019		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
Total (Net Emissions)			
1. Energy			
A. Fuel Combustion (sectoral approach)			
1. Energy industries			
2. Manufacturing industries and construction	1.A.2 Manufacturing industries and construction –gaseous, liquid and solid fuels – CO2, CH4 and N2O	Distribute fuel consumption and emissions from the generation of electricity and heat in manufacturing industries and construction for the period 1990–2000, in accordance with the detailed industrial split for stationary combustion provided in the 2006 IPCC Guidelines	MMR Article9
3. Transport	1A3b	Error in COPERT model-wrong CH4 emissions	MMR Article9
4. Other sector			
5. Other			
B. Fugitive emissions from fuels			
1. Solid fuels			
2. Oil and natural gas and other emissions from energy production	1B2b1 Fugitive Emissions from Natural Gas Exploration	Overestimation of emissions	MMR Article9
C. CO2 transport and storage			

Member State:	Croatia		
Reporting year:	2019		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
2. Industrial processes and product use			
A. Mineral industry	2.A.2 Lime production - CO2	The TERT notes that there is a lack of transparency	MMR Article9
B. Chemical industry			
C. Metal industry			
D. Non-energy products from fuels and solvent use	2.D.1 Lubricant use - CO2	Separately estimate emissions from lubricant use for two-stroke engines and report those emissions under the energy sector, in accordance with the 2006 IPCC Guidelines.	MMR Article9
E. Electronic industry			
F. Product uses as substitutes for ODS	2F Product uses as substitutes for ozone depleting	The TERT identified a potential underestimate exc	MMR Article9
G. Other product manufacture and use	2.G.1 Electrical equipment – SF6	The Party reported in its NIR (p. 171) that due to the unavailability of all data needed to calculate SF6 emissions from electrical equipment for 2017 and 2018, recalculation was performed by linear extrapolation method (using time series 2014-2016). During the review the Party provided the details of the extrapolation method used and acknowledged that an inaccuracy was found in the calculation of the submitted data for 2017 and 2018. The Party informed that a recalculation was made, which will be included in the next submission.	MMR Article9
H. Other			

Member State:	Croatia		
Reporting year:	2019		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
3. Agriculture			
A. Enteric fermentation	3A Enteric Fermentation, CH ₄ , HR-3-2020-0001, A.1 3. General (agriculture) – CH ₄ and N ₂ O (A.9, 2018) Comparability	Emission estimates were recalculated using the EF values from the revised estimates sheets provided by Croatia and accepted by the TERT as part of the TC for years 2005, 2016, 2017, 2018, 2019., Corrected to NE in CRF	MMR Article9
B. Manure management	3 Agriculture, CH ₄ , N ₂ O, HR-3-2020-0004, A.25	Emission estimates were recalculated using the EF	MMR Article9
C. Rice cultivation			
D. Agricultural soils	3D Agricultural Soils, N ₂ O, HR-3-2020-0003	Estimate calculation was revised, errors (Fracgass and	MMR Article9
E. Prescribed burning of savannahs			
F. Field burning of agricultural residues			
G. Liming			
H. Urea application			
I. Other carbon containing fertilisers			
J. Other			

Member State:	Croatia		
Reporting year:	2019		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
4. Land use, land-use change and forestry	4. Land representation	Following the ERT recommendation, Croatia perfo	MMR Article9
A. Forest land	4.A.1 Forest land remaining forest land – CO ₂ , CH ₄ and N ₂ O	Partially; recalculation has been performed due to	MMR Article9
B. Cropland			
C. Grassland	4C.2 Land converted to Grassland	Grassland areas has been redefined as explained in	MMR Article9
D. Wetlands			
E. Settlements			
F. Other land			
G. Harvested wood products			
H. Other			



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