

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

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

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.4 Other Sectors - Gaseous Fuels	CH ₄
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O
1.A.4 Other Sectors - Biomass	CH ₄
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

Source Categories Assessed in Key Source Category Analysis	Direct GHG
3.B Manure Management	N ₂ O
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O
3.G Liming	CO ₂
3.H Urea Application	CO ₂
LAND USE, LAND USE CHANGE AND FORESTRY	
4.A.1 Forest Land Remaining Forest Land	CO ₂
4.A.2 Land Converted to Forest Land	CO ₂
4.B.1 Cropland Remaining Cropland	CO ₂
4.B.2 Land Converted to Cropland	CO ₂
4.C.1 Grassland Remaining Grassland	CO ₂
4.C.2 Land Converted to Grassland	CO ₂
4.D.2 Land Converted to Wetlands	CO ₂
4.E.2 Land Converted to Settlements	CO ₂
4.G Harvested Wood Products	CO ₂
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O
4(V) Biomass Burning	CO ₂
4(V) Biomass Burning	CH ₄
4(V) Biomass Burning	N ₂ O
WASTE	
5.A Solid Waste Disposal	CH ₄
5.B Biological Treatment of Soild Waste	CH ₄
5.B Biological Treatment of Soild Waste	N ₂ O
5.C Incineration and Open Burning of Waste	CO ₂
5.C Incineration and Open Burning of Waste	N ₂ O
5.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	4,615.029	0.145	14%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.110	25%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.077	33%
3.A Enteric Fermentation	CH ₄	2,171.549	0.068	40%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.068	47%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	0.058	53%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.053	58%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.052	63%
2.C.3 Aluminium Production	PFCs	1,240.239	0.039	67%
2.A.1 Cement Production	CO ₂	1,093.483	0.034	70%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	0.033	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	0.023	78%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.019	80%
2.B.1 Ammonia Production	CO ₂	558.672	0.018	82%
5.A Solid Waste Disposal	CH ₄	539.010	0.017	84%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.016	85%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	0.014	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	0.014	88%
3.B Manure Management	CH ₄	416.113	0.013	89%
3.B Manure Management	N ₂ O	361.580	0.011	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	0.011	92%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.010	93%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.007	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.006	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.005	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.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.005	97%
1.A.3.c Railways	CO ₂	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.004	98%
2.C.3 Aluminium Production	CO ₂	118.797	0.004	98%
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.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	40.611	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	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%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	0.001	100%
1.A.3.c Railways	N ₂ O	13.248	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	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	5.715	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	4.973	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	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	2.096	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	1.555	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	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	F-gases	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	0.000	100%
2.F.4 Aerosols	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		31,858.362		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2017

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.254	25%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.087	34%
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.071	41%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.065	48%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.051	53%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.049	58%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.047	62%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.044	67%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.043	71%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.041	75%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.039	79%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.033	82%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.023	85%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.019	87%
3.B Manure Management	CH ₄	416.113	423.665	0.017	88%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.014	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.013	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.011	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.010	93%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.009	94%
3.B Manure Management	N ₂ O	361.580	153.527	0.006	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.006	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.006	96%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.004	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.004	96%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.004	97%
3.H Urea Application	CO ₂	50.020	70.211	0.003	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.003	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.002	98%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.002	99%
1.A.3.c Railways	CO ₂	140.079	55.701	0.002	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.002	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.002	99%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.001	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.000	100%
3.G Liming	CO ₂	0.000	10.917	0.000	100%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	100%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2017) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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		31,858.362	25,019.749		

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-CO2)	Level Assessment	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	0.170	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	0.117	29%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.089	38%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.062	44%
3.A Enteric Fermentation	CH ₄	2,171.549	0.055	49%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.055	55%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	0.047	59%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.043	64%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.042	68%
2.C.3 Aluminium Production	PFCs	1,240.239	0.031	71%
2.A.1 Cement Production	CO ₂	1,093.483	0.028	74%
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,056.449	0.027	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%
2.B.1 Ammonia Production	CO ₂	558.672	0.014	83%
5.A Solid Waste Disposal	CH ₄	539.010	0.014	85%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.013	86%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	0.011	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	0.011	88%
3.B Manure Management	CH ₄	416.113	0.011	89%
3.B Manure Management	N ₂ O	361.580	0.009	90%
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	343.940	0.009	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	93%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	0.006	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.006	94%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	0.005	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.005	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.004	95%
4.E.2 Land Converted to Settlements	CO ₂	165.753	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.004	96%
2.A.2 Lime Production	CO ₂	156.820	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.004	97%
1.A.3.c Railways	CO ₂	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.003	97%
2.C.3 Aluminium Production	CO ₂	118.797	0.003	98%
4.C.2 Land Converted to Grassland	CO ₂	103.921	0.003	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	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.4 Other Sectors - Biomass	N ₂ O	50.267	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	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	40.611	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	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%
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	31.905	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%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	0.000	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	F-gases	10.450	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	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	5.715	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	4.973	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	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	2.096	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	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	1.079	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	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	CH ₄	0.735	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	F-gases	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	0.000	100%
2.F.4 Aerosols	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		39,480.164		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2017

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.190	19%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	5,208.757	0.156	35%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.065	41%
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.053	46%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.049	51%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.039	55%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.036	59%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.036	62%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.033	66%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.032	69%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.031	72%
4.G Harvested Wood Products	CO ₂	301.544	1,008.247	0.030	75%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.029	78%
4(V) Biomass Burning	CO ₂	14.979	824.110	0.025	80%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.024	83%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.017	84%
4.E.2 Land Converted to Settlements	CO ₂	165.753	534.597	0.016	86%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.014	87%
3.B Manure Management	CH ₄	416.113	423.665	0.013	89%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.010	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.010	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.008	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.008	92%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	238.199	0.007	93%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.007	94%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	208.000	0.006	94%
4.C.2 Land Converted to Grassland	CO ₂	103.921	162.532	0.005	95%
3.B Manure Management	N ₂ O	361.580	153.527	0.005	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.004	96%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.003	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.003	97%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.003	97%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	31.905	80.745	0.002	97%
3.H Urea Application	CO ₂	50.020	70.211	0.002	97%
4(V) Biomass Burning	CH ₄	1.230	69.234	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.002	98%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.002	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.002	99%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.002	99%
1.A.3.c Railways	CO ₂	140.079	55.701	0.002	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.002	99%
4(V) Biomass Burning	N ₂ O	0.858	48.899	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.001	99%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.001	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	14.153	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.000	100%
3.G Liming	CO ₂	0.000	10.917	0.000	100%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	8.945	0.000	100%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	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 (2017) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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		39,480.164	33,428.237		

Table A1.3-5: Key categories analysis – Trend Assessment - Tier 1 (Excluding LULUCF) – 2017

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.183	0.198	20%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.130	0.141	34%
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.069	0.075	41%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.053	0.057	47%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.052	0.056	53%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.050	0.054	58%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.038	0.041	62%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.038	0.041	66%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.038	0.041	70%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.033	0.036	74%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.030	0.033	77%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.025	0.027	80%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.024	0.026	83%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.022	0.024	85%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.020	0.022	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.016	0.017	89%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.008	0.008	90%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.007	0.008	91%
3.B Manure Management	N ₂ O	361.580	153.527	0.007	0.007	91%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.007	0.007	92%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.006	0.007	93%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.006	0.006	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.006	0.006	94%
3.B Manure Management	CH ₄	416.113	423.665	0.005	0.005	94%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.005	0.005	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.005	0.005	95%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.005	0.005	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.004	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.004	0.004	97%
1.A.3.c Railways	CO ₂	140.079	55.701	0.003	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.002	0.003	97%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.002	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.002	0.002	98%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.002	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.002	0.002	98%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.002	0.002	98%
3.H Urea Application	CO ₂	50.020	70.211	0.002	0.002	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.001	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.001	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.001	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.001	0.001	99%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.001	0.001	99%
3.G Liming	CO ₂	0.000	10.917	0.001	0.001	99%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.000	100%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	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 - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2017) Estimate (Gg eq-CO2)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.000	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	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.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
TOTAL		31,858.362	25,019.749			

Table A1.3-6: Key categories analysis – Trend Assessment - Tier 1 (Including LULUCF) – 2017

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.119	0.155	15%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.100	0.130	29%
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.047	0.061	35%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.040	0.051	40%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.037	0.048	45%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.035	0.046	49%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.031	0.041	53%
4(V) Biomass Burning	CO ₂	14.979	824.110	0.029	0.037	57%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.028	0.036	61%
4.G Harvested Wood Products	CO ₂	301.544	1,008.247	0.027	0.035	64%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.026	0.034	67%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.025	0.033	71%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.022	0.029	73%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.019	0.025	76%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.017	0.022	78%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	5,208.757	0.017	0.021	80%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.015	0.020	82%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.014	0.019	84%
4.E.2 Land Converted to Settlements	CO ₂	165.753	534.597	0.014	0.018	86%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.013	0.017	88%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	208.000	0.006	0.008	88%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	192.426	0.000	0.006	0.007	89%
3.B Manure Management	N ₂ O	361.580	153.527	0.005	0.007	90%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.005	0.007	91%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.005	0.007	91%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.005	0.006	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.004	0.006	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.004	0.006	93%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.004	0.005	93%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.003	0.004	94%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.003	0.004	94%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.003	0.004	95%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.003	0.004	95%
4.C.2 Land Converted to Grassland	CO ₂	103.921	162.532	0.003	0.003	95%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	238.199	0.003	0.003	96%
3.B Manure Management	CH ₄	416.113	423.665	0.003	0.003	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.002	0.003	96%
4(V) Biomass Burning	CH ₄	1.230	69.234	0.002	0.003	97%
1.A.3.c Railways	CO ₂	140.079	55.701	0.002	0.003	97%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	31.905	80.745	0.002	0.002	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.002	0.002	97%
4(V) Biomass Burning	N ₂ O	0.858	48.899	0.002	0.002	98%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.002	0.002	98%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.001	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.001	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.001	0.001	98%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	8.945	0.001	0.001	98%
3.H Urea Application	CO ₂	50.020	70.211	0.001	0.001	99%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.001	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.001	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.001	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.001	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.000	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.000	0.001	99%
3.G Liming	CO ₂	0.000	10.917	0.000	0.001	100%

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.000	0.000	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	14.153	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	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 - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	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	0.862	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.000	0.000	0.000	0.000	100%
TOTAL		39,480.164	33,428.237			

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	0.163	16%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	0.135	30%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	0.121	42%
3.A Enteric Fermentation	CH ₄	2,171.549	0.060	48%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	0.047	53%
5.A Solid Waste Disposal	CH ₄	539.010	0.047	57%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	0.038	61%
2.A.1 Cement Production	CO ₂	1,093.483	0.037	65%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.028	68%
3.B Manure Management	N ₂ O	361.580	0.024	70%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.023	72%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.020	74%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.019	76%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	0.019	78%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.018	80%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.017	82%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.017	83%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	0.015	85%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.014	86%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.014	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.013	89%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.012	90%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	0.010	91%
1.A.3.b Road Transportation	N ₂ O	38.685	0.009	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.009	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.007	93%
3.B Manure Management	CH ₄	416.113	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	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.005	96%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	0.005	96%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.004	97%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.004	97%
1.A.3.c Railways	N ₂ O	13.248	0.003	97%
1.A.3.b Road Transportation	CH ₄	40.611	0.002	98%
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	8.920	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	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	7.502	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	5.715	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	0.001	99%
2.G Other Product Manufacture and Use	F-gases	10.450	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
1.A.3.c Railways	CO ₂	140.079	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	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	0.001	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	1.079	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	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	2.096	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
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	1.555	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	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	0.735	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%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	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	F-gases	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	0.000	100%
2.F.4 Aerosols	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		31,858.362		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2017

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2017) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.213	21%
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.175	39%
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.134	52%
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.072	59%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.035	63%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.032	66%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.031	69%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.028	72%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.025	74%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.022	77%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.019	79%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.019	80%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.018	82%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.014	84%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.013	85%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.012	86%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.012	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.012	89%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.012	90%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.012	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.011	92%
3.B Manure Management	CH ₄	416.113	423.665	0.010	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.009	94%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.008	95%
3.B Manure Management	N ₂ O	361.580	153.527	0.007	95%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.006	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.004	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.003	97%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.003	98%
3.H Urea Application	CO ₂	50.020	70.211	0.002	98%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.002	99%
3.G Liming	CO ₂	0.000	10.917	0.001	99%
2.F.4 Aerosols	F-gases	0.000	8.689	0.001	99%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.001	99%
1.A.3.c Railways	CO ₂	140.079	55.701	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.001	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2017) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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		31,858.362	25,019.749		

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-CO2)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	0.422	42%
2.C.3 Aluminium Production	PFCs	1,240.239	0.067	49%
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,056.449	0.056	54%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	0.054	60%
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	343.940	0.050	65%
4.E.2 Land Converted to Settlements	CO ₂	165.753	0.031	68%
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	31.905	0.026	70%
3.A Enteric Fermentation	CH ₄	2,171.549	0.025	73%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	0.019	75%
5.A Solid Waste Disposal	CH ₄	539.010	0.019	77%
4.C.2 Land Converted to Grassland	CO ₂	103.921	0.019	79%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	0.015	80%
2.A.1 Cement Production	CO ₂	1,093.483	0.015	82%
4.B.2 Land Converted to Cropland	CO ₂	23.135	0.015	83%
4.G Harvested Wood Products	CO ₂	301.544	0.014	85%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.012	86%
3.B Manure Management	N ₂ O	361.580	0.010	87%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.009	88%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.008	88%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.008	89%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	0.008	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.007	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.007	91%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.007	92%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	0.006	93%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	0.006	93%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.006	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.006	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.005	95%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.005	96%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	0.004	96%
1.A.3.b Road Transportation	N ₂ O	38.685	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.004	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.003	97%
3.B Manure Management	CH ₄	416.113	0.003	97%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	0.003	98%
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	98%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.002	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.002	99%
1.A.3.c Railways	N ₂ O	13.248	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	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	8.920	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	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	7.502	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	5.715	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	0.000	100%
3.H Urea Application	CO ₂	50.020	0.000	100%
1.A.3.c Railways	CO ₂	140.079	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.000	100%
4(V) Biomass Burning	CO ₂	14.979	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	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	1.079	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	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	2.096	0.000	100%
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	1.555	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	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%
4(V) Biomass Burning	N ₂ O	0.858	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	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%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	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	F-gases	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	0.000	100%
2.F.4 Aerosols	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		39,480.164		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2017

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	5,208.757	0.443	44%
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.057	50%
4.G Harvested Wood Products	CO ₂	301.544	1,008.247	0.053	55%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.047	60%
4.E.2 Land Converted to Settlements	CO ₂	165.753	534.597	0.046	65%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	238.199	0.046	69%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	31.905	80.745	0.044	74%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.036	77%
4(V) Biomass Burning	CO ₂	14.979	824.110	0.033	81%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	208.000	0.023	83%
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.019	85%
4.C.2 Land Converted to Grassland	CO ₂	103.921	162.532	0.019	87%
4.B.2 Land Converted to Cropland	CO ₂	23.135	14.153	0.014	88%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.010	89%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.009	90%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.008	91%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.007	92%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.007	92%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.006	93%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.005	93%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.005	94%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.005	94%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.004	95%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.004	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.003	96%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.003	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.003	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.003	97%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.003	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.003	97%
3.B Manure Management	CH ₄	416.113	423.665	0.003	97%
4(V) Biomass Burning	CH ₄	1.230	69.234	0.003	98%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	8.945	0.002	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.002	98%
4(V) Biomass Burning	N ₂ O	0.858	48.899	0.002	99%
3.B Manure Management	N ₂ O	361.580	153.527	0.002	99%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.002	99%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.001	99%
3.H Urea Application	CO ₂	50.020	70.211	0.001	99%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.000	100%
3.G Liming	CO ₂	0.000	10.917	0.000	100%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	100%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	100%
1.A.3.c Railways	CO ₂	140.079	55.701	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	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 (2017) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	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	3.615	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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		39,480.164	33,428.237		

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 (2017) Estimate (Gg eq- CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.052	0.344	34%
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.013	0.087	43%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.010	0.068	50%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.009	0.062	56%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.005	0.035	60%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.005	0.034	63%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.004	0.029	66%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.004	0.026	68%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.004	0.025	71%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.003	0.018	73%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.003	0.018	75%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.003	0.018	76%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.003	0.018	78%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.002	0.016	80%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.002	0.016	81%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.002	0.015	83%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.002	0.014	84%
3.B Manure Management	N ₂ O	361.580	153.527	0.002	0.012	85%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.002	0.012	87%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.002	0.011	88%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.002	0.010	89%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.001	0.010	90%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.001	0.010	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.001	0.008	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.001	0.007	92%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.001	0.006	93%
3.B Manure Management	CH ₄	416.113	423.665	0.001	0.005	93%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.001	0.005	94%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.001	0.004	94%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.001	0.004	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.001	0.004	95%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.001	0.004	95%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.001	0.004	96%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.001	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	0.003	96%
3.G Liming	CO ₂	0.000	10.917	0.000	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	0.003	97%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	0.003	97%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.002	98%
3.H Urea Application	CO ₂	50.020	70.211	0.000	0.002	98%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.000	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.000	0.002	98%
1.A.3.c Railways	CO ₂	140.079	55.701	0.000	0.001	98%

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO ₂)	Last Year (2017) Estimate (Gg eq- CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.000	0.001	99%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.000	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.000	0.001	99%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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%

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO ₂)	Last Year (2017) Estimate (Gg eq- CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
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		31,858.362	25,019.749			

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF) – 2017

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2017) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230	0.035	0.114	11%
4.G Harvested Wood Products	CO ₂	301.544	1,008.247	0.033	0.106	22%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,703.837	5,208.757	0.033	0.106	33%
4.E.2 Land Converted to Settlements	CO ₂	165.753	534.597	0.028	0.091	42%
4(V) Biomass Burning	CO ₂	14.979	824.110	0.027	0.088	51%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	31.905	80.745	0.024	0.079	58%
4.A.2 Land Converted to Forest Land	CO ₂	28.890	208.000	0.017	0.055	64%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	238.199	0.011	0.037	68%
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	0.009	0.028	70%
4.C.2 Land Converted to Grassland	CO ₂	103.921	162.532	0.007	0.024	73%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	0.007	0.023	75%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	475.304	0.007	0.023	77%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	8.945	0.007	0.022	80%
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919	0.005	0.015	81%
4.B.2 Land Converted to Cropland	CO ₂	23.135	14.153	0.004	0.014	83%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365	0.004	0.013	84%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266	0.004	0.012	85%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.449	815.995	0.004	0.012	86%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.940	263.408	0.003	0.010	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	0.003	0.009	88%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	0.003	0.008	89%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	0.002	0.007	90%
4(V) Biomass Burning	CH ₄	1.230	69.234	0.002	0.007	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	0.002	0.006	91%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	0.002	0.006	92%
5.D Wastewater Treatment and Discharge	CH ₄	445.000	224.173	0.002	0.006	92%
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	0.002	0.006	93%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	231.980	68.225	0.002	0.006	93%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	0.002	0.005	94%
4(V) Biomass Burning	N ₂ O	0.858	48.899	0.002	0.005	94%
3.B Manure Management	N ₂ O	361.580	153.527	0.001	0.005	95%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	0.001	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.571	0.001	0.004	96%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	0.001	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	0.001	0.003	97%
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333	0.001	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530	0.001	0.003	97%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	0.001	0.003	97%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	0.001	0.002	98%
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	0.001	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	0.000	0.001	98%
1.A.3.b Road Transportation	CH ₄	40.611	11.095	0.000	0.001	98%
3.B Manure Management	CH ₄	416.113	423.665	0.000	0.001	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	5.139	0.000	0.001	98%
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	0.000	0.001	99%
1.A.3.c Railways	N ₂ O	13.248	6.407	0.000	0.001	99%
3.G Liming	CO ₂	0.000	10.917	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	0.000	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894	0.000	0.001	99%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.001	99%
3.H Urea Application	CO ₂	50.020	70.211	0.000	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	3.749	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	69.026	0.000	0.001	99%
1.A.3.c Railways	CO ₂	140.079	55.701	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	0.000	0.001	100%

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2017) Estimate (Gg eq-CO2)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	2.681	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	100%
2.B.1 Ammonia Production	CO ₂	558.672	566.791	0.000	0.000	100%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	43.808	1.865	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	0.000	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	3.250	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	156.820	88.041	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.575	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.362	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	43.216	31.897	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.062	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	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		39,480.164	33,428.237			

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2019, 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.4 Other Sectors - Biomass	CH ₄	Yes	L1e, L2e	L1i	
1.A.4 Other Sectors - Biomass	N ₂ O	Yes	L2e		
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	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	L1i	
3. Agriculture					
3.A Enteric Fermentation	CH ₄	Yes	L1e, L2e	L1i, L2i	
3.B Manure Management	CH ₄	Yes	L1e	L1i	
3.B Manure Management	N ₂ O	Yes	L1e, L2e	L1i, L2i	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e	L1i, L2i	
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e	L1i, L2i	
4. Land use, land use change and forestry					
4(III).Direct N2O 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		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 2019, year t=2017)

Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year = 2017)							
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, L2e	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	T1e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e, L2e	T1e, T2e	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.4 Other Sectors - Biomass	CH ₄	Yes	L1e, L2e	T1e, 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		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	T2e	L1i, L2i	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.D Non-energy Products from Fuels and Solvent Use	CO ₂	Yes		T1e, T2e		T1i	
2.F.1 Refrigeration and Air conditioning -	F-gases	Yes	L1e, L2e	T1e, T2e	L1i	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	T1i, T2i	
3.B Manure Management	CH ₄	Yes	L1e	T1e	L1i		
3.B Manure Management	N ₂ O	Yes	L1e	T1e, T2e		T1i,	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	Yes	L1e, L2e		L1i, L2i	T1i, T2i	
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(V) Biomass Burning	CO ₂	Yes			L1i, L2i	T1i, 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	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	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	T1e, T2e	L1i	T1i	
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.

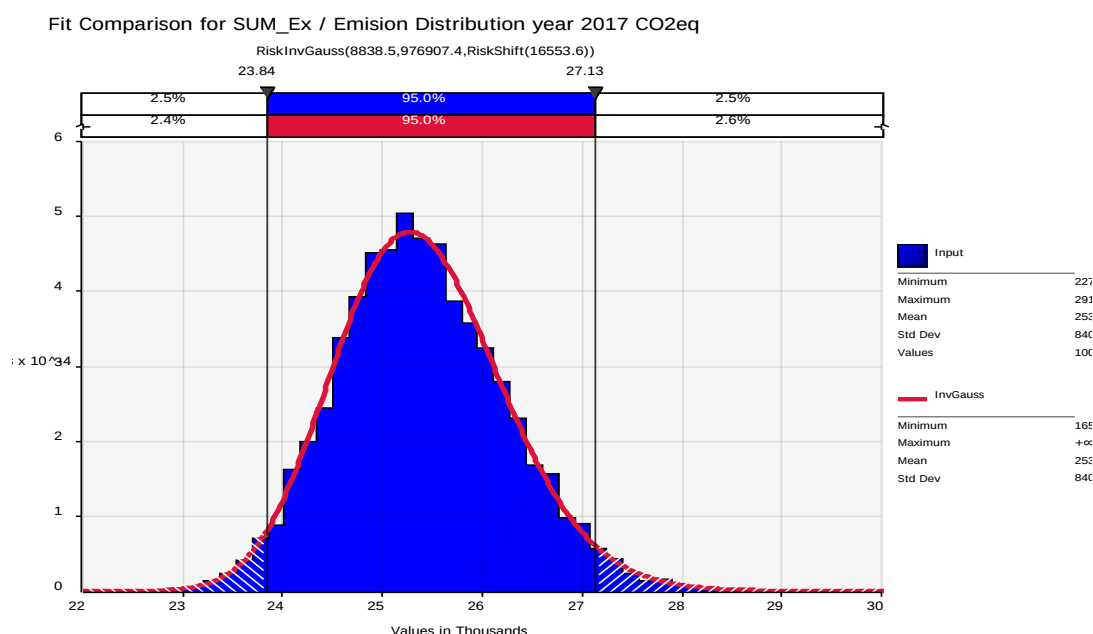
2.2.3. Uncertainty excluding LULUCF sector

2.2.3.1. Uncertainty in the emissions excluding LULUCF

The estimate of CO₂-eq emissions in 2017 was estimated at 25,019.75 kt CO₂-eq.

The estimate of CO₂-eq emissions in 1990 was estimated at 31,858.36 kt CO₂-eq.

Figure A2.2-1: Distribution of the total CO₂ emissions for year 2017 excluding LULUCF



Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2017 (25,392.09 Kt CO₂-eq) according to simulation varies between 23,844.47 kt CO₂-eq (2.5% percentile) and 27,131.51 Kt CO₂-eq (97.5% percentile). Figure A2.2-1 shows the distribution of total CO₂ emission for year 2017 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 (32,483.05 kt CO₂-eq) varies between 30,616.17 kt CO₂-eq (2.5% percentile) and 34,495.95 kt CO₂-eq (97.5% percentile).

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

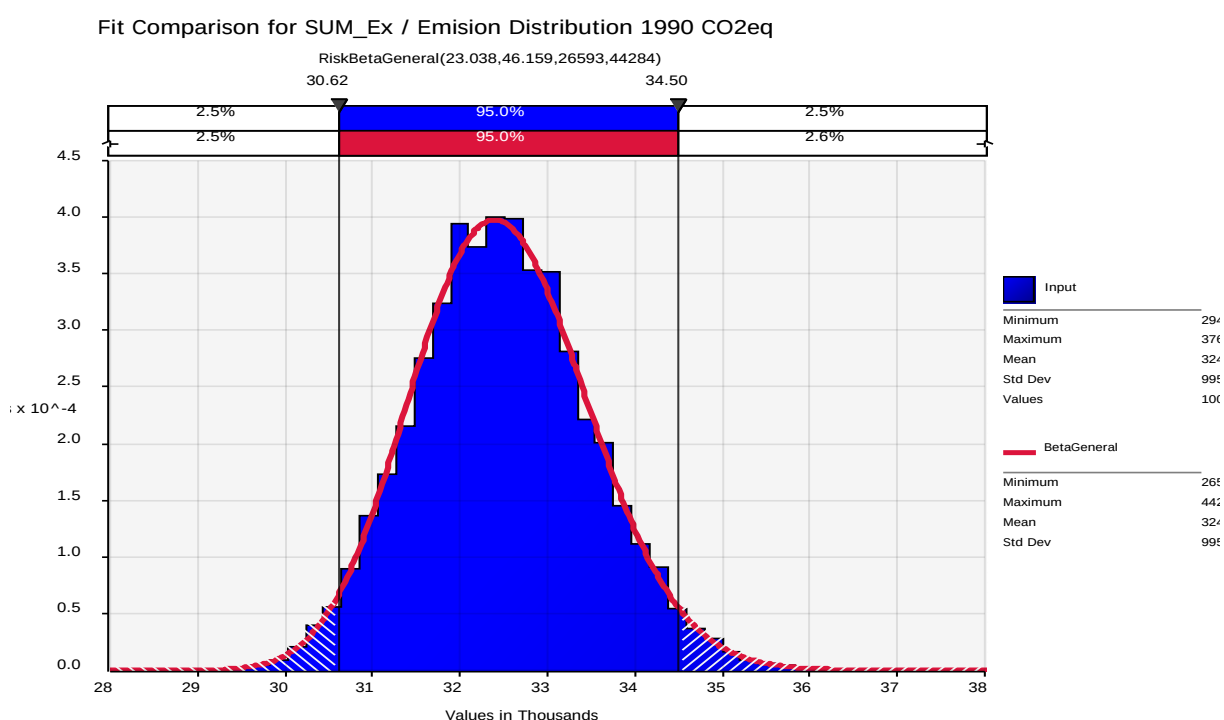


Figure A2.2-2 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

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:

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

The Inventory trend excluding LULUCF is -21.47%, simulated trend is -21.76% and the 95% probability range of the trend is -28.28% (2.5% percentile) to -14.69% (97.5% percentile).

Figure A2.2-3: Distribution of trend for year 2017 with the respect to year 1990

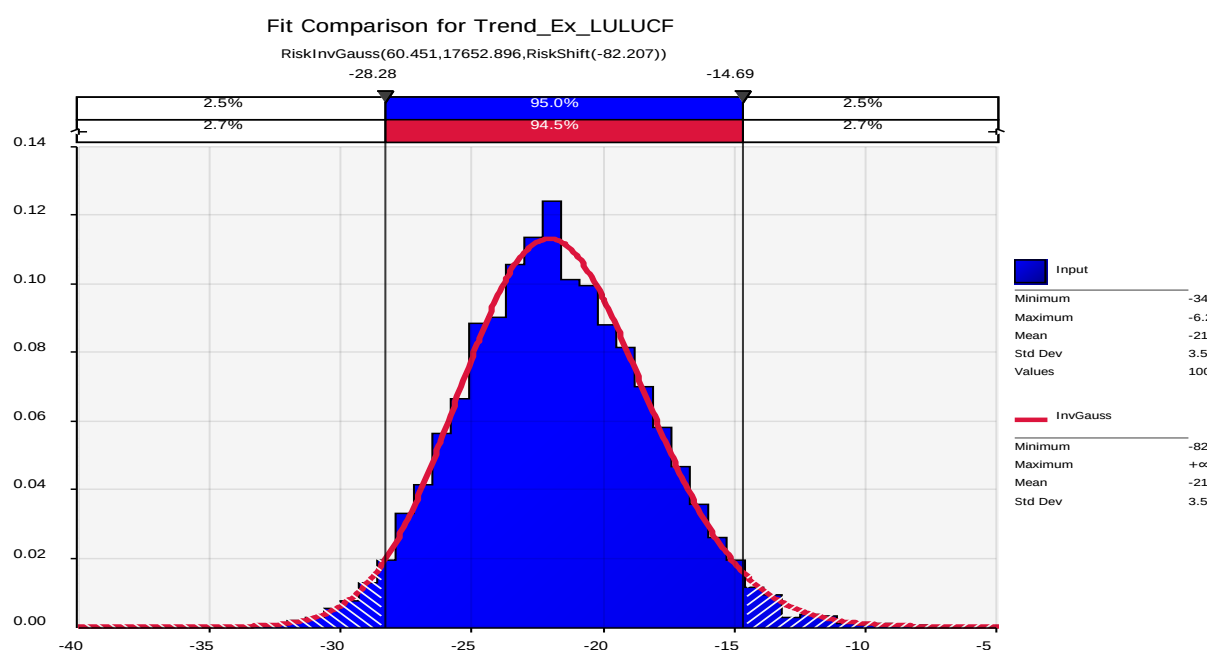


Figure A2.2-3: shows the distribution of trend for year 2017 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2.4. Uncertainty including LULUCF sector

2.2.4.1. Uncertainty in the emissions including LULUCF

The estimate of CO₂-eq emissions in 2017 was estimated at 20,253.17 kt CO₂-eq.

The estimate of CO₂-eq emissions in 1990 was estimated at 25,203.78 kt CO₂-eq.

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2017 (24710.58 kt CO₂-eq) according to simulation varies between 17,616.96 kt CO₂-eq (2.5% percentile) and 31,783.27 kt CO₂-eq (97.5% percentile).

Figure A2.2-4 shows the distribution of total CO₂ emission including LULUCF for year 2017 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 2017 including LULUCF

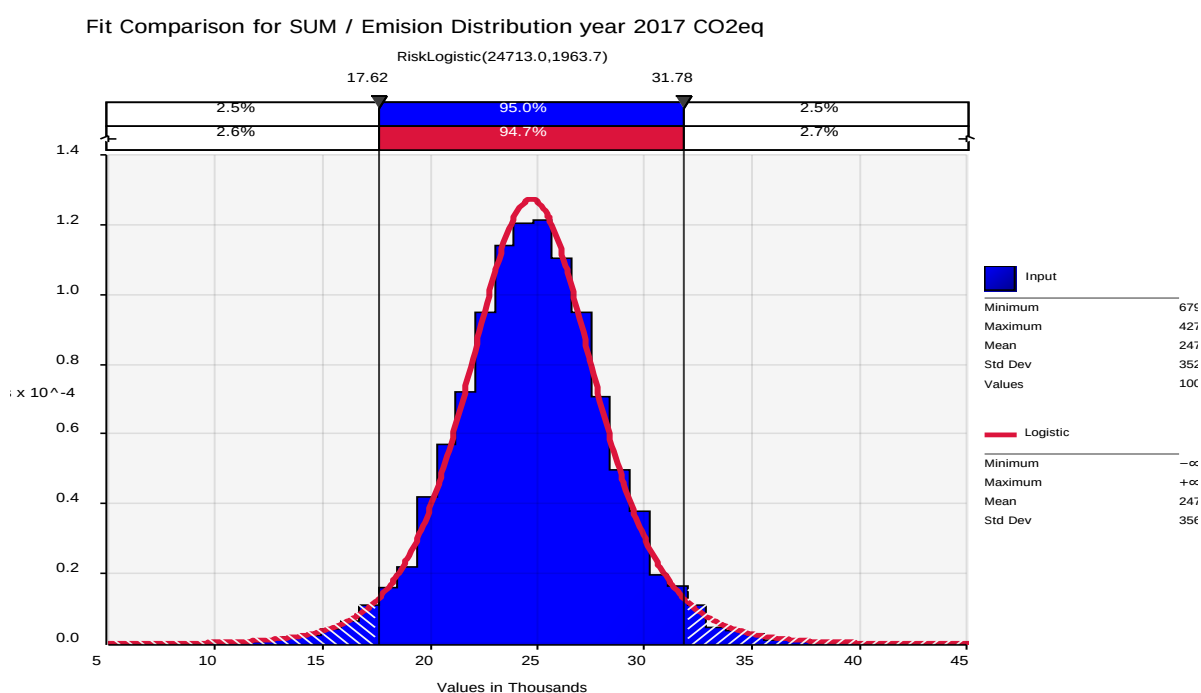
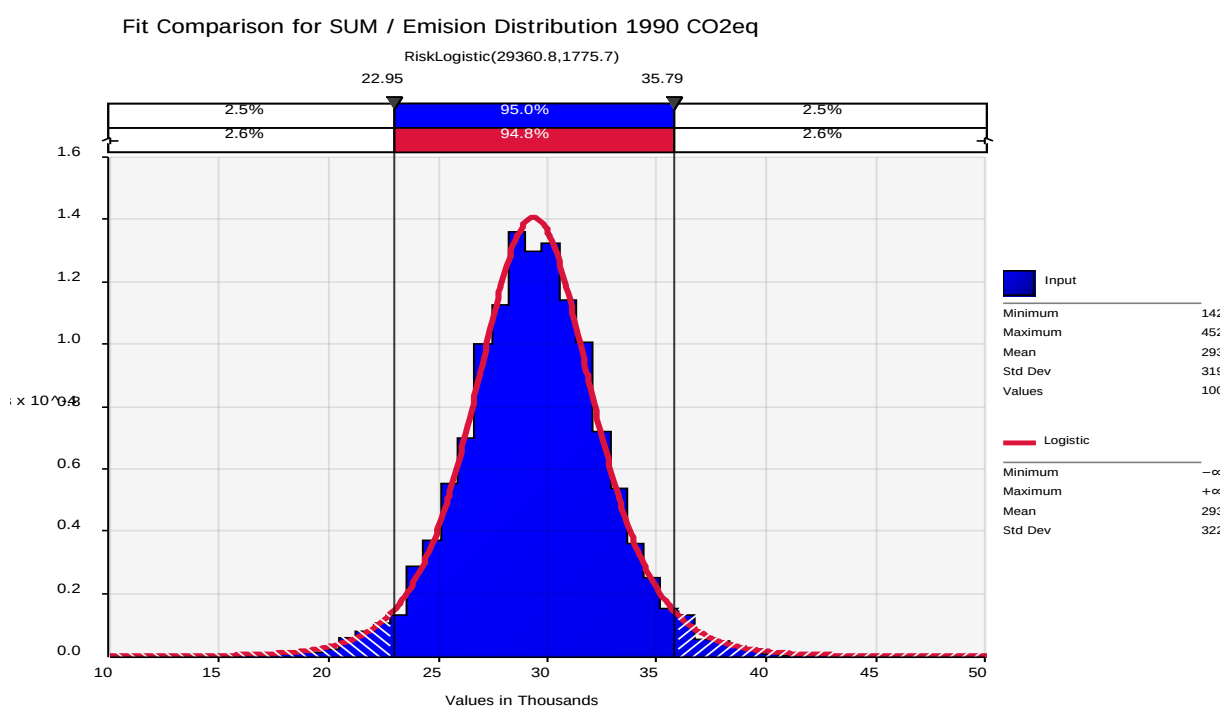


Figure A2.2-5: Distribution of total CO₂ emission for year 1990 including LULUCF



Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (29,360.53 kt CO₂-eq) varies between 22,948.06 kt CO₂-eq (2.5% percentile) and 35,786.02 CO₂-eq (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.

2.2.4.2. Uncertainty in the trend including LULUCF

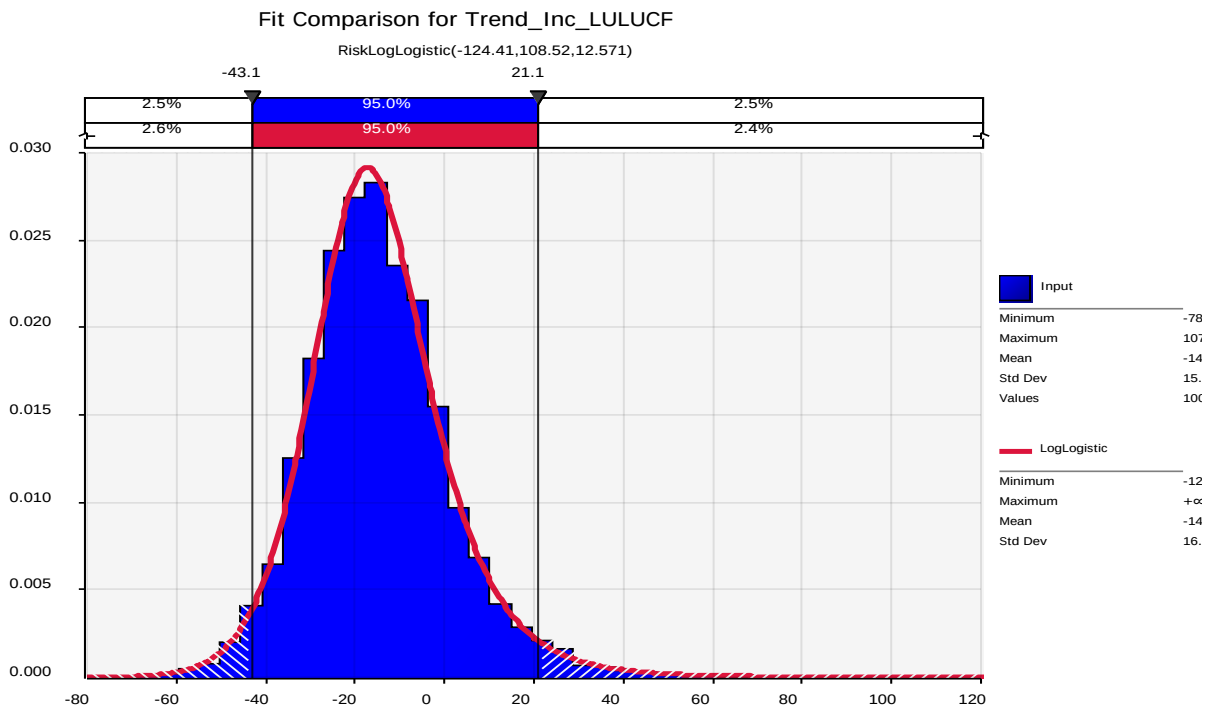
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following formula:

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

The Inventory trend including LULUCF is -19.64%, simulated trend is -14.78% and the 95% probability range of the trend is -43.07% (2,5% percentile) to 21.14% (97.5% percentile), so the uncertainty introduced in trend varies from -23.42% to 40.78% with respect to the base year emissions.

Figure A2.2-6: shows the distribution of trend for year 2017 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 2017 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=2017 (IPCC 2006 Table 3.3)

A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	1,066.691	-5	5	-5	5	-6.96	7.12	0.000120	-76.89	-2.25	2.49	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.700	-5	5	-50	50	-50.09	50.58	0.000000	-81.11	-10.50	23.03	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.888	-5	5	-200	200	-91.66	209.04	0.000000	-78.83	-19.91	303.39	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	595.119	1,214.571	-5	5	-5	5	-6.97	7.23	0.000155	104.09	-19.64	21.18	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.327	-5	5	-50	50	-50.33	50.41	0.000000	105.29	-114.19	252.23	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	5.853	-5	5	-200	200	-91.71	207.39	0.000002	105.29	-192.42	3137.93	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,838.442	2,183.505	-5	5	-5	5	-7.00	7.16	0.000505	18.77	-11.57	12.47	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	2.631	-5	5	-50	50	-49.95	50.12	0.000000	69.22	-92.94	207.09	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	8.669	-5	5	-200	200	-91.69	209.31	0.000004	51.68	-141.64	2226.30	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄		3.250	-5	5	-50	50	-50.26	50.28	0.000000				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O		5.139	-5	5	-200	200	-91.73	206.93	0.000001				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	1,037.297	-5	5	-5	5	-6.91	7.13	0.000112	-51.93	-4.60	5.04	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.884	-5	5	-50	50	-50.10	50.56	0.000000	-57.83	-23.01	50.70	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	2.095	-5	5	-200	200	-91.61	207.37	0.000000	-57.88	-39.40	614.06	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	322.479	-5	5	-5	5	-6.97	7.22	0.000011	-81.06	-1.80	1.99	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.819	-5	5	-50	50	-49.90	50.68	0.000000	-80.49	-10.68	24.47	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.464	-5	5	-200	200	-91.68	207.23	0.000000	-80.49	-18.33	278.59	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	979.370	-5	5	-5	5	-7.09	7.30	0.000102	-40.32	-5.73	6.35	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.436	-5	5	-50	50	-50.34	50.56	0.000000	-40.59	-32.75	73.43	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.520	-5	5	-200	200	-91.78	208.65	0.000000	-40.59	-55.58	924.53	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂		69.026	-5	5	-5	5	-6.94	7.09	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄		0.362	-5	5	-50	50	-50.22	50.32	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O		0.575	-5	5	-200	200	-91.64	208.16	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.006	-5	5	-50	50	-50.18	50.40	0.000000	-62.74	-20.60	44.17	

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.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	1.599	-5	5	-200	200	-91.72	209.52	0.000000	-62.74	-34.86	541.47	
1.A.3.a Domestic Aviation	CO ₂	6.601	31.423	-5	5	-5	5	-6.98	7.07	0.000000	376.03	-45.56	51.15	
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	-5	5	-50	50	-49.64	50.71	0.000000	375.73	-260.78	579.36	
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.262	-5	5	-200	200	-91.66	209.48	0.000000	375.73	-445.30	6958.28	
1.A.3.b Road Transportation	CO ₂	3,505.875	6,342.538	-5	5	-5	5	-6.95	7.14	0.004157	80.91	-17.15	18.93	
1.A.3.b Road Transportation	CH ₄	40.611	11.095	-5	5	-50	50	-50.46	50.55	0.000001	-72.68	-15.05	33.28	
1.A.3.b Road Transportation	N ₂ O	38.685	55.991	-5	5	-200	200	-91.70	208.50	0.000165	44.74	-135.84	2168.14	
1.A.3.c Railways	CO ₂	140.079	55.701	-5	5	-5	5	-7.01	7.13	0.000000	-60.24	-3.83	4.20	
1.A.3.c Railways	CH ₄	0.174	0.062	-5	5	-50	50	-50.01	50.66	0.000000	-64.20	-19.74	46.23	
1.A.3.c Railways	N ₂ O	13.248	6.407	-5	5	-200	200	-91.74	209.08	0.000002	-51.64	-45.20	706.47	
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	140.201	-5	5	-5	5	-7.07	7.13	0.000002	4.33	-10.01	11.10	
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.331	-5	5	-50	50	-50.11	50.00	0.000000	4.53	-58.25	126.72	
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.128	-5	5	-200	200	-91.73	208.20	0.000000	4.53	-97.83	1552.79	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,186.797	-5	5	-5	5	-6.95	7.14	0.000146	-51.57	-4.55	5.06	
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.626	-5	5	-50	50	-49.84	50.56	0.000000	-58.52	-22.51	49.74	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	66.983	-5	5	-200	200	-91.76	207.71	0.000235	-24.01	-70.63	1183.00	
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	12.348	-5	5	-5	5	-7.07	7.11	0.000000	-97.65	-0.22	0.25	
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.900	-5	5	-50	50	-50.19	50.16	0.000000	-97.31	-1.50	3.35	
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.055	-5	5	-200	200	-91.66	206.84	0.000000	-97.66	-2.19	32.32	
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,622.355	-5	5	-5	5	-7.04	7.33	0.000280	118.04	-21.03	23.17	
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.615	-5	5	-50	50	-50.16	50.41	0.000000	116.46	-118.48	267.40	
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.862	-5	5	-200	200	-91.70	206.96	0.000000	54.12	-144.89	2377.94	
1.A.4 Other Sectors - Biomass	CH ₄	316.275	345.171	-5	5	-50	50	-50.19	49.87	0.000631	9.14	-59.62	136.52	
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	54.860	-5	5	-200	200	-91.55	207.91	0.000158	9.14	-102.25	1588.35	
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	43.571											
1. Exploration	CO ₂	28.536	7.879	-5	5	-50	50	-49.83	50.26	0.000000	-72.39	-15.21	33.83	
2. Production(7)	CO ₂	129.245	35.688	-5	5	-50	50	-50.11	50.12	0.000007	-72.39	-15.03	33.17	
3. Transport	CO ₂	0.006	0.003	-5	5	-50	50	-50.44	50.28	0.000000	-43.09	-31.21	69.00	

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	62.365											
1. Exploration	CH ₄	15.205	4.199	-5	5	-100	100	-84.21	101.51	0.000000	-72.39	-23.77	166.41	
2. Production(7)	CH ₄	199.531	55.096	-5	5	-100	100	-84.16	100.56	0.000056	-72.39	-23.57	167.56	
3. Transport	CH ₄	1.516	0.863	-5	5	-100	100	-84.31	100.76	0.000000	-43.09	-49.18	347.13	
4. Refining/storage	CH ₄	4.348	2.207	-5	5	-100	100	-84.33	100.18	0.000000	-49.23	-43.17	312.70	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.018	-5	5	-10	1000	-100.00	-100.00	0.000000	-72.39			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	442.772	252.266											
1. Exploration	CO ₂	18.043	13.503	-5	5	-50	50	-100.00	-100.00	0.000000	-25.16	-74.84	-74.84	
2. Production(7)	CO ₂	418.423	234.012	-5	5	-100	100	-84.40	100.94	0.001014	-44.07	-47.59	329.12	
3. Processing	CO ₂	6.276	4.697	-5	5	-100	100	-84.25	101.41	0.000000	-25.16	-63.99	428.86	
4. Transmission and storage	CO ₂	0.011	0.012	-5	5	-100	100	-84.29	100.13	0.000000	11.97	-95.68	677.78	
5. Distribution	CO ₂	0.019	0.043	-5	5	-20	500	-100.00	-100.00	0.000000	119.72			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	137.894											
1. Exploration	CH ₄	9.614	7.195	-5	5	-100	100	-84.37	100.51	0.000001	-25.16	-64.32	442.47	
2. Production(7)	CH ₄	66.445	49.725	-5	5	-100	100	-84.17	101.43	0.000046	-25.16	-63.93	460.31	
3. Processing	CH ₄	29.338	21.956	-5	5	-100	100	-84.19	100.80	0.000009	-25.16	-63.95	444.99	
4. Transmission and storage	CH ₄	32.239	36.100	-5	5	-100	100	-84.24	101.40	0.000024	11.97	-95.59	659.76	
5. Distribution	CH ₄	10.431	22.919	-5	5	-20	500	-100.00	-100.00	0.000000	119.72			
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	-84.35	100.89	0.000000	-93.95	-5.18	35.03	
1.B.2.c. Venting and flaring	CH ₄	0.590	0.036											
1. Venting - Oil	CH ₄	0.590	0.036	-5	5	-100	100	-84.27	100.78	0.000000	-93.95	-5.17	37.05	
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.189											
2. Flaring - Oil	N ₂ O	0.598	0.165	-5	5	-100	100	-84.36	100.52	0.000000	-72.39	-23.47	160.74	
2. Flaring - Gas	N ₂ O	0.032	0.024	-5	5	-100	100	-84.12	100.63	0.000000	-25.16	-64.08	436.76	
2.A.1 Cement Production	CO ₂	1,093.483	1,287.251	-2	2	-2	2	-2.81	2.87	0.000028	17.72	-27.17	51.06	
2.A.2 Lime Production	CO ₂	156.820	88.041	-2	2	-2	2	-2.80	2.87	0.000000	-43.86	-2.19	2.29	
2.A.3 Glass Production	CO ₂	43.216	31.897	-2	2	-2	2	-2.83	2.80	0.000000	-26.19	-2.91	3.01	
2.A.4 Other Process Uses of Carbonates	CO ₂	16.866	31.435											
2.A.4.a Ceramics	CO ₂	12.939	7.906	-7.5	7.5	-5	5	-9.00	9.09	0.000000	-38.90	-6.28	6.47	

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.A.4.b Other uses of Soda Ash	CO ₂	3.927	7.127	-7.5	7.5	-5	5	-8.91	9.10	0.000000	81.51	-18.55	19.67	
2.A.4.d Other	CO ₂		16.401	-7.5	7.5	-5	5	-8.91	9.14	0.000000				
2.B.1 Ammonia Production	CO ₂	558.672	566.791	-2	2	-2	2	-2.80	2.84	0.000005	1.45	-3.99	4.21	5
2.B.2 Nitric Acid Production	N ₂ O	754.265	98.599	-2	2	-2	2	-2.78	2.90	0.000000	-86.93	-2.23	3.33	
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	1.865											
2.C.1.a Steel	CO ₂	19.505	0.270	-5	5	-5	5	-7.05	7.19	0.000000	-98.62	-0.20	0.25	
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	231.980	68.225											
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO ₂	72.603	16.656	-5	5	-50	50	-50.03	50.69	0.000001	-77.06	-12.40	28.05	
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO ₂	22.816	3.783	-5	5	-50	50	-50.24	50.13	0.000000	-83.42	-9.24	19.98	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use	CO ₂	136.546	40.867	NA	NA	-50	50	-40.79	58.49	0.000009	-70.07	-14.90	29.42	4
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt	CO ₂	0.005	0.021	-10	10	-50	50	-50.25	51.90	0.000000	306.20	-223.23	514.78	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC	CO ₂		6.886	-5	5	-5	5	#VALUE!	#VALUE!					
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing	CO ₂	0.009	0.011	-10	10	-50	50	-50.65	51.60	0.000000	12.49	-62.44	137.87	
2.F.1 Refrigeration and Air conditioning	F-gases		475.304											

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a		65.377	-50	50	-50	50	-61.78	79.56	0.000046				2
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125		43.714	-50	50	-50	50	-63.05	79.75	0.000021				2
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a		5.519	-50	50	-50	50	-62.23	79.89	0.000000				2
2.F.1.a Commercial Refrigeration\HFC-32	HFC-32	-	0.068	-50	50	-50	50	-62.48	79.73	0.000000				2
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a		0.218	-50	50	-50	50	-62.76	81.92	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a		2.581	-50	50	-50	50	-62.35	80.87	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125		18.625	-50	50	-50	50	-63.32	80.29	0.000004				2
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a		21.212	-50	50	-50	50	-62.37	82.72	0.000005				2
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32		0.808	-50	50	-50	50	-61.97	80.15	0.000000				2
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a		10.773	-50	50	-50	50	-62.64	80.70	0.000001				2
2.F.1.d Transport Refrigeration\HFC-125	HFC-125	-	37.563	-50	50	-50	50	-62.54	78.97	0.000015				2
2.F.1.d Transport Refrigeration\HFC-143a	HFC-143a	-	56.696	-50	50	-50	50	-62.60	79.28	0.000035				2
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a		119.403	-50	50	-50	50	-61.21	80.56	0.000154				2
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32		13.763	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125		72.390	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a		6.016	-50	50	-50	50	-100.00	-100.00	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-143a	HFC-143a	-	0.579	-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		4.714											
2.F.3 Fire Protection\HFC-125	HFC-125		0.504	-50	50	-50	50	-61.79	79.71	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-227ea		3.503	-50	50	-50	50	-62.12	81.58	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-236fa		0.706	-50	50	-50	50	-62.22	80.69	0.000000				2
2.F.4 Aerosols	F-gases		8.689											
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a	HFC-134a		8.689	-50	50	-50	50	-62.65	79.90	0.000001				2
2.G Other Product Manufacture and Use	N ₂ O	33.376	62.333											
2.G.3 N2O from Product Uses\2.G.3.a Medical Applications	N ₂ O	32.780	62.282	-50	50	-50	50	-63.08	80.32	0.000042	90.00			
2.G.3 N2O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products	N ₂ O	0.596	0.051	-50	50	-50	50	-63.35	79.97	0.000000	-91.50	-5.81	17.49	2
2.G Other Product Manufacture and Use	F-gases	10.450	6.391											
2.G.1 Electrical Equipment\SF6	SF ₆	10.450	6.391	-50	50	-50	50	-96.17	-82.06	0.000000	-38.84	-40.42	124.54	
3.A Enteric Fermentation	CH ₄	2,171.549	1,106.919											

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Mature dairy cattle	CH ₄	1,371.447	447.850	-30	30	-20	20	-34.22	38.21	0.000548	-67.34	-13.40	22.36	
Other mature cattle	CH ₄	79.186	83.936	-10	10	-20	20	-21.56	23.11	0.000007	6.00	-28.91	40.43	
Growing cattle	CH ₄	544.415	384.875	-10	10	-20	20	-21.63	22.89	0.000155	-29.30	-19.28	26.36	
Sheep	CH ₄	93.875	127.362	-10	10	-20	20	-21.79	23.44	0.000017	35.67	-36.76	50.41	
Market swine	CH ₄	5.800	4.814	-10	10	-20	20	-21.99	23.03	0.000000	-17.01	-22.85	31.31	
Breeding swine	CH ₄	33.525	37.225	-10	10	-20	20	-21.66	22.87	0.000001	11.04	-30.00	42.26	
Goats	CH ₄	21.500	9.596	-10	10	-20	20	-21.81	22.49	0.000000	-55.37	-12.39	16.98	
Horses	CH ₄	17.550	10.444	-30	30	-20	20	-34.33	38.02	0.000000	-40.49	-24.39	40.34	
Mules and Asses	CH ₄	4.250	0.818	-30	30	-20	20	-34.50	37.90	0.000000	-80.76	-7.92	13.35	
3.B Manure Management	CH ₄	416.113	423.665											
Mature dairy cattle	CH ₄	149.038	136.919	-30	30	-20	20	-34.58	38.60	0.000052	-8.13	-37.98	61.57	
Other mature cattle	CH ₄	7.889	13.876	-10	10	-20	20	-21.68	23.30	0.000000	75.90	-47.57	67.64	
Growing cattle	CH ₄	52.552	66.074	-10	10	-20	20	-21.68	22.78	0.000005	25.73	-34.55	47.99	
Sheep	CH ₄	4.013	3.491	-10	10	-20	20	-21.28	22.84	0.000000	-12.99	-23.80	33.51	
Market swine	CH ₄	32.520	29.926	-10	10	-20	20	-21.57	23.25	0.000001	-7.98	-25.48	35.11	
Breeding swine	CH ₄	137.244	154.606	-10	10	-20	20	-21.80	23.21	0.000025	12.65	-30.71	42.24	
Goats	CH ₄	0.443	0.202	-10	10	-20	20	-22.04	23.08	0.000000	-54.50	-12.66	16.99	
Horses	CH ₄	1.749	1.041	-30	30	-20	20	-34.58	38.43	0.000000	-40.49	-24.34	41.38	
Mules and Asses	CH ₄	0.645	0.124	-30	30	-20	20	-33.20	38.82	0.000000	-80.76	-7.79	13.36	
Poultry	CH ₄	30.020	17.406	-10	10	-20	20	-21.67	23.12	0.000000	-42.02	-15.87	21.65	
3.B Manure Management	N ₂ O	361.580	153.527											
Mature dairy cattle	N ₂ O	56.942	12.230	-30	30	-50	100	-84.70	112.13	0.000003	-78.52			
Other mature cattle	N ₂ O	4.558	3.249	-10	10	-50	100	-84.31	101.31	0.000000	-28.72			
Growing cattle	N ₂ O	30.363	15.469	-10	10	-50	100	-84.31	101.82	0.000004	-49.05			
Sheep	N ₂ O	2.165	2.152	-10	10	-50	100	-84.57	101.69	0.000000	-0.63			
Market swine	N ₂ O	10.580	1.586	-10	10	-50	100	-84.49	102.88	0.000000	-85.01			
Breeding swine	N ₂ O	15.132	1.941	-10	10	-50	100	-84.39	101.67	0.000000	-87.17			
Goats	N ₂ O	0.212	0.148	-10	10	-50	100	-84.31	101.48	0.000000	-29.86			
Horses	N ₂ O	1.200	0.674	-30	30	-50	100	-84.98	112.07	0.000000	-43.80			

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Mules and Asses	N ₂ O	0.057	0.032	-30	30	-50	100	-84.48	111.52	0.000000	-44.12			
Poultry	N ₂ O	23.984	12.192	-10	10	-50	100	-84.12	102.90	0.000003	-49.17			
Indirect N2O emission	N ₂ O	216.387	103.854											
Total N volatilised as NH3 and NOx	N ₂ O	216.387	103.854	-10	10	-30	30	-30.82	31.80	0.000022	-52.01	-17.60	29.15	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,056.449	815.995											
Inorganic N fertilizers	N ₂ O	503.002	460.849	-20	20	-70	200	-91.77	214.05	0.011421	-8.38	-86.06	1388.65	
Organic N fertilizers	N ₂ O	249.984	151.659	-10	10	-30	30	-31.40	32.51	0.000048	-39.33	-22.41	36.17	
Urine and dung deposited by grazing animals	N ₂ O	106.029	39.918	-10	10	-50	150	-90.48	154.04	0.000055	-62.35	-34.72	443.16	
Crop residues	N ₂ O	187.207	153.406	-20	20	-70	200	-91.84	215.92	0.001280	-18.06	-77.23	1250.43	
Mineralization/immobilization associated with loss/gain of soil organic matter	N ₂ O	0.167	0.102	-20	20	-30	30	-33.82	38.29	0.000000	-38.79	-24.81	41.16	
Cultivation of organic soils	N ₂ O	10.061	10.061	-10	10	-500	500	-89.04	545.71	0.000024	0.00	-95.63	2170.95	
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	343.940	263.408											
Atmospheric deposition	N ₂ O	115.385	83.305	-20	20	-250	250	-91.54	267.84	0.000535	-27.80	-68.48	1246.20	
Nitrogen leaching and run-off	N ₂ O	228.555	180.103	-20	20	-400	400	-90.18	442.72	0.005388	-21.20	-75.09	1642.65	
3.G Liming	CO ₂		10.917	-50	50	-50	50	-62.94	81.79	0.000001				
3.H Urea Application	CO ₂	50.020	70.211	-20	20	-50	0	-20.01	19.99	0.000004	40.37	-34.44	47.19	
4.A.1 Forest Land Remaining Forest Land	CO ₂	- 6,703.837	- 5,208.757					-58.62	197.93	0.880056	-22.30	-686.51	648.42	1, 3
4.A.2 Land Converted to Forest Land	CO ₂	- 28.890	- 208.000					-261.23	191.24	0.004372	619.98	-1923.21	3453.09	1, 3
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	238.199					-449.55	446.68	0.022472	20.97	-1399.15	1173.27	1, 3
4.B.2 Land Converted to Cropland	CO ₂	23.135	14.153					-2159.67	2219.02	0.001895	-38.82	-1370.23	1263.41	1, 3
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069					-95.88	95.71	0.000000	0.00	-142.09	397.44	1, 3
4.C.2 Land Converted to Grassland	CO ₂	- 103.921	- 162.532					-205.94	277.51	0.003049	56.40	-1624.13	1271.84	1, 3
4.D.2 Land Converted to Wetlands	CO ₂	46.781	8.945					-228.70	627.78	0.000029	-80.88	-160.78	237.07	1, 3
4.E.2 Land Converted to Settlements	CO ₂	165.753	534.597					-91.57	201.58	0.012119	222.53	-310.56	966.62	1, 3
4.G Harvested Wood Products	CO ₂	- 301.544	- 1,008.247					-90.74	122.98	0.000521	234.36	-543.80	-248.23	1, 3
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	31.905	80.745					-1273.98	1106.57	0.018306	153.08	-2887.95	2040.87	1, 3
4(V) Biomass Burning	CO ₂	14.979	824.110					-93.97	-89.28	0.000007	5401.93	-4998.23	-4300.83	1, 3
4(V) Biomass Burning	CH ₄	1.230	69.234					-90.60	-82.49	0.000000	5526.84	-5254.09	-2833.08	1, 3
4(V) Biomass Burning	N ₂ O	0.858	48.899					-90.94	-81.77	0.000000	5599.30	-5273.12	-3898.70	1, 3
5.A Solid Waste Disposal	CH ₄	539.010	1,775.230											

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.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH ₄	26.684	1,616.157	-50	50	-50	50	-62.31	83.31	0.028798	5956.73	-4143.26	13204.63	
5.A.2 Unmanaged Waste Disposal Sites	CH ₄	512.327	159.073	-50	50	-50	50	-62.61	78.36	0.000271	-68.95	-20.92	65.77	
5.B Biological Treatment of Soild Waste	CH ₄		3.749											
5.B Biological Treatment of Soild Waste\5.B.1 Composting	CH ₄		3.749	-50	50	-100	100	-86.33	131.41	0.000000				2
5.B Biological Treatment of Soild Waste	N ₂ O		2.681											
5.B Biological Treatment of Soild Waste\5.B.1 Composting	N ₂ O		2.681	-50	50	-110	110	-88.06	140.32	0.000000				2
5.C Incineration and Open Burning of Waste	CO ₂	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	N ₂ O	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	CH ₄	445.000	224.173											
5.D.1 Domestic wastewater	CH ₄	348.357	120.307	-30	30	-30	30	-39.04	46.58	0.000055	-65.46	-15.92	30.14	
5.D.2 Industrial wastewater	CH ₄	96.643	103.866	-30	30	-30	30	-39.36	45.43	0.000041	7.47	-49.70	92.69	
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.530											
5.D.1 Domestic wastewater	N ₂ O	66.884	88.530	-50	50	-50	50	-61.86	82.04	0.000086	32.36	-88.49	271.02	
TOTAL	CO ₂ eq	25,203.781	20,253.166					-13.02	56.93	1.000000	-19.64	-23.42	40.78	

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

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
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
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
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
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
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
Other biomass	PJ				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
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
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
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
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
NCV for other biomass												
EMISSION FACTORS												
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

Table A3-2: 1A1a_{iii} - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
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
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
Natural gas	1000000 m ³	315.50	363.40	479.00	649.90	652.10	673.90	580.40	352.10	343.70	407.90	745.60
Coke oven gas	1000000 m ³											
Biogas	PJ				0.14	0.17	0.34	0.41	0.48	1.07	1.50	2.22
Other biomass	TJ				1.90	803.20	1003.50	1146.10	1190.30	2189.00	3730.20	4244.80
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
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
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
NCV for natural gas	MJ/m ³	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70
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
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
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
EF CO₂ t/TJ	t/TJ											
EF CO ₂ -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
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	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	74.10
EF CO ₂ - 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
EF CO ₂ - 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
EF CO ₂ - 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
EF CO ₂ - 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
EF CH₄ kg/TJ	kg/TJ											
EF CH ₄ -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
EF CH ₄ - 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
EF CH ₄ - 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
EF CH ₄ - 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
EF CH ₄ - 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
EF CH ₄ - 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
EF CH ₄ - 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
EF N₂O kg/TJ	kg/TJ											
EF N ₂ O -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
EF N ₂ O - 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
EF N ₂ O - 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
EF N ₂ O - 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
EF N ₂ O - 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
EF N ₂ O - 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
EF N ₂ O - 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

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

ACTIVITY DATA		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
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
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
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
Coke oven gas	1000000 m3												
Biogas	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other biomass	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
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
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
NCV for coke oven gas	MJ/kg	17.91											
NCV for biogas	TJ/PJ					1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass	TJ/PJ					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		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
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
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 - 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
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 - 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
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
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
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
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 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
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
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
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
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
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
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
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
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
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
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 - 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
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
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
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
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
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
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

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

Refining - transformation		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption												
Fuel oil (1000 t)	1000 t	227.20	193.40	254.00	244.30	196.30	153.30	108.40	100.80	134.10	131.60	114.10
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	1000 t	0.00	0.00	9.50	0.00	0.00	2.70	1.50	0.00	0.00	0.00	0.00
NCV for LPG (MJ/kg)	MJ/kg	46.89	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	0.00	0.00	70.70	55.90	43.90	54.50	40.80	25.30	31.30	35.60	37.90
NCV for petroleum coke (MJ/kg)	MJ/kg	33.57	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
Refinery gas (1000 t)	1000 t	58.40	40.70	241.10	161.50	267.10	293.80	175.40	276.20	208.10	155.30	184.70
NCV for refinery gas (MJ/kg)	MJ/kg	48.57	48.57	48.57	48.57	48.57	46.00	46.00	42.60	42.60	42.60	42.60
Natural gas (1000000 m3)	1000 t	7.30	0.20	1.20	27.10	158.40	212.40	237.50	227.20	183.30	199.80	214.10
NCV for natural gas (MJ/m3)	MJ/kg	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70
Total fuel consumption (TJ)	TJ	12215.9	9756.3	24596.4	20316.8	27608.8	28713.6	21835.1	24462.7	21567.0	19961.4	21058.1
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	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	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	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	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	56.10
CO2 Emission (Gg)	Gg	884.06	715.86	1,729.54	1,448.87	1,805.63	1,849.22	1,394.72	1,516.22	1,387.39	1,298.59	1,350.64
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
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	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	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	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	1.00
CH4 Emission (Mg)	Mg	30.48	25.30	45.01	39.95	43.39	41.04	30.55	32.56	32.35	30.54	30.23
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
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	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	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	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	0.10
N2O Emission (Mg)	Mg	5.79	4.86	10.63	9.37	8.61	8.32	6.13	5.57	6.21	6.19	6.04

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

Manufacture of solid fuels and other energy industries	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption										
LPG (1000 t)										
NCV for LPG (MJ/kg)										
Gas Coke (1000000 m3)	107.40									
NCV for gas coke (MJ/m3)	17.91									
Light heating oil (1000 t)										
NCV for light heating oil (MJ/kg)										
Natural gas (1000000 m3)										
NCV for natural gas (MJ/m3)										
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Total fuel consumption (TJ)	1,923.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.00	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	0.00	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	2000	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption										
LPG (1000 t)	12.10	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)	0.70	7.10								
NCV for light heating oil (MJ/kg)	42.71	42.71								
Natural gas (1000000 m3)	391.10	140.00	241.70	156.30	114.40	120.20	91.70	121.30	102.90	112.20
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
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Total fuel consumption (TJ)	13,894.67	5,110.13	8,217.80	5,314.20	3,889.60	4,086.80	3,172.82	4,196.98	3,580.92	3,893.34
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)	784.00	292.46	461.02	298.13	218.21	229.27	178.00	235.45	200.89	218.42
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)	13.95	5.72	8.22	5.31	3.89	4.09	3.17	4.20	3.58	3.89
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)	1.40	0.66	0.82	0.53	0.39	0.41	0.32	0.42	0.36	0.39

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

Manufacture of solid fuels and other energy industries	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
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)	0.70	0.40								
NCV for light heating oil (MJ/kg)	42.71	42.71								
Natural gas (1000000 m3)	0.90	0.50								
NCV for natural gas (MJ/m3)	34.00	34.00								
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Biogas						22.54	17.30	26.54	26.93	27.50
NCV for biogas (TJ/TJ)						1.00	1.00	1.00	1.00	1.00
Total fuel consumption (TJ)	60.50	34.08	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)	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)	3.93	2.22	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
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)	0.12	0.07	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
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)	0.02	0.01	0.00	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	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		0	0.6	1.6	0.2	1.3	1.5	0.9	0.1	0
Coking coal (kameni ugljen)	10 ³ t	0	1	0	0	0.3	0.2	0	1.8	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	28.7	22.9	35	31.5	15.5	15.7	15.6	17.5	13	13.8
Wood	10 ³ m ³			0.8	0.7	0.5	0.3	0.3	0.5	0.4	0.3
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0.6	0	0	0	3.2
Coke oven coke	10 ³ t	5.2	4.3	3.7	2	1.6	2.5	2.5	0.6	0.3	0.3
Liquified petroleum gas	10 ³ t	1.7	4.2	1.4	2.1	2.8	3.8	2.2	0.8	0.8	1.1
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0	0
Diesel	10 ³ t		0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	4.1	2.7	0.9	1.2	0.7	0.6	0.5	0.6	0.5	0.7
Residual fuel oil	10 ³ t	1.3	2.7	1.2	1	1.3	1.1	1.4	1.1	1	0.9
Petroleum coke	10 ³ t	0	0	0.7	0	0.2	0	0.3	0.3	0.1	0.3
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
Gas works gas	10 ³ m ³	0	0.031	0	0	0	0	0	0	0	0

1A2b Non-Ferrous metals											
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		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	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	4.6	1	0.4	1.2	1.1	0.9	1.1	2.6	2.6	9.4
Wood	10 ³ m ³			0.6	0.6	0.5	0.4	0.4	0.2	0.4	0.4
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0	0
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0	0.2	0
Liquified petroleum gas	10 ³ t	0.5	2.1	3.1	3.8	5.1	5.3	4.2	0.8	0.5	0.6
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							0.6	0.2	0	0
Diesel	10 ³ t		0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	1.4	0.2	0.1	0.2	0.8	0.8	0.7	0.9	1.1	0.2
Residual fuel oil	10 ³ t	0.5	4	1.2	1.4	0	0.0	0	0	0	0
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
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	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		0.2	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	1.2	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	139.3	183.1	227.6	210.2	143.4	129.8	140.2	146.9	145.8	166.2
Wood	10 ³ m ³			0.1	0.1	0.1	0	0	0	0	0
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	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	5.7	0	0.1	0.1	0.1	0.1	0.2	0	0	0
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							1.4	2.4	3.5	2.6
Diesel	10 ³ t		0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	9	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.2	0.2
Residual fuel oil	10 ³ t	99.7	73	3.6	4.9	1.3	1.1	3	0	0	0
Petroleum coke	10 ³ t	0	0.7	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
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	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		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	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	74.3	69.2	68.8	65.8	58.8	53.3	34.7	27.6	45.6	46.6
Wood	10 ³ m ³			13.2	0	0	0	0	0.1	0	3.1
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	169.4	151.8	193.2	422.6	145.9301546	5.5	20	1.2	22.4
Coke oven coke	10 ³ t	0	0	0	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0	0
Diesel	10 ³ t		0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	0.9	1.6	0.1	0.1	0.1	0.1	0	0	0	0
Residual fuel oil	10 ³ t	9.2	11.9	9.5	7.1	4.3	3.5	1.2	5.2	5.2	1.8
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
Gas works gas	10 ⁶ m ³	0	0.031	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2e Food Processing, Beverages and Tobacco											
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		0	0.7	0.5	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	1.2	0.9	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	39.2	47.7	39.9	41	35.7	35.7	35	34	39.8	37.8
Lignite	10 ³ t	18.1	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	139.4	173	166.6	156.1	143.6	133.7	137.9	114.7	120.9	114.3
Wood	10 ³ m ³			0.5	0.7	1.4	4.2	10.6	13.5	10.9	2.7
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	9.37	0	0	0	149.4
Coke oven coke	10 ³ t	4.8	9.6	6.4	6.4	7	3	5.2	4	4.5	4.7
Liquified petroleum gas	10 ³ t	0.6	1.6	1.3	1.5	1.2	1.4	1.5	1.4	1.2	1.2
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0	0
Diesel	10 ³ t		0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	13.1	13.3	10	9.9	9.9	9.1	8.9	8.7	7.1	6.5
Residual fuel oil	10 ³ t	29.1	32.4	22.9	23.6	12.2	9.8	7.7	9.1	11.4	8.3
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
Gas works gas	10 ⁶ m ³	0.1	0.1099	0	0	0	0	0	0	0	0

1A2f Non-Metallic Minerals											
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		0.1	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	0	0	0	0	1	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	54.5	73.4	56.4	55.4	48.4	50.1	48.5	41.8	47.8	53.4
Wood	10 ³ m ³			0	0	0	0	0	0	0	0
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0	0.7
Coke oven coke	10 ³ t	7.6	7.7	0.1	0	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	2.8	2.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0	0
Diesel	10 ³ t		0.1	0	0	0	0	0	0	0	0
Gas/Diesel oil	10 ³ t	0.3	2.7	0	0.1	0	0	0	0	0	0
Residual fuel oil	10 ³ t	2.2	3.8	2.2	1.8	1.8	0.1	0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	5.4	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
Gas works gas	10 ⁶ m ³	2.5	0.923	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction												
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017	
Anthracite	10 ³ t		0	0	0	0	1.3	0	0	0	0	
Coking coal (kameni ugljen)	10 ³ t	68.8	168.3	193.4	162	145.9	120.7	106.6	74.7	46.3	57.2	
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	3	5	1.1	18.4	0	4.5	1.5	2.7	2.7	1.9	
Lignite	10 ³ t	2	0	0	0	0	1.3	0	0	0	0.1	
Natural gas	10 ⁶ m ³	195.9	124.4	76.4	67.6	54.1	39.3	36.3	40.7	38.4	52	
Wood	10 ³ m ³			0.3	0.2	0.5	0.2	0.7	0.9	2.3	1.9	
Biogas	TJ			0	0	0	0	0	0	0	0	
Wood waste	TJ	0	0	370.6	213.6	361.4	391.6	12.1	289	31.9	70.5	
Coke oven coke	10 ³ t	0	0	17.3	18.7	19.5	19.4	21.3	20.6	24.2	26.6	
Liquified petroleum gas	10 ³ t	4.1	4.6	3.2	2.8	3.1	2.7	2.4	1.6	1.4	1.4	
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0	0	
Petroleum	10 ³ t							0	0	0	0	
Diesel	10 ³ t		15	14.3	13.5	12	12.3	11.6	11.1	10.4	11.5	
Gas/Diesel oil	10 ³ t	24.9	7	4.3	3.5	3.1	2.6	2.5	2.7	2.8	3.4	
Residual fuel oil	10 ³ t	160.9	53.1	7.3	5.6	5.5	4.4	4.9	3.9	3	3.1	
Petroleum coke	10 ³ t	16.3	171.6	115.3	93.3	93.7	146.4	154.7	167.2	169.8	202	
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	
Gas works gas	10 ⁶ m ³	0.1	0	0	0	0	0	0	0	0	0	
Industrial waste-non ren.	TJ			319.1	179.4	340.6	366.2	424.9	390	413.4	482.7	

1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo)											
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	10 ³ t		0	0	0	0	0	0	0	0	0.3
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	0.1	4.2	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0.1	0.2	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	50.8	65.3	54.4	59.9	52.7	43.4	42.1	44.2	42.5	47.4
Wood	10 ³ m ³			39.4	44.5	45.6	44.4	35.3	27.4	31.7	33.8
Biogas	TJ			0	0	0	0	0	0	0	0
Wood waste	TJ	1979.4	2087.5	1456.677	1232.8	1306.1	1260.09985	1188	579	371.5	715.3
Coke oven coke	10 ³ t	0.7	1	0.1	0.1	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	4.4	8	6.8	5.5	5.8	5.5	5.7	5.7	3.5	4.3
Motor Gasoline	10 ³ t	7.8	6.9	5.1	4.7	4.2	4.1	4.1	4	4.1	0
Petroleum	10 ³ t							0	0	0	0
Diesel	10 ³ t	68	110.6	102.2	98.3	90	87.4	78.6	79.2	76.9	0
Gas/Diesel oil	10 ³ t	8.2	23	12.2	11.6	10.7	9.8	8.4	8.7	3.4	5
Residual fuel oil	10 ³ t	22.6	17.7	8.4	5.8	5.7	3.6	3.3	3.8	3.5	2.4
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
Gas works gas	10 ⁶ m ³	4.2	2.456	0	0	0	0	0	0	0	0

1A2g vii Off-road vehicles and other machinery													
Fuel consumption	Jedinica	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Motor gasoline	10 ³ t	0.2	8.5	7.6	6.9	5.1	4.7	4.2	4.1	4.1	4	4.1	0
Diesel	10 ³ t	137.1	43.6	66.1	125.7	116.5	111.8	102	99.7	90.2	90.3	87.3	11.5

Table A3-8: 1A2a-g – fuel consumption

1A2g viii - Total for the period from 1990 -2000				
Fuel consumption	Jedinica	1990	1995	2000
Antracit	10^3 t	107.2	5	
Kameni ugljen-Bituminous Coal	10^3 t	42	41.9	53.2
Mrki ugljen-Sub-bituminous Coal	10^3 t	261.2	95.8	28.2
Lignit-Lignite	10^3 t	73.2	56.3	14.4
Briquetts	10^3 t	3.3		
Natural gas	10^6 m ³	845.7	656.8	703.8
Fuel wood	10^3 m ³			
Biogass	TJ			
Wood waste	TJ	3600	2450	2227.6
Coke oven coke	10^3 t	251.2	31.4	37.7
Liquified petroleum gas	10^3 t	17.5	17.6	21
Motor gasoline	10^3 t	0.2	8.5	7.6
Diesel	10^3 t	137.1	43.6	66.1
Gas/diesel oil	10^3 t	109.4	57.9	64.7
Residual fuel oil	10^3 t	419.2	269.7	302.2
Petroleum coke	10^3 t	0		
Koksni plin-Coke oven gas	106 m ³	29.9		
Petroleum coke	10^3 t	0.1		
Lubricants	10^3 t	8.6		
Gas works gas	10^0 m ³	6.1	9.84	7.9

Table A3-9: 1A2a-g – NCV and emission factors

Net Calorific Value		2001	2005	2010	2011	2012	2013	2014	2015	2016	2017
Anthracite	MJ/kg		29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31
Coking coal (kameni ugljen)	MJ/kg	25.8	25.1	24.77332	25.24	26.46616	27.0700000	26.2	26.7	27.39	27.28
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	18.2	18.5	17.6	17.1	17.8	16.74	16.89	17	17	19.6
Lignite	MJ/kg	12.2	12.1				10.5	0	0	0	11.8
Natural gas	MJ/m3	34.0	34.0	34.0	34.0	34.0	34.0	34.6	34.6	34.8	34.7
Wood	MJ/m3	9.0	9.0	9.0	9.0	9.0	9.0	9	9	9	9
Biogas	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1	1
Wood waste	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1	1
Coke oven coke	MJ/kg	29.3	29.3	29.3	29.3	29.3	29.3	29.31	29.31	29.31	29.31
Liquified petroleum gas	MJ/kg	46.9	46.9	46.9	46.9	46.9	46.9	46.89	46.89	46.89	46.89
Motor Gasoline	MJ/kg	44.6	44.6	44.6	44.6	44.6	44.6	44.59	44.59	44.59	44.59
Petroleum	MJ/kg							43.96	43.96	43.96	43.96
Diesel	MJ/kg	42.7	42.7	42.7	42.7	42.7	42.7	42.71	42.71	42.71	42.71
Gas/Diesel oil	MJ/kg	42.7	42.7	42.7	42.7	42.7	42.7	42.71	42.71	42.71	42.71
Residual fuel oil	MJ/kg	40.2	40.2	40.2	40.2	40.2	40.2	40.19	40.19	40.19	40.19
Petroleum coke	MJ/kg	31.0	31.0	31.0	31.0	31.0	31.0	31	31	31	31
Refinery gas	MJ/kg							0	0	0	0
Other oil derivates	MJ/kg							0	0	0	0
Gas works gas	MJ/m3	19.5	21.47					0	0	0	0
Other fosil fuels	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1	1

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 derivates	0	3	0.6
Gas works gas	44.4	1	0.1
Other fosil fuels	143	30	4

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

		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Domestic aviation											
Fuel consumption											
Aviation gasoline	1000 t	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.30	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	44.59
Jet kerosene	1000 t	2.00	8.00	9.00	10.00	9.00	9.00	8.70	9.50	9.50	9.60
NCV for jet kerosene	MJ/kg	44.00	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96
Motor gasoline	1000 t	0.10	0.10								
NCV motor gasoline	MJ/kg	44.59	44.59								
Total fuel consumption	TJ	92.46	356.14	440.23	484.19	440.23	440.23	427.04	431.00	435.46	439.85
Emissions											
EF CO2 - aviation gasoline	t/TJ	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
EF CO2 - jet kerosene	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO2 - motor gasoline	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
CO2 Emission	Gg	6.60	25.45	31.41	34.55	31.41	31.41	30.47	30.80	31.11	31.42
EF CH4 - gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH4 - jet kerosene	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH4 - motor gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CH4 Emission	Mg	0.05	0.18	0.22	0.24	0.22	0.22	0.21	0.22	0.22	0.22
EF N2O - gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - jet kerosene	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - motor gasoline	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	0.18	0.71	0.88	0.97	0.88	0.88	0.85	0.86	0.87	0.88

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

1A3bi	CARS		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
	FUEL CONSUMPTION											
	Gasoline	t	722.22	715.13	593.09	581.06	544.15	532.54	487.61	486.99	490.03	469.84
	Diesel oil	t	36.02	184.56	520.28	529.06	556.27	490.57	598.66	679.22	706.37	810.28
	LPG	t	#DIV/0!	9.80	58.70	43.10	54.80	56.30	60.40	67.00	70.70	70.70
	CNG	106 m3			0.04	0.02	0.03	0.06	0.16	0.16	0.38	0.56
	Biodiesel	t										
	NCV											
	Gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
	CNG	MJ/106m3	34	34	34	34	34	34	34	34.6	34.6	34.7
	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	2000	2010	2011	2012	2013	2014	2015	2016	2017
	FUEL CONSUMPTION											
	Gasoline	t	28.854491	32.403256	15.371464	14.118263	10.0428583	9.25653025	9.51087142	9.44943066	8.68463089	9.36288647
	Diesel oil	t	87.873625	158.77765	258.50002	249.42493	228.838597	217.860028	187.056133	195.30161	205.195274	262.442256
	LPG	t	0	0	0	0	0	0	0	0	0	0
	CNG	106 m3										
	Biodiesel	t										
	NCV											
	Gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
	CNG	MJ/106m3	34	34	34	34	34	34	34	34.6	34.6	34.7
	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	2000	2010	2011	2012	2013	2014	2015	2016	2017
	FUEL CONSUMPTION											
	Gasoline	t	2.2670	1.2417	1.0036	0.7871	0.6261	0.5703	0.7190	0.6133	0.4523	0.3655
	Diesel oil	t	242.3113	214.4574	321.2182	308.2179	280.4962	393.8747	334.4795	343.2799	368.0312	371.9825
	LPG	t	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	CNG	106 m3			2.5619	0.7788	0.9683	1.8377	3.7394	3.8350	4.0197	4.5406
	Biodiesel	t										
	NCV											
	Gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
	CNG	MJ/106m3	34	34	34	34	34	34	34	34.6	34.6	34.7
	Biodiesel	MJ/kg	0	0	0	0	0	0	0	0	0	0
	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

HEAVY DUTY TRUCKS+BUSSES		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
FUEL CONSUMPTION	TJ										
Biodiesel	TJ			114.39	138.1475	1513.362	1334.2	1249	1020.155	44.67833	23.24312
EF CH4											
EF CH4 - Biodiesel (t/TJ)	kg/TJ	3	3	3	3	3	3	3	3	3	3
CH4 EMISSION	Gg										
Biodiesel	Gg	0	0	0.000343	0.000414	0.00454	0.004003	0.003747	0.00306	0.000134	6.97E-05

1A3biii	HEAVY DUTY TRUCKS+BUSSES		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
	FUEL CONSUMPTION	TJ										
	Biodiesel	TJ			114.39	138.1475	1513.362	1334.2	1249	1020.1553	44.678334	23.243123
	EF N2O											
	EF N2O - Biodiesel	kg/TJ	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	CH4 EMISSION	Gg										
	Biodiesel	Gg	0	0	6.9E-05	8.29E-05	0.000908	0.000801	0.000749	0.0006121	2.681E-05	1.395E-05

1A3biv	MOTORCYCLES		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
	FUEL CONSUMPTION											
	Gasoline	t	6.163	15.429	27.137	26.036	23.382	22.330	23.259	22.944	22.733	22.435
	Diesel oil	t										
	LPG	t										
	CNG	106 m3										
	Biodiesel	t										
	NCV											
	Gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
	CNG	MJ/106m3	34	34	34	34	34	34	34	34.6	34.6	34.7
	Biodiesel	MJ/kg	0	0	0	0	0	0	0	0	0	0
	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

		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption											
Gasoline (1000 t)	1000 t	0.10	0.10								
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59								
Diesel (1000 t)	1000 t	36.10	27.20	28.50	26.40	24.80	23.40	21.20	17.50	18.30	17.60
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
Fuel oil (1000 t)	1000 t	0.20									
NCV for fuel oil (MJ/kg)	MJ/kg	40.19									
Light heating oil (1000 t)	1000 t	1.10									
NCV for light heating oil (MJ/	MJ/kg	42.71									
Brown coal (1000 t)	1000 t	10.00									
NCV for brown coal (MJ/kg)	MJ/kg	16.74									
Lignite (1000 t)	1000 t	4.30									
NCV for lignite (MJ/kg)	MJ/kg	10.90									
Jet Kerosene (1000 t)	1000 t	0.10									
NCV for jet kerosene (MJ/m3)	MJ/kg	43.94									
Total fuel consumption (TJ)	TJ	1,819.97	1,166.17	1,217.24	1,127.54	1,059.21	999.41	905.45	747.43	781.59	751.70
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
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
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 - light heating oil (t/T	t/TJ	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
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
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
EF CO2 - petroleum (t/TJ)	t/TJ										
CO2 Emission (Gg)	Gg	140.08	86.39	90.20	83.55	78.49	74.06	67.09	55.38	57.92	55.70
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
EF CH4 - diesel (kg/TJ)	kg/TJ	4.15	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
EF CH4 - light heating oil (kg/	kg/TJ	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
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
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
EF CH4 - petroleum (t/TJ)	kg/TJ										
CH4 Emission (Mg)	Mg	6.97	3.87	4.04	3.74	3.52	3.32	3.01	2.48	2.59	2.50
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
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
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 - light heating oil (kg/	kg/TJ	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
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
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
EF N2O - petroleum (t/TJ)	kg/TJ										
N2O Emission (Mg)	Mg	44.46	33.23	34.81	32.25	30.29	28.58	25.90	21.38	22.35	21.50

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

National navigation		1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption											
Gasoline (1000 t)		0.10	0.30								
NCV for gasoline (MJ/kg)		44.59	44.59								
Diesel (1000 t)		38.70	25.70	34.80	35.40	33.50	38.50	42.00	41.20	41.80	44.30
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	1.40	2.00	1.80	1.90		0.40			
NCV for fuel oil (MJ/kg)		40.19	40.19	40.19	40.19	40.19		40.19			
Light heating oil (1000 t)		1.60						1.10			
NCV for light heating oil (MJ/kg)		42.71						42.71			
Total fuel consumption (TJ)		1,810.07	1,167.29	1,566.69	1,584.28	1,507.15	1,644.34	1,856.88	1,759.65	1,785.28	1,892.05
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	86.62	116.36	117.63	111.93	121.85	137.65	130.39	132.29	140.20
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	8.17	10.97	11.09	10.55	11.51	13.00	12.32	12.50	13.24
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	2.33	3.13	3.17	3.01	3.29	3.62	3.52	3.57	3.78

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

Commercial/Institutional	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Fuel consumption										
Petroleum (1000 t)	3.80									
NCV for jet kerosene (MJ/kg)	43.94									
Light heating oil (1000 t)	90.30	120.50	73.80	64.80	50.00	44.20	36.10	44.60	44.30	43.50
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	3.90	8.00	9.70	9.50	4.60	3.20	2.70	1.50	0.80
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	13.90	12.90	13.70	12.10	12.10	12.10	12.30	12.60	12.10
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	9.50	2.20	5.20	4.90	0.50	0.10		0.10	0.10
NCV for brown coal (MJ/kg)	16.74	17.80	17.60	17.10	17.80	18.00	16.89	16.89	17.00	19.60
Lignite (1000 t)	40.00	1.20	0.30	0.10			0.10	0.10	0.00	0.20
NCV for lignite (MJ/kg)	10.90	12.00	11.60	11.60	11.60		10.50	10.50	10.50	11.80
Briquettes (1000 t)	2.90									
NCV for briquettes (MJ/kg)	16.74									
Gas work gas (1000000 m3)	4.90	1.50	2.84	2.49	1.87	1.49	1.14	0.39		
NCV for gas work gas (MJ/m3)	15.82	19.49	18.72	17.20	17.20	17.10	17.10	17.10		
Natural gas (1000000 m3)	124.30	98.20	192.70	173.50	162.00	166.00	159.80	204.80	217.90	231.30
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
Gasoline (1000 t)										
NCV for gasoline (MJ/kg)										
Petroleum coke (1000 t)	1.50									
NCV for petroleum coke (MJ/kg)	33.57									
Anthracite (1000 t)						0.10				
NCV for anthracite (MJ/kg)						29.31				
Solid Biomass-Wood (TJ) + characoal	0.00	0.00	129.80	157.85	140.00	143.00	177.98	213.50	176.90	346.60
Bio gass (TJ)			102.26	110.60	86.07	75.83	103.20	116.59	119.11	118.13
Total fuel consumption (TJ)	12,190.9	9,506.6	10,957.7	10,100.1	8,938.2	8,540.3	8,070.2	10,014.1	10,423.8	10,952.6
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	640.93	690.73	641.00	562.78	529.07	496.89	614.15	634.03	671.92

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 - 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 - 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	74.97	110.66	113.30	99.01	95.31	101.22	123.12	114.07	166.48
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 - 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 - 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	3.86	3.40	3.33	2.82	2.46	2.34	2.84	2.71	3.40

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

Residential	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
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
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
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
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)	48.70	8.10	10.40	11.90	12.30	7.10	5.10	4.30	2.40	1.30
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)	97.90	51.90	72.20	74.40	56.90	54.20	47.40	47.60	48.80	46.50
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
Brown coal (1000 t)	123.10	12.00	6.10	2.30	4.10	2.60	2.00	1.20	3.20	1.90
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
Lignite (1000 t)	207.30	15.00	9.40	9.00	4.80	11.50	7.40	7.00	4.10	7.00
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
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
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
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
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
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
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 - 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
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 -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
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 - 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 work 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 - 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 - Charcoal (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
CO2 Emission (Gg)	6,751.88	6,393.72	7,703.87	7,398.41	7,172.20	7,027.67	6,173.41	6,948.26	6,833.12	6,681.24

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

EF CH4 - gasoline (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	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
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 - brown coal (kg/TJ)	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
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
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
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
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
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 -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 -Charcoal (kg/TJ)	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
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
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 - 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 - hard 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 - anthracite (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)	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
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 - Charcoal (kg/TJ)	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

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

Agriculture/forestry/fishing	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
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	200.10	200.20	186.30	182.20	182.20	182.60	180.90	180.90
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 consumption - mobile (TJ)	9,938.7	10,147.9	8,546.3	8,550.5	7,956.9	7,781.8	7,781.8	7,798.8	7,726.2	7,726.2
Fuel oil (1000 t)	12.30	13.40	4.40	4.40	4.10	3.50	2.50	2.10	1.20	0.80
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)	4.40	2.60	2.70	2.70	2.50	2.50	2.50	2.50	2.50	2.50
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
Gas work gas (1000000 m3)										
NCV for gas work gas (MJ/m3)										
Natural gas (1000000 m3)	25.00	14.50	22.20	21.50	20.70	21.00	21.70	21.40	27.80	24.00
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
Fuel consumption - stationary (TJ)	1,550.7	1,153.5	1,058.2	1,034.4	985.8	971.9	968.5	942.1	1,132.9	982.2
Total fuel consumption (TJ)	11,489.4	11,301.4	9,604.5	9,585.0	8,942.7	8,753.7	8,750.3	8,740.9	8,859.1	8,708.4
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	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	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	74.10
CO2 emission (Gg) - mobile	736.45	751.96	633.28	633.60	589.60	576.63	576.63	577.89	572.51	572.51
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 - 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
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) - stationary	98.97	77.03	64.02	62.68	59.63	58.34	57.29	55.47	65.40	56.61
Total CO2 emission (Gg)	835.42	828.99	697.30	696.28	649.24	634.97	633.92	633.36	637.92	629.12
EF CH4 - gasoline (kg/TJ)	140.00	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	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	4.15
CH4 emission (Mg) - mobile	41.84	42.11	35.47	35.48	33.02	32.29	32.29	32.37	32.06	32.06
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 - 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
CH4 emission (Mg) - stationary	10.22	8.46	6.18	6.06	5.75	5.56	5.34	5.13	5.91	5.07
Total CH4 emission (Mg)	52.07	50.57	41.64	41.54	38.77	37.86	37.64	37.50	37.97	37.14
EF N2O - gasoline (kg/TJ)	0.40	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	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	28.60
N2O emission (Mg) - mobile	284.12	290.23	244.42	244.55	227.57	222.56	222.56	223.05	220.97	220.97
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 - 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
N2O emission (Mg) - stationary	0.40	0.38	0.19	0.19	0.18	0.17	0.15	0.14	0.14	0.11
Total N2O emission (Mg)	284.53	290.61	244.62	244.74	227.75	222.73	222.71	223.18	221.11	221.08

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

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

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

1. B. 2. a. Oil				1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
1. Exploration	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Well Drilling	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
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
2. Production	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Conventional oil	10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
Conventional oil	10 ³ m ³ total oil production	Venting	1.B.2.a.i	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
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	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Pipelines	10 ³ m ³ total oil transported by pipelines	All	1.B.2.a.iii.3	11229.85	5551.99	7454.46	6184.73	5182.86	6275.87	5780.74	7217.42	8020.01	6391.45
Tanker Trucks and Rail	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	275.30	124.13	85.04	42.67	41.30	49.84969	50.01066	95.35354	57.04444
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	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Oil Refining	10 ³ m ³ oil refined	All	1.B.2.a.iii.4	7977.56	6120.7	3769.19	3904.65	3614.3	3526.51	2838.837	3328.372	3748.953	4050.349
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	2000	2010	2011	2012	2013	2014	2015	2016	2017	
1.	Exploration	Emission source	IPCC Code										
	ACTIVITY DATA												
	Well Drilling		1.B.2.a.i	1982.30	1638.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	Well Testing		1.B.2.a.i	1982.30	1638.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	Well Servicing		1.B.2.a.i	1982.30	1638.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	EMISSION FACTOR												
	CO2												
	Well Drilling	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Well Testing	Flaring and Venting	1.B.2.a.i	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	Flaring and Venting	1.B.2.a.i	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.	Production	Emission source	IPCC Code										
	ACTIVITY DATA												
	Gas production	Fugitives	1.B.2.b.iii.2	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	Gas production	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
	EMISSION FACTOR												
	CO2												
	Gas production	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	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
	CH4												
	Gas production	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	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
	N2O												
	Gas production	Fugitives	1.B.2.b.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Gas production	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	Emission source	IPCC Code										
	ACTIVITY DATA												
	Default weighted	Fugitives	1.B.2.b.iii.3	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	Default weighted	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
	Default weighted	Raw CO2 venting	1.B.2.b.i	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50
	EMISSION FACTOR												
	CO2												
	Default weighted	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	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
	Default weighted	Raw CO2 venting	1.B.2.b.i	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CH4												
	Default weighted	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	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	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	N2O												
	Default weighted	Fugitives	1.B.2.b.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Default weighted	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	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.	Transmission	Emission source	IPCC Code										
	ACTIVITY DATA												
	Transmission	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
	Transmission	Venting	1.B.2.b.i	2686.6	2704.8	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4	3008.3
	Storage	All	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
	EMISSION FACTOR												
	CO2												
	Transmission	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	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	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
	CH4												
	Transmission	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	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	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
	N2O												
	Transmission	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Transmission	Venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Storage	All	1.B.2.b.iii.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5.	Distribution of	Emission source	IPCC Code										
	ACTIVITY DATA												
	Gas distribution	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
	EMISSION FACTOR												
	CO2												
	Gas distribution	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
	CH4												
	Gas distribution	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
	N2O												
	Gas distribution	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

1. B. 2. a. Oil			1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
2. Production			Emission source IPCC Code									
ACTIVITY DATA												
Conventional oil	Flaring	1.B.2.a.ii	3135.12	1411.51	837.67	772.56	697.56	698.49	689.77	779.30	857.09	865.70
EMISSION FACTOR												
N2O												
Conventional oil	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Flaring	1.B.2.a.ii	0.00000064	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			Emission source IPCC Code									
ACTIVITY DATA												
Pipelines	All	1.B.2.a.iii.3	11229.85	5551.99	7454.46	6184.73	5182.86	6275.87	5780.74	7217.42	8020.01	6391.45
Tanker Trucks and Rail Cars	Venting	1.B.2.a.i	943.49	275.30	124.13	85.04	42.67	41.30	49.85	50.01	95.35	57.04
Natural gas liquids transport-LPG	All	1.B.2.a.iii.3										
EMISSION FACTOR												
CO2												
Tanker Trucks and Rail Cars	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												
Tanker Trucks and Rail Cars	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												
Tanker Trucks and Rail Cars	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			1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
2. Production			Emission source IPCC Code									
ACTIVITY DATA												
Gas production	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
EMISSION FACTOR												
Gas production	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			Emission source IPCC Code									
ACTIVITY DATA												
Default weighted total	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
EMISSION FACTOR												
N2O												
Default weighted total	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
4. Transmission and storage			Emission source IPCC Code									
ACTIVITY DATA												
Transmission	Fugitives	1.B.2.b.iii.4	2686.6	2704.8	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4	2611.4
EMISSION FACTOR												
N2O												
Transmission	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Distribution of Natural Gas			Emission source IPCC Code									
ACTIVITY DATA												
Gas distribution	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	806.2
EMISSION FACTOR												
N2O												
Gas distribution	All	1.B.2.a.iii.5	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

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	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.

Project	Status	Main objectives
(abbreviated: LULUCF 2)		
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	Planned	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

Project	Status	Main objectives
		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 about the calculation for HWPs.
LULUCF 3	Planned	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 national models 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.

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

Table A4-1: National Energy balance for 2017, natural units

ENERGY BALANCE 2016 natural units	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
	103 t	103 t	103 t	103 t	103 t	106 m3
Production					744.5	1483.5
Import	0.3	623.8	41.7	7.3	2818.0	1818.3
Export		34.6				199.7
Import-processing						
Export-processing						
Stock change		-5.1			-23.9	-93.8
Bunkers						
Energy supplied	0.3	584.1	41.7	7.3	3538.6	3008.3
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		526.9				5.3
public cogeneration plants						745.6
public heating plants						54.8
industrial cogeneration plants			37.8			315.7
– in refineries						49.4
– in gas production						49.2
Industrial heating plants						59.6
Petroleum refineries					3483.3	98.3
NGL-plant					55.3	8.9
Coke plant						
Gas works						
Total transformation sector		526.9	37.8		3538.6	1288.2
Energy sector own use						
Oil and gas extraction						39.3
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						65.7
NGL-plant						23.7
Gas works						
Total energy sector own use						128.7
Losses						32.2
Final energy demand	0.3	57.2	3.9	7.3	0.0	1559.2
Non energy use						493.6
Energy sector						
Petrochemical industry						493.6
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	0.3	57.2	3.9	7.3	0.0	1065.6
Industry	0.3	57.2	1.9	0.1		227.1
Iron and steel						12.8
Non-ferrous metals						9.4
Non-metallic minerals						50.6
Chemical						9.2
Construction materials		57.2	1.9	0.1		52.0
Pulp and paper						7.4
Food production						46.1
Not elsewhere specified	0.3					39.6
Transport						5.1
Rail						
Road						0.2
Air						
– international						
– domestic						
Sea and River						
Public transport						4.9
Not elsewhere specified						
Other sectors			2.0	7.2		833.4
Households			1.9	7.0		578.1
Services			0.1	0.2		231.3
Agriculture						24.0
Construction						

Table A4-1: National Energy balance for 2017, natural units, cont.

ENERGY BALANCE 2016 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	53807.2	5619.2	11762.4	1307.1	345.1	158506.0	0.4	14094.9
Import		64.0					0.3	950.2
Export		748.1						7220.1
Import-processing								
Export-processing								
Stock change								-148.3
Bunkers								
Energy supplied	53807.2	4935.1	11762.4	1307.1	345.1	158506.0	0.7	7676.7
Production								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in refineries								
– in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Transformation sector								
hydro power plants	53807.2							
– small HPP	969.1							
Wind power plants			11762.4					
Solar power plants				768.9				
Geothermal power plants								
thermal power plants						17784.0		
public cogeneration plants						133562.0		4244.8
public heating plants								3.0
industrial cogeneration plants						7160.0		
– in refineries								
– in gas production								
Industrial heating plants								576.5
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	53807.2		11762.4	768.9		158506.0		4824.3
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		4935.1		538.2	345.1		0.7	2852.4
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		4935.1		538.2	345.1		0.7	2852.4
Industry		42.2						867.7
Iron and steel		0.3						3.2
Non-ferrous metals		0.4						
Non-metallic minerals								0.7
Chemical								
Construction materials		1.9						553.2
Pulp and paper		3.1						16.5
Food production		2.7						80.5
Not elsewhere specified		33.8						213.6
Transport							0.7	
Rail								
Road							0.7	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		4892.9		538.2	345.1			1984.7
Households		4879.6		376.7				1757.8
Services		13.3		161.5	186.7			226.9
Agriculture					158.4			
Construction								

Table A4-1: National Energy balance for 2017, natural units, cont.

ENERGY BALANCE 2016 natural units	Coke oven coke	petroleum gases	motor gasoline	motor gasoline	Petroleum	Jet fuel	Diesel oil	Light heating oil	Low sulphur fuel oil	Standard fuel oil
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production		283.4	1005.3			130.5	1331.8	159.7	10.6	566.0
Import	32.5	46.8	160.0	0.5	2.6	30.0	1371.5	42.3	47.5	
Export	1.2	188.1	643.2			15.0	900.2	38.8	16.6	503.5
Import-processing										
Export-processing										
Stock change	0.3	0.7	-8.9			4.9	-35.5	1.8	6.0	62.8
Bunkers							3.8			2.6
Energy supplied	31.6	142.8	513.2	0.5	2.6	150.4	1763.8	165.0	47.5	122.7
Production										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants										
public cogeneration plants										
public heating plants										
industrial cogeneration plants										
– in refineries										
– in gas production										
Industrial heating plants										
Petroleum refineries		241.5	1005.3			130.5	1331.8	159.7	10.6	566.0
NGL-plant		41.9								
Coke plant										
Gas works										
Total production		283.4	1005.3			130.5	1331.8	159.7	10.6	566.0
Transformation sector										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								1.2		
public cogeneration plants								0.5		34.1
public heating plants								4.2	2.6	
industrial cogeneration plants									40.0	3.1
– in refineries									40.0	3.1
– in gas production										
Industrial heating plants										50.7
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								5.9	42.6	87.9
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									1.9	26.0
NGL-plant										
Gas works										
Total energy sector own use									1.9	26.0
Losses										
Final energy demand	31.6	142.8	513.2	0.5	2.6	150.4	1763.8	159.1	3.0	8.8
Non energy use										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	31.6	142.8	513.2	0.5	2.6	150.4	1763.8	159.1	3.0	8.8
Industry	31.6	8.9			2.6		11.5	16.0	0.9	8.0
Iron and steel	0.3	1.1						0.7		0.5
Non-ferrous metals		0.6						0.2		
Non-metallic minerals		0.2								
Chemical					2.6			0.2		
Construction materials	26.6	1.4					11.5	3.4	0.9	2.2
Pulp and paper		0.1								
Food production	4.7	1.2						6.5		4.6
Not elsewhere specified		4.3						5.0		0.7
Transport		70.7	502.0	0.5		150.4	1506.6			
Rail							17.6			
Road		70.7	502.0				1419.8			
Air				0.5		150.4				
– international				0.1		140.8				
– domestic				0.4		9.6				
Sea and River							44.3			
Public transport							24.9			
Not elsewhere specified										
Other sectors		63.2	11.2				245.7	143.1	2.1	0.8
Households		46.5						83.4	1.3	
Services		12.1						43.5	0.8	
Agriculture		2.5	7.4				169.5	11.4		0.8
Construction		2.1	3.8				76.2	4.8		

Table A4-1: National Energy balance for 2017, natural units, cont.

ENERGY BALANCE 2016 natural units	Naphta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production	73.5			11.3		73.8		115.1
Import		3.2	121.0	31.5	7.9	163.1		
Export	49.8	0.1	17.3	8.9	0.2	3.0		99.3
Import-processing								
Export-processing								
Stock change	-1.8					6.3		-9.7
Bunkers								
Energy supplied	21.9	3.1	103.7	33.9	7.7	240.2		6.1
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	51.5			11.3		73.8		115.1
NGL-plant	22.0							
Coke plant								
Gas works								
Total production	73.5			11.3		73.8		115.1
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	21.9							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	21.9							
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						37.9		
NGL-plant								
Gas works								
Total energy sector own use						37.9		
Losses								
Final energy demand	0.0	3.1	103.7	33.9	7.7	202.3		6.1
Non energy use		3.1	103.7	33.9	7.7			6.1
Energy sector				2.3				
Petrochemical industry								
Other industry		3.1	9.9	6.6	7.7			6.1
Construction			93.8	0.9				
Transport				22.6				
Agriculture				1.5				
Energy consumption	0.0					202.3		
Industry						202.3		
Iron and steel						0.3		
Non-ferrous metals								
Non-metallic minerals								
Chemical								
Construction materials						202.0		
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 2017, natural units, cont.

ENERGY BALANCE 2016 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	waste, non renewable
Production	184.7				11983.5	27582.6	482.7
Import		287.5	61.9		9487.6		
Export					2533.9		
Import-processing							
Export-processing							
Stock change		23.8	1.5				
Bunkers							
Energy supplied	184.7	311.3	63.4		18937.2	27582.6	482.7
Production							
hydro power plants					5507.7		
– small HPP					99.2		
Wind power plants					1204.0		
Solar power plants					78.7		
Geothermal power plants							
thermal power plants					1395.9		
public cogeneration plants					3383.0	10658.3	
public heating plants						1771.9	
industrial cogeneration plants					414.2	10159.4	
– in refineries					102.6	3354.0	
– in gas production					112.1	495.0	
Industrial heating plants						4325.9	
Petroleum refineries	184.7						
NGL-plant							
Coke plant							
Gas works							
Total production	184.7				11983.5	26915.5	
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	25.6						
– in refineries	25.6						
– in gas production							
Industrial heating plants	10.8						
Petroleum refineries		311.3	63.4				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	36.4	311.3	63.4				
Energy sector own use							
Oil and gas extraction					119.1	355.0	
Coal production						136.3	
Electric energy supply industry					28.2		
hydro power plants					356.1		
thermal power plants					132.2		
public cogeneration plants					232.2	1123.0	
industrial cogeneration plants							
Wind power					5.6		
Petroleum refineries	148.3				283.9	5216.0	
NGL-plant					54.1	140.0	
Gas works							
Total energy sector own use	148.3				1211.4	6970.3	
Losses					1765.3	1533.7	
Final energy demand					15960.5	19078.6	482.7
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption					15960.5	19078.6	482.7
Industry					3539.5	11742.9	482.7
Iron and steel					258.1	87.5	
Non-ferrous metals					86.2		
Non-metallic minerals					152.4	82.8	
Chemical					312.1	5071.9	
Construction materials					557.5		482.7
Pulp and paper					228.5	980.3	
Food production					681.5	3087.5	
Not elsewhere specified					1263.2	2432.9	
Transport					323.0		
Rail					164.7		
Road							
Air					32.2		
– international							
– domestic					32.2		
Sea and River					23.4		
Public transport					63.9		
Not elsewhere specified					38.8		
Other sectors					12098.0	7335.7	
Households					6265.7	5566.9	
Services					5694.1	1533.9	
Agriculture					61.6	234.9	
Construction					76.6		

Table A4-2: National Energy balance for 2017, energy units

<i>PI</i>	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production	-	-	-	-	31.79	51.756
Import	0.01	15.65	0.82	0.09	120.33	63.095
Export	-	0.87	-	-	-	6.930
Import-processing	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-
Stock change	-	0.13	-	-	1.02	3.255
Bunkers	-	-	-	-	-	-
Energy supplied	0.01	14.65	0.82	0.09	151.10	104.67
<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	0.01	14.65	0.82	0.09	151.10	104.67
<i>Transformation sector</i>	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-
thermal power plants	-	13.09	-	-	-	0.18
public cogeneration plants	-	-	-	-	-	25.87
public heating plants	-	-	-	-	-	1.90
industrial cogeneration plants	-	-	0.74	-	-	10.95
- in refineries	-	-	-	-	-	1.71
- in gas production	-	-	-	-	-	1.71
Industrial heating plants	-	-	-	-	-	2.07
Petroleum refineries	-	-	-	-	148.74	3.41
NGL-plant	-	-	-	-	2.36	0.59
Coke plant	-	-	-	-	-	-
Gas works	-	-	-	-	-	-
Total transformation sector	-	13.09	0.74	-	151.10	44.98
<i>Energy sector own use</i>	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	1.36
Coal production	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	2.28
NGL-plant	-	-	-	-	-	0.82
Gas works	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	4.47
Losses	-	-	-	-	-	1.12
Final energy demand	0.01	1.56	0.08	0.09	-	54.10
Non energy use	-	-	-	-	-	17.13
Energy sector	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	17.13
Other industry	-	-	-	-	-	-
Construction	-	-	-	-	-	-
Transport	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-
Energy consumption	0.01	1.56	0.08	0.09	-	36.98
Industry	0.01	1.56	0.04	0.00	-	7.88
Iron and steel	-	-	-	-	-	0.44
Non-ferrous metals	-	-	-	-	-	0.33
Non-metallic minerals	-	-	-	-	-	1.76
Chemical	-	-	-	-	-	0.32
Construction materials	-	1.56	0.04	0.00	-	1.80
Pulp and paper	-	-	-	-	-	0.26
Food production	-	-	-	-	-	1.60
Not elsewhere specified	0.01	-	-	-	-	1.37
Transport	-	-	-	-	-	0.18
Rail	-	-	-	-	-	-
Road	-	-	-	-	-	0.01
Air	-	-	-	-	-	-
- international	-	-	-	-	-	-
- domestic	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-
Public transport	-	-	-	-	-	0.17
Not elsewhere specified	-	-	-	-	-	-
Other sectors	-	-	0.04	0.08	-	28.92
Households	-	-	0.04	0.08	-	20.06
Services	-	-	0.00	0.00	-	8.03
Agriculture	-	-	-	-	-	0.83
Construction	-	-	-	-	-	-

Table A4-2: National Energy balance for 2017, energy units, cont.

<i>PI</i>	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
Production	53.81	50.573	11.762	1.307	0.345	2.6716	0.013	14.095
Import	-	0.58	-	-	-	-	0.01	0.95
Export	-	6.73	-	-	-	-	-	7.22
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	-	-	-	-	-	-	-	0.15
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	53.81	44.42	11.76	1.31	0.35	2.6716	0.02	7.68
<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	53.81	44.42	11.76	1.31	0.35	2.6716	0.02	7.68
<i>Transformation sector</i>	-	-	-	-	-	-	-	-
hydro power plants	53.81	-	-	-	-	-	-	-
– small HPP	0.97	-	-	-	-	-	-	-
Wind power plants	-	-	11.76	-	-	-	-	-
Solar power plants	-	-	-	0.77	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	0.3086	-	-
public cogeneration plants	-	-	-	-	-	2.2174	-	4.24
public heating plants	-	-	-	-	-	-	-	0.00
industrial cogeneration plants	-	-	-	-	-	0.1456	-	-
– in refineries	-	-	-	-	-	-	-	-
– in gas production	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	0.58
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	53.81	-	11.76	0.77	-	2.6716	-	4.82
<i>Energy sector own use</i>	-	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	-	-	-
Coal production	-	-	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	-	-	-
Losses	-	-	-	-	-	-	-	-
Final energy demand	-	44.42	-	0.54	0.35	-	0.02	2.85
Non energy use	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-
Energy consumption	-	44.42	-	0.54	0.35	-	0.02	2.85
Industry	-	0.38	-	-	-	-	-	0.87
Iron and steel	-	0.00	-	-	-	-	-	0.00
Non-ferrous metals	-	0.00	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	0.00
Chemical	-	-	-	-	-	-	-	-
Construction materials	-	0.02	-	-	-	-	-	0.55
Pulp and paper	-	0.03	-	-	-	-	-	0.02
Food production	-	0.02	-	-	-	-	-	0.08
Not elsewhere specified	-	0.30	-	-	-	-	-	0.21
Transport	-	-	-	-	-	-	0.02	-
Rail	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	0.02	-
Air	-	-	-	-	-	-	-	-
– international	-	-	-	-	-	-	-	-
– domestic	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
Other sectors	-	44.04	-	0.54	0.35	-	-	1.98
Households	-	43.92	-	0.38	-	-	-	1.76
Services	-	0.12	-	0.16	0.19	-	-	0.23
Agriculture	-	-	-	-	0.16	-	-	-
Construction	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2017, 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	-	-	-	-	-	-	-	-	-	-
Import	0.95	2.19	7.13	0.02	0.11	1.32	58.58	1.81	1.91	-
Export	0.04	8.82	28.68	-	-	0.66	38.45	1.66	0.67	20.24
Import-processing	-	-	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-	-	-
Stock change	0.01	0.03	0.40	-	-	0.22	1.52	0.08	0.24	2.52
Bunkers	-	-	-	-	-	-	0.16	-	-	0.10
Energy supplied	0.93	6.59	21.94	0.02	0.11	0.87	18.45	0.23	1.48	17.82
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	-	11.32	44.83	-	-	5.74	56.88	6.82	0.43	22.75
NGL-plant	-	1.96	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total production	-	13.29	44.83	-	-	5.74	56.88	6.82	0.43	22.75
Gross production	0.93	6.70	22.88	0.02	0.11	6.61	75.33	7.05	1.91	4.93
Transformation sector	-	-	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	0.05	-	-
public cogeneration plants	-	-	-	-	-	-	-	0.02	-	1.37
public heating plants	-	-	-	-	-	-	-	0.18	0.10	-
industrial cogeneration plants	-	-	-	-	-	-	-	-	1.61	0.12
- in refineries	-	-	-	-	-	-	-	-	1.61	0.12
- in gas production	-	-	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-	-	2.04
Petroleum refineries	-	-	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total transformation sector	-	-	-	-	-	-	-	0.25	1.71	3.53
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	-	-	-	-	-	-	-	-	0.08	1.04
NGL-plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	-	-	-	0.08	1.04
Losses	-	-	-	-	-	-	-	-	-	-
Final energy demand	0.93	6.70	22.88	0.02	0.11	6.61	75.33	6.80	0.12	0.35
Non energy use	-	-	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-
Energy consumption	0.93	6.70	22.88	0.02	0.11	6.61	75.33	6.80	0.12	0.35
Industry	0.93	0.42	-	-	0.11	-	0.49	0.68	0.04	0.32
Iron and steel	0.01	0.05	-	-	-	-	-	0.03	-	0.02
Non-ferrous metals	-	0.03	-	-	-	-	-	0.01	-	-
Non-metallic minerals	-	0.01	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	0.11	-	-	0.01	-	-
Construction materials	0.78	0.07	-	-	-	-	0.49	0.15	0.04	0.09
Pulp and paper	-	0.00	-	-	-	-	-	-	-	-
Food production	0.14	0.06	-	-	-	-	-	0.28	-	0.18
Not elsewhere specified	-	0.20	-	-	-	-	-	0.21	-	0.03
Transport	-	3.32	22.38	0.02	-	6.61	64.35	-	-	-
Rail	-	-	-	-	-	-	0.75	-	-	-
Road	-	3.32	22.38	-	-	-	60.64	-	-	-
Air	-	-	-	0.02	-	6.61	-	-	-	-
- international	-	-	-	0.00	-	6.19	-	-	-	-
- domestic	-	-	-	0.02	-	0.42	-	-	-	-
Sea and River	-	-	-	-	-	-	1.89	-	-	-
Public transport	-	-	-	-	-	-	1.06	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Other sectors	-	2.96	0.50	-	-	-	10.49	6.11	0.08	0.03
Households	-	2.18	-	-	-	-	-	3.56	0.05	-
Services	-	0.57	-	-	-	-	-	1.86	0.03	-
Agriculture	-	0.12	0.33	-	-	-	7.24	0.49	-	0.03
Construction	-	0.10	0.17	-	-	-	3.25	0.21	-	-

Table A4-2: National Energy balance for 2017, energy units, cont.

<i>PI</i>	Naphta	White spirit	Bitumen	Lubricants	Paraffin and wax	Petroleum coke	Etan	Other derivatives
Production	-	-	-	-	-	-	-	-
Import	-	0.11	4.05	1.06	0.26	5.06	-	-
Export	2.22	0.00	0.58	0.30	0.01	0.09	-	3.99
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	- 0.08	-	-	-	-	0.20	-	0.39
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	- 2.30	0.10	3.47	0.76	0.26	5.16	-	4.38
<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	2.30	-	-	0.38	-	2.29	-	4.63
NGL-plant	0.98	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total production	3.28	-	-	0.38	-	2.29	-	4.63
Gross production	0.98	0.10	3.47	1.14	0.26	7.45	-	0.25
<i>Transformation sector</i>	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-	-
public heating plants	-	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-	-
- in refineries	-	-	-	-	-	-	-	-
- in gas production	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	0.98	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	0.98	-	-	-	-	-	-	-
<i>Energy sector own use</i>	-	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	-	-	-
Coal production	-	-	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	1.17	-	-
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	1.17	-	-
Losses	-	-	-	-	-	-	-	-
Final energy demand	0.00	0.10	3.47	1.14	0.26	6.27	-	0.25
Non energy use	-	0.1039	3.4740	1.1357	0.2580	-	-	0.2452
Energy sector	-	-	-	0.08	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	0.10	0.33	0.22	0.26	-	-	0.25
Construction	-	-	3.14	0.03	-	-	-	-
Transport	-	-	-	0.76	-	-	-	-
Agriculture	-	-	-	0.05	-	-	-	-
Energy consumption	0.00	-	-	-	-	6.27	-	-
Industry	-	-	-	-	-	6.27	-	-
Iron and steel	-	-	-	-	-	0.01	-	-
Non-ferrous metals	-	-	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	-	-	-	-
Construction materials	-	-	-	-	-	6.26	-	-
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 A4-2: National Energy balance for 2017, energy units, cont.

<i>PI</i>	Refinery gas	Refinery semiproducts	Additives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production	-	-	-	-	-	0.67	0.48
Import	-	12.28	2.64	-	34.16	-	-
Export	-	-	-	-	9.12	-	-
Import-processing	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-
Stock change	-	1.02	0.06	-	-	-	-
Bunkers	-	-	-	-	-	-	-
Energy supplied	-	13.29	2.71	-	25.03	0.67	0.48
Production	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	19.83	-	-
– small HPP	-	-	-	-	0.36	-	-
Wind power plants	-	-	-	-	4.33	-	-
Solar power plants	-	-	-	-	0.28	-	-
Geothermal power plants	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	5.03	-	-
public cogeneration plants	-	-	-	-	12.18	10.66	-
public heating plants	-	-	-	-	-	1.77	-
industrial cogeneration plants	-	-	-	-	1.49	10.16	-
– in refineries	-	-	-	-	0.37	3.35	-
– in gas production	-	-	-	-	0.40	0.50	-
Industrial heating plants	-	-	-	-	-	4.33	-
Petroleum refineries	7.87	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total production	7.87	-	-	-	43.14	26.92	-
Gross production	7.87	13.29	2.71	-	68.17	27.58	0.48
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	1.09	-	-	-	-	-	-
– in refineries	1.09	-	-	-	-	-	-
– in gas production	-	-	-	-	-	-	-
Industrial heating plants	0.46	-	-	-	-	-	-
Petroleum refineries	-	13.29	2.71	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total transformation sector	1.55	13.29	2.71	-	-	-	-
Energy sector own use	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	0.43	0.36	-
Coal production	-	-	-	-	-	0.14	-
Electric energy supply industry	-	-	-	-	0.10	-	-
hydro power plants	-	-	-	-	1.28	-	-
thermal power plants	-	-	-	-	0.48	-	-
public cogeneration plants	-	-	-	-	0.84	1.12	-
industrial cogeneration plants	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	0.02	-	-
Petroleum refineries	6.32	-	-	-	1.02	5.22	-
NGL-plant	-	-	-	-	0.19	0.14	-
Gas works	-	-	-	-	-	-	-
Total energy sector own use	6.32	-	-	-	4.36	6.97	-
Losses	-	-	-	-	6.36	1.53	-
Final energy demand	-	0.00	-	0.00	-	57.46	19.08
Non energy use	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-
Energy consumption	-	0.00	-	0.00	-	57.46	19.08
Industry	-	-	-	-	-	12.74	11.74
Iron and steel	-	-	-	-	-	0.93	0.09
Non-ferrous metals	-	-	-	-	-	0.31	-
Non-metallic minerals	-	-	-	-	-	0.55	0.08
Chemical	-	-	-	-	-	1.12	5.07
Construction materials	-	-	-	-	-	2.01	-
Pulp and paper	-	-	-	-	-	0.82	0.98
Food production	-	-	-	-	-	2.45	3.09
Not elsewhere specified	-	-	-	-	-	4.55	2.43
Transport	-	-	-	-	-	1.16	-
Rail	-	-	-	-	-	0.59	-
Road	-	-	-	-	-	-	-
Air	-	-	-	-	-	0.12	-
– international	-	-	-	-	-	-	-
– domestic	-	-	-	-	-	0.12	-
Sea and River	-	-	-	-	-	0.08	-
Public transport	-	-	-	-	-	0.23	-
Not elsewhere specified	-	-	-	-	-	0.14	-
Other sectors	-	-	-	-	-	43.55	7.34
Households	-	-	-	-	-	22.56	5.57
Services	-	-	-	-	-	20.50	1.53
Agriculture	-	-	-	-	-	0.22	0.23
Construction	-	-	-	-	-	0.28	-

Annex 5: Any additional information

Annex 5-1: Archiving, inventory data record sheet

5.1.1. Inventory data record sheet

Year: 2017

MODULE: ENERGY	
SUBMODULE: CO ₂ from Fuel Combustion by Source Categories	
WORKSHEET: 1_1A1A_PUBLIC_ELE_HEAT_1990-2017	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 2015; Annual Energy Report: "Energy in Croatia 2016" 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 CO₂ emission calculation – country specific EF from verified reports are used Tier 2 method for 1A1aii (natural gas) for CO₂ emission calculation – country specific EF from verified reports are used	
ADDITIONAL INTERCALCULATION: Not necessary	
DATA ARCHIVATION: Hard copy and electronic copy	
DATA GAPS:	
SUGGESTION FOR THE FUTURE:	
NOTES:	

Default value for carbon emission factor, fraction of carbon stored and fraction of carbon oxidized were used.

RESPONSIBILITY:

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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 2019 v2

CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	16648.52	4425.06	2879.51	NO	1240.24	10.45	NO	NO	25203.78
1. Energy	20656.68	842.81	230.24						21729.73
A. Fuel combustion (sectoral approach)	20056.11	413.91	229.55						20699.58
1. Energy industries	7048.59	5.42	17.49						7071.49
2. Manufacturing industries and construction	5501.67	9.73	17.64						5529.04
3. Transport	3786.94	41.10	53.07						3881.11
4. Other sectors	3718.91	357.67	141.35						4217.93
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	600.56	428.90	0.69						1030.15
1. Solid fuels	NO	59.64	NO,NA						59.64
2. Oil and natural gas	600.56	369.26	0.69						970.51
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2629.87	9.35	787.64	NO	1240.24	10.45	NO	NO	4677.54
A. Mineral industry	1310.39								1310.39
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	231.98	NA	NA						231.98
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	2587.66	1761.97						4399.65
A. Enteric fermentation		2171.55							2171.55
B. Manure management		416.11	361.58						777.69
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1400.39						1400.39
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⁾	-6688.57	1.23	32.76						-6654.58
A. Forest land	-6717.75	1.12	0.74						-6715.89
B. Cropland	220.04	NO	3.95						223.99
C. Grassland	-101.85	0.11	0.12						-101.62
D. Wetlands	46.78	NO	6.23						53.01
E. Settlements	165.75	NO	21.72						187.48
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	984.01	66.89						1051.44
A. Solid waste disposal	NA,NO	539.01							539.01
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		445.00	66.88						511.88
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	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	5126.24								5126.24
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	1717.23								1717.23
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31858.36
Total CO₂ equivalent emissions with land use, land-use change and forestry									25203.78
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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1991
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	9285.27	4293.05	2732.16	NO	850.75	10.33	NO	NO	17171.56
1. Energy	15164.22	792.47	199.29						16155.99
A. Fuel combustion (sectoral approach)	14570.70	442.21	198.78						15211.70
1. Energy industries	4722.56	3.97	12.00						4738.53
2. Manufacturing industries and construction	3919.00	7.08	12.57						3938.65
3. Transport	2866.87	31.02	43.67						2941.55
4. Other sectors	3062.28	400.14	130.55						3592.97
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	593.52	350.26	0.50						944.28
1. Solid fuels	NO	53.15	NO,NA						53.15
2. Oil and natural gas	593.52	297.11	0.50						891.13
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1973.47	8.74	696.16	NO	850.75	10.33	NO	NO	3539.46
A. Mineral industry	869.65								869.65
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	167.78	NA	NA						167.78
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	2481.22	1739.15						4271.32
A. Enteric fermentation		2053.11							2053.11
B. Manure management		428.11	348.58						776.69
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1390.57						1390.57
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⁾	-7903.91	3.18	34.29						-7866.44
A. Forest land	-8480.77	3.00	1.98						-8475.79
B. Cropland	207.17	NO	3.82						210.98
C. Grassland	-73.17	0.18	0.19						-72.80
D. Wetlands	46.86	NO	6.23						53.09
E. Settlements	173.62	NO	22.07						195.69
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	1007.42	63.27						1071.23
A. Solid waste disposal	NA,NO	565.55							565.55
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		441.87	63.27						505.14
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	5986.51								5986.51
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	1791.71								1791.71
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25038.00
Total CO₂ equivalent emissions with land use, land-use change and forestry									17171.56
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1992
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8477.11	3873.98	2775.36	NO	NO	10.42	NO	NO	15136.87
1. Energy	14437.67	697.58	179.24						15314.50
A. Fuel combustion (sectoral approach)	13833.95	377.02	178.79						14389.76
1. Energy industries	5382.10	4.57	15.42						5402.09
2. Manufacturing industries and construction	3114.89	5.44	9.58						3129.91
3. Transport	2776.67	27.67	37.68						2842.01
4. Other sectors	2560.29	339.34	116.12						3015.75
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	603.73	320.55	0.46						924.74
1. Solid fuels	NO	41.30	NO,NA						41.30
2. Oil and natural gas	603.73	279.26	0.46						883.44
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2008.79	7.57	898.60	NO	NO	10.42	NO	NO	2925.37
A. Mineral industry	944.78								944.78
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	110.21	NA	NA						110.21
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	2124.29	1590.90						3780.70
A. Enteric fermentation		1759.93							1759.93
B. Manure management		364.36	282.34						646.70
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1308.56						1308.56
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8035.39	15.15	42.96						-7977.28
A. Forest land	-8716.86	13.64	9.00						-8694.23
B. Cropland	214.57	NO	3.68						218.25
C. Grassland	-80.46	1.51	1.64						-77.31
D. Wetlands	46.88	NO	6.23						53.11
E. Settlements	175.94	NO	22.41						198.35
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	1029.39	63.65						1093.58
A. Solid waste disposal	NA,NO	590.64							590.64
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		438.75	63.64						502.39
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
CO ₂ emissions from biomass	5219.31								5219.31
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	1866.54								1866.54
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23114.15
Total CO₂ equivalent emissions with land use, land-use change and forestry									15136.87
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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1993
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8650.88	3961.02	2408.89	NO	NO	10.53	NO	NO	15031.32
1. Energy	15213.61	727.77	193.62						16135.00
A. Fuel combustion (sectoral approach)	14408.69	393.46	193.16						14995.32
1. Energy industries	5903.57	4.88	17.13						5925.57
2. Manufacturing industries and construction	3031.80	5.21	9.17						3046.18
3. Transport	2925.04	27.16	46.40						2998.59
4. Other sectors	2548.29	356.21	120.46						3024.97
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	804.92	334.31	0.46						1139.69
1. Solid fuels	NO	39.52	NO,NA						39.52
2. Oil and natural gas	804.92	294.79	0.46						1100.16
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1699.63	6.25	685.59	NO	NO	10.53	NO	NO	2401.99
A. Mineral industry	806.34								806.34
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	119.86	NA	NA						119.86
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	2142.30	1409.92						3604.36
A. Enteric fermentation		1754.21							1754.21
B. Manure management		388.09	286.84						674.94
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1123.08						1123.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8315.03	34.39	55.89						-8224.75
A. Forest land	-8770.41	32.81	21.64						-8715.96
B. Cropland	202.80	NO	3.54						206.34
C. Grassland	-83.81	1.58	1.72						-80.51
D. Wetlands	46.89	NO	6.24						53.13
E. Settlements	178.26	NO	22.76						201.02
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	1050.31	63.86						1114.71
A. Solid waste disposal	NA,NO	614.68							614.68
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		435.63	63.86						499.49
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	5493.15								5493.15
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	1941.87								1941.87
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23256.07
Total CO₂ equivalent emissions with land use, land-use change and forestry									15031.32
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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1994
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	7666.33	3727.35	2427.15	NO	NO	10.64	NO	NO	13831.47
1. Energy	14277.28	662.15	188.53						15127.95
A. Fuel combustion (sectoral approach)	13555.89	359.88	188.11						14103.88
1. Energy industries	4614.80	3.27	12.05						4630.13
2. Manufacturing industries and construction	3202.34	4.85	8.64						3215.82
3. Transport	3102.80	29.54	48.89						3181.24
4. Other sectors	2635.95	322.22	118.52						3076.69
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	721.38	302.27	0.42						1024.07
1. Solid fuels	NO	35.44	NO,NA						35.44
2. Oil and natural gas	721.38	266.83	0.42						988.63
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1899.67	6.53	739.64	NO	NO	10.64	NO	NO	2656.48
A. Mineral industry	973.52								973.52
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	129.39	NA	NA						129.39
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	1970.40	1391.93						3409.90
A. Enteric fermentation		1575.98							1575.98
B. Manure management		394.42	268.33						662.75
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1123.60						1123.60
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⁾	-8558.72	11.51	40.67						-8506.55
A. Forest land	-8896.40	10.68	7.04						-8878.67
B. Cropland	218.89	NO	3.40						222.30
C. Grassland	-92.04	0.82	0.90						-90.32
D. Wetlands	46.91	NO	6.24						53.15
E. Settlements	180.33	NO	23.09						203.42
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	1076.77	66.39						1143.70
A. Solid waste disposal	NA,NO	639.10							639.10
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		437.67	66.38						504.05
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
CO ₂ emissions from biomass	4929.23								4929.23
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2018.60								2018.60
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22338.02
Total CO₂ equivalent emissions with land use, land-use change and forestry									13831.47
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 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	7824.44	3670.03	2338.67	29.32	NO	11.12	NO	NO	13873.58
1. Energy	15175.22	679.03	179.50						16033.75
A. Fuel combustion (sectoral approach)	14321.54	379.67	179.10						14880.31
1. Energy industries	5217.28	4.04	12.35						5233.67
2. Manufacturing industries and construction	2954.66	4.74	8.46						2967.87
3. Transport	3292.78	30.88	44.29						3367.95
4. Other sectors	2856.82	340.01	114.00						3310.83
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	853.68	299.36	0.40						1153.44
1. Solid fuels	NO	28.23	NO,NA						28.23
2. Oil and natural gas	853.68	271.14	0.40						1125.22
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1711.24	5.85	711.25	29.32	NO	11.12	NO	NO	2468.78
A. Mineral industry	755.30								755.30
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	159.63	NA	NA						159.63
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				29.32	NO	NO	NO	NO	29.32
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	1881.23	1337.72						3265.24
A. Enteric fermentation		1501.37							1501.37
B. Manure management		379.86	250.54						630.40
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1087.18						1087.18
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-9108.85	7.54	38.14						-9063.17
A. Forest land	-9409.59	7.03	4.63						-9397.93
B. Cropland	224.64	NO	3.27						227.91
C. Grassland	-98.07	0.52	0.56						-96.99
D. Wetlands	46.92	NO	6.24						53.16
E. Settlements	182.84	NO	23.43						206.27
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	1096.38	72.06						1168.98
A. Solid waste disposal	NA,NO	665.11							665.11
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		431.27	72.05						503.32
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	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
CO ₂ emissions from biomass	5212.59								5212.59
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2097.00								2097.00
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									22936.75
Total CO₂ equivalent emissions with land use, land-use change and forestry									13873.58
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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1996
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	8757.45	3671.52	2350.51	49.77	NO	11.57	NO	NO	14840.82
1. Energy	15743.63	710.25	229.77						16683.66
A. Fuel combustion (sectoral approach)	14917.08	422.54	229.39						15569.00
1. Energy industries	5041.66	4.06	12.92						5058.63
2. Manufacturing industries and construction	2998.35	4.71	8.41						3011.48
3. Transport	3620.09	33.32	72.27						3725.69
4. Other sectors	3256.98	380.45	135.78						3773.20
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	826.55	287.71	0.39						1114.66
1. Solid fuels	NO	22.77	NO,NA						22.77
2. Oil and natural gas	826.55	264.95	0.39						1091.89
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1727.62	5.18	665.11	49.77	NO	11.57	NO	NO	2459.25
A. Mineral industry	841.55								841.55
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	165.28	NA	NA						165.28
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				49.77	NO	NO	NO	NO	49.77
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	1822.85	1342.22						3217.51
A. Enteric fermentation		1435.90							1435.90
B. Manure management		386.95	241.45						628.40
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1100.77						1100.77
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⁾	-8766.78	16.53	44.64						-8705.60
A. Forest land	-9123.16	15.14	9.99						-9098.03
B. Cropland	222.11	NO	3.13						225.24
C. Grassland	-103.24	1.39	1.51						-100.34
D. Wetlands	46.94	NO	6.24						53.18
E. Settlements	185.22	NO	23.78						209.00
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	1116.71	68.76						1186.01
A. Solid waste disposal	NA,NO	694.84							694.84
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		421.87	68.75						490.62
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	314.02	0.25	2.57						316.84
Aviation	223.16	0.04	1.86						225.06
Navigation	90.86	0.21	0.71						91.78
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5801.38								5801.38
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2176.21								2176.21
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									23546.42
Total CO ₂ equivalent emissions with land use, land-use change and forestry									14840.82
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1997
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	10347.12	3620.67	2538.52	71.93	NO	11.43	NO	NO	16589.67
1. Energy	16616.78	676.89	226.29						17519.96
A. Fuel combustion (sectoral approach)	15838.80	395.32	225.90						16460.02
1. Energy industries	5538.02	4.47	15.14						5557.62
2. Manufacturing industries and construction	3026.43	5.13	8.98						3040.54
3. Transport	3965.98	35.31	83.18						4084.47
4. Other sectors	3308.37	350.42	118.60						3777.39
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	777.98	281.56	0.39						1059.94
1. Solid fuels	NO	16.65	NO,NA						16.65
2. Oil and natural gas	777.98	264.91	0.39						1043.28
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1898.65	5.51	698.44	71.93	NO	11.43	NO	NO	2685.96
A. Mineral industry	965.17								965.17
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	149.59	NA	NA						149.59
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				71.93	NO	NO	NO	NO	71.93
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	1770.27	1498.91						3337.57
A. Enteric fermentation		1379.77							1379.77
B. Manure management		390.50	233.87						624.37
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1265.04						1265.04
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8238.52	17.63	45.54						-8175.36
A. Forest land	-8535.50	16.28	10.73						-8508.49
B. Cropland	239.60	NO	2.99						242.59
C. Grassland	-112.73	1.35	1.47						-109.91
D. Wetlands	46.96	NO	6.25						53.20
E. Settlements	185.97	NO	24.10						210.07
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	1150.38	69.34						1221.54
A. Solid waste disposal	NA,NO	726.45							726.45
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		423.93	69.30						493.24
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	5428.42								5428.42
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2256.77								2256.77
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24765.02
Total CO₂ equivalent emissions with land use, land-use change and forestry									16589.67
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1998
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11288.61	3613.84	2203.46	101.88	NO	11.99	NO	NO	17219.78
1. Energy	17463.39	664.38	209.96						18337.72
A. Fuel combustion (sectoral approach)	16771.64	399.23	209.59						17380.46
1. Energy industries	6192.08	5.18	16.82						6214.08
2. Manufacturing industries and construction	3313.18	5.14	9.16						3327.47
3. Transport	4098.64	36.21	58.51						4193.36
4. Other sectors	3167.75	352.70	125.11						3645.55
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	691.74	265.15	0.37						957.26
1. Solid fuels	NO	17.44	NO,NA						17.44
2. Oil and natural gas	691.74	247.71	0.37						939.82
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1778.27	4.89	534.06	101.88	NO	11.99	NO	NO	2431.09
A. Mineral industry	1030.71								1030.71
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	125.18	NA	NA						125.18
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				101.88	NO	NO	NO	NO	101.88
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	1723.75	1326.46						3094.47
A. Enteric fermentation		1329.52							1329.52
B. Manure management		394.24	225.96						620.20
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1100.50						1100.50
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⁾	-8001.00	45.11	65.53						-7890.35
A. Forest land	-8207.84	39.83	26.26						-8141.75
B. Cropland	252.79	NO	2.86						255.65
C. Grassland	-117.81	5.29	5.75						-106.77
D. Wetlands	46.97	NO	6.25						53.22
E. Settlements	190.05	NO	24.42						214.47
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	1175.71	67.45						1246.85
A. Solid waste disposal	NA,NO	761.16							761.16
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		414.55	67.38						481.93
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	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
CO ₂ emissions from biomass	5442.75								5442.75
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2338.23								2338.23
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									25110.13
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17219.78
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1999
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11499.71	3594.35	2401.35	122.08	NO	11.99	NO	NO	17629.49
1. Energy	17984.69	640.80	264.32						18889.81
A. Fuel combustion (sectoral approach)	17308.72	393.95	263.98						17966.64
1. Energy industries	6420.48	5.45	17.42						6443.35
2. Manufacturing industries and construction	2980.25	4.26	7.69						2992.21
3. Transport	4329.03	36.91	103.63						4469.57
4. Other sectors	3578.95	347.33	135.23						4061.51
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	675.98	246.85	0.34						923.17
1. Solid fuels	NO	5.25	NO,NA						5.25
2. Oil and natural gas	675.98	241.59	0.34						917.91
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2087.58	4.95	623.59	122.08	NO	11.99	NO	NO	2850.19
A. Mineral industry	1287.07								1287.07
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	71.43	NA	NA						71.43
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				122.08	NO	NO	NO	NO	122.08
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	1726.46	1402.49						3179.44
A. Enteric fermentation		1297.44							1297.44
B. Manure management		429.02	231.61						660.63
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1170.88						1170.88
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8627.43	5.91	38.33						-8583.19
A. Forest land	-8804.42	4.26	2.81						-8797.35
B. Cropland	244.50	NO	2.72						247.22
C. Grassland	-121.52	1.65	1.80						-118.07
D. Wetlands	46.99	NO	6.25						53.24
E. Settlements	192.72	NO	24.75						217.47
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	1216.24	72.62						1293.24
A. Solid waste disposal	NA,NO	796.75							796.75
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		419.48	72.54						492.03
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
CO ₂ emissions from biomass	5257.71								5257.71
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2422.54								2422.54
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									26212.68
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17629.49
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2000
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12533.66	3620.54	2580.50	147.90	NO	11.62	NO	NO	18894.21
1. Energy	17385.42	591.18	274.34						18250.94
A. Fuel combustion (sectoral approach)	16659.08	352.94	274.02						17286.04
1. Energy industries	5783.35	3.94	18.63						5805.92
2. Manufacturing industries and construction	3103.13	4.44	8.05						3115.63
3. Transport	4354.24	35.65	109.50						4499.39
4. Other sectors	3418.37	308.91	137.84						3865.11
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	726.33	238.23	0.32						964.89
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	726.33	238.23	0.32						964.89
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2246.77	3.40	727.32	147.90	NO	11.62	NO	NO	3137.01
A. Mineral industry	1441.95								1441.95
B. Chemical industry	700.99	2.92	693.94	NO	NO	NO	NO	NO	1397.85
C. Metal industry	29.68	0.48	NO	NO	NO	NO	NO	NO	30.17
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				147.90	NO	NO	NO	NO	147.90
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	1665.83	1406.84						3133.54
A. Enteric fermentation		1250.04							1250.04
B. Manure management		415.80	218.26						634.06
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1188.58						1188.58
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⁾	-7165.55	96.91	101.97						-6966.66
A. Forest land	-7427.45	87.11	57.44						-7282.90
B. Cropland	319.67	NO	2.58						322.25
C. Grassland	-131.83	9.80	10.67						-111.37
D. Wetlands	47.00	NO	6.25						53.26
E. Settlements	197.11	NO	25.04						222.15
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	1263.21	70.02						1339.39
A. Solid waste disposal	NA,NO	837.26							837.26
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		425.95	69.91						495.86
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	4694.77								4694.77
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2513.55								2513.55
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25860.88
Total CO₂ equivalent emissions with land use, land-use change and forestry									18894.21
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 A5.2-13: GHG emission in Croatia, 2001

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2001
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12865.74	3629.91	2510.35	161.46	NO	11.69	NO	NO	19179.14
1. Energy	18376.94	632.36	271.56						19280.86
A. Fuel combustion (sectoral approach)	17596.49	378.20	271.25						18245.95
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	4419.92	30.61	104.62						4555.15
4. Other sectors	3635.73	338.75	137.61						4112.10
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	780.45	254.15	0.31						1034.91
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	780.45	254.15	0.31						1034.91
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2341.39	3.52	615.78	161.46	NO	11.69	NO	NO	3133.84
A. Mineral industry	1663.37								1663.37
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	75.06	NA	NA						75.06
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				161.46	NO	NO	NO	NO	161.46
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	1692.09	1493.09						3277.27
A. Enteric fermentation		1263.11							1263.11
B. Manure management		428.97	218.79						647.76
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1274.30						1274.30
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⁾	-7951.37	19.00	55.26						-7877.11
A. Forest land	-8397.99	16.02	10.56						-8371.40
B. Cropland	339.23	NO	3.05						342.28
C. Grassland	-180.37	2.98	3.24						-174.15
D. Wetlands	38.26	NO	5.98						44.24
E. Settlements	355.96	NO	32.44						388.40
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	1282.95	74.65						1364.28
A. Solid waste disposal	NA,NO	879.37							879.37
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		403.58	74.53						478.11
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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 captured	NO								NO
Long-term storage of C in waste disposal sites	2608.32								2608.32
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27056.25
Total CO₂ equivalent emissions with land use, land-use change and forestry									19179.14
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 A5.2-14: GHG emission in Croatia, 2002

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2002
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13712.08	3621.75	2411.06	185.34	NO	12.01	NO	NO	19942.22
1. Energy	19530.51	623.39	227.25						20381.14
A. Fuel combustion (sectoral approach)	18734.85	364.00	226.94						19325.78
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	4729.16	29.65	64.62						4823.43
4. Other sectors	3723.03	325.12	129.48						4177.63
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	795.66	259.39	0.31						1055.36
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	795.66	259.39	0.31						1055.36
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2310.15	3.27	600.08	185.34	NO	12.01	NO	NO	3110.85
A. Mineral industry	1665.34								1665.34
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	89.19	NA	NA						89.19
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				185.34	NO	NO	NO	NO	185.34
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	1659.65	1451.54						3191.94
A. Enteric fermentation		1223.75							1223.75
B. Manure management		435.91	212.53						648.43
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1239.01						1239.01
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⁾	-8213.11	6.39	53.64						-8153.08
A. Forest land	-8648.41	5.62	3.70						-8639.09
B. Cropland	322.76	NO	3.52						326.28
C. Grassland	-173.94	0.78	0.85						-172.31
D. Wetlands	36.52	NO	5.70						42.22
E. Settlements	411.28	NO	39.87						451.16
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	1329.04	78.55						1411.37
A. Solid waste disposal	NA,NO	928.01							928.01
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		401.03	78.48						479.51
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	262.60	0.20	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
CO ₂ emissions from biomass	4975.57								4975.57
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2706.46								2706.46
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									28095.30
Total CO₂ equivalent emissions with land use, land-use change and forestry									19942.22
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 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15860.28	3792.21	2344.85	212.23	NO	12.28	NO	NO	22221.85
1. Energy	20865.01	674.14	241.73						21780.88
A. Fuel combustion (sectoral approach)	20116.28	413.37	241.44						20771.08
1. Energy industries	7900.31	5.84	25.93						7932.07
2. Manufacturing industries and construction	3136.78	4.94	8.93						3150.65
3. Transport	5126.60	28.54	66.84						5221.98
4. Other sectors	3952.60	374.04	139.74						4466.39
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	748.73	260.78	0.29						1009.80
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	748.73	260.78	0.29						1009.80
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2339.95	3.12	569.27	212.23	NO	12.28	NO	NO	3136.84
A. Mineral industry	1668.68								1668.68
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	90.22	NA	NA						90.22
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				212.23	NO	NO	NO	NO	212.23
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	1697.29	1371.52						3140.60
A. Enteric fermentation		1240.76							1240.76
B. Manure management		456.53	214.77						671.29
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1156.75						1156.75
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⁾	-7417.28	39.55	84.38						-7293.35
A. Forest land	-7967.84	35.95	23.70						-7908.19
B. Cropland	310.84	NO	3.99						314.83
C. Grassland	-167.51	3.60	3.92						-159.98
D. Wetlands	34.78	NO	5.42						40.20
E. Settlements	463.41	NO	47.34						510.75
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	1378.11	77.96						1456.87
A. Solid waste disposal	NA,NO	982.59							982.59
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		395.53	77.94						473.47
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
CO ₂ emissions from biomass	5755.73								5755.73
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2807.68								2807.68
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									29515.19
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22221.85
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2004
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15288.04	3930.99	2587.82	240.33	NO	12.57	NO	NO	22059.74
1. Energy	20291.96	661.10	283.42						21236.47
A. Fuel combustion (sectoral approach)	19494.03	402.09	283.14						20179.25
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	5262.05	26.83	116.33						5405.21
4. Other sectors	3864.98	364.40	132.57						4361.95
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	797.93	259.01	0.28						1057.22
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	797.93	259.01	0.28						1057.22
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2556.51	3.74	684.84	240.33	NO	12.57	NO	NO	3497.99
A. Mineral industry	1768.72								1768.72
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	108.50	NA	NA						108.50
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				240.33	NO	NO	NO	NO	240.33
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	1825.06	1475.25						3376.25
A. Enteric fermentation		1331.22							1331.22
B. Manure management		493.85	227.83						721.67
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1247.42						1247.42
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-7636.72	2.92	66.69						-7567.11
A. Forest land	-8232.92	1.95	1.29						-8229.68
B. Cropland	309.38	NO	4.46						313.83
C. Grassland	-161.07	0.97	1.05						-159.06
D. Wetlands	33.04	NO	5.14						38.18
E. Settlements	519.49	NO	54.76						574.25
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	1438.17	77.62						1516.13
A. Solid waste disposal	NA,NO	1036.43							1036.43
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		401.73	77.61						479.35
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
CO ₂ emissions from biomass	5660.22								5660.22
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	2911.70								2911.70
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									29626.85
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22059.74
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2005
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15540.05	3889.29	2537.11	265.80	NO	13.03	NO	NO	22245.27
1. Energy	20676.93	681.29	237.60						21595.82
A. Fuel combustion (sectoral approach)	19899.40	421.47	237.33						20558.20
1. Energy industries	6810.03	4.61	22.86						6837.50
2. Manufacturing industries and construction	3723.73	5.41	9.90						3739.05
3. Transport	5467.52	25.22	68.84						5561.59
4. Other sectors	3898.12	386.23	135.72						4420.06
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	777.53	259.83	0.27						1037.62
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	777.53	259.83	0.27						1037.62
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2621.29	3.77	670.12	265.80	NO	13.03	NO	NO	3574.01
A. Mineral industry	1833.69								1833.69
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	111.29	NA	NA						111.29
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				265.80	NO	NO	NO	NO	265.80
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	1763.89	1474.76						3324.11
A. Enteric fermentation		1309.21							1309.21
B. Manure management		454.68	208.39						663.06
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1266.37						1266.37
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⁾	-7843.80	2.74	74.00						-7767.06
A. Forest land	-8286.49	2.16	1.43						-8282.90
B. Cropland	281.48	NO	4.92						286.40
C. Grassland	-137.40	0.57	0.62						-136.20
D. Wetlands	31.30	NO	4.86						36.16
E. Settlements	566.76	NO	62.16						628.93
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	1437.61	80.63						1518.40
A. Solid waste disposal	NA,NO	1038.94							1038.94
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		398.67	80.63						479.30
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
CO ₂ emissions from biomass	5908.79								5908.79
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3018.32								3018.32
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									30012.33
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22245.27
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2006
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15980.51	4007.54	2567.97	292.57	NO	13.01	NO	NO	22861.59
1. Energy	20756.61	667.30	239.63						21663.54
A. Fuel combustion (sectoral approach)	19965.94	388.81	239.36						20594.11
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	5820.73	24.13	73.64						5918.51
4. Other sectors	3658.66	354.11	132.63						4145.40
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	790.67	278.50	0.27						1069.44
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	790.67	278.50	0.27						1069.44
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2764.89	3.66	662.70	292.57	NO	13.01	NO	NO	3736.83
A. Mineral industry	1969.73								1969.73
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	123.96	NA	NA						123.96
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				292.57	NO	NO	NO	NO	292.57
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	1798.22	1498.74						3377.63
A. Enteric fermentation		1297.28							1297.28
B. Manure management		500.94	214.99						715.93
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1283.75						1283.75
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⁾	-7622.39	6.06	83.80						-7532.53
A. Forest land	-8098.02	5.46	3.60						-8088.95
B. Cropland	225.90	NO	5.39						231.29
C. Grassland	-109.11	0.60	0.65						-107.87
D. Wetlands	29.56	NO	4.59						34.14
E. Settlements	615.18	NO	69.57						684.76
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	1532.29	83.09						1616.13
A. Solid waste disposal	NA,NO	1129.38							1129.38
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		402.91	83.08						485.99
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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
CO ₂ emissions from biomass	5497.41								5497.41
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3128.01								3128.01
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									30394.12
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22861.59
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2007
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	18018.91	4033.13	2635.12	326.74	NO	13.05	NO	NO	25026.95
1. Energy	21990.82	664.94	246.24						22902.01
A. Fuel combustion (sectoral approach)	21236.90	375.42	245.98						21858.30
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	6241.46	23.33	77.86						6342.65
4. Other sectors	3327.24	340.71	130.51						3798.46
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	753.92	289.52	0.26						1043.71
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	753.92	289.52	0.26						1043.71
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2838.16	3.41	727.75	326.74	NO	13.05	NO	NO	3909.12
A. Mineral industry	1999.27								1999.27
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	128.89	NA	NA						128.89
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				326.74	NO	NO	NO	NO	326.74
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	1711.69	1474.22						3275.23
A. Enteric fermentation		1233.37							1233.37
B. Manure management		478.32	199.90						678.22
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1274.32						1274.32
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⁾	-6900.05	31.76	101.67						-6766.62
A. Forest land	-7282.42	29.59	19.51						-7233.32
B. Cropland	181.38	NO	5.33						186.71
C. Grassland	-67.22	2.17	2.37						-62.68
D. Wetlands	27.37	NO	4.29						31.66
E. Settlements	526.43	NO	70.17						596.60
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	1621.32	85.23						1707.21
A. Solid waste disposal	NA,NO	1211.63							1211.63
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		408.18	84.14						492.31
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	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
CO ₂ emissions from biomass	5323.07								5323.07
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3243.84								3243.84
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									31793.57
Total CO ₂ equivalent emissions with land use, land-use change and forestry									25026.95
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2008
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	16357.70	4016.12	2919.66	338.04	NO	11.98	NO	NO	23643.49
1. Energy	20826.46	651.47	243.14						21721.06
A. Fuel combustion (sectoral approach)	20164.80	373.83	242.89						20781.51
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	6078.62	21.48	73.60						6173.70
4. Other sectors	3441.78	341.95	134.90						3918.63
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	661.66	277.64	0.25						939.55
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	661.66	277.64	0.25						939.55
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2736.13	3.23	743.16	338.04	NO	11.98	NO	NO	3832.55
A. Mineral industry	1908.84								1908.84
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	127.24	NA	NA						127.24
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				338.04	NO	NO	NO	NO	338.04
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	1637.57	1760.37						3494.54
A. Enteric fermentation		1196.33							1196.33
B. Manure management		441.23	184.55						625.78
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1575.82						1575.82
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⁾	-7302.16	9.58	86.71						-7205.88
A. Forest land	-7615.24	8.64	5.70						-7600.91
B. Cropland	176.44	NO	5.27						181.71
C. Grassland	-123.13	0.94	1.02						-121.17
D. Wetlands	25.54	NO	4.00						29.54
E. Settlements	530.18	NO	70.72						600.90
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	1714.28	86.28						1801.22
A. Solid waste disposal	NA,NO	1311.62							1311.62
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		401.17	85.21						486.38
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
CO ₂ emissions from biomass	5298.85								5298.85
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3363.32								3363.32
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									30849.37
Total CO ₂ equivalent emissions with land use, land-use change and forestry									23643.49
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2009
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	14607.88	4104.52	2282.41	341.35	0.26	8.03	NO	NO	21344.44
1. Energy	19665.24	656.04	236.78						20558.06
A. Fuel combustion (sectoral approach)	19066.76	386.45	236.55						19689.76
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	6089.63	20.40	72.52						6182.56
4. Other sectors	3454.34	356.00	133.68						3944.02
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	598.48	269.59	0.23						868.30
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	598.48	269.59	0.23						868.30
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2106.52	2.91	626.04	341.35	0.26	8.03	NO	NO	3085.10
A. Mineral industry	1475.91								1475.91
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	96.50	NA	NA						96.50
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				341.35	0.26	NO	NO	NO	341.61
G. Other product manufacture and use	NO	NO	32.83	NO	NO	8.03	NO	NO	40.86
H. Other	NA	NA	NA						NA
3. Agriculture	76.96	1675.56	1248.36						3000.88
A. Enteric fermentation		1200.32							1200.32
B. Manure management		475.24	188.24						663.48
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1060.11						1060.11
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⁾	-7241.00	5.10	83.67						-7152.24
A. Forest land	-7821.45	4.87	3.21						-7813.36
B. Cropland	207.59	NO	5.20						212.79
C. Grassland	-70.78	0.22	0.24						-70.32
D. Wetlands	23.71	NO	3.71						27.41
E. Settlements	584.94	NO	71.30						656.25
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	1764.91	87.56						1852.63
A. Solid waste disposal	NA,NO	1412.90							1412.90
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		350.76	86.67						437.43
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	5577.15								5577.15
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3485.54								3485.54
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									28496.68
Total CO₂ equivalent emissions with land use, land-use change and forestry									21344.44
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2010
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13864.78	4193.24	2522.53	378.87	0.03	8.95	NO	NO	20968.42
1. Energy	18830.68	681.21	235.26						19747.16
A. Fuel combustion (sectoral approach)	18264.34	410.82	235.04						18910.20
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	5865.04	18.28	69.02						5952.34
4. Other sectors	3506.16	382.98	135.21						4024.35
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	566.34	270.39	0.22						836.96
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	566.34	270.39	0.22						836.96
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2145.72	2.72	796.07	378.87	0.03	8.95	NO	NO	3332.37
A. Mineral industry	1426.68								1426.68
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	89.00	NA	NA						89.00
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				378.87	0.03	NO	NO	NO	378.91
G. Other product manufacture and use	NO	NO	31.08	NO	NO	8.95	NO	NO	40.03
H. Other	NA	NA	NA						NA
3. Agriculture	88.04	1680.50	1325.78						3094.31
A. Enteric fermentation		1207.30							1207.30
B. Manure management		473.20	184.46						657.66
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1141.32						1141.32
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⁾	-7199.71	1.76	81.64						-7116.31
A. Forest land	-7644.50	1.64	1.08						-7641.77
B. Cropland	196.53	NO	5.14						201.67
C. Grassland	-79.96	0.12	0.13						-79.71
D. Wetlands	21.87	NO	3.42						25.29
E. Settlements	543.77	NO	71.87						615.64
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	1827.06	83.77						1910.88
A. Solid waste disposal	NA,NO	1451.99							1451.99
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		373.72	82.81						456.53
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	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
CO ₂ emissions from biomass	5940.99								5940.99
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3583.56								3583.56
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									28084.72
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20968.42
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2011
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	14566.52	4197.56	2599.62	396.20	0.02	9.37	NO	NO	21769.28
1. Energy	18616.66	648.39	221.65						19486.70
A. Fuel combustion (sectoral approach)	18035.28	399.28	221.45						18656.01
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	5726.02	16.65	56.88						5799.55
4. Other sectors	3281.84	373.05	133.57						3788.46
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	581.38	249.11	0.20						830.69
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	581.38	249.11	0.20						830.69
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1977.15	1.75	786.53	396.20	0.02	9.37	NO	NO	3171.01
A. Mineral industry	1283.92								1283.92
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	83.40	NA	NA						83.40
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				396.20	0.02	NO	NO	NO	396.21
G. Other product manufacture and use	NO	NO	32.60	NO	NO	9.37	NO	NO	41.96
H. Other	NA	NA	NA						NA
3. Agriculture	105.18	1671.68	1412.51						3189.36
A. Enteric fermentation		1203.65							1203.65
B. Manure management		468.03	176.47						644.50
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1236.03						1236.03
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⁾	-6132.52	18.63	94.23						-6019.65
A. Forest land	-6550.14	15.20	10.02						-6524.92
B. Cropland	172.68	NO	5.21						177.90
C. Grassland	-59.41	3.43	3.74						-52.25
D. Wetlands	20.03	NO	3.12						23.15
E. Settlements	543.95	NO	72.14						616.10
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	1857.12	84.70						1941.87
A. Solid waste disposal	NA,NO	1493.11							1493.11
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		362.61	83.70						446.31
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	387.14	0.23	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	5834.61								5834.61
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3696.79								3696.79
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27788.93
Total CO₂ equivalent emissions with land use, land-use change and forestry									21769.28
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2012
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13323.08	4144.05	2395.55	397.28	0.03	9.18	NO	NO	20269.17
1. Energy	17236.44	610.71	213.31						18060.45
A. Fuel combustion (sectoral approach)	16744.87	395.19	213.13						17353.18
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	5544.99	14.06	55.20						5614.24
4. Other sectors	2941.62	371.55	128.03						3441.19
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	491.56	215.52	0.18						707.27
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	491.56	215.52	0.18						707.27
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1778.11	NO,NE,IE,NA	694.69	397.28	0.03	9.18	NO	NO	2879.29
A. Mineral industry	1197.12								1197.12
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	77.55	NA	NA						77.55
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				397.28	0.03	NO	NO	NO	397.31
G. Other product manufacture and use	NO	NO	42.33	NO	NO	9.18	NO	NO	51.50
H. Other	NA	NA	NA						NA
3. Agriculture	101.23	1640.59	1293.06						3034.88
A. Enteric fermentation		1190.26							1190.26
B. Manure management		450.33	171.26						621.59
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1121.80						1121.80
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⁾	-5792.78	38.88	107.33						-5646.57
A. Forest land	-6172.66	36.09	23.80						-6112.77
B. Cropland	230.47	NO	5.29						235.75
C. Grassland	-96.43	2.79	3.04						-90.60
D. Wetlands	18.18	NO	2.83						21.01
E. Settlements	537.84	NO	72.38						610.22
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	1853.87	87.16						1941.11
A. Solid waste disposal	NA,NO	1534.59							1534.59
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		316.68	85.30						401.98
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	330.03	0.06	2.75						332.84
Aviation	330.03	0.06	2.75						332.84
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	6017.15								6017.15
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3832.35								3832.35
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									25915.74
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20269.17
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2013
Submission 2019 v2
CROATIA

GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11968.74	3920.06	1788.51	469.19	NO	6.05	NO	NO	18152.55
1. Energy	16499.11	596.43	209.27						17304.81
A. Fuel combustion (sectoral approach)	16029.43	391.71	209.09						16630.23
1. Energy industries	5238.07	4.16	20.92						5263.15
2. Manufacturing industries and construction	2380.65	4.40	7.72						2392.78
3. Transport	5631.06	13.91	54.58						5699.55
4. Other sectors	2779.65	369.23	125.88						3274.76
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	469.67	204.72	0.18						674.57
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	469.67	204.72	0.18						674.57
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1880.89	NO,NE,IE,NA	282.37	469.19	NO	6.05	NO	NO	2638.50
A. Mineral industry	1285.66								1285.66
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	71.97	NA	NA						71.97
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				469.19	NO	NO	NO	NO	469.19
G. Other product manufacture and use	NO	NO	42.10	NO	NO	6.05	NO	NO	48.15
H. Other	NA	NA	NA						NA
3. Agriculture	74.61	1585.66	1126.03						2786.31
A. Enteric fermentation		1157.11							1157.11
B. Manure management		428.56	162.58						591.14
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	963.46						963.46
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⁾	-6485.91	1.93	82.00						-6401.99
A. Forest land	-6705.63	1.46	0.96						-6703.22
B. Cropland	190.07	NO	5.36						195.44
C. Grassland	-61.65	0.47	0.51						-60.66
D. Wetlands	16.33	NO	2.53						18.86
E. Settlements	535.98	NO	72.63						608.60
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	1736.04	88.84						1824.92
A. Solid waste disposal	NA,NO	1544.76							1544.76
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		187.17	85.90						273.07
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	366.52	0.06	3.01						369.59
Aviation	366.52	0.06	3.01						369.59
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5962.40								5962.40
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	3971.56								3971.56
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									24554.54
Total CO ₂ equivalent emissions with land use, land-use change and forestry									18152.55
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	11178.39	3928.42	1725.78	474.76	NO	6.77	NO	NO	17314.12
1. Energy	15629.81	536.38	197.82						16364.01
A. Fuel combustion (sectoral approach)	15174.35	345.17	197.65						15717.16
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	5575.58	12.77	54.14						5642.49
4. Other sectors	2530.53	325.33	118.76						2974.62
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	455.46	191.22	0.17						646.85
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	455.46	191.22	0.17						646.85
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2008.81	NO,NE,IE,NA	285.30	474.76	NO	6.77	NO	NO	2775.64
A. Mineral industry	1371.16								1371.16
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	67.71	NA	NA						67.71
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				474.76	NO	NO	NO	NO	474.76
G. Other product manufacture and use	NO	NO	19.10	NO	NO	6.77	NO	NO	25.87
H. Other	NA	NA	NA						NA
3. Agriculture	69.47	1560.78	1071.95						2702.19
A. Enteric fermentation		1129.72							1129.72
B. Manure management		431.06	160.23						591.29
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	911.71						911.71
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⁾	-6529.74	0.32	80.81						-6448.61
A. Forest land	-6413.14	0.22	0.14						-6412.78
B. Cropland	49.01	0.08	5.49						54.58
C. Grassland	-54.17	0.03	0.03						-54.11
D. Wetlands	14.49	NO	2.24						16.72
E. Settlements	532.13	NO	72.91						605.04
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	1830.94	89.90						1920.89
A. Solid waste disposal	NA,NO	1608.20							1608.20
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		218.77	87.06						305.83
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	368.10	0.06	3.03						371.19
Aviation	368.10	0.06	3.03						371.19
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5249.83								5249.83
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4097.53								4097.53
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									23762.73
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17314.12
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12301.70	4116.62	1906.85	482.50	NO	5.22	NO	NO	18812.88
1. Energy	15800.49	595.07	208.40						16603.97
A. Fuel combustion (sectoral approach)	15544.80	392.91	208.21						16145.92
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	5883.52	12.41	55.89						5951.83
4. Other sectors	2719.76	373.03	126.72						3219.51
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	255.69	202.17	0.19						458.05
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	255.69	202.17	0.19						458.05
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1970.84	NO,NE,IE,NA	341.59	482.50	NO	5.22	NO	NO	2800.14
A. Mineral industry	1320.13								1320.13
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	69.14	NA	NA						69.14
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				482.50	NO	NO	NO	NO	482.50
G. Other product manufacture and use	NO	NO	30.24	NO	NO	5.22	NO	NO	35.46
H. Other	NA	NA	NA						NA
3. Agriculture	69.34	1636.93	1173.35						2879.62
A. Enteric fermentation		1191.55							1191.55
B. Manure management		445.38	167.60						612.98
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1005.75						1005.75
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⁾	-5539.01	13.96	90.51						-5434.54
A. Forest land	-5407.07	9.82	6.48						-5390.77
B. Cropland	233.54	2.58	7.21						243.33
C. Grassland	-118.11	1.57	1.70						-114.84
D. Wetlands	12.64	NO	1.94						14.58
E. Settlements	546.08	NO	73.17						619.25
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	1870.65	93.00						1963.69
A. Solid waste disposal	NA,NO	1670.06							1670.06
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		193.10	87.64						280.74
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	359.45	0.07	2.95						362.48
Aviation	354.08	0.06	2.91						357.05
Navigation	5.37	0.01	0.04						5.42
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	6010.65								6010.65
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4246.97								4246.97
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24247.42
Total CO₂ equivalent emissions with land use, land-use change and forestry									18812.88
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 A5.2-27: GHG emission in Croatia, 2016

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2016
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	12442.81	4232.44	1676.03	483.53	NO	6.39	NO	NO	18841.20
1. Energy	16168.03	585.59	212.90						16966.52
A. Fuel combustion (sectoral approach)	15945.51	382.61	212.69						16540.81
1. Energy industries	4846.79	5.45	23.03						4875.27
2. Manufacturing industries and construction	2207.24	2.87	5.21						2215.33
3. Transport	6101.45	11.87	60.06						6173.38
4. Other sectors	2790.02	362.42	124.40						3276.83
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	222.52	202.98	0.21						425.71
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	222.52	202.98	0.21						425.71
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1838.29	NO,NE,IE,NA	165.38	483.53	NO	6.39	NO	NO	2493.59
A. Mineral industry	1215.21								1215.21
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	74.16	NA	NA						74.16
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				483.53	NO	NO	NO	NO	483.53
G. Other product manufacture and use	NO	NO	56.02	NO	NO	6.39	NO	NO	62.41
H. Other	NA	NA	NA						NA
3. Agriculture	76.17	1621.17	1119.58						2816.92
A. Enteric fermentation		1178.49							1178.49
B. Manure management		442.68	164.20						606.88
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	955.38						955.38
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⁾	-5639.72	8.92	87.17						-5543.63
A. Forest land	-5515.38	7.42	4.89						-5503.06
B. Cropland	311.41	0.05	5.62						317.08
C. Grassland	-215.63	1.44	1.57						-212.62
D. Wetlands	10.79	NO	1.65						12.44
E. Settlements	532.50	NO	73.44						605.94
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	2016.76	91.00						2107.80
A. Solid waste disposal	NO,NA	1716.34							1716.34
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		296.67	88.31						384.98
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	5893.14								5893.14
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4373.62								4373.62
Indirect N₂O			NO,NA						
Indirect CO₂⁽³⁾	NO,NA								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24384.83
Total CO₂ equivalent emissions with land use, land-use change and forestry									18841.20
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
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GREENHOUSE GAS SOURCE AND	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
SINK CATEGORIES	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	13751.31	4177.49	1829.27	488.71	NO	6.39	NO	NO	20253.17
1. Energy	16560.14	574.52	214.56						17349.21
A. Fuel combustion (sectoral approach)	16264.30	374.22	214.35						16852.87
1. Energy industries	4464.77	6.91	21.55						4493.22
2. Manufacturing industries and construction	2408.17	3.51	6.25						2417.93
3. Transport	6569.86	11.49	63.79						6645.14
4. Other sectors	2821.50	352.31	122.76						3296.57
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	295.84	200.30	0.21						496.34
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	295.84	200.30	0.21						496.34
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2075.51	NO,NE,IE,NA	160.93	488.71	NO	6.39	NO	NO	2731.53
A. Mineral industry	1438.62								1438.62
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	68.22	NA	NA						68.22
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				488.71	NO	NO	NO	NO	488.71
G. Other product manufacture and use	NO	NO	62.33	NO	NO	6.39	NO	NO	68.72
H. Other	NA	NA	NA						NA
3. Agriculture	81.13	1530.58	1232.93						2844.64
A. Enteric fermentation		1106.92							1106.92
B. Manure management		423.66	153.53						577.19
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1079.40						1079.40
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									
4. Land use, land-use change and forestry⁽¹⁾	-4965.46	69.23	129.64						-4766.58
A. Forest land	-4599.37	61.21	40.36						-4497.80
B. Cropland	259.08	0.48	5.99						265.54
C. Grassland	-160.46	7.54	8.21						-144.71
D. Wetlands	8.95	NO	1.35						10.30
E. Settlements	534.60	NO	73.73						608.33
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	2003.15	91.21						2094.36
A. Solid waste disposal	NO,NA	1775.23							1775.23
B. Biological treatment of solid waste		3.75	2.68						6.43
C. Incineration and open burning of waste	NO	NO,NA	NO,NA						NO,NA
D. Waste water treatment and discharge		224.17	88.53						312.70
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	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
CO ₂ emissions from biomass	5906.62								5906.62
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	4486.55								4486.55
Indirect N ₂ O			NO,NA						
Indirect CO ₂ ⁽³⁾	NO,NA								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									25019.75
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20253.17
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

Table 5.3-1: National net calorific values, CO₂ emission factors and oxidation factors for 2016 (needed for monitoring and reporting on CO₂ emission)

Fuel		DOV Unit	2016	CO ₂ Emission factor (t CO ₂ /TJ)	Oxidation factor (OF)
Motorni benzin	Motor Gasoline	GJ/t	44.5900	69.30	1
Aviobenzin	Aviation Gasoline	GJ/t	44.5900	70.00	1
Kerozin (Mlazno gorivo)	Jet Kerosene	GJ/t	43.9600	71.50	1
Dizel i ekstra lako loživo ulje (plinsko ulje)	Gas/Diesel Oil	GJ/t	42.7100	74.10	1
Loživo ulje i srednje loživo ulje	Residual Fuel Oil	GJ/t	40.1900	77.40	1
Ukapljeni naftni plin	Liquefield 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 bituminouse coal Industry	GJ/t	27.2800	94.60	1
Kameni ugljen- Termoelektrane	Other bituminouse coal Thermal power plant	GJ/t	24.8500	94.60	1
Ugljen za proizvodnju koksa (koksni ugljen)	Coking coal	GJ/t	28.2000	94.60	1
Mrki ugljen (smeđi ugljen) Industrija	Sub bituminouse coal Industry	GJ/t	19.6000	96.10	1
Lignit	Lignite	GJ/t	11.8000	101.00	1
Briketi kamenog ugljena	Brown coal briquettes	GJ/t	20.7000	97.50	1
Koks	Coke oven coke	GJ/t	29.3100	107.00	1
Prirodni plin	Natural Gas	GJ/10 ³ m ³	34.7000	56.10	1
Gradski plin	Gas Works Gas	GJ/t	38.7000	44.40	1
Koksni plin	Coke Oven Gas	GJ/t	38.7000	44.40	1
Rafinerijski plin	Refinery Gas	GJ/t	42.6000	57.60	1

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

Napomene:

- podcrtane vrijednosti za DOV su preuzete iz 2006 IPCC Vodiča jer u 2016. godini u Nacionalnoj energetske bilanci nisu specificirane

Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2017.

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	202.27	NO	NO	202.2666383	NO	NO	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy	CO	201.45	201.71	-0.26	0.00	201.71	0.26	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
A. Fuel combustion (sector)	CO	180.70	180.96	-0.26	0.00	180.96	0.26	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	1.39	1.39	0.00	0.00	1.39	0.00	0.00	
2. Manufacturing industries and construction	CO	11.68	11.68	0.00	0.00	11.68	0.00	0.00	
3. Transport	CO	36.52	36.79	-0.26	-0.01	36.79	0.26	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	131.11	131.11	0.00	0.00	131.11	0.00	0.00	
5. Other	CO	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from energy production	CO	20.75	20.75	0.00	0.00	20.75	0.00	0.00	
1. Solid fuels	CO	NO	NO	NO	NO	NO	NO	NO	
and other emissions from energy production	CO	20.75	20.75	0.00	0.00	20.75	0.00	0.00	
2. Industrial processes and other	CO	0.06		0.06	#DIV/0!	0.06	0.00	0.00	Data for 2016 were used by mistake. It will be corrected in next submission
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	0.06	0.04	0.02	0.41	0.04	-0.02	-0.41	Data for 2016 were used by mistake. It will be corrected in next submission
D. Non-energy products from manufacturing	CO	0.00	NO	NO	NO	NO	NO	NO	
G. Other product manufacturing	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,NA		NO	NO	0.00	NO	NO	
A. Solid waste disposal	CO	NO,NA		NO	NO	0.00	NO	NO	
B. Biological treatment of waste	CO	NE,NA		NO	NO	0.00	NO	NO	
C. Incineration and open burning	CO	NO	0.00078	NO	NO	0.00	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment	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	11.99	NO	NO	NO	NO	NO	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy	SO2	11.78	11.81	-0.03	0.00	11.78	0.26	2.25	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	SO2	7.72	7.75	-0.03	0.00	7.72	0.26	3.43	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy industries	SO2	4.62	4.62	0.00	0.00	4.62	0.00	0.00	
2. Manufacturing industries and construction	SO2	1.95	1.95	0.00	0.00	1.95	0.00	0.00	
3. Transport	SO2	0.09	0.12	-0.03	-0.26	0.09	0.00	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
4. Other sectors	SO2	1.06	1.06	0.00	0.00	1.06	0.00	0.00	
5. Other	SO2	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	SO2	4.06	4.06	0.00	0.00	4.06	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	4.06	4.06	0.00	0.00	4.06	0.00	0.00	
2. Industrial processes and product use	SO2	NO		NO	NO	NO		NO	Data for 2016 were used by mistake. It will be corrected in next submission
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	0.41	0.00	0.00	0.00	Data for 2016 were used by mistake. It will be corrected in next submission
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	0.00065	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 (CLRTAP) inventory (in kt)	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		NO	50.69	NO	NO	50.69	NO	NO	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy		45.05	45.17	-0.12	0.00	45.17	-0.12	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)	NOx	44.88	45.01	-0.12	0.00	45.01	-0.12	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy industries	NOx	4.35	4.35	0.00	0.00	4.35	0.00	0.00	
2. Manufacturing industries and construction	NOx	5.49	5.49	0.00	0.00	5.49	0.00	0.00	
3. Transport	NOx	24.99	25.12	-0.12	0.00	25.12	-0.12	0.00	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
4. Other sectors	NOx	10.06	10.06	0.00	0.00	10.06	0.00	0.00	
5. Other	NOx	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	NOx	0.16	0.16	0.00	0.00	0.16	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	0.16	0.16	0.00	0.00	0.16	0.00	0.00	
2. Industrial processes and product use	NOx	1.20	1.21	-0.01	-0.01	1.21	-0.01	-0.01	Data for 2016 were used by mistake. It will be corrected in next submission
A. Mineral industry	NOx	NO	NO	NO	NO	NO	NO	NO	
B. Chemical industry	NOx	1.20	1.20	0.00	0.00	1.20	0.00	0.00	
C. Metal industry	NOx	0.00	0.00	0.00	0.41	0.00	0.00	0.41	Data for 2016 were used by mistake. It will be corrected in next submission
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	4.30	-1.87	-0.43	4.30	-1.87	-0.43	data from 2016 are used. It will be corrected for march submission
B. Manure management	NOx	0.11	0.11	2.49	23.68	0.11	NO	NO	
D. Agricultural soils	NOx	2.43	2.43	0.00	0.00	2.43	0.00	0.00	
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	NO	0.00	NO	NO	
B. Biological treatment of solid waste	NOx	NE,NA	NO	NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NOx	NO	0.00466	NO	NO	0.00	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NOx	NO,NA	NO	NO	NO	0.00	NO	NO	
E. Other	NOx	NO	NO	NO	NO	0.00	NO	NO	
6. Other	NOx	NO	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 (CLRTAP) inventory (in kt)	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		61.27	64.56	-3.28	-5%	64.56	-3.28	-5%	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy	NMVOC	27.55	28.65	-1.09	-0.04	28.65	-1.09	-0.04	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
A. Fuel combustion (sectoral approach)	NMVOC	24.03	25.13	-1.09	-0.04	25.13	-1.09	-0.04	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
1. Energy industries	NMVOC	0.37	0.37	0.00	0.00	0.37	0.00	0.00	
2. Manufacturing industries and construction	NMVOC	1.12	1.12	0.00	0.00	1.12	0.00	0.00	
3. Transport	NMVOC	5.59	6.68	-1.09	-0.16	6.68	-1.09	-0.16	In LRTAP report International aviation is reported in total country emissions while in GHG inventory those emissions are excluded
4. Other sectors	NMVOC	16.95	16.95	0.00	0.00	16.95	0.00	0.00	
5. Other	NMVOC	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	NMVOC	3.52	3.52	0.00	0.00	3.52	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	3.52	3.52	0.00	0.00	3.52	0.00	0.00	
2. Industrial processes and product use	NMVOC	23.98	24.96	-0.98	-0.04	24.96	-0.98	-0.04	Data for 2016 were used by mistake. It will be corrected in next submission
A. Mineral industry	NMVOC	NO	0.02	NO	NO	0.02	NO	NO	
B. Chemical industry	NMVOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. Metal industry	NMVOC	0.00	0.00	0.00	0.30	0.00	0.00	0.30	Data for 2016 were used by mistake. It will be corrected in next submission
D. Non-energy products from fuels and solvent use	NMVOC	18.59	18.59	0.00	0.00	18.59	0.00	0.00	
G. Other product manufacture and use	NMVOC	NO	0.96	NO	NO	0.96	NO	NO	
H. Other	NMVOC	5.38	5.38	0.00	0.00	5.38	0.00	0.00	
3. Agriculture	NMVOC	6.98	8.18	-1.21	-0.15	8.18	-1.21	-0.15	data from 2016 are used. It will be corrected for march submission
B. Manure management	NMVOC	6.35	7.56	-1.21	-0.16	7.56	-1.21	-0.16	data from 2016 are used. It will be corrected for march submission
D. Agricultural soils	NMVOC	0.63	0.63	0.00	0.00	0.63	0.00	0.00	
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	2.76	2.77	0.00	0.00	2.77	0.00	0.00	
A. Solid waste disposal	NMVOC	2.76	2.77	0.00	0.00	2.77	0.00	0.00	
B. Biological treatment of solid waste	NMVOC	NE,NA	NO	NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NMVOC	NO	0.0011	NO	NO	0.00	NO	NO	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NMVOC	0.00	0.00	0.00	#DIV/0!	0.00	0.00	#DIV/0!	
E. Other	NMVOC	NO	NO	NO	NO	0.00	NO	NO	
6. Other	NMVOC	NO	NO	NO	NO	0.00	NO	NO	

ANNEX 5-5: REPORTING ON RECALCULATIONS OF THE 2016 AND 1990

Recalculated year	2016	Note: Replicate table below if more gases need reporting.					
Greenhouse gas	CO2	Previous submission (CO2-submission (CO2-Difference (CO2- eq, kt)	Latest submission (CO2-submission (CO2-Difference (CO2- eq, kt)	Difference(1) %	Impact or recalculation on total emissions excluding	Impact or recalculation on total emissions including	Explanation for recalculations
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH4						
double counted emissions from scrubbing process, technical corrections (corrected data input errors; new methodology used for emissions from lime production in sugar factories), corrections in litter estimation; estimation for the dead wood pool has been performed; corrections in emissions due to							
Total National Emissions and Removals	CO2	12,681.13	12,442.81	-238.3182594	-2%	-1%	-1% the fires
1. Energy	CO2	16,275.96	16,168.03	-107.9315954	-1%	0%	-1% double counted emissions from scrubbing process
A. Fuel combustion activities	CO2	15,987.55	15,945.51	-42.04359544	0%	0%	0%
1. Energy industries	CO2	4,888.84	4,846.79	-42.04359544	0%	0%	0%
2. Manufacturing industries and construction	CO2	2,207.24	2,207.24	0	0%	0%	0%
3. Transport	CO2	6,101.45	6,101.45	0	0%	0%	0%
4. Other sectors	CO2	2,790.02	2,790.02	0	0%	0%	0%
5. Other	CO2	NO,IE	NO,IE	NO	NO	NO	NO
B. Fugitive Emissions from Fuels	CO2	288.41	222.52	-65.888	-1%	0%	0% double counted emissions from scrubbing process
1. Solid fuels	CO2	NO	NO	NO	NO	NO	NO
2. Oil and natural gas	CO2	288.41	222.52	-65.888	-1%	0%	0% double counted emissions from scrubbing process
C. CO2 transport and storage	CO2	NO	NO	NO	NO	NO	NO
2. Industrial processes and product use	CO2	1,868.41	1,838.29	-30.12143089	0%	0%	0% technical corrections (corrected data input errors; new methodology used for emissions from lime
technical corrections (corrected data input errors; new methodology used for emissions from lime production in sugar factories)							
A. Mineral industry	CO2	1,238.07	1,215.21	-22.85693224	0%	0%	0%
B. Chemical industry	CO2	547.86	547.86	-0.0013065	0%	0%	0%
C. Metal industry	CO2	1.05	1.05	0	0%	0%	0%
D. Non-energy products from fuels and solvent use	CO2	81.42	74.16	-7.26319215	0%	0%	0% some errors were corrected
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	76.18	76.17	-0.018185305	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
Recalculation was performed for the year 2016 due to a correction of minor error in conversion of							
G. Liming	CO2	11.22	11.20	-0.018185305	0%	0%	0% emission to CO2-C to CO2
H. Urea application	CO2	64.96	64.96	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
corrections in litter estimation; estimation for the dead wood pool has been performed; corrections							
4. Land use, land-use change and forestry (net) (4)	CO2	-5,539.47	-5,639.72	-100.2470478	-1%	0%	-1% in emissions due to the fires
corrections in litter estimation; estimation for the dead wood pool has been performed; corrections							
A. Forestland	CO2	-5,551.34	-5,515.38	35.96497407	0%	0%	0% in emissions due to the fires
B. Cropland	CO2	307.40	311.41	4.007806143	0%	0%	0% corrections in litter estimation; estimation for the dead wood pool has been performed;
C. Grassland	CO2	-215.63	-215.63	0	0%	0%	0%
D. Wetlands	CO2	10.79	10.79	0	0%	0%	0%
E. Settlements	CO2	672.72	532.50	-140.219828	-1%	-1%	-1% corrections in litter estimation; estimation for the dead wood pool has been performed;
F. Other land	CO2	NO	NO	NO	NO	NO	NO
G. Harvested wood products	CO2	-763.42	-763.42	0	0%	0%	0%
H. Other	CO2	NO	NO	NO	NO	NO	NO
5. Waste	CO2	0.05	0.05	0	0%	0%	0%
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	0.05	0.05	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	388.96	388.96	0	0%	0%	0%
Aviation	CO2	375.75	375.75	0	0%	0%	0%
Navigation	CO2	13.21	13.21	0	0%	0%	0%
Multilateral operations	CO2	C	C	NO	NO	NO	NO
CO2 emissions from biomass	CO2	5,893.14	5,893.14	0	0%	0%	0%
CO2 captured	CO2	NO	NO	NO	NO	NO	NO
Long-term storage of C in waste disposal sites	CO2	NE	4,373.62	NO	NO	NO	NO

Recalculated year	2016								
Greenhouse gas	CH4								
Note: Replicate table below if more gases need reporting.									
	Gas (CO2, N2O, CH4)	Previous submission (CO2-submission eq, kt)	Latest submission (CO2-submission eq, kt)	CO2-Difference (CO2-Difference 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 CATEGORY	CH4								
Total National Emissions and Removals	CH4	3,959.84	4,232.44	272.6047633	6%	1%	1%	New and corrected data are included.	
1. Energy	CH4	585.59	585.59	0	0%	0%	0%		
A. Fuel combustion activities	CH4	382.61	382.61	0	0%	0%	0%		
1. Energy industries	CH4	5.45	5.45	0	0%	0%	0%		
2. Manufacturing industries and construction	CH4	2.87	2.87	0	0%	0%	0%		
3. Transport	CH4	11.87	11.87	0	0%	0%	0%		
4. Other sectors	CH4	362.42	362.42	0	0%	0%	0%		
5. Other	CH4	NO,IE	NO,IE	NO	NO	NO	NO		
B. Fugitive Emissions from Fuels	CH4	202.98	202.98	0	0%	0%	0%		
1. Solid fuels	CH4	NO	NO	NO	NO	NO	NO		
2. Oil and natural gas	CH4	202.98	202.98	0	0%	0%	0%		
C. CO2 transport and storage	CH4	NO		NO	NO	NO	NO		
2. Industrial processes and product use	CH4	0.15	NO,NE,IE,NA	NO	NO	NO	NO		
A. Mineral industry	CH4			NO	NO	NO	NO		
B. Chemical industry	CH4	0.15	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	1,616.92	1,621.17	4.251241319	0%	0%	0%	new data are included	
A. Enteric fermentation	CH4	1,175.51	1,178.49	2.9832225	0%	0%	0%	new data are included	
B. Manure management	CH4	441.42	442.68	1.268018819	0%	0%	0%	new data are included	
C. Rice cultivation	CH4	NO	NO	NO	NO	NO	NO		
D. Agricultural soils	CH4	NA	NA	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	8.92	8.92	0	0%	0%	0%		
A. Forestland	CH4	7.42	7.42	0	0%	0%	0%		
B. Cropland	CH4	0.05	0.05	0	0%	0%	0%		
C. Grassland	CH4	1.44	1.44	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	1,748.25	2,016.76	268.5067753	6%	1%	1%	New and corrected data are included.	
A. Solid waste disposal	CH4	1,278.72	1,716.34	437.6217063	10%	2%	2%	New data on industrial waste and sludge are included.	
B. Biological treatment of solid waste	CH4	2.74	3.75	1.005244	0%	0%	0%	Corrected data are included.	
C. Incineration and open burning of waste	CH4	NO,NA	NO,NA	NO	NO	NO	NO		
D. Waste water treatment and discharge	CH4	466.79	296.67	-170.120175	-4%	-1%	-1%	New data on sludge removed are included.	
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	0.06	0.10	0.03073035	0%	0%	0%		
Aviation	CH4	0.03	0.06	0.034056488	0%	0%	0%		
Navigation	CH4	C	0.03	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		

Recalculated year	2016							
Greenhouse gas	N2O							
Note: Replicate table below if more gases need reporting.								
GREENHOUSE GAS SOURCE AND SINK CATEGORY	Gas	Previous	Latest	Difference (C)	Difference(1)	Impact of	Impact of	Explanation for recalculations
Total National Emissions and Removals	N2O	1,814.96	1,676.03	-138.9343393	-3%	-1%	-1%	new data are included, National (new) values for C/N ratio for FL-CL and GL-CL, GL-SL, CL-SL and FL-SL
1. Energy	N2O	212.90	212.90	0	0%	0%	0%	
A. Fuel combustion activities	N2O	212.69	212.69	0	0%	0%	0%	
1. Energy industries	N2O	23.03	23.03	0	0%	0%	0%	
2. Manufacturing industries and construction	N2O	5.21	5.21	0	0%	0%	0%	
3. Transport	N2O	60.06	60.06	0	0%	0%	0%	
4. Other sectors	N2O	124.40	124.40	0	0%	0%	0%	
5. Other	N2O	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	N2O	0.21	0.21	0	0%	0%	0%	
1. Solid fuels	N2O	NO,NA	NO,NA	NO	NO	NO	NO	
2. Oil and natural gas	N2O	0.21	0.21	0	0%	0%	0%	
C. CO2 transport and storage	N2O	NO		NO	NO	NO	NO	
2. Industrial processes and product use	N2O	165.56	165.38	-0.18296495	0%	0%	0%	
A. Mineral industry	N2O			NO	NO	NO	NO	
B. Chemical industry	N2O	109.54	109.36	-0.18296495	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	56.02	56.02	0	0%	0%	0%	
H. Other	N2O	NA	NA	NO	NO	NO	NO	
3. Agriculture	N2O	1,237.84	1,119.58	-118.2573226	-3%	0%	-1%	new data are included
A. Enteric fermentation	N2O			NO	NO	NO	NO	
B. Manure management	N2O	164.19	164.20	0.005136125	0%	0%	0%	
C. Rice cultivation	N2O			NO	NO	NO	NO	
D. Agricultural soils	N2O	1,073.64	955.38	-118.2624587	-3%	0%	-1%	new data are included
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	108.38	87.17	-21.21300221	-1%	0%	0%	new value for carbon stock in soil carbon stock in unseald areas of SL
A. Forestland	N2O	4.89	4.89	0	0%	0%	0%	
B. Cropland	N2O	5.83	5.62	-0.208874997	0%	0%	0%	difference noticed and will be corrected in next submission after QC check
C. Grassland	N2O	1.57	1.57	0	0%	0%	0%	
D. Wetlands	N2O	1.65	1.65	0	0%	0%	0%	
E. Settlements	N2O	94.44	73.44	-21.00412721	0%	0%	0%	new value for carbon stock in soil carbon stock in unseald areas of SL
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	90.28	91.00	0.718950509	0%	0%	0%	Corrected data are included.
A. Solid waste disposal	N2O			NO	NO	NO	NO	
B. Biological treatment of solid waste	N2O	1.96	2.68	0.718950509	0%	0%	0%	Corrected data are included.
C. Incineration and open burning of waste	N2O	NO,IE,NA	NO,IE,NA	NO	NO	NO	NO	
D. Waste water treatment and discharge	N2O	88.31	88.31	0	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	3.19	3.19	0	0%	0%	0%	
Aviation	N2O	3.09	3.09	0	0%	0%	0%	
Navigation	N2O	0.10	0.10	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	

Recalculated year	1990							
Greenhouse gas	CO2							
Note: Replicate table below if more gases need reporting.								
	Gas	Previous submission (CO2, N2O, CH4)	Latest submission (CO2-submission (CO2-Difference (CO2-		Impact of recalculation on total emissions excluding	Impact of recalculation on total emissions including		
GREENHOUSE GAS SOURCE AND SINK CATEGORY	CH4	eq, kt)	eq, kt)	Difference(1)				Explanation for recalculations
Total National Emissions and Removals	CO2	16,788.34	16,648.18	-140.1628084	-1%	0%	-1%	double counted emissions from scrubbing process, technical correction
1. Energy	CO2	20,758.79	20,656.68	-102.1102046	-1%	0%	0%	double counted emissions from scrubbing process
A. Fuel combustion activities	CO2	20,078.93	20,056.11	-22.8182046	0%	0%	0%	
1. Energy industries	CO2	7,071.41	7,048.59	-22.8182046	0%	0%	0%	
2. Manufacturing industries and construction	CO2	5,501.67	5,501.67	0	0%	0%	0%	
3. Transport	CO2	3,786.94	3,786.94	0	0%	0%	0%	
4. Other sectors	CO2	3,718.91	3,718.91	0	0%	0%	0%	
5. Other	CO2	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	CO2	679.85	600.56	-79.292	0%	0%	0%	double counted emissions from scrubbing process
1. Solid fuels	CO2	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas	CO2	679.85	600.56	-79.292	0%	0%	0%	double counted emissions from scrubbing process
C. CO2 transport and storage	CO2	NO	NO	NO	NO	NO	NO	
2. Industrial processes and product use	CO2	2,632.62	2,629.87	-2.757802891	0%	0%	0%	technical corrections (additional data included; calculation errors corrected)
A. Mineral industry	CO2	1,280.88	1,310.39	29.51034918	0%	0%	0%	technical corrections (additional data included; calculation errors corrected)
B. Chemical industry	CO2	778.44	751.10	-27.3372034	0%	0%	0%	higher tier applied for emissions from carbon black production
C. Metal industry	CO2	336.40	336.40	0	0%	0%	0%	
D. Non-energy products from fuels and solvent use	CO2	231.98	231.98	0	0%	0%	0%	
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	NO	
B. Manure management	CO2		NO	NO	NO	NO	NO	
C. Rice cultivation	CO2		NO	NO	NO	NO	NO	
D. Agricultural soils	CO2		NO	NO	NO	NO	NO	
E. Prescribed burning of savannahs	CO2		NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	CO2		NO	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	-6,653.63	-6,688.92	-35.29480092	0%	0%	0%	corrections in litter estimation; estimation for the dead wood pool
A. Forestland	CO2	-6,723.94	-6,718.09	5.845788494	0%	0%	0%	corrections in litter estimation; estimation for the dead wood pool
B. Cropland	CO2	220.04	220.04	0	0%	0%	0%	corrections in litter estimation; estimation for the dead wood pool has
C. Grassland	CO2	-101.85	-101.85	0	0%	0%	0%	
D. Wetlands	CO2	46.78	46.78	0	0%	0%	0%	
E. Settlements	CO2	206.89	165.75	-41.14058941	0%	0%	0%	corrections in litter estimation; estimation for the dead wood pool has
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	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	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	5,126.24	0	0%	0%	0%	
CO2 captured	CO2	NO	NO	NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	CO2	NE	1,717.23	NO	NO	NO	NO	
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)	recalculation on total emissions excluding LULUCF (2) %	recalculation on total emissions including LULUCF (3) %		
GREENHOUSE GAS SOURCE AND SINK CATEGORY	CH4	eq, kt	eq, kt	Difference (1)	LULUCF (2) %	LULUCF (3) %	Explanation for recalculations	
Total National Emissions and Removals	CH4	4,355.72	4,425.20	69.47698268	2%	0%	0% New data are included.	
1. Energy	CH4	842.81	842.81	0	0%	0%	0%	
A. Fuel combustion activities	CH4	413.91	413.91	0	0%	0%	0%	
1. Energy industries	CH4	5.42	5.42	0	0%	0%	0%	
2. Manufacturing industries and construction	CH4	9.73	9.73	0	0%	0%	0%	
3. Transport	CH4	41.10	41.10	0	0%	0%	0%	
4. Other sectors	CH4	357.67	357.67	0	0%	0%	0%	
5. Other	CH4	NO,IE	NO,IE	NO	NO	NO		
B. Fugitive Emissions from Fuels	CH4	428.90	428.90	0	0%	0%	0%	
1. Solid fuels	CH4	59.64	59.64	0	0%	0%	0%	
2. Oil and natural gas	CH4	369.26	369.26	0	0%	0%	0%	
C. CO2 transport and storage	CH4	NO		NO	NO	NO		
2. Industrial processes and product use	CH4	9.53	9.48	-0.045936	0%	0%	0%	
A. Mineral industry	CH4			NO	NO	NO		
B. Chemical industry	CH4	5.63	5.58	-0.045936	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		
G. Other product manufacture and use	CH4	NO	NO	NO	NO	NO		
H. Other	CH4	NA	NA	NO	NO	NO		
3. Agriculture	CH4	2,586.16	2,587.66	1.499559813	0%	0%	0%	
A. Enteric fermentation	CH4	2,171.55	2,171.55	0	0%	0%	0%	
B. Manure management	CH4	414.61	416.11	1.499559813	0%	0%	0% New data are included.	
C. Rice cultivation	CH4	NO	NO	NO	NO	NO		
D. Agricultural soils	CH4	NA	NA	NO	NO	NO		
E. Prescribed burning of savannahs	CH4	NO	NO	NO	NO	NO		
F. Field burning of agricultural residues	CH4	NO	NO	NO	NO	NO		
G. Liming	CH4			NO	NO	NO		
H. Urea application	CH4			NO	NO	NO		
I. Other carbon-containing fertilizer	CH4			NO	NO	NO		
J. Other	CH4	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		
C. Grassland	CH4	0.11	0.11	0	0%	0%	0%	
D. Wetlands	CH4	NO	NO	NO	NO	NO		
E. Settlements	CH4	NO	NO	NO	NO	NO		
F. Other land	CH4	NO	NO	NO	NO	NO		
G. Harvested wood products	CH4			NO	NO	NO		
H. Other	CH4	NO	NO	NO	NO	NO		
5. Waste	CH4	915.99	984.01	68.02335887	2%	0%	0% New data are included.	
A. Solid waste disposal	CH4	348.61	539.01	190.403404	4%	1%	1% New data on industrial waste and sludge are included.	
B. Biological treatment of solid waste	CH4	NO,NE,IE	NO,NE,IE	NO	NO	NO		
C. Incineration and open burning of waste	CH4	NA,NO	NA,NO	NO	NO	NO		
D. Waste water treatment and discharge	CH4	567.38	445.00	-122.3800452	-3%	0%	0% New data on sludge removed are included.	
E. Other	CH4	NO	NO	NO	NO	NO		
6. Other (As specified in summary 1.A)	CH4	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		
CO2 captured	CH4	NO		NO	NO	NO		
Long-term storage of C in waste disposal sites	CH4	NE		NO	NO	NO		
Indirect N2O				NO	NO	NO		
Indirect CO2				NO	NO	NO		

Recalculated year	1990							
Greenhouse gas	N2O							
Note: Replicate table below if more gases need reporting.								
GREENHOUSE GAS SOURCE AND SINK CATEGORY	Gas	Previous	Latest	Difference (CC)	Difference(1)	Impact of	Impact of	Explanation for recalculations
Total National Emissions and Removals	N2O	2,885.89	2,879.67	-6.221165805	0%	0%	0%	National (new) values for C/N ratio for GL-CL, GL-SL, CL-SL and FL-SL
1. Energy	N2O	230.24	230.24	0	0%	0%	0%	
A. Fuel combustion activities	N2O	229.55	229.55	0	0%	0%	0%	
1. Energy industries	N2O	17.49	17.49	0	0%	0%	0%	
2. Manufacturing industries and construction	N2O	17.64	17.64	0	0%	0%	0%	
3. Transport	N2O	53.07	53.07	0	0%	0%	0%	
4. Other sectors	N2O	141.35	141.35	0	0%	0%	0%	
5. Other	N2O	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	N2O	0.69	0.69	0	0%	0%	0%	
1. Solid fuels	N2O	NO,NA	NO,NA	NO	NO	NO	NO	
2. Oil and natural gas	N2O	0.69	0.69	0	0%	0%	0%	
C. CO2 transport and storage	N2O	NO		NO	NO	NO	NO	
2. Industrial processes and product use	N2O	787.80	787.80	0	0%	0%	0%	
A. Mineral industry	N2O			NO	NO	NO	NO	
B. Chemical industry	N2O	754.43	754.43	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	0.11	0.11	0	0%	0%	0%	
H. Other	N2O		NA	NO	NO	NO	NO	
3. Agriculture	N2O	1,762.15	1,761.97	-0.182326171	0%	0%	0%	
A. Enteric fermentation	N2O			NO	NO	NO	NO	
B. Manure management	N2O	361.58	361.58	0	0%	0%	0%	
C. Rice cultivation	N2O			NO	NO	NO	NO	
D. Agricultural soils	N2O	1,400.57	1,400.39	-0.182326171	0%	0%	0%	
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	38.80	32.76	-6.038839634	0%	0%	0%	National (new) values for C/N ratio for GL-CL, GL-SL, CL-SL and FL-SL
A. Forestland	N2O	0.74	0.74	0	0%	0%	0%	
B. Cropland	N2O	3.95	3.95	-2.98E-09	0%	0%	0%	0 difference noticed and will be corrected in next submission after QC check
C. Grassland	N2O	0.12	0.12	0	0%	0%	0%	
D. Wetlands	N2O	6.23	6.23	0	0%	0%	0%	
E. Settlements	N2O	27.76	21.72	-6.038839631	0%	0%	0%	new value for carbon stock in soil carbon stock in unsealed areas of SL
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	66.89	66.89	0	0%	0%	0%	
A. Solid waste disposal	N2O			NO	NO	NO	NO	
B. Biological treatment of solid waste	N2O	NO,NE,IE	NO,NE,IE	NO	NO	NO	NO	
C. Incineration and open burning of waste	N2O	0.01	0.01	0	0%	0%	0%	
D. Waste water treatment and discharge	N2O	66.88	66.88	0	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	4.14	5.29	1.15433876	0%	0%	0%	
Aviation	N2O	1.15	4.14	2.98528652	0%	0%	0%	
Navigation	N2O	C	1.15	NO	NO	NO	NO	
Multilateral operations	N2O	C		NO	NO	NO	NO	
CO2 emissions from biomass	N2O	0.00		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			NA,NO	NO	NO	NO	NO	
Indirect CO2				NO	NO	NO	NO	
				NO	NO	NO	NO	

Recalculated year	2016								
Greenhouse gas	HFC	Note: Replicate table below if more gases need reporting.							
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	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 LULUCF (2) %	Impact of recalculation on total emissions including LULUCF(3) %	Explanation for recalculations	
F-gases: Total actual Emissions	HFC	419.67	483.53	63.86185941	15%	NO	0%	Saturday paper issue	
2.B.9. Fluorochemical production	HFC	NO	NO	NO	NO	NO	NO		
2.B.10. Other	HFC	NO	NO	NO	NO	NO	NO		
2.C.3. Aluminium production	HFC	NO	NO	NO	NO	NO	NO		
2.C.4. Magnesium production	HFC	NO	NO	NO	NO	NO	NO		
2.C.7. Other	HFC	NO	NO	NO	NO	NO	NO		
2.E.1. Integrated circuit or semiconductor	HFC	NO	NO	NO	NO	NO	NO		
2.E.2. TFT flat panel display	HFC	NO	NO	NO	NO	NO	NO		
2.E.3. Photovoltaics	HFC	NO	NO	NO	NO	NO	NO		
2.E.4. Heat transfer fluid	HFC	NO	NO	NO	NO	NO	NO		
2.E.5. Other (as specified in table 2(II))	HFC	NO	NO	NO	NO	NO	NO		
2.F.1. Refrigeration and air conditioning	HFC	406.27	470.13	63.86185941	16%	NO	0%	Saturday paper issue	
2.F.2. Foam blowing agents	HFC	NO	NO	NO	NO	NO	NO		
2.F.3. Fire protection	HFC	4.71	4.71	0	0%	NO	0%		
2.F.4. Aerosols	HFC	8.69	8.69	0	0%	NO	0%		
2.F.5. Solvents	HFC	NO	NO	NO	NO	NO	NO		
2.F.6. Other applications	HFC	NO	NO	NO	NO	NO	NO		
2.G.1. Electrical equipment	HFC	NO	NO	NO	NO	NO	NO		
2.G.2. SF6 and PFCs from other product use	HFC	NO	NO	NO	NO	NO	NO		
2.G.4. Other	HFC	NO	NO	NO	NO	NO	NO		
2.H. Other (please specify)	HFC	NO	NO	NO	NO	NO	NO		

Recalculated year	2016							
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 LULUCF (2) %	Impact of recalculation on total emissions including LULUCF(3) %	Explanation for recalculations
GREENHOUSE GAS SOURCE AND SINK CATEGORY								
F-gases: Total actual Emissions	PFC	NO	NO	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	NO	NO	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	2016								
Greenhouse gas	SF6	Note: Replicate table below if more gases need reporting.							
									</

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 LULUCF (2) %	Impact of recalculation on total emissions including LULUCF(3) %	Explanation for recalculations
GREENHOUSE GAS SOURCE AND SINK CATEGORY								
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.							
					</				

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

Reporting year:		2013			
Total emissions (CO2 -eq)					
Category[1]	Gas	Greenhouse gas inventory emissions [kt]	Verified emissions under Directive 2003/87/EC [kt]	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	24,522.86	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	18,423.25	8,545.51	0.46	
CO2 emissions					
Category[1]		Greenhouse gas inventory emissions [kt]	Verified emissions under Directive 2003/87/EC [kt]	Ratio in % (Verified emissions/inventory emissions)[3]	Comment[2]
1.A Fuel combustion activities, total					
1.A Fuel combustion activities, stationary combustion [4]	CO2	14,863.34	NA	NA	
1.A.1 Energy industries	CO2	9,232.28	7,259.43	78.63%	
1.A.1.a Public electricity and heat production	CO2	5,238.07	4,918.89	93.91%	In inventory data from ETS are not used for emission
1.A.1.b Petroleum refining	CO2	3,614.08	3,493.80	96.67%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO2	1,394.72	1,328.74	95.27%	
1.A.2 Manufacturing industries and construction	CO2	229.27	96.35	42.02%	
1.A.2.a Iron and steel	CO2	2,380.65	2,340.54	98.32%	
1.A.2.b Non-ferrous metals	CO2	58.36	19.83	33.98%	
1.A.2.c Chemicals	CO2	19.93	0.00	NO	
1.A.2.d Pulp, paper and print	CO2	253.20	1,157.79	457.27%	In Inventory emissions from consumption of natural gas
1.A.2.e Food processing, beverages and tobacco	CO2	113.37	60.63	53.49%	
1.A.2.f Non-metallic minerals	CO2	388.01	170.55	43.96%	
1.A.2.g Other	CO2	96.50	931.73	965.50%	In inventory emissions from Construction sector are
1.A.3 Transport	CO2	1,451.29	NO	NO	In Inventory emissions from Construction sector are
1.A.3.e Other transportation (pipeline transport)	CO2	5,631.06	NO	NO	
1.A.4 Other sectors	CO2	NO	NO	NO	
1.A.4.a Commercial / Institutional	CO2	1,143.88	NO	NO	
1.A.4.c Agriculture / Forestry / Fisheries	CO2	508.91	NO	NO	
1.B Fugitive emissions from Fuels	CO2	634.97	NO	NO	
1.C CO2 Transport and storage	CO2	469.67	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	1,285.66	1,270.28	98.80%	
2.A.1 Cement Production	CO2	1,141.03	1,141.03	100.00%	
2.A.2 Lime production	CO2	78.76	74.26	94.29%	
2.A.3 Glass production	CO2	29.48	49.87	169.17%	
2.A.4 Other process uses of carbonates	CO2	36.40	5.12	14.07%	
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					
Category[1]	Gas	Greenhouse gas inventory emissions [kt]	Verified emissions under Directive 2003/87/EC [kt]	Ratio in % (Verified emissions/inventory emissions)[3]	Comment[2]
2.B.2 Nitric acid production	N2O	240.27/17276	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	

Reporting year:		2014			
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	23,732.00	8,387.46	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	17,677.40	8,121.27	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		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	
1.A.2.c Chemicals	CO2	288.09	1,219.60	423.34%	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	71.38	58.79	82.36%	
1.A.2.e Food processing, beverages and tobacco	CO2	399.58	188.06	47.06%	
1.A.2.f Non-metallic minerals	CO2	94.73	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	1,396.07	988.94	70.84%	In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.3 Transport	CO2	5,575.58	27.24	0.49%	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,530.53	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	455.46	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	1,371.16	1,354.10	98.76%	
2.A.1 Cement Production	CO2	1,225.09	1,225.09	100.00%	
2.A.2 Lime production	CO2	77.94	74.72	95.87%	
2.A.3 Glass production	CO2	30.48	43.31	142.06%	
2.A.4 Other process uses of carbonates	CO2	37.65	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					
Category[1]	Gas	Greenhouse gas inventory emissions [kt CO2eq][3]	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	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:		2015			
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	24,216.36	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	17,809.92	8,074.87	0.45	
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		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	
1.A.2.c Chemicals	CO2	294.34	2.99	1.02%	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	70.04	43.21	61.69%	
1.A.2.e Food processing, beverages and tobacco	CO2	350.71	20.75	5.92%	
1.A.2.f Non-metallic minerals	CO2	81.73	2,280.65	2790.53%	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.g Other	CO2	1,363.40	NO	NO	In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.3 Transport	CO2	5,883.52	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2 NO		NO	NO	
1.A.4 Other sectors	CO2	2,719.76	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	255.69	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	1,320.13	1,306.39	98.96%	
2.A.1 Cement Production	CO2	1,169.23	1,169.23	100.00%	
2.A.2 Lime production	CO2	78.90	73.40	93.03%	
2.A.3 Glass production	CO2	30.68	30.68	100.00%	
2.A.4 Other process uses of carbonates	CO2	41.31	33.07	80.06%	
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 NO		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					
Category[1]	Gas	Greenhouse gas inventory emissions [kt CO2eq][3]	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	311.3476689	311.35	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)					
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	24,353.46	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	17,809.60	8,157.76	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	7,276.56	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	7,054.04	6,321.20	89.61%	
					In inventory data from ETS are not used for emission calculation
1.A.1 Energy industries	CO2	4,846.79	4,494.58	92.73%	
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	2,207.24	1,826.62	82.76%	
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	110.23	1,719.81	1560.17%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	1,273.85	NO	NO	
1.A.3 Transport	CO2	6,101.45	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2 NO		NO	NO	
1.A.4 Other sectors	CO2	2,790.02	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	222.52	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	1,215.21	1,201.24	98.85%	
2.A.1 Cement Production	CO2	1,076.51	1,076.51	100.00%	
2.A.2 Lime production	CO2	69.73	63.79	91.47%	
2.A.3 Glass production	CO2	32.62	32.62	100.00%	
2.A.4 Other process uses of carbonates	CO2	36.35	28.32	77.92%	
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					
Category[1]	Gas	Greenhouse gas inventory emissions [kt CO2eq][3]	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	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:		2017			
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	24,988.06	8,367.77	0.33	
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	17,809.29	8,269.17	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	7,168.78	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,872.94	6,132.96	89.23%	
1.A.1 Energy industries	CO2	4,464.77	4,139.85	92.72%	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	1,215.34	89.98%	
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	2,408.17	1,993.11	82.76%	
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	
					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	332.42	2.71	0.82%	
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	19.27	5.38%	
					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	104.54	1,876.58	1795.01%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	1,458.52	2.02	NO	
1.A.3. Transport	CO2	6,569.86	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO2	NO	NO	NO	
1.A.4 Other sectors	CO2	2,821.50	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	295.84	128.55	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	1,438.62	1,425.54	99.09%	
2.A.1 Cement Production	CO2	1,287.25	1,287.25	100.00%	
2.A.2. Lime production	CO2	88.04	82.08	93.23%	
2.A.3. Glass production	CO2	31.90	31.90	100.00%	
2.A.4. Other process uses of carbonates	CO2	31.43	24.31	77.33%	
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					
		Greenhouse gas inventory emissions [kt CO2eq][3]	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	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	

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

Reporting year:	2017		
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	1.A.1.a.	1.A.1.a.i and 1.A.1.a.ii, solid and gaseous fuels	MMR IR-Article9.1 (UNFCCC)
2. Manufacturing industries and construction			
3. Transport			
4. Other sector			
5. Other			
B. Fugitive emissions from fuels			
1. Solid fuels			
2. Oil and natural gas and other emissions from energy production	1.B.2.b Natural gas – Gaseous, CO2	1.B.2.b Natural gas – Gaseous, CO2	MMR IR-Article9.1 (UNFCCC)
C. CO2 transport and storage			

Reporting year:	2017		
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			
B. Chemical industry			
C. Metal industry			
D. Non-energy products from fuels and solvent use			
E. Electronic industry			
F. Product uses as substitutes for ODS	2.F.1 Refrigeration and air conditioning	2.F.1 Refrigeration and air conditioning	MMR IR-Article9.1 (UNFCCC)
G. Other product manufacture and use			
H. Other			

Reporting year:	2017		
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			
B. Manure management			
C. Rice cultivation			
D. Agricultural soils			
E. Prescribed burning of savannahs			
F. Field burning of agricultural residues			
G. Liming			
H. Urea application			
I. Other carbon containing fertilisers			
J. Other			

Reporting year:	2017		
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			
A. Forest land			
B. Cropland			
C. Grassland			
D. Wetlands			
E. Settlements			
F. Other land			
G. Harvested wood products			
H. Other			

Reporting year:	2017		
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.
5. Waste			
A. Solid waste disposal	5.A Solid waste disposal	5.A Solid waste disposal	MMR IR-Article9.1 (UNFCCC)
B. Biological treatment of solid waste			
C. Incineration and open burning of waste			
D. Wastewater treatment and discharge			
E. Other			
6. Other (as specified in Summary 1.A)			

Reporting year:	2017		
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.
KP LULUCF			
Article 3.3 activities			
Afforestation/reforestation			
Deforestation			
Article 3.4 activities			
Forest management			
Cropland management (if elected)			
Grazing land management (if elected)			
Revegetation (if elected)			
Wetland drainage and rewetting (if elected)			



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