

ANNEXES TO THE NATIONAL INVENTORY REPORT

May, 2018

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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 Solid Waste	CH ₄
5.B Biological Treatment of Solid Waste	N ₂ O
5.C Incineration and Open Burning of Waste	CO ₂
5.C Incineration and Open Burning of Waste	N ₂ O
5.D Wastewater Treatment and Discharge	CH ₄
5.D Wastewater Treatment and Discharge	N ₂ O

1.2. Information on the level of disaggregation

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

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

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

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

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	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	1,853.020	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	0.051	63%
2.C.3 Aluminium Production	PFCs	1,240.239	0.039	67%
2.A.1 Cement Production	CO ₂	1,085.790	0.034	70%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	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	603.361	0.019	80%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	0.018	82%
2.B.1 Ammonia Production	CO ₂	558.672	0.018	84%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.016	85%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	0.016	87%
3.B Manure Management	CH ₄	414.613	0.013	88%
3.B Manure Management	N ₂ O	361.580	0.011	89%
5.A Solid Waste Disposal	CH ₄	348.607	0.011	91%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	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	234.749	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	219.763	0.007	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	153.440	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	45.970	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%
2.A.3 Glass Production	CO ₂	35.871	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.001	100%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
1.A.3.c Railways	N ₂ O	13.248	0.000	100%
2.G Other Product Manufacture and Use	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%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	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	5.493	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%
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%

Tier 1 Analysis - Level Assessment

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
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%
2.B.1 Ammonia Production	N ₂ O	0.163	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	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.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		31,894.235		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2016

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.242	24%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.095	34%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.068	40%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.065	47%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.053	52%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.050	57%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.048	62%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.044	66%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.040	70%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.038	74%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.037	78%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.033	81%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.023	84%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.019	85%
3.B Manure Management	CH ₄	414.613	441.416	0.018	87%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.017	89%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.015	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.012	92%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.011	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.010	94%
3.B Manure Management	N ₂ O	361.580	164.193	0.007	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.006	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.005	95%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.004	96%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.004	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.004	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.003	97%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.003	97%
3.H Urea Application	CO ₂	50.020	64.964	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.003	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.002	98%
1.A.3.c Railways	CO ₂	140.079	57.916	0.002	98%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.002	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.002	99%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.002	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.002	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.001	99%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.001	100%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.000	100%
3.G Liming	CO ₂	0.000	11.220	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.000	100%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.661	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 - Gaseous Fuels	N ₂ O	5.715	5.966	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	100%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	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	N ₂ O	0.007	0.000	0.000	100%
TOTAL		31,894.235	24,304.160		

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

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	0.169	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	37%
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	1,853.020	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	0.041	68%
2.C.3 Aluminium Production	PFCs	1,240.239	0.031	71%
2.A.1 Cement Production	CO ₂	1,085.790	0.027	74%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	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	603.361	0.015	82%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	0.014	83%
2.B.1 Ammonia Production	CO ₂	558.672	0.014	84%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.013	86%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	0.013	87%
3.B Manure Management	CH ₄	414.613	0.010	88%
3.B Manure Management	N ₂ O	361.580	0.009	89%
5.A Solid Waste Disposal	CH ₄	348.607	0.009	90%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	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	92%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	0.006	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.006	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.006	94%
4.E.2 Land Converted to Settlements	CO ₂	206.893	0.005	95%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	0.005	95%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.004	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.004	96%
2.A.2 Lime Production	CO ₂	153.440	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	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.001	99%
3.H Urea Application	CO ₂	50.020	0.001	99%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	45.970	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%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	0.001	99%
2.A.3 Glass Production	CO ₂	35.871	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.001	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	0.001	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	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%
4(V) Biomass Burning	CO ₂	8.987	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%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	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	5.493	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%
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%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
4.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%
2.B.1 Ammonia Production	N ₂ O	0.163	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	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.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		39,557.426		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2016

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.183	18%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	5,384.287	0.168	35%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.072	42%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.052	47%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.049	52%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.040	56%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.038	60%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.037	64%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.034	67%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.030	70%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.029	73%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.028	76%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.025	78%
4.G Harvested Wood Products	CO ₂	301.544	763.418	0.024	81%
4.E.2 Land Converted to Settlements	CO ₂	206.893	672.724	0.021	83%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.017	85%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.015	86%
3.B Manure Management	CH ₄	414.613	441.416	0.014	87%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.013	89%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.011	90%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	288.884	0.009	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.009	92%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.008	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.008	93%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	231.014	0.007	94%
4.C.2 Land Converted to Grassland	CO ₂	103.921	217.699	0.007	95%
3.B Manure Management	N ₂ O	361.580	164.193	0.005	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.004	95%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.004	96%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.003	96%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	101.885	0.003	97%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.003	97%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.002	98%
3.H Urea Application	CO ₂	50.020	64.964	0.002	98%
4(V) Biomass Burning	CO ₂	8.987	64.646	0.002	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.002	98%
1.A.3.c Railways	CO ₂	140.079	57.916	0.002	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.002	99%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.002	99%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.002	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.001	99%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.001	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	17.827	0.001	100%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.000	100%
3.G Liming	CO ₂	0.000	11.220	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.000	100%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	10.792	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	8.916	0.000	100%
2.F.4 Aerosols	F-gases	0.000	6.689	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.661	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	6.498	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 - Gaseous Fuels	N ₂ O	5.715	5.966	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	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 (2016) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	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	N ₂ O	0.007	0.000	0.000	100%
TOTAL		39,557.426	32,074.822		

Table A1.3-5: Key categories analysis – Trend Assessment - Tier 1 (Excluding LULUCF) – 2016

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.173	0.184	18%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.139	0.148	33%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.099	0.105	44%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.055	0.058	49%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.055	0.058	55%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.054	0.058	61%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.051	0.054	66%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.036	0.038	70%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.036	0.038	74%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.026	0.027	77%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.025	0.027	79%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.022	0.023	82%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.021	0.022	84%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.019	0.021	86%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.013	0.014	87%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.013	0.014	89%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.009	0.010	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.008	0.009	91%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.007	0.008	91%
3.B Manure Management	CH ₄	414.613	441.416	0.007	0.007	92%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.007	0.007	93%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.006	0.007	94%
3.B Manure Management	N ₂ O	361.580	164.193	0.006	0.006	94%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.006	0.006	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.005	0.006	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	43.139	0.004	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.003	0.003	97%
1.A.3.c Railways	CO ₂	140.079	57.916	0.003	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.002	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.002	0.002	97%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.002	0.002	98%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.002	0.002	98%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.002	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.002	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.002	0.002	98%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.002	0.002	98%
3.H Urea Application	CO ₂	50.020	64.964	0.001	0.002	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.001	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.001	0.001	99%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.001	0.001	99%
3.G Liming	CO ₂	0.000	11.220	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.000	0.000	100%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.000	100%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	0.000	100%
1.A.3.c Railways	N ₂ O	13.248	6.661	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	2.844	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	0.000	100%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	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.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
TOTAL		31,894.235	24,304.160			

Table A1.3-6: Key categories analysis – Trend Assessment - Tier 1 (Including LULUCF) – 2016

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.117	0.154	15%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.108	0.142	30%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.070	0.092	39%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.042	0.056	44%
2.C.3 Aluminium Production	PFCs	1,240.239	0.000	0.039	0.051	50%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.038	0.051	55%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.037	0.049	60%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.030	0.040	63%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.030	0.039	67%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.023	0.030	70%
4.G Harvested Wood Products	CO ₂	301.544	763.418	0.020	0.026	73%
4.E.2 Land Converted to Settlements	CO ₂	206.893	672.724	0.019	0.026	76%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.019	0.025	78%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.017	0.022	80%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.016	0.021	82%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.016	0.021	85%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	231.014	0.008	0.011	86%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.008	0.010	87%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.007	0.009	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.007	0.009	88%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.006	0.008	89%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.000	0.005	0.007	90%
4.C.2 Land Converted to Grassland	CO ₂	103.921	217.699	0.005	0.007	91%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	288.884	0.005	0.007	91%
3.B Manure Management	N ₂ O	361.580	164.193	0.005	0.007	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.005	0.006	92%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.004	0.006	93%
3.B Manure Management	CH ₄	414.613	441.416	0.004	0.005	94%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.004	0.005	94%
2.C.3 Aluminium Production	CO ₂	118.797	0.000	0.004	0.005	95%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.004	0.005	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.003	0.004	95%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	101.885	0.003	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.002	0.003	96%
4(V) Biomass Burning	CO ₂	8.987	64.646	0.002	0.003	96%
1.A.3.c Railways	CO ₂	140.079	57.916	0.002	0.003	97%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	5,384.287	0.002	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.000	0.002	0.002	97%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.002	0.002	97%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.001	0.002	98%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.001	0.002	98%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.001	0.002	98%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.001	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.001	0.001	98%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	10.792	0.001	0.001	98%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.001	0.001	99%
3.H Urea Application	CO ₂	50.020	64.964	0.001	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.001	0.001	99%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.001	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.001	0.001	99%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.001	0.001	99%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.001	0.001	99%
3.G Liming	CO ₂	0.000	11.220	0.000	0.001	99%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.000	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	8.916	0.000	0.000	99%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.000	0.000	99%
4(V) Biomass Burning	N ₂ O	0.858	6.498	0.000	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
1.A.3.c Railways	N ₂ O	13.248	6.661	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	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	2.844	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	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.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	0.000	0.000	100%
4.B.2 Land Converted to Cropland	CO ₂	23.135	17.827	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	0.000	100%
1.B.2.c Venting and flaring	CH ₄	0.590	0.060	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	0.000	100%
1.B.2.c Venting and flaring	N ₂ O	0.630	0.190	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	0.000	100%
1.B.2.c Venting and flaring	CO ₂	0.002	0.000	0.000	0.000	100%
TOTAL		39,557.426	32,074.822			

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 (%)
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	0.168	17%
3.A Enteric Fermentation	CH ₄	2,171.549	0.084	25%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	0.067	32%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	0.051	37%
5.A Solid Waste Disposal	CH ₄	348.607	0.041	41%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.039	45%
2.C.3 Aluminium Production	PFCs	1,240.239	0.038	49%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	0.038	53%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	0.034	56%
3.B Manure Management	N ₂ O	361.580	0.033	59%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.031	62%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.029	65%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.028	68%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.025	71%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.024	73%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.024	75%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	0.021	77%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.019	79%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.019	81%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.018	83%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.016	85%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	0.014	86%
1.A.3.b Road Transportation	N ₂ O	38.685	0.012	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.012	89%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.010	90%
3.B Manure Management	CH ₄	414.613	0.010	91%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.008	91%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.008	92%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.007	93%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	0.007	94%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.006	94%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.006	95%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.005	95%
2.A.1 Cement Production	CO ₂	1,085.790	0.005	96%
3.H Urea Application	CO ₂	50.020	0.004	96%
1.A.3.c Railways	N ₂ O	13.248	0.004	97%
1.A.3.b Road Transportation	CH ₄	40.611	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	0.003	97%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.003	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	98%
2.C.3 Aluminium Production	CO ₂	118.797	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	0.002	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	0.002	99%
1.A.3.c Railways	CO ₂	140.079	0.002	99%
2.G Other Product Manufacture and Use	F-gases	10.450	0.002	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	99%
2.C.1 Iron and Steel Production	CO ₂	45.970	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.001	100%
2.A.2 Lime Production	CO ₂	153.440	0.001	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	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%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	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 - 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%
2.A.3 Glass Production	CO ₂	35.871	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.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%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	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%
2.B.1 Ammonia Production	N ₂ O	0.163	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
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%
2.B.1 Ammonia Production	CH ₄	0.137	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.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		31,894.235		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2016

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.182	18%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.170	35%
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.085	44%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.041	48%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.040	52%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.036	55%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.034	59%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.033	62%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.032	65%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.031	68%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.028	71%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.024	74%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.023	76%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.022	78%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.021	80%
3.B Manure Management	N ₂ O	361.580	164.193	0.017	82%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.017	84%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.016	85%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.014	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.014	88%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.013	89%
3.B Manure Management	CH ₄	414.613	441.416	0.013	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.013	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.011	93%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.009	94%
3.H Urea Application	CO ₂	50.020	64.964	0.007	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.007	95%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.006	96%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.005	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.004	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.004	97%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.003	97%
1.A.3.c Railways	N ₂ O	13.248	6.661	0.003	98%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.002	98%
3.G Liming	CO ₂	0.000	11.220	0.002	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	11.492	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.001	99%
1.A.3.c Railways	CO ₂	140.079	57.916	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.001	99%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.001	99%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.001	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.001	99%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	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	N ₂ O	0.007	0.000	0.000	100%
TOTAL		31,894.235	24,304.160		

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

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	0.478	48%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	0.061	54%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	0.056	60%
4.E.2 Land Converted to Settlements	CO ₂	206.893	0.033	63%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	0.029	66%
3.A Enteric Fermentation	CH ₄	2,171.549	0.028	69%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	0.022	71%
4.C.2 Land Converted to Grassland	CO ₂	103.921	0.022	73%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	0.017	75%
4.B.2 Land Converted to Cropland	CO ₂	23.135	0.017	76%
4.G Harvested Wood Products	CO ₂	301.544	0.015	78%
5.A Solid Waste Disposal	CH ₄	348.607	0.014	79%
1.A.3.b Road Transportation	CO ₂	3,505.875	0.013	81%
2.C.3 Aluminium Production	PFCs	1,240.239	0.013	82%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	0.013	83%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	0.011	84%
3.B Manure Management	N ₂ O	361.580	0.011	85%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	0.011	86%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	0.010	87%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	0.009	88%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	0.008	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.008	90%
2.B.2 Nitric Acid Production	N ₂ O	754.265	0.008	91%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	0.007	91%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	0.007	92%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	0.006	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.006	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.006	94%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	0.005	95%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	0.005	95%
1.A.3.b Road Transportation	N ₂ O	38.685	0.004	95%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	0.004	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	0.003	96%
3.B Manure Management	CH ₄	414.613	0.003	97%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	0.003	97%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	0.003	97%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	0.003	97%
2.C.2 Ferroalloys Production	CO ₂	173.798	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	0.002	98%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	0.002	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	0.002	98%
2.A.1 Cement Production	CO ₂	1,085.790	0.002	99%
3.H Urea Application	CO ₂	50.020	0.001	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%
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	0.001	100%
1.A.3.c Railways	CO ₂	140.079	0.001	100%
2.G Other Product Manufacture and Use	F-gases	10.450	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	45.970	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	153.440	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	0.000	100%
4(V) Biomass Burning	CO ₂	8.987	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%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	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 - Gaseous Fuels	N ₂ O	0.559	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
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%
2.A.3 Glass Production	CO ₂	35.871	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%
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%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	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%
2.B.1 Ammonia Production	CH ₄	0.137	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.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		39,557.426		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2016

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	5,384.287	0.498	50%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	288.884	0.053	55%
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	101.885	0.050	60%
4.G Harvested Wood Products	CO ₂	301.544	763.418	0.047	65%
4.E.2 Land Converted to Settlements	CO ₂	206.893	672.724	0.045	69%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.044	74%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.041	78%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	231.014	0.025	80%
4.C.2 Land Converted to Grassland	CO ₂	103.921	217.699	0.024	83%
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.020	85%
4.B.2 Land Converted to Cropland	CO ₂	23.135	17.827	0.015	86%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.010	87%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.009	88%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.009	89%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.008	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.008	91%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.008	91%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.007	92%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.007	93%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.006	93%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.006	94%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.005	94%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.005	95%
3.B Manure Management	N ₂ O	361.580	164.193	0.004	95%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.004	96%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.003	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.003	97%
3.B Manure Management	CH ₄	414.613	441.416	0.003	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.003	98%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	10.792	0.003	98%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.002	98%
3.H Urea Application	CO ₂	50.020	64.964	0.002	99%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.002	99%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.001	99%
4(V) Biomass Burning	CO ₂	8.987	64.646	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.001	99%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.001	99%
1.A.3.c Railways	N ₂ O	13.248	6.661	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	100%
3.G Liming	CO ₂	0.000	11.220	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	11.492	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.000	100%
1.A.3.c Railways	CO ₂	140.079	57.916	0.000	100%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	100%
4(V) Biomass Burning	CH ₄	1.230	8.916	0.000	100%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.000	100%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	100%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	100%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.000	100%
4(V) Biomass Burning	N ₂ O	0.858	6.498	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	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 (2016) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	0.000	100%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	100%
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.000	100%
1.B.2.c. Venting and flaring	CO ₂	0.002	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH ₄	59.644	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	N ₂ O	0.007	0.000	0.000	100%
TOTAL		39,557.426	32,074.822		

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 (2016) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.039	0.275	28%
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.013	0.088	36%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.010	0.070	43%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.008	0.058	49%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.007	0.049	54%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.006	0.039	58%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.005	0.036	61%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.005	0.032	65%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.004	0.027	67%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.004	0.027	70%
3.B Manure Management	N ₂ O	361.580	164.193	0.003	0.022	72%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.003	0.022	75%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.003	0.020	77%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.003	0.018	78%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.003	0.018	80%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.002	0.017	82%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.002	0.015	83%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.002	0.014	85%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.002	0.012	86%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.002	0.011	87%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.001	0.011	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.001	0.010	89%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.001	0.009	90%
3.B Manure Management	CH ₄	414.613	441.416	0.001	0.007	91%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.001	0.007	91%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.001	0.007	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.001	0.006	93%
3.H Urea Application	CO ₂	50.020	64.964	0.001	0.006	93%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.001	0.005	94%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.001	0.005	94%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.001	0.005	95%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.001	0.004	95%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.001	0.004	96%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.001	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	0.003	96%
3.G Liming	CO ₂	0.000	11.220	0.000	0.003	97%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.000	0.003	97%
1.A.3.c Railways	N ₂ O	13.248	6.661	0.000	0.003	97%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.003	97%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	0.001	98%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	0.001	98%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	0.001	98%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.000	0.001	99%
1.A.3.c Railways	CO ₂	140.079	57.916	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	0.000	0.001	99%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.001	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	0.001	99%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.000	0.001	99%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.000	0.001	99%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.000	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.000	0.001	99%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	0.001	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	0.000	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	0.000	99%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	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 (2016) Estimate (Gg eq- CO ₂)	Trend Assessme nt Tier 2	% Contributi on to Trend	Cumulativ e Total (%)
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	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.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	N ₂ O	0.007	0.000	0.000	0.000	100%
TOTAL		31,894.235	24,304.160			

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF) – 2016

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
4(III).Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	37.944	101.885	0.028	0.114	11%
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719	0.028	0.111	23%
4.E.2 Land Converted to Settlements	CO ₂	206.893	672.724	0.027	0.110	33%
4.G Harvested Wood Products	CO ₂	301.544	763.418	0.026	0.105	44%
4.B.1 Cropland Remaining Cropland	CO ₂	196.901	288.884	0.019	0.078	52%
4.A.2 Land Converted to Forest Land	CO ₂	28.744	231.014	0.018	0.073	59%
4.C.2 Land Converted to Grassland	CO ₂	103.921	217.699	0.012	0.048	64%
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	0.008	0.034	67%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029	935.224	0.008	0.031	70%
2.F.1 Refrigeration and Air conditioning	F-gases	0.000	406.270	0.006	0.024	73%
4.D.2 Land Converted to Wetlands	CO ₂	46.781	10.792	0.005	0.021	75%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	0.005	0.020	77%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271	0.005	0.019	79%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831	0.004	0.016	80%
3.A Enteric Fermentation	CH ₄	2,171.549	1,175.506	0.004	0.016	82%
4.A.1 Forest Land Remaining Forest Land	CO ₂	6,704.183	5,384.287	0.004	0.016	84%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	0.003	0.012	85%
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	0.003	0.011	86%
3.B Manure Management	N ₂ O	361.580	164.193	0.003	0.011	87%
3.D.2 Indirect N ₂ O Emissions From Managed Soils	N ₂ O	343.973	260.244	0.002	0.010	88%
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.002	0.009	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	0.002	0.009	90%
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	0.002	0.008	90%
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	0.002	0.008	91%
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	234.749	81.420	0.002	0.007	92%
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	0.002	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	157.786	43.139	0.001	0.006	93%
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	0.001	0.005	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	0.001	0.005	94%
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	0.001	0.005	95%
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315	0.001	0.004	95%
2.G Other Product Manufacture and Use	N ₂ O	33.376	56.021	0.001	0.004	95%
4(V) Biomass Burning	CO ₂	8.987	64.646	0.001	0.003	96%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	0.001	0.003	96%
4.B.2 Land Converted to Cropland	CO ₂	23.135	17.827	0.001	0.003	96%
3.B Manure Management	CH ₄	414.613	441.416	0.001	0.002	97%
2.B.2 Nitric Acid Production	N ₂ O	754.265	109.359	0.001	0.002	97%
3.H Urea Application	CO ₂	50.020	64.964	0.001	0.002	97%
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	0.001	0.002	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087	0.000	0.002	97%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	0.000	0.002	98%
1.A.3.b Road Transportation	CH ₄	40.611	11.492	0.000	0.002	98%
3.D.1 Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,056.597	813.401	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O	0.000	4.503	0.000	0.001	98%
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	0.000	0.001	98%
3.G Liming	CO ₂	0.000	11.220	0.000	0.001	99%
1.A.3.c Railways	N ₂ O	13.248	6.661	0.000	0.001	99%
2.F.4 Aerosols	F-gases	0.000	8.689	0.000	0.001	99%
2.A.1 Cement Production	CO ₂	1,085.790	1,076.508	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	59.116	0.000	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	0.000	0.001	99%
1.A.3.c Railways	CO ₂	140.079	57.916	0.000	0.001	99%
5.B Biological Treatment of Solid Waste	CH ₄	0.000	2.744	0.000	0.001	99%
2.F.3 Fire Protection	F-gases	0.000	4.714	0.000	0.000	99%
4(V) Biomass Burning	CH ₄	1.230	8.916	0.000	0.000	99%
5.B Biological Treatment of Solid Waste	N ₂ O	0.000	1.962	0.000	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	0.000	0.000	99%
2.B.1 Ammonia Production	CO ₂	558.672	547.863	0.000	0.000	99%
2.C.1 Iron and Steel Production	CO ₂	45.970	1.053	0.000	0.000	99%
5.D Wastewater Treatment and Discharge	CH ₄	567.380	466.791	0.000	0.000	99%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2016) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
4(V) Biomass Burning	N ₂ O	0.858	6.498	0.000	0.000	99%
2.G Other Product Manufacture and Use	F-gases	10.450	6.391	0.000	0.000	100%
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775	35.614	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄	0.000	2.844	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.493	0.000	0.000	100%
2.A.2 Lime Production	CO ₂	153.440	93.327	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	0.000	0.000	100%
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH ₄	0.590	0.060	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	0.000	100%
1.B.2.c. Venting and flaring	N ₂ O	0.630	0.190	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.310	0.000	0.000	100%
2.B.1 Ammonia Production	N ₂ O	0.163	0.183	0.000	0.000	100%
2.A.3 Glass Production	CO ₂	35.871	32.622	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	0.000	0.000	100%
1.A.3.c Railways	CH ₄	0.174	0.065	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	0.000	0.000	100%
2.B.1 Ammonia Production	CH ₄	0.137	0.153	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.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	N ₂ O	0.007	0.000	0.000	0.000	100%
TOTAL		39,557.42 6	32,074.82 2			

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2018, 1990)

Tier 1 and Tier 2 Analysis - Key Source Analysis Summary (Croatian Inventory, year 1990)					
A	B	C	D		E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification		Com.
1. Energy					
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	Yes	L1e, L2e	L1i	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	Yes	L1e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	Yes	L1e, L2e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	Yes	L1e, L2e	L1i	
1.A.3.b Road Transportation	CO ₂	Yes	L1e, L2e	L1i, L2i	
1.A.3.b Road Transportation	N ₂ O	Yes	L2e		
1.A.4 Other Sectors - Biomass	CH ₄	Yes	L1e, L2e	L1i, L2i	
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	CH ₄	Yes	L2e		
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	Yes	L1e, L2e	L1i, L2i	
2. Industrial processes and product use					
2.A.1 Cement Production	CO ₂	Yes	L1e	L1i	
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, L2e	L1i	
3. Agriculture					
3.A Enteric Fermentation	CH ₄	Yes	L1e, L2e	L1i, L2i	
3.B Manure Management	CH ₄	Yes	L1e, L2e	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		L2i	
4.B.2 Land Converted to Cropland	CO ₂	Yes		L2i	
4.C.2 Land Converted to Grassland	CO ₂	Yes		L2i	
4.E.2 Land Converted to Settlements	CO ₂	Yes		L1i, L2i	
4.G Harvested Wood Products	CO ₂	Yes		L1i, L2i	
5. Waste					
5.A Solid Waste Disposal	CH ₄	Yes	L1e, L2e	L1i, L2i	
5.D Wastewater Treatment and Discharge	CH ₄	Yes	L1e, L2e	L1i, L2i	

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

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

Table A1.3-14: Source Analysis Summary (Croatian Inventory NIR 2018, year t=2016)

Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year 2016)							
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	L1i	T1i	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	Yes	L1e	T1e, T2e	L1i	T1i, T2i	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	Yes	L1e	T1e, T2e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - 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, L2i	T1i	
1.A.4 Other Sectors - Biomass	N ₂ O	Yes	L2e	T2e			
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	Yes	L2e				
1.A.4 Other Sectors - Solid Fuels	CO ₂	Yes		T1e, T2e		T1i	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	Yes		T2e			
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	L1e, L2e				
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
2. Industrial processes and product use							
2.A.1 Cement Production	CO ₂	Yes	L1e	T1e	L1i	T1i	
2.B.1 Ammonia Production	CO ₂	Yes	L1e	T1e	L1i	T1i	
2.B.2 Nitric Acid Production	N ₂ O	Yes		T1e		T1i	
2.B.8 Petrochemical and Carbon Black Production	CO ₂	Yes		T1e, T2e		T1i, T2i	
2.C.2 Ferroalloys Production	CO ₂	Yes		T1e		T1i	
2.C.3 Aluminium Production	CO ₂	Yes				T1i	
2.C.3 Aluminium Production	PFCs	Yes		T1e		T1i	
2.D Non-energy Products from Fuels and Solvent Use	CO ₂	Yes		T2e		T1i	
2.F.1 Refrigeration and Air conditioning - Aggregate	F-gases	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
3. Agriculture							
3.A Enteric Fermentation	CH ₄	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
3.B Manure Management	CH ₄	Yes	L1e, L2e	T1e	L1i	T1i	
3.B Manure Management	N ₂ O	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
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	T2i	
4.A.1 Forest Land Remaining Forest Land	CO ₂	Yes			L1i, L2i	T2i	
4.A.2 Land Converted to Forest Land	CO ₂	Yes			L1i, L2i	T1i, T2i	
4.B.1 Cropland Remaining Cropland	CO ₂	Yes			L1i, L2i	T2i	
4.B.2 Land Converted to Cropland	CO ₂	Yes			L2i		
4.C.2 Land Converted to Grassland	CO ₂	Yes			L1i, L2i	T1i, T2i	
4.D.2 Land Converted to Wetlands	CO ₂	Yes				T2i	
4.E.2 Land Converted to Settlements	CO ₂	Yes			L1i, L2i	T1i, T2i	
4.G Harvested Wood Products	CO ₂	Yes			L2i	T1i, T2i	
5. Waste							
5.A Solid Waste Disposal	CH ₄	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
5.D Wastewater Treatment and Discharge	CH ₄	Yes	L1e, L2e		L1i, L2i		
5.D Wastewater Treatment and Discharge	N ₂ O	Yes	L2e	T2e			

L1e - Level excluding LULUCF – Tier 1 T1e - Trend excluding LULUCF – Tier 1

L2e - Level excluding LULUCF – Tier 2 T2e - Trend excluding LULUCF – Tier 2

L1i - Level including LULUCF – Tier 1 T1i - Trend including LULUCF – Tier 1

L2i - Level including LULUCF – Tier 2 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.

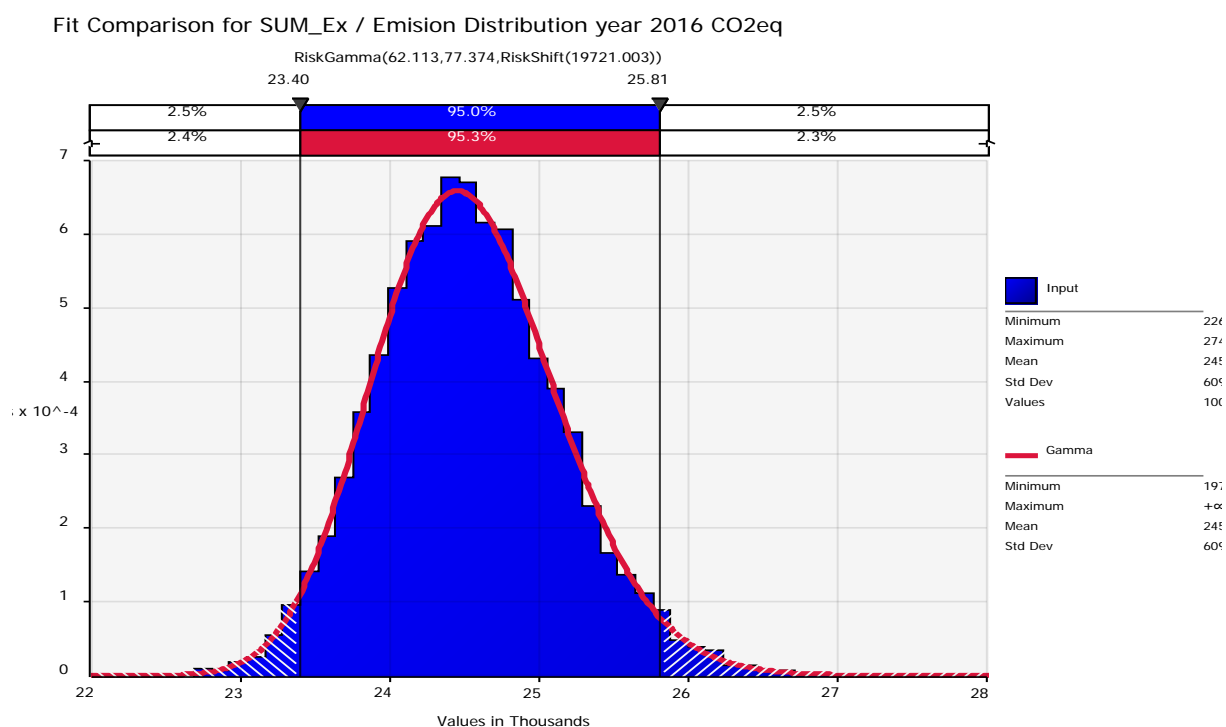
2.2.3. Uncertainty excluding LULUCF sector

2.2.3.1. Uncertainty in the emissions excluding LULUCF

The estimate of CO₂-eq emissions in 2016 was estimated at 24,304.16 Gg CO₂-eq.

The estimate of CO₂-eq emissions in 1990 was estimated at 31,894.24 Gg CO₂-eq.

Figure A2.2-1: Distribution of the total CO₂ emissions for year 2016 excluding LULUCF



Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2016 (24,526.97 Gg CO₂-eq) according to simulation varies between 23,397.94 Gg CO₂-eq (2.5% percentile) and 25,813.80 Gg CO₂-eq (97.5% percentile). Figure A2.2-1 shows the distribution of total CO₂ emission for year 2016 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 (32,120.34 Gg CO₂-eq) varies between 30,925.02 Gg CO₂-eq (2.5% percentile) and 33,405.96 Gg CO₂-eq (97.5% percentile).

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

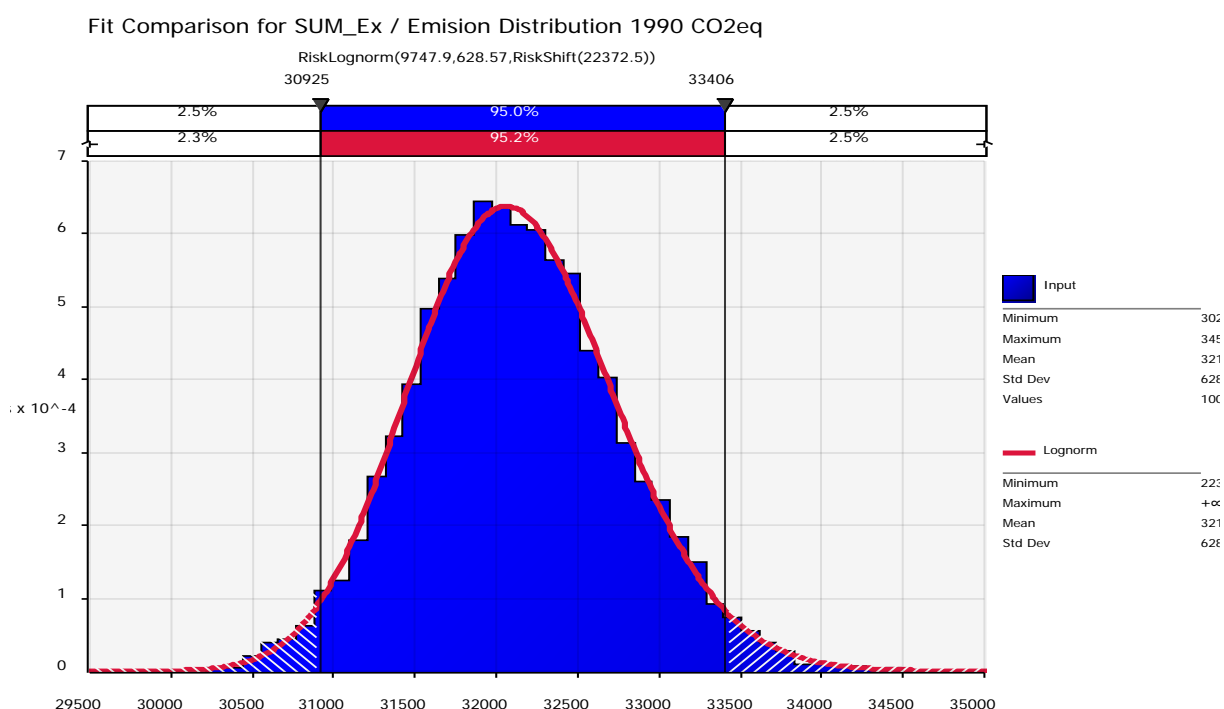


Figure A2.2-2 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

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:

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

The Inventory trend excluding LULUCF is -23.80%, simulated trend is -23.61% and the 95% probability range of the trend is -28.22% (2.5% percentile) to -18.64% (97.5% percentile).

Figure A2.2-3: Distribution of trend for year 2016 with the respect to year 1990

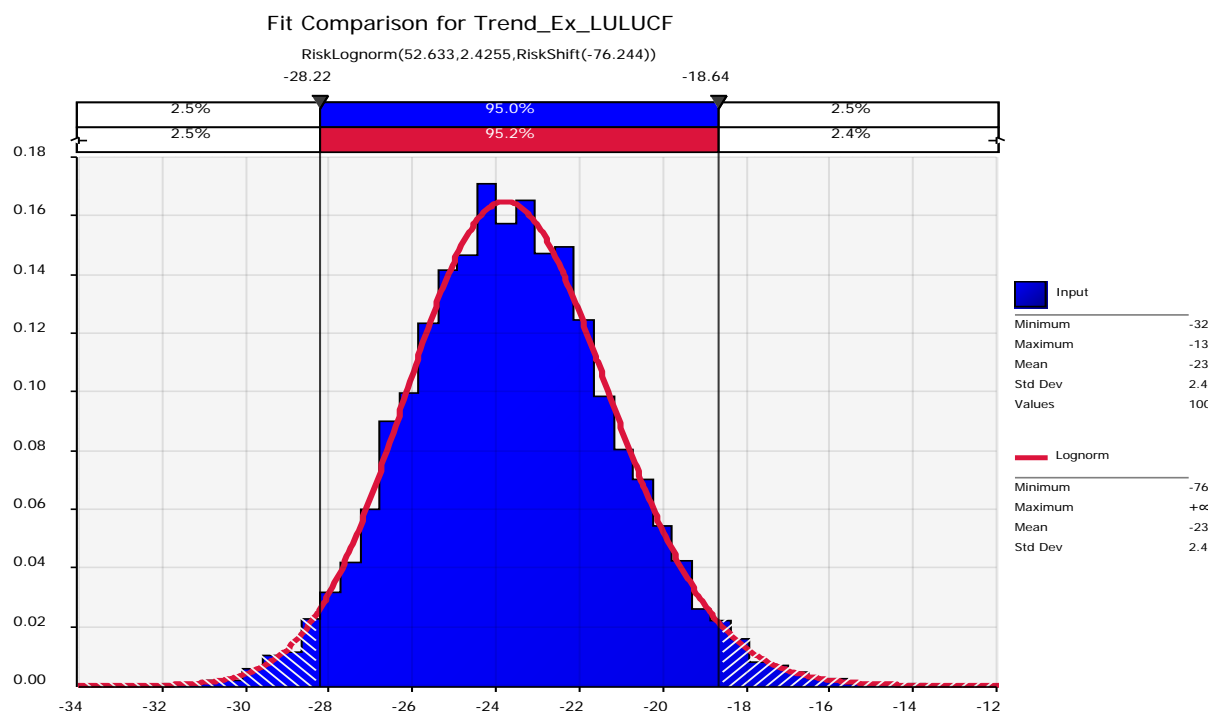


Figure A2.2-3: shows the distribution of trend for year 2016 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2.4. Uncertainty including LULUCF sector

2.2.4.1. Uncertainty in the emissions including LULUCF

The estimate of CO₂-eq emissions in 2016 was estimated at 18,881.99 Gg CO₂-eq.

The estimate of CO₂-eq emissions in 1990 was estimated at 25,280.64 Gg CO₂-eq.

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2016 (23,845.57 Gg CO₂-eq) according to simulation varies between 16,897.68 Gg CO₂-eq (2.5% percentile) and 30,884.18 Gg CO₂-eq (97.5% percentile).

Figure A2.2-4 shows the distribution of total CO₂ emission including LULUCF for year 2016 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 2016 including LULUCF

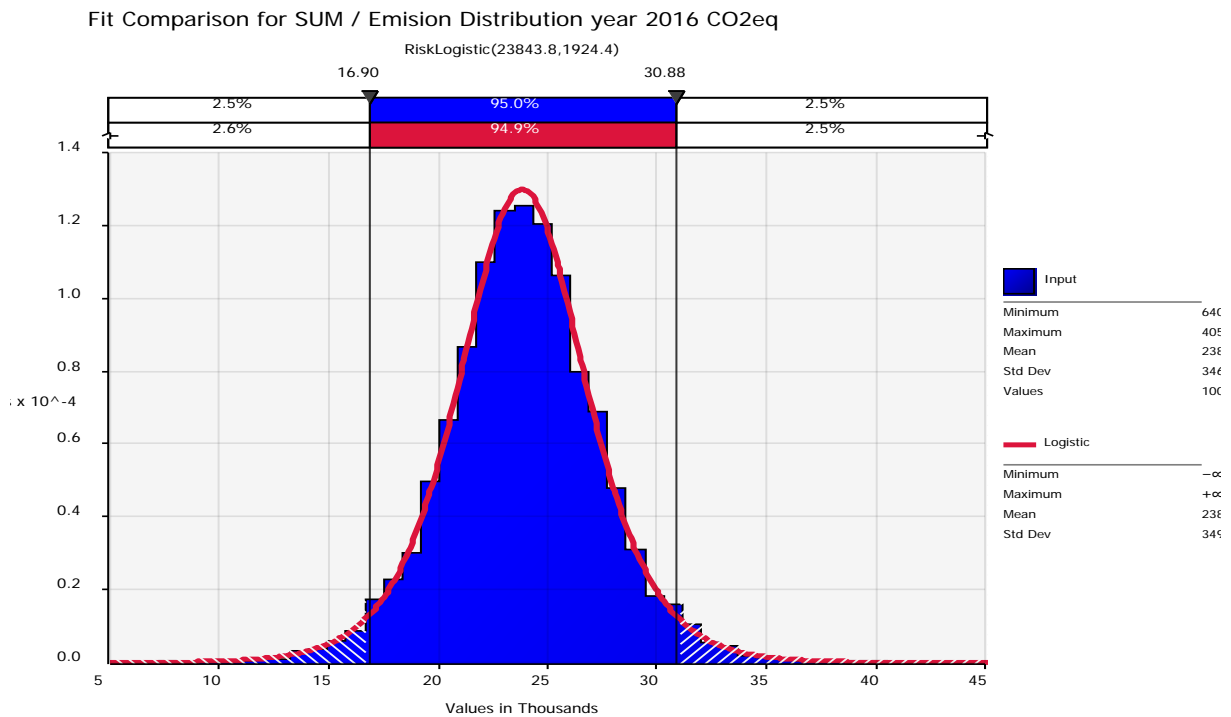
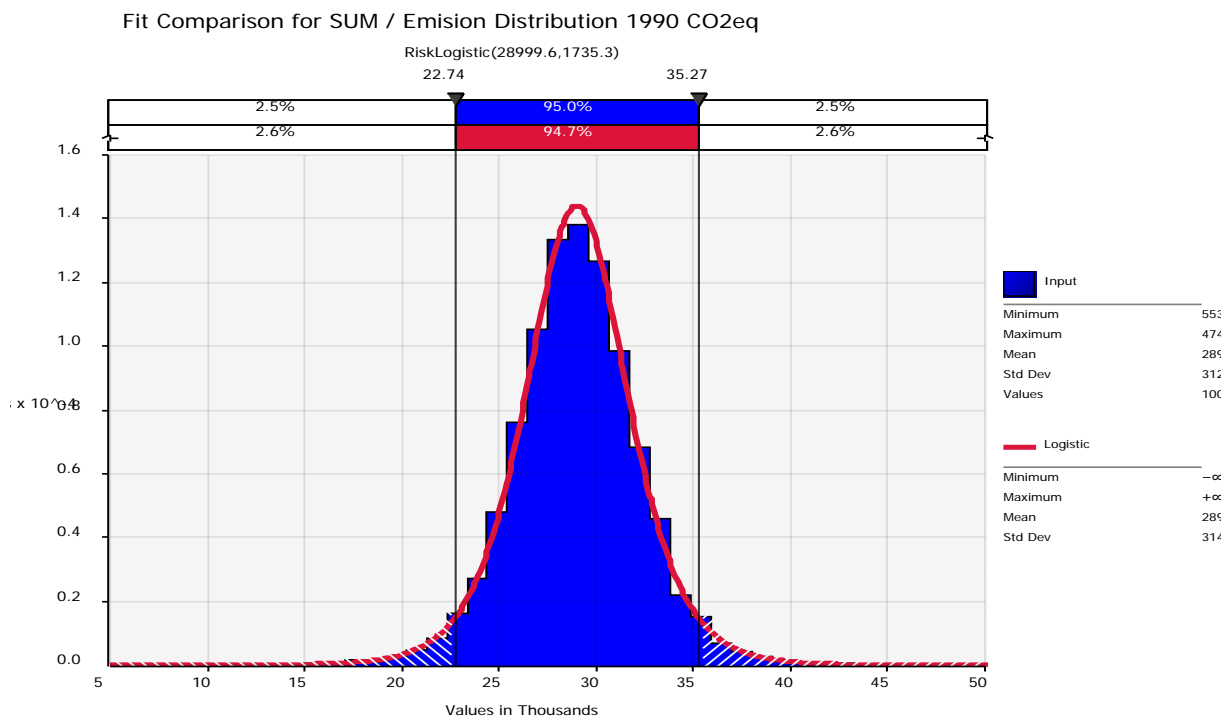


Figure A2.2-5: Distribution of total CO₂ emission for year 1990 including LULUCF



Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (28,997.12 Gg CO₂-eq) varies between 22,741.84 Gg CO₂-eq (2.5% percentile) and 35,271.42 Gg 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

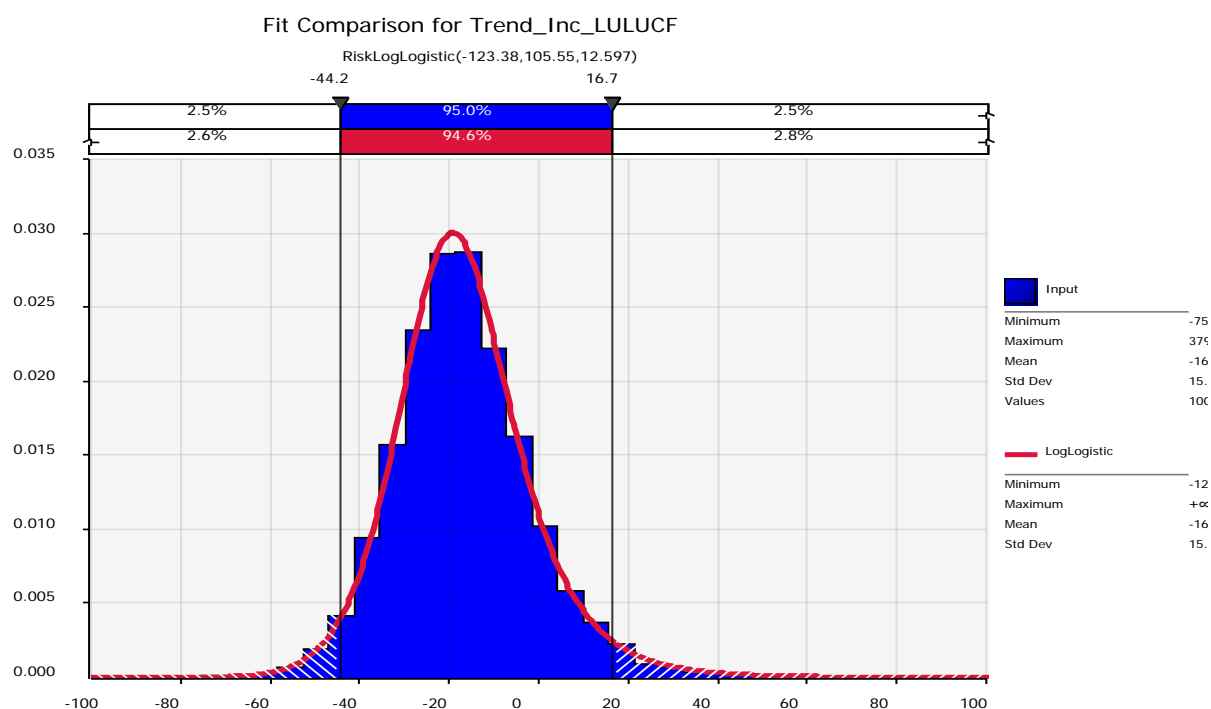
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following formula:

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

The Inventory trend including LULUCF is -25.31%, simulated trend is -16.76% and the 95% probability range of the trend is -44.21% (2.5% percentile) to 16.66% (97.5% percentile), so the uncertainty introduced in trend varies from -18.90% to 41.97% with respect to the base year emissions.

Figure A2.2-6: shows the distribution of trend for year 2016 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 2016 with the respect to year 1990 including LULUCF



1.1. 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 2016 (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	935.224	-5	5	-5	5	-6.96	7.14	0.000094	-79.74	-1.90	2.18	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702	0.616	-5	5	-50	50	-50.00	50.43	0.000000	-83.36	-9.12	20.70	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920	1.699	-5	5	-200	200	-91.58	206.96	0.000000	-80.95	-17.86	281.47	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361	2,298.667	-5	5	-5	5	-6.92	7.01	0.000568	280.98	-36.86	39.39	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159	0.607	-5	5	-50	50	-50.02	50.25	0.000000	280.98	-208.20	469.51	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851	10.862	-5	5	-200	200	-91.65	208.94	0.000006	280.98	-358.27	5520.66	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020	1,654.948	-5	5	-5	5	-6.91	7.36	0.000299	-10.69	-8.48	9.17	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555	1.379	-5	5	-50	50	-49.98	50.76	0.000000	-11.30	-48.93	104.39	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715	5.966	-5	5	-200	200	-91.75	206.85	0.000002	4.38	-97.95	1517.21	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄		2.844	-5	5	-50	50	-50.05	50.51	0.000000				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O		4.503	-5	5	-200	200	-91.71	207.96	0.000001				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	975.449	-5	5	-5	5	-7.08	7.24	0.000104	-54.80	-4.32	4.79	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.843	-5	5	-50	50	-50.04	50.21	0.000000	-59.81	-22.39	48.87	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.998	-5	5	-200	200	-91.59	208.42	0.000000	-59.83	-37.71	597.98	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	281.264	-5	5	-5	5	-7.07	7.10	0.000009	-83.48	-1.59	1.71	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.712	-5	5	-50	50	-49.95	50.21	0.000000	-83.02	-9.35	21.23	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	1.274	-5	5	-200	200	-91.82	208.04	0.000000	-83.02	-15.88	246.91	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	891.411	-5	5	-5	5	-7.06	7.09	0.000087	-45.68	-5.22	5.68	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.397	-5	5	-50	50	-50.02	50.13	0.000000	-45.93	-29.55	64.58	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.474	-5	5	-200	200	-91.74	207.21	0.000000	-45.93	-50.57	771.55	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂		59.116	-5	5	-5	5	-6.94	7.02	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄		0.310	-5	5	-50	50	-50.09	51.14	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O		0.493	-5	5	-200	200	-91.67	209.48	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.612	-5	5	-50	50	-49.92	50.48	0.000000	-77.34	-12.54	28.35	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.973	-5	5	-200	200	-91.70	209.50	0.000000	-77.34	-21.26	353.98	
1.A.3.a Domestic Aviation	CO ₂	6.601	31.108	-5	5	-5	5	-7.00	7.02	0.000000	371.27	-44.70	48.60	
1.A.3.a Domestic Aviation	CH ₄	0.001	0.005	-5	5	-50	50	-50.21	50.71	0.000000	370.97	-262.21	572.41	
1.A.3.a Domestic Aviation	N ₂ O	0.055	0.260	-5	5	-200	200	-91.57	207.41	0.000000	370.97	-440.57	6781.84	
1.A.3.b Road Transportation	CO ₂	3,505.875	5,880.133	-5	5	-5	5	-6.95	7.25	0.003786	67.72	-16.17	18.05	
1.A.3.b Road Transportation	CH ₄	40.611	11.492	-5	5	-50	50	-50.32	50.26	0.000001	-71.70	-15.70	34.82	
1.A.3.b Road Transportation	N ₂ O	38.685	52.072	-5	5	-200	200	-91.61	207.52	0.000146	34.60	-126.49	2012.88	
1.A.3.c Railways	CO ₂	140.079	57.916	-5	5	-5	5	-6.98	6.99	0.000000	-58.65	-3.97	4.28	
1.A.3.c Railways	CH ₄	0.174	0.065	-5	5	-50	50	-50.03	50.19	0.000000	-62.78	-20.48	44.39	
1.A.3.c Railways	N ₂ O	13.248	6.661	-5	5	-200	200	-91.68	208.01	0.000002	-49.72	-46.94	738.33	

A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383	132.289	-5	5	-5	5	-6.98	7.13	0.000002	-1.56	-9.15	10.35	
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.312	-5	5	-50	50	-50.03	50.25	0.000000	-1.37	-54.77	121.90	
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079	1.064	-5	5	-200	200	-91.74	208.35	0.000000	-1.37	-92.22	1537.53	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466	1,206.356	-5	5	-5	5	-6.84	6.96	0.000155	-50.77	-4.73	5.20	
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331	2.680	-5	5	-50	50	-50.24	50.79	0.000000	-57.67	-23.40	51.06	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151	67.014	-5	5	-200	200	-91.72	208.42	0.000242	-23.98	-71.28	1089.53	
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388	9.739	-5	5	-5	5	-6.94	7.12	0.000000	-98.14	-0.18	0.20	
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392	0.731	-5	5	-50	50	-49.96	50.05	0.000000	-97.81	-1.20	2.69	
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377	0.044	-5	5	-200	200	-91.68	209.04	0.000000	-98.14	-1.75	26.76	
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057	1,573.928	-5	5	-5	5	-7.04	7.08	0.000270	111.53	-20.58	22.13	
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670	3.507	-5	5	-50	50	-50.10	50.40	0.000000	110.00	-114.27	260.36	
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559	0.836	-5	5	-200	200	-91.73	208.70	0.000000	49.52	-140.45	2321.10	
1.A.4 Other Sectors - Biomass	CH ₄	316.275	355.498	-5	5	-50	50	-49.82	50.48	0.000688	12.40	-61.25	139.88	
1.A.4 Other Sectors - Biomass	N ₂ O	50.267	56.502	-5	5	-200	200	-91.61	207.90	0.000172	12.40	-105.39	1733.69	
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	43.139											
1. Exploration	CO ₂	28.536	7.801	-5	5	-50	50	-50.26	50.67	0.000000	-72.66	-15.03	33.03	
2. Production(7)	CO ₂	129.245	35.334	-5	5	-50	50	-49.65	50.29	0.000007	-72.66	-15.26	34.49	
3. Transport	CO ₂	0.006	0.004	-5	5	-50	50	-50.37	50.69	0.000000	-28.58	-38.86	87.70	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600	61.831											
1. Exploration	CH ₄	15.205	4.157	-5	5	-100	100	-84.37	100.30	0.000000	-72.66	-23.34	164.42	
2. Production(7)	CH ₄	199.531	54.549	-5	5	-100	100	-84.04	100.68	0.000057	-72.66	-23.22	162.73	
3. Transport	CH ₄	1.516	1.083	-5	5	-100	100	-84.25	100.51	0.000000	-28.58	-60.79	441.24	
4. Refining/storage	CH ₄	4.348	2.043	-5	5	-100	100	-84.31	100.49	0.000000	-53.01	-40.04	276.27	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064	0.017	-5	5	-10	1000	-100.00	-100.00	0.000000	-72.66			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO ₂	522.064	245.271											
1. Exploration	CO ₂	18.043	14.993	-5	5	-50	50	-100.00	-100.00	0.000000	-16.90	-83.10	-83.10	
2. Production(7)	CO ₂	418.423	159.124	-5	5	-100	100	-84.33	100.46	0.000481	-61.97	-32.69	223.96	
3. Processing	CO ₂	85.568	71.103	-5	5	-100	100	-84.24	100.45	0.000096	-16.90	-71.66	460.52	
4. Transmission and storage	CO ₂	0.011	0.011	-5	5	-100	100	-84.36	101.44	0.000000	-2.80	-83.78	585.45	
5. Distribution	CO ₂	0.019	0.041	-5	5	-20	500	-100.00	-100.00	0.000000	112.55			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH ₄	148.067	141.087											
1. Exploration	CH ₄	9.614	7.989	-5	5	-100	100	-84.30	101.91	0.000001	-16.90	-71.02	494.66	
2. Production(7)	CH ₄	66.445	55.212	-5	5	-100	100	-84.28	100.55	0.000058	-16.90	-71.09	501.02	
3. Processing	CH ₄	29.338	24.379	-5	5	-100	100	-84.26	100.87	0.000011	-16.90	-71.37	504.28	
4. Transmission and storage	CH ₄	32.239	31.337	-5	5	-100	100	-84.25	100.40	0.000019	-2.80	-83.48	573.12	
5. Distribution	CH ₄	10.431	22.171	-5	5	-20	500	-100.00	-100.00	0.000000	112.55			
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	-84.25	100.84	0.000000	-89.89	-8.73	60.20	

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.B.2.c. Venting and flaring	CH₄	0.590	0.060											
1. Venting - Oil	CH ₄	0.590	0.060	-5	5	-100	100	-84.35	100.98	0.000000	-89.89	-8.64	59.82	
1.B.2.c. Venting and flaring	N₂O	0.630	0.190											
2. Flaring - Oil	N ₂ O	0.598	0.163	-5	5	-100	100	-84.35	101.46	0.000000	-72.66	-23.24	166.70	
2. Flaring - Gas	N ₂ O	0.032	0.027	-5	5	-100	100	-84.10	101.23	0.000000	-16.90	-70.75	468.90	
2.A.1 Cement Production	CO₂	1,085.790	1,076.508	-2	2	-2	2	-2.81	2.89	0.000020	-0.85	-3.89	4.02	
2.A.2 Lime Production	CO₂	153.440	93.327	-2	2	-2	2	-2.79	2.84	0.000000	-39.18	-2.37	2.51	
2.A.3 Glass Production	CO₂	35.871	32.622	-2	2	-2	2	-2.84	2.86	0.000000	-9.06	-3.52	3.71	
2.A.4 Other Process Uses of Carbonates	CO₂	5.775	35.614											
2.A.4.a Ceramics	CO ₂	5.775	10.485	-7.5	7.5	-5	5	-8.78	9.05	0.000000	81.56	-21.58	25.11	
2.A.4.b Other uses of Soda Ash	CO ₂		7.291	-7.5	7.5	-5	5	-8.93	8.97	0.000000				
2.A.4.d Other	CO ₂		17.838	-7.5	7.5	-5	5	-8.74	9.09	0.000000				
2.B.1 Ammonia Production	CO₂	558.672	547.863	-2	2	-2	2	-2.85	2.81	0.000005	-1.93	-3.87	3.99	5
2.B.1 Ammonia Production	CH₄	0.137	0.153	-5	5	-50	50	-50.13	50.45	0.000000	11.89	-60.89	136.09	
2.B.1 Ammonia Production	N₂O	0.163	0.183	-5	5	-200	200	-91.80	207.75	0.000000	11.89	-105.47	1706.17	
2.B.2 Nitric Acid Production	N₂O	754.265	109.359	-2	2	-2	2	-2.80	2.81	0.000000	-85.50	-2.46	3.66	
2.B.8 Petrochemical and Carbon Black Production	CO₂	219.763	0.001											
2.B.8.a Methanol	CO ₂		0.001	-7.5	7.5	-30	30	-30.56	31.61	0.000000				2
2.B.8.b Ethylene	CO ₂	125.652												
2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer	CO ₂	13.877												2
2.B.8.f Carbon Black	CO ₂	80.235												2
2.B.8 Petrochemical and Carbon Black Production	CH₄	5.493	0.000											
2.B.8.a Methanol	CH ₄		0.000	-7.5	7.5	-30	30	-30.71	31.11	0.000000				2
2.B.8.b Ethylene	CH ₄	5.447												
2.B.8.f Carbon Black	CH ₄	0.046												2
2.C.1 Iron and Steel Production	CO₂	45.970	1.053											
2.C.1.a Steel	CO ₂	45.970	1.053	-5	5	-5	5	-7.03	7.28	0.000000	-97.71	-0.33	0.42	
2.C.2 Ferroalloys Production	CO₂	173.798												2
2.C.2 Ferroalloys Production	CH₄	3.899												2
2.C.3 Aluminium Production	CO₂	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	CO₂	234.749	81.420											
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO ₂	72.603	16.951	-5	5	-50	50	-50.24	50.59	0.000002	-76.65	-12.90	29.20	
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO ₂	22.816	3.882	-5	5	-50	50	-50.10	50.54	0.000000	-82.99	-9.33	21.15	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use	CO ₂	139.315	54.462	NA	NA	-50	50	-40.78	58.48	0.000016	-60.91	-19.54	38.86	4
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt	CO ₂	0.005	0.020	-10	10	-50	50	-50.61	51.09	0.000000	274.04	-206.13	459.39	

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC	CO ₂		6.099	-5	5	-5	5	-6.97	7.36	0.000000				
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing	CO ₂	0.009	0.007	-10	10	-50	50	-50.42	51.67	0.000000	-29.27	-39.50	90.46	
2.F.1 Refrigeration and Air conditioning	F-gases		406.270											
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a		88.385	-50	50	-50	50	-61.92	81.29	0.000087				2
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125		58.559	-50	50	-50	50	-62.31	79.90	0.000038				2
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a		2.175	-50	50	-50	50	-61.88	78.50	0.000000				2
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a		0.390	-50	50	-50	50	-61.70	79.31	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a		5.711	-50	50	-50	50	-62.52	81.76	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125		21.000	-50	50	-50	50	-61.41	80.33	0.000005				2
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a		0.715	-50	50	-50	50	-62.26	82.54	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32		3.838	-50	50	-50	50	-62.70	80.27	0.000000				2
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a		42.292	-50	50	-50	50	-62.10	79.90	0.000020				2
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a		157.229	-50	50	-50	50	-63.82	81.82	0.000282				2
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32		3.318	-50	50	-50	50	-62.29	80.94	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125		17.675	-50	50	-50	50	-62.71	80.06	0.000004				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a		4.982	-50	50	-50	50	-61.97	78.69	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	-61.82	82.55	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-227ea		3.503	-50	50	-50	50	-62.15	82.28	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-236fa		0.706	-50	50	-50	50	-62.65	79.71	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	-61.81	78.76	0.000001				2
2.G Other Product Manufacture and Use	N₂O	33.376	56.021											
2.G.3 N2O from Product Uses\2.G.3.a Medical Applications	N ₂ O	32.780	55.964	-50	50	-50	50	-62.78	80.06	0.000035	70.73	2875.77	28559.28	
2.G.3 N2O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products	N ₂ O	0.596	0.057	-50	50	-50	50	-62.12	80.37	0.000000	-90.50	-6.33	18.99	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	-96.31	-81.99	0.000000	-38.84	-41.20	125.96	
3.A Enteric Fermentation	CH₄	2,171.549	1,175.506											
Mature dairy cattle	CH ₄	1,371.447	472.447	-30	30	-20	20	-34.18	38.50	0.000628	-65.55	-13.96	23.94	
Other mature cattle	CH ₄	79.186	114.206	-10	10	-20	20	-21.67	23.18	0.000014	44.23	-39.37	54.31	
Growing cattle	CH ₄	544.415	402.904	-10	10	-20	20	-21.30	23.26	0.000173	-25.99	-20.21	28.90	
Sheep	CH ₄	93.875	123.779	-10	10	-20	20	-21.66	23.09	0.000017	31.86	-36.30	49.64	
Market swine	CH ₄	5.800	5.341	-10	10	-20	20	-21.62	23.13	0.000000	-7.92	-25.31	34.84	
Breeding swine	CH ₄	33.525	36.424	-10	10	-20	20	-21.76	23.16	0.000001	8.65	-30.19	41.21	
Goats	CH ₄	21.500	9.441	-10	10	-20	20	-22.05	23.01	0.000000	-56.09	-12.17	16.24	
Horses	CH ₄	17.550	10.249	-30	30	-20	20	-34.65	38.31	0.000000	-41.60	-23.65	39.92	
Mules and Asses	CH ₄	4.250	0.716	-30	30	-20	20	-34.05	37.86	0.000000	-83.16	-6.92	11.49	
3.B Manure Management	CH₄	414.613	441.416											

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Mature dairy cattle	CH ₄	149.038	142.725	-30	30	-20	20	-34.10	37.55	0.000057	-4.24	-39.25	66.14	
Other mature cattle	CH ₄	7.889	18.261	-10	10	-20	20	-21.79	23.10	0.000000	131.49	-63.23	88.40	
Growing cattle	CH ₄	52.552	61.731	-10	10	-20	20	-21.81	22.91	0.000004	17.47	-32.32	44.64	
Sheep	CH ₄	2.513	2.125	-10	10	-20	20	-22.12	23.09	0.000000	-15.44	-23.20	31.46	
Market swine	CH ₄	32.520	35.774	-10	10	-20	20	-21.88	23.30	0.000001	10.01	-30.15	41.12	
Breeding swine	CH ₄	137.244	163.021	-10	10	-20	20	-22.12	23.04	0.000029	18.78	-32.77	43.83	
Goats	CH ₄	0.443	0.198	-10	10	-20	20	-21.85	22.99	0.000000	-55.23	-12.14	16.80	
Horses	CH ₄	1.749	1.021	-30	30	-20	20	-33.59	38.72	0.000000	-41.60	-23.62	40.02	
Mules and Asses	CH ₄	0.645	0.109	-30	30	-20	20	-34.11	39.00	0.000000	-83.16	-6.86	11.74	
Poultry	CH ₄	30.020	16.450	-10	10	-20	20	-21.87	22.82	0.000000	-45.20	-15.07	21.26	
3.B Manure Management	N₂O	361.580	164.193											
Mature dairy cattle	N ₂ O	56.942	13.137	-30	30	-50	100	-100.00	-100.00	0.000000	-76.93			
Other mature cattle	N ₂ O	4.558	4.519	-10	10	-50	100	-100.00	-100.00	0.000000	-0.84			
Growing cattle	N ₂ O	30.363	15.278	-10	10	-50	100	-100.00	-100.00	0.000000	-49.68			
Sheep	N ₂ O	2.165	2.093	-10	10	-50	100	-100.00	-100.00	0.000000	-3.35			
Market swine	N ₂ O	10.580	1.946	-10	10	-50	100	-100.00	-100.00	0.000000	-81.61			
Breeding swine	N ₂ O	15.132	2.154	-10	10	-50	100	-100.00	-100.00	0.000000	-85.77			
Goats	N ₂ O	0.212	0.146	-10	10	-50	100	-100.00	-100.00	0.000000	-30.97			
Horses	N ₂ O	1.200	0.664	-30	30	-50	100	-100.00	-100.00	0.000000	-44.69			
Mules and Asses	N ₂ O	0.057	0.028	-30	30	-50	100	-100.00	-100.00	0.000000	-50.95			
Poultry	N ₂ O	23.984	11.958	-10	10	-50	100	-100.00	-100.00	0.000000	-50.14			
Indirect N ₂ O emission	N ₂ O	216.387	112.270											
Total N volatilised as NH ₃ and NO _x	N ₂ O	216.387	112.270	-10	10	-30	30	-30.98	32.32	0.000027	-48.12	-19.32	30.95	
3.D.1 Direct N₂O Emissions From Managed Soils	N₂O	1,056.597	813.401											
Inorganic N fertilizers	N ₂ O	503.002	427.780	-20	20	-30	30	-33.81	38.08	0.000516	-14.95	-34.93	59.38	
Organic N fertilizers	N ₂ O	249.984	156.064	-10	10	-30	30	-31.00	32.35	0.000052	-37.57	-23.31	37.04	
Urine and dung deposited by grazing animals	N ₂ O	106.029	39.583	-10	10	-50	50	-50.26	52.32	0.000009	-62.67	-20.62	46.27	
Crop residues	N ₂ O	187.207	179.705	-20	20	-30	30	-34.15	37.27	0.000090	-4.01	-39.15	65.27	
Mineralization/immobilization associated with loss/gain of soil organic matter	N ₂ O	0.316	0.207	-20	20	-30	30	-33.67	38.53	0.000000	-34.36	-27.12	46.52	
Cultivation of organic soils	N ₂ O	10.061	10.061	-10	10	-500	500	-88.95	547.89	0.000025	0.00	-95.62	2167.30	
3.D.2 Indirect N₂O Emissions From Managed Soils	N₂O	343.973	260.244											
Atmospheric deposition	N ₂ O	115.385	80.771	-20	20	-250	250	-91.81	268.59	0.000514	-30.00	-65.99	1252.77	
Nitrogen leaching and run-off	N ₂ O	228.588	179.473	-20	20	-400	400	-90.47	444.78	0.005339	-21.49	-74.94	1551.38	
3.G Liming	CO₂		11.220	-50	50	-50	50	-62.65	79.52	0.000001				
3.H Urea Application	CO₂	50.020	64.964	-20	20	-50	50	-51.22	56.90	0.000026	29.88	-74.16	170.32	
4.A.1 Forest Land Remaining Forest Land	CO₂	-6,704.18	-5,384.29					-53.40	194.63	0.904685	-19.69	-674.34	638.75	1, 3
4.A.2 Land Converted to Forest Land	CO₂	-28.74	-231.01					-225.23	182.21	0.004496	703.69	-2050.68	3579.76	1, 3
4.B.1 Cropland Remaining Cropland	CO₂	196.90	288.88					-388.06	350.94	0.023121	46.72	-1418.46	1100.48	1, 3
4.B.2 Land Converted to Cropland	CO₂	23.13	17.83					-1736.20	1742.65	0.001950	-22.94	-1462.80	1326.44	1, 3

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		Gg CO2 equivalent	Gg CO2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
4.C.1 Grassland Remaining Grassland	CO ₂	2.07	2.07					-95.89	95.67	0.000000	0.00	-146.75	405.53	1, 3
4.C.2 Land Converted to Grassland	CO ₂	-103.92	-217.70					-128.39	232.40	0.003132	109.49	-1661.48	1312.08	1, 3
4.D.2 Land Converted to Wetlands	CO ₂	46.78	10.79					-206.92	503.32	0.000030	-76.93	-164.10	224.89	1, 3
4.E.2 Land Converted to Settlements	CO ₂	206.89	672.72					-93.23	139.70	0.012449	225.16	-314.19	981.33	1, 3
4.G Harvested Wood Products	CO ₂	-301.54	-763.42					-87.78	130.36	0.000536	153.17	-468.21	-175.75	1, 3
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	37.94	101.89					-1029.98	856.43	0.018722	168.51	-2899.07	2264.36	1, 3
4(V) Biomass Burning	CO ₂	8.99	64.65					-23.12	36.62	0.000008	619.32	-213.92	490.26	1, 3
4(V) Biomass Burning	CH ₄	1.23	8.92					-27.01	36.01	0.000000	624.66	-356.98	2083.74	1, 3
4(V) Biomass Burning	N ₂ O	0.86	6.50					-31.82	37.19	0.000000	657.39	-329.93	1060.92	1, 3
5.A Solid Waste Disposal	CH ₄	348.607	1,278.719											
5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH ₄	17.258	1,147.160	-50	50	-50	50	-61.43	81.11	0.014420	6547.21	-4504.23	13407.79	
5.A.2 Unmanaged Waste Disposal Sites	CH ₄	331.349	131.560	-50	50	-50	50	-62.19	78.91	0.000190	-60.30	-27.07	80.78	
5.B Biological Treatment of Solid Waste	CH ₄		2.744											
5.B Biological Treatment of Solid Waste\5.B.1 Composting	CH ₄		2.744	-50	50	-100	100	-85.87	129.12	0.000000				2
5.B Biological Treatment of Solid Waste	N ₂ O		1.962											
5.B Biological Treatment of Solid Waste\5.B.1 Composting	N ₂ O		1.962	-50	50	-110	110	-87.96	140.57	0.000000				2
5.C Incineration and Open Burning of Waste	CO ₂	0.536	0.049											
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Clinical Waste	CO ₂	0.123	0.049	-50	50	-30	30	-53.82	62.04	0.000000	-60.23	-23.50	58.83	
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	567.380	466.791											
5.D.1 Domestic wastewater	CH ₄	470.738	362.925	-30	30	-30	30	-39.66	46.28	0.000522	-22.90	-35.78	66.98	
5.D.2 Industrial wastewater	CH ₄	96.643	103.866	-30	30	-30	30	-39.00	44.84	0.000042	7.47	-49.01	92.38	
5.D Wastewater Treatment and Discharge	N ₂ O	66.884	88.315											
5.D.1 Domestic wastewater	N ₂ O	66.884	88.315	-50	50	-50	50	-62.32	79.99	0.000087	32.04	-88.70	277.30	
TOTAL	CO ₂ eq	25,280.643	18,881.985					-10.51	63.56	1.000000	-25.31	-18.90	41.97	

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

2.3. ABLE 3.3 OF VOLUME 1 OF THE 2006 IPCC GUIDELINES

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contributi on to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Appro ach and Comm ents
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO ₂	4,615.029		-5	5	-5	5	-6.96	7.14	0.000094	-79.74	-1.90	2.18	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH ₄	3.702		-5	5	-50	50	-50.00	50.43	0.000000	-83.36	-9.12	20.70	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N ₂ O	8.920		-5	5	-200	200	-91.58	206.96	0.000000	-80.95	-17.86	281.47	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO ₂	603.361		-5	5	-5	5	-6.92	7.01	0.000568	280.98	-36.86	39.39	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH ₄	0.159		-5	5	-50	50	-50.02	50.25	0.000000	280.98	-208.20	469.51	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N ₂ O	2.851		-5	5	-200	200	-91.65	208.94	0.000006	280.98	-358.27	5520.66	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO ₂	1,853.020		-5	5	-5	5	-6.91	7.36	0.000299	-10.69	-8.48	9.17	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH ₄	1.555		-5	5	-50	50	-49.98	50.76	0.000000	-11.30	-48.93	104.39	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N ₂ O	5.715		-5	5	-200	200	-91.75	206.85	0.000002	4.38	-97.95	1517.21	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH ₄			-5	5	-50	50	-50.05	50.51	0.000000				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N ₂ O			-5	5	-200	200	-91.71	207.96	0.000001				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CO ₂	2,158.014		-5	5	-5	5	-7.08	7.24	0.000104	-54.80	-4.32	4.79	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CH ₄	2.096		-5	5	-50	50	-50.04	50.21	0.000000	-59.81	-22.39	48.87	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	N ₂ O	4.973		-5	5	-200	200	-91.59	208.42	0.000000	-59.83	-37.71	597.98	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CO ₂	1,702.511		-5	5	-5	5	-7.07	7.10	0.000009	-83.48	-1.59	1.71	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CH ₄	4.196		-5	5	-50	50	-49.95	50.21	0.000000	-83.02	-9.35	21.23	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	N ₂ O	7.502		-5	5	-200	200	-91.82	208.04	0.000000	-83.02	-15.88	246.91	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CO ₂	1,641.149		-5	5	-5	5	-7.06	7.09	0.000087	-45.68	-5.22	5.68	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CH ₄	0.735		-5	5	-50	50	-50.02	50.13	0.000000	-45.93	-29.55	64.58	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	N ₂ O	0.876		-5	5	-200	200	-91.74	207.21	0.000000	-45.93	-50.57	771.55	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CO ₂			-5	5	-5	5	-6.94	7.02	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CH ₄			-5	5	-50	50	-50.09	51.14	0.000000				2

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	N ₂ O			-5	5	-200	200	-91.67	209.48	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	CH ₄	2.700		-5	5	-50	50	-49.92	50.48	0.000000	-77.34	-12.54	28.35	
1.A.2 Fuel combustion - Manufacturing Industries and Construction -	N ₂ O	4.291		-5	5	-200	200	-91.70	209.50	0.000000	-77.34	-21.26	353.98	
1.A.3.a Domestic Aviation	CO ₂	6.601		-5	5	-5	5	-7.00	7.02	0.000000	371.27	-44.70	48.60	
1.A.3.a Domestic Aviation	CH ₄	0.001		-5	5	-50	50	-50.21	50.71	0.000000	370.97	-262.21	572.41	
1.A.3.a Domestic Aviation	N ₂ O	0.055		-5	5	-200	200	-91.57	207.41	0.000000	370.97	-440.57	6781.84	
1.A.3.b Road Transportation	CO ₂	3,505.875		-5	5	-5	5	-6.95	7.25	0.003786	67.72	-16.17	18.05	
1.A.3.b Road Transportation	CH ₄	40.611		-5	5	-50	50	-50.32	50.26	0.000001	-71.70	-15.70	34.82	
1.A.3.b Road Transportation	N ₂ O	38.685		-5	5	-200	200	-91.61	207.52	0.000146	34.60	-126.49	2012.88	
1.A.3.c Railways	CO ₂	140.079		-5	5	-5	5	-6.98	6.99	0.000000	-58.65	-3.97	4.28	
1.A.3.c Railways	CH ₄	0.174		-5	5	-50	50	-50.03	50.19	0.000000	-62.78	-20.48	44.39	
1.A.3.c Railways	N ₂ O	13.248		-5	5	-200	200	-91.68	208.01	0.000002	-49.72	-46.94	738.33	
1.A.3.d Domestic Navigation - Liquid Fuels	CO ₂	134.383		-5	5	-5	5	-6.98	7.13	0.000002	-1.56	-9.15	10.35	
1.A.3.d Domestic Navigation - Liquid Fuels	CH ₄	0.317		-5	5	-50	50	-50.03	50.25	0.000000	-1.37	-54.77	121.90	
1.A.3.d Domestic Navigation - Liquid Fuels	N ₂ O	1.079		-5	5	-200	200	-91.74	208.35	0.000000	-1.37	-92.22	1537.53	
1.A.4 Other Sectors - Liquid Fuels	CO ₂	2,450.466		-5	5	-5	5	-6.84	6.96	0.000155	-50.77	-4.73	5.20	
1.A.4 Other Sectors - Liquid Fuels	CH ₄	6.331		-5	5	-50	50	-50.24	50.79	0.000000	-57.67	-23.40	51.06	
1.A.4 Other Sectors - Liquid Fuels	N ₂ O	88.151		-5	5	-200	200	-91.72	208.42	0.000242	-23.98	-71.28	1089.53	
1.A.4 Other Sectors - Solid Fuels	CO ₂	524.388		-5	5	-5	5	-6.94	7.12	0.000000	-98.14	-0.18	0.20	
1.A.4 Other Sectors - Solid Fuels	CH ₄	33.392		-5	5	-50	50	-49.96	50.05	0.000000	-97.81	-1.20	2.69	
1.A.4 Other Sectors - Solid Fuels	N ₂ O	2.377		-5	5	-200	200	-91.68	209.04	0.000000	-98.14	-1.75	26.76	
1.A.4 Other Sectors - Gaseous Fuels	CO ₂	744.057		-5	5	-5	5	-7.04	7.08	0.000270	111.53	-20.58	22.13	
1.A.4 Other Sectors - Gaseous Fuels	CH ₄	1.670		-5	5	-50	50	-50.10	50.40	0.000000	110.00	-114.27	260.36	
1.A.4 Other Sectors - Gaseous Fuels	N ₂ O	0.559		-5	5	-200	200	-91.73	208.70	0.000000	49.52	-140.45	2321.10	

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A IPCC category	B Gas	C Base year emissions /removals Gg CO2 equivalent	D Year t emissions /removals Gg CO2 equivalent	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t (fraction)	I Inventory trend in national emissions for year t increase with respect to base year (% of base year)	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments
				(-)	(+)	(-)	(+)	(-)	(+)			(-)	(+)	
				%	%	%	%	%	%			%	%	
1.A.4 Other Sectors - Biomass	CH ₄	316.275		-5	5	-50	50	-49.82	50.48	0.000688	12.40	-61.25	139.88	
1.A.4 Other Sectors - Biomass	N ₂ O	50.267		-5	5	-200	200	-91.61	207.90	0.000172	12.40	-105.39	1733.69	
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												
1. Exploration	CO ₂	28.536		-5	5	-50	50	-50.26	50.67	0.000000	-72.66	-15.03	33.03	
2. Production(7)	CO ₂	129.245		-5	5	-50	50	-49.65	50.29	0.000007	-72.66	-15.26	34.49	
3. Transport	CO ₂	0.006		-5	5	-50	50	-50.37	50.69	0.000000	-28.58	-38.86	87.70	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	220.600												
1. Exploration	CH ₄	15.205		-5	5	-100	100	-84.37	100.30	0.000000	-72.66	-23.34	164.42	
2. Production(7)	CH ₄	199.531		-5	5	-100	100	-84.04	100.68	0.000057	-72.66	-23.22	162.73	
3. Transport	CH ₄	1.516		-5	5	-100	100	-84.25	100.51	0.000000	-28.58	-60.79	441.24	
4. Refining/storage	CH ₄	4.348		-5	5	-100	100	-84.31	100.49	0.000000	-53.01	-40.04	276.27	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N ₂ O	0.064		-5	5	-10	1000	-	-	0.000000	-72.66			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural	CO ₂	522.064												
1. Exploration	CO ₂	18.043		-5	5	-50	50	-	-	0.000000	-16.90	-83.10	-83.10	
2. Production(7)	CO ₂	418.423		-5	5	-100	100	-84.33	100.46	0.000481	-61.97	-32.69	223.96	
3. Processing	CO ₂	85.568		-5	5	-100	100	-84.24	100.45	0.000096	-16.90	-71.66	460.52	
4. Transmission and storage	CO ₂	0.011		-5	5	-100	100	-84.36	101.44	0.000000	-2.80	-83.78	585.45	
5. Distribution	CO ₂	0.019		-5	5	-20	500	-	-	0.000000	112.55			
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural	CH ₄	148.067												
1. Exploration	CH ₄	9.614		-5	5	-100	100	-84.30	101.91	0.000001	-16.90	-71.02	494.66	
2. Production(7)	CH ₄	66.445		-5	5	-100	100	-84.28	100.55	0.000058	-16.90	-71.09	501.02	
3. Processing	CH ₄	29.338		-5	5	-100	100	-84.26	100.87	0.000011	-16.90	-71.37	504.28	
4. Transmission and storage	CH ₄	32.239		-5	5	-100	100	-84.25	100.40	0.000019	-2.80	-83.48	573.12	

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
5. Distribution	CH ₄	10.431		-5	5	-20	500	-	-	0.000000	112.55			
1.B.2.c. Venting and flaring	CO ₂	0.002												
1. Venting - Oil	CO ₂	0.002		-5	5	-100	100	-84.25	100.84	0.000000	-89.89	-8.73	60.20	
1.B.2.c. Venting and flaring	CH ₄	0.590												
1. Venting - Oil	CH ₄	0.590		-5	5	-100	100	-84.35	100.98	0.000000	-89.89	-8.64	59.82	
1.B.2.c. Venting and flaring	N ₂ O	0.630												
2. Flaring - Oil	N ₂ O	0.598		-5	5	-100	100	-84.35	101.46	0.000000	-72.66	-23.24	166.70	
2. Flaring - Gas	N ₂ O	0.032		-5	5	-100	100	-84.10	101.23	0.000000	-16.90	-70.75	468.90	
2.A.1 Cement Production	CO ₂	1,085.790		-2	2	-2	2	-2.81	2.89	0.000020	-0.85	-3.89	4.02	
2.A.2 Lime Production	CO ₂	153.440		-2	2	-2	2	-2.79	2.84	0.000000	-39.18	-2.37	2.51	
2.A.3 Glass Production	CO ₂	35.871		-2	2	-2	2	-2.84	2.86	0.000000	-9.06	-3.52	3.71	
2.A.4 Other Process Uses of Carbonates	CO ₂	5.775												
2.A.4.a Ceramics	CO ₂	5.775		-7.5	7.5	-5	5	-8.78	9.05	0.000000	81.56	-21.58	25.11	
2.A.4.b Other uses of Soda Ash	CO ₂			-7.5	7.5	-5	5	-8.93	8.97	0.000000				
2.A.4.d Other	CO ₂			-7.5	7.5	-5	5	-8.74	9.09	0.000000				
2.B.1 Ammonia Production	CO ₂	558.672		-2	2	-2	2	-2.85	2.81	0.000005	-1.93	-3.87	3.99	5
2.B.1 Ammonia Production	CH ₄	0.137		-5	5	-50	50	-50.13	50.45	0.000000	11.89	-60.89	136.09	
2.B.1 Ammonia Production	N ₂ O	0.163		-5	5	-200	200	-91.80	207.75	0.000000	11.89	-105.47	1706.17	
2.B.2 Nitric Acid Production	N ₂ O	754.265		-2	2	-2	2	-2.80	2.81	0.000000	-85.50	-2.46	3.66	
2.B.8 Petrochemical and Carbon Black Production	CO ₂	219.763												
2.B.8.a Methanol	CO ₂			-7.5	7.5	-30	30	-30.56	31.61	0.000000				2
2.B.8.b Ethylene	CO ₂	125.652												
2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer	CO ₂	13.877												2
2.B.8.f Carbon Black	CO ₂	80.235												2

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
2.B.8 Petrochemical and Carbon Black Production	CH ₄	5.493												
2.B.8.a Methanol	CH ₄			-7.5	7.5	-30	30	-30.71	31.11	0.000000				2
2.B.8.b Ethylene	CH ₄	5.447												
2.B.8.f Carbon Black	CH ₄	0.046												2
2.C.1 Iron and Steel Production	CO ₂	45.970												
2.C.1.a Steel	CO ₂	45.970		-5	5	-5	5	-7.03	7.28	0.000000	-97.71	-0.33	0.42	
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	234.749												
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO ₂	72.603		-5	5	-50	50	-50.24	50.59	0.000002	-76.65	-12.90	29.20	
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO ₂	22.816		-5	5	-50	50	-50.10	50.54	0.000000	-82.99	-9.33	21.15	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent	CO ₂	139.315		NA	NA	-50	50	-40.78	58.48	0.000016	-60.91	-19.54	38.86	4
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road	CO ₂	0.005		-10	10	-50	50	-50.61	51.09	0.000000	274.04	-206.13	459.39	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\	CO ₂			-5	5	-5	5	-6.97	7.36	0.000000				
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt	CO ₂	0.009		-10	10	-50	50	-50.42	51.67	0.000000	-29.27	-39.50	90.46	
2.F.1 Refrigeration and Air conditioning	Aggr. F-													
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a			-50	50	-50	50	-61.92	81.29	0.000087				2
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125			-50	50	-50	50	-62.31	79.90	0.000038				2
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a			-50	50	-50	50	-61.88	78.50	0.000000				2

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a			-50	50	-50	50	-61.70	79.31	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a			-50	50	-50	50	-62.52	81.76	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125			-50	50	-50	50	-61.41	80.33	0.000005				2
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a			-50	50	-50	50	-62.26	82.54	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32			-50	50	-50	50	-62.70	80.27	0.000000				2
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a			-50	50	-50	50	-62.10	79.90	0.000020				2
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a			-50	50	-50	50	-63.82	81.82	0.000282				2
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32			-50	50	-50	50	-62.29	80.94	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125			-50	50	-50	50	-62.71	80.06	0.000004				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a			-50	50	-50	50	-61.97	78.69	0.000000				2
2.F.3 Fire Protection	Aggr. F-													
2.F.3 Fire Protection\HFC-125	HFC-125			-50	50	-50	50	-61.82	82.55	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-			-50	50	-50	50	-62.15	82.28	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-			-50	50	-50	50	-62.65	79.71	0.000000				2
2.F.4 Aerosols	Aggr. F-													
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a	HFC-134a			-50	50	-50	50	-61.81	78.76	0.000001				2
2.G Other Product Manufacture and Use	N ₂ O	33.376												
2.G.3 N ₂ O from Product Uses\2.G.3.a Medical Applications	N ₂ O	32.780		-50	50	-50	50	-62.78	80.06	0.000035	70.73	2875.77	28559.2	
2.G.3 N ₂ O from Product Uses\2.G.3.b Other\Propellant for pressure and	N ₂ O	0.596		-50	50	-50	50	-62.12	80.37	0.000000	-90.50	-6.33	18.99	2
2.G Other Product Manufacture and Use	Aggr. F-	10.450												
2.G.1 Electrical Equipment\SF ₆	SF ₆	10.450		-50	50	-50	50	-96.31	-81.99	0.000000	-38.84	-41.20	125.96	
3.A Enteric Fermentation	CH ₄	2,171.549												
Mature dairy cattle	CH ₄	1,371.447		-30	30	-20	20	-34.18	38.50	0.000628	-65.55	-13.96	23.94	
Other mature cattle	CH ₄	79.186		-10	10	-20	20	-21.67	23.18	0.000014	44.23	-39.37	54.31	

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A IPCC category	B Gas	C Base year emissions /removals Gg CO2 equivalent	D Year t emissions /removals Gg CO2 equivalent	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t (fraction)	I Inventory trend in national emissions for year t increase with respect to base year (% of base year)	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments
				(-)	(+)	(-)	(+)	(-)	(+)			(-)	(+)	
				%	%	%	%	%	%			%	%	
Growing cattle	CH ₄	544.415		-10	10	-20	20	-21.30	23.26	0.000173	-25.99	-20.21	28.90	
Sheep	CH ₄	93.875		-10	10	-20	20	-21.66	23.09	0.000017	31.86	-36.30	49.64	
Market swine	CH ₄	5.800		-10	10	-20	20	-21.62	23.13	0.000000	-7.92	-25.31	34.84	
Breeding swine	CH ₄	33.525		-10	10	-20	20	-21.76	23.16	0.000001	8.65	-30.19	41.21	
Goats	CH ₄	21.500		-10	10	-20	20	-22.05	23.01	0.000000	-56.09	-12.17	16.24	
Horses	CH ₄	17.550		-30	30	-20	20	-34.65	38.31	0.000000	-41.60	-23.65	39.92	
Mules and Asses	CH ₄	4.250		-30	30	-20	20	-34.05	37.86	0.000000	-83.16	-6.92	11.49	
3.B Manure Management	CH₄	414.613												
Mature dairy cattle	CH ₄	149.038		-30	30	-20	20	-34.10	37.55	0.000057	-4.24	-39.25	66.14	
Other mature cattle	CH ₄	7.889		-10	10	-20	20	-21.79	23.10	0.000000	131.49	-63.23	88.40	
Growing cattle	CH ₄	52.552		-10	10	-20	20	-21.81	22.91	0.000004	17.47	-32.32	44.64	
Sheep	CH ₄	2.513		-10	10	-20	20	-22.12	23.09	0.000000	-15.44	-23.20	31.46	
Market swine	CH ₄	32.520		-10	10	-20	20	-21.88	23.30	0.000001	10.01	-30.15	41.12	
Breeding swine	CH ₄	137.244		-10	10	-20	20	-22.12	23.04	0.000029	18.78	-32.77	43.83	
Goats	CH ₄	0.443		-10	10	-20	20	-21.85	22.99	0.000000	-55.23	-12.14	16.80	
Horses	CH ₄	1.749		-30	30	-20	20	-33.59	38.72	0.000000	-41.60	-23.62	40.02	
Mules and Asses	CH ₄	0.645		-30	30	-20	20	-34.11	39.00	0.000000	-83.16	-6.86	11.74	
Poultry	CH ₄	30.020		-10	10	-20	20	-21.87	22.82	0.000000	-45.20	-15.07	21.26	
3.B Manure Management	N₂O	361.580												
Mature dairy cattle	N ₂ O	56.942		-30	30	-50	100	-	-	0.000000	-76.93			
Other mature cattle	N ₂ O	4.558		-10	10	-50	100	-	-	0.000000	-0.84			
Growing cattle	N ₂ O	30.363		-10	10	-50	100	-	-	0.000000	-49.68			
Sheep	N ₂ O	2.165		-10	10	-50	100	-	-	0.000000	-3.35			
Market swine	N ₂ O	10.580		-10	10	-50	100	-	-	0.000000	-81.61			

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t (fraction)	Inventory trend in national emissions for year t increase with respect to base year (% of base year)	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
Breeding swine	N ₂ O	15.132		-10	10	-50	100	-	-	0.000000	-85.77			
Goats	N ₂ O	0.212		-10	10	-50	100	-	-	0.000000	-30.97			
Horses	N ₂ O	1.200		-30	30	-50	100	-	-	0.000000	-44.69			
Mules and Asses	N ₂ O	0.057		-30	30	-50	100	-	-	0.000000	-50.95			
Poultry	N ₂ O	23.984		-10	10	-50	100	-	-	0.000000	-50.14			
Indirect N2O emission	N ₂ O	216.387												
Total N volatilised as NH3 and NOx	N ₂ O	216.387		-10	10	-30	30	-30.98	32.32	0.000027	-48.12	-19.32	30.95	
3.D.1 Direct N2O Emissions From Managed Soils	N ₂ O	1,056.597												
Inorganic N fertilizers	N ₂ O	503.002		-20	20	-30	30	-33.81	38.08	0.000516	-14.95	-34.93	59.38	
Organic N fertilizers	N ₂ O	249.984		-10	10	-30	30	-31.00	32.35	0.000052	-37.57	-23.31	37.04	
Urine and dung deposited by grazing animals	N ₂ O	106.029		-10	10	-50	50	-50.26	52.32	0.000009	-62.67	-20.62	46.27	
Crop residues	N ₂ O	187.207		-20	20	-30	30	-34.15	37.27	0.000090	-4.01	-39.15	65.27	
Mineralization/immobilization associated with loss/gain of soil organic	N ₂ O	0.316		-20	20	-30	30	-33.67	38.53	0.000000	-34.36	-27.12	46.52	
Cultivation of organic soils	N ₂ O	10.061		-10	10	-500	500	-88.95	547.89	0.000025	0.00	-95.62	2167.30	
3.D.2 Indirect N2O Emissions From Managed Soils	N ₂ O	343.973												
Atmospheric deposition	N ₂ O	115.385		-20	20	-250	250	-91.81	268.59	0.000514	-30.00	-65.99	1252.77	
Nitrogen leaching and run-off	N ₂ O	228.588		-20	20	-400	400	-90.47	444.78	0.005539	-21.49	-74.94	1551.38	
3.G Liming	CO ₂			-50	50	-50	50	-62.65	79.52	0.000001				
3.H Urea Application	CO ₂	50.020		-20	20	-50	50	-51.22	56.90	0.000026	29.88	-74.16	170.32	
4.A.1 Forest Land Remaining Forest Land	CO ₂	-6,704.18	-5,384.29					-53.40	194.63	0.904685	-19.69	-674.34	638.75	1, 3
4.A.2 Land Converted to Forest Land	CO ₂	-28.74	-231.01					-	182.21	0.004496	703.69	-	3579.76	1, 3
4.B.1 Cropland Remaining Cropland	CO ₂	196.90	288.88					-	350.94	0.023121	46.72	-	1100.48	1, 3
4.B.2 Land Converted to Cropland	CO ₂	23.13	17.83					-	1742.6	0.001950	-22.94	-	1326.44	1, 3
4.C.1 Grassland Remaining Grassland	CO ₂	2.07	2.07					-95.89	95.67	0.000000	0.00	-146.75	405.53	1, 3

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A IPCC category	B Gas	C Base year emissions /removals Gg CO2 equivalent	D Year t emissions /removals Gg CO2 equivalent	E Activity data uncertainty		F Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		G Combined uncertainty		H Contribution to variance in Year t (fraction)	I Inventory trend in national emissions for year t increase with respect to base year (% of base year)	J Uncertainty introduced into the trend in total national emissions with respect to base year		K Approach and Comments
				(-)	(+)	(-)	(+)	(-)	(+)			(-)	(+)	
				%	%	%	%	%	%			%	%	
4.C.2 Land Converted to Grassland	CO ₂	-103.92	-217.70					-	232.40	0.003132	109.49	-	1312.08	1, 3
4.D.2 Land Converted to Wetlands	CO ₂	46.78	10.79					-	503.32	0.000030	-76.93	-164.10	224.89	1, 3
4.E.2 Land Converted to Settlements	CO ₂	206.89	672.72					-93.23	139.70	0.012449	225.16	-314.19	981.33	1, 3
4.G Harvested Wood Products	CO ₂	-301.54	-763.42					-87.78	130.36	0.000536	153.17	-468.21	-175.75	1, 3
4(III).Direct N2O emissions from N mineralization/immobilization	N ₂ O	37.94	101.89					-	856.43	0.018722	168.51	-	2264.36	1, 3
4(V) Biomass Burning	CO ₂	8.99	64.65					-23.12	36.62	0.000008	619.32	-213.92	490.26	1, 3
4(V) Biomass Burning	CH ₄	1.23	8.92					-27.01	36.01	0.000000	624.66	-356.98	2083.74	1, 3
4(V) Biomass Burning	N ₂ O	0.86	6.50					-31.82	37.19	0.000000	657.39	-329.93	1060.92	1, 3
5.A Solid Waste Disposal	CH ₄	348.607												
5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH ₄	17.258		-50	50	-50	50	-61.43	81.11	0.014420	6547.21	-	13407.7	
5.A.2 Unmanaged Waste Disposal Sites	CH ₄	331.349		-50	50	-50	50	-62.19	78.91	0.000190	-60.30	-27.07	80.78	
5.B Biological Treatment of Solid Waste	CH ₄													
5.B Biological Treatment of Solid Waste\5.B.1 Composting	CH ₄			-50	50	-100	100	-85.87	129.12	0.000000				2
5.B Biological Treatment of Solid Waste	N ₂ O													
5.B Biological Treatment of Solid Waste\5.B.1 Composting	N ₂ O			-50	50	-110	110	-87.96	140.57	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	CO ₂	0.123		-50	50	-30	30	-53.82	62.04	0.000000	-60.23	-23.50	58.83	
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial	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	N ₂ O	0.007												2
5.D Wastewater Treatment and Discharge	CH ₄	567.380												
5.D.1 Domestic wastewater	CH ₄	470.738		-30	30	-30	30	-39.66	46.28	0.000522	-22.90	-35.78	66.98	
5.D.2 Industrial wastewater	CH ₄	96.643		-30	30	-30	30	-39.00	44.84	0.000042	7.47	-49.01	92.38	
5.D Wastewater Treatment and Discharge	N ₂ O	66.884												

TABLE 3.3 (Year t = 2016) GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(-) %	(+) %	
5.D.1 Domestic wastewater	N ₂ O	66.884		-50	50	-50	50	-62.32	79.99	0.000087	32.04	-88.70	277.30	
TOTAL	CO ₂ eq	25,280.643						-10.51	63.56	1.000000	-25.31	-18.90	41.97	

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
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
Fuel oil	1000 t	570.40	283.40	284.00	15.10	58.50	60.10	18.90	1.60	10.60	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
Natural gas	1000000 m3	201.70	155.80	36.30	24.00	27.00	14.00	2.70	0.60	52.50	66.10
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
Other biomass	PJ				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
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
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
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
NCV for coke oven gas	MJ/kg	17.91									
NCV for biogas	TJ/PJ	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass											
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
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 - 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 - 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 - Biogass	t/TJ	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
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
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
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 - 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 - Biogass	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 biomass	kg/TJ	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
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 - 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	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
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
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

Table A3-2: 1A1aⁱⁱⁱ - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
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
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
Coke oven gas	1000000 m ³										
Biogas	PJ			0.00	0.14	0.17	0.34	0.41	0.48	1.07	1.50
Other biomass	TJ				1.90	803.20	1003.50	1146.10	1190.30	2189.00	3730.20
Net calorific values											
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	24.35	24.96	24.64	25.00	24.95
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
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
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
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
NCV for other biomass		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
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
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
EF CO ₂ - 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 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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

Table A3-2: 1A1aII - activity data NCV and emission factors

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
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
Natural gas	1000000 m3	315.50	363.40	479.00	649.90	652.10	673.90	580.40	352.10	343.70	407.90
Coke oven gas	1000000 m3										
Biogas	PJ			0.00	0.14	0.17	0.34	0.41	0.48	1.07	1.50
Other biomass	TJ				1.90	803.20	1003.50	1146.10	1190.30	2189.00	3730.20
Net calorific values											
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	24.35	24.96	24.64	25.00	24.95
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
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
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
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
NCV for other biomass		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EMISSION FACTORS											
EF CO2 t/TJ	t/TJ										
EF CO2 - Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
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 - 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 - 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 - Biogas	t/TJ	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
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
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
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	3.67	2.73	2.87	3.67	3.58	3.51	3.24	2.25	2.42	2.81
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 - Biogas	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 biomass	kg/TJ	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
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 - 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	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
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
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

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

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption	UNIT										
Hard coal	1000 t				0.00	0.00	0.00	0.00			
Fuel oil	1000 t	0.00	37.00	39.00	23.20	23.50	13.70	4.50	2.90	3.70	3.70
Light heating oil	1000 t	0.00	4.40	6.70	4.90	5.30	3.10	3.70	3.10	3.90	3.70
Natural gas	1000000 m3	0.00	53.00	71.30	86.50	76.00	76.60	85.90	71.60	72.40	71.00
Coke oven gas	1000000 m3										
Biogas	PJ				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
Gas works gas	1000000 m3			1.46							
Liquified petroleum gas	1000 t	0.00									
Net calorific values											
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	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
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
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
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
NCV for other biomass	TJ/PJ				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									
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
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 - 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 - 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 -Biogas	t/TJ	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
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 - LPG	t/TJ	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
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
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 - 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 - Biogas	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 biomass	kg/TJ	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
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 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
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 - 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	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
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
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
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
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

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

Refining - transformation		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	1000 t	0.00	0.00	9.50	0.00	0.00	2.70	1.50	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
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
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
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
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
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
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
Total fuel consumption (TJ)	TJ	12,215.9	9,756.3	24,596.4	20,316.8	27,608.8	28,713.6	21,835.1	24,462.7	21,567.0	19,961.4
Emission factors											
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - petroleum coke (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - refinery gas (t/TJ)	t/TJ	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60
EF CO2 - natural gas (t/TJ)	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	Gg	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
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - LPG (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - petroleum coke (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - refinery gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - natural gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	Mg	30.48	25.30	45.01	39.95	43.39	41.04	30.55	32.56	32.35	30.54
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - petroleum coke (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - refinery gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	Mg	5.79	4.86	10.63	9.37	8.61	8.32	6.13	5.57	6.21	6.19

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

Manufacture of solid fuels and other energy industries	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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	2005	2010	2011	2012	2013	2014	2015	2016
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	5.50							
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71							
Natural gas (1000000 m3)	391.10	140.00	175.50	241.70	156.30	114.40	120.20	91.70	121.30	102.90
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
Other Kerosene prod (petrolej) (1000 t)										
NCV for petroleum (MJ/m3)										
Total fuel consumption (TJ)	13,894.67	5,110.13	6,201.91	8,217.80	5,314.20	3,889.60	4,086.80	3,172.82	4,196.98	3,580.92
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	352.16	461.02	298.13	218.21	229.27	178.00	235.45	200.89
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	6.67	8.22	5.31	3.89	4.09	3.17	4.20	3.58
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	0.74	0.82	0.53	0.39	0.41	0.32	0.42	0.36

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

Manufacture of solid fuels and other energy industries	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
NCV for biogas (TJ/TJ)							1.00	1.00	1.00	1.00
Total fuel consumption (TJ)	60.50	34.08	0.00	0.00	0.00	0.00	22.54	17.30	26.54	26.93
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
Anthracite	10 ³ t		0	0.6	1.6	0.2	1.3	1.5	0.9	0.1
Coking coal (kameni ugljen)	10 ³ t	0	1	0	0	0.3	0.2	0	1.8	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	28.7	22.9	35	31.5	15.5	15.7	15.6	17.5	13
Wood	10 ³ m ³			0.8	0.7	0.5	0.3	0.3	0.5	0.4
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0.6	0	0	0
Coke oven coke	10 ³ t	5.2	4.3	3.7	2	1.6	2.5	2.5	0.6	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
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t		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
Residual fuel oil	10 ³ t	1.3	2.7	1.2	1	1.3	1.1	1.4	1.1	1
Petroleum coke	10 ³ t	0	0	0.7	0	0.2	0	0.3	0.3	0.1
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			0	0	0	0	0	0	0
Gas works gas	10 ³ m ³	0	0.031	0	0	0	0	0	0	0

1A2b Non-Ferrous metals										
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016
Anthracite	10 ³ t		0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	4.6	1	0.4	1.2	1.1	0.9	1.1	2.6	2.6
Wood	10 ³ m ³			0.6	0.6	0.5	0.4	0.4	0.2	0.4
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	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
Liquified petroleum gas	10 ³ t	0.5	2.1	3.1	3.8	5.1	5.3	4.2	0.8	0.5
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0.6	0.2	0
Diesel	10 ³ t		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
Residual fuel oil	10 ³ t	0.5	4	1.2	1.4	0	0.0	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			0	0	0	0	0	0	0
Gas works gas	10 ³ m ³	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
Anthracite	10 ³ t		0.2	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	1.2	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	139.3	183.1	227.6	210.2	143.4	129.8	140.2	146.9	145.8
Wood	10 ³ m ³			0.1	0.1	0.1	0	0	0	0
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0
Coke oven coke	10 ³ t	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
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							1.4	2.4	3.5
Diesel	10 ³ t		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
Residual fuel oil	10 ³ t	99.7	73	3.6	4.9	1.3	1.1	3	0	0
Petroleum coke	10 ³ t	0	0.7	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			0	0	0	0	0	0	0
Gas works gas	10 ⁶ m ³	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
Anthracite	10 ³ t		0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	74.3	69.2	68.8	65.8	58.8	53.3	34.7	27.6	45.6
Wood	10 ³ m ³			13.2	0	0	0	0	0.1	0
Biogas	TJ			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
Coke oven coke	10 ³ t	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
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t		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
Residual fuel oil	10 ³ t	9.2	11.9	9.5	7.1	4.3	3.5	1.2	5.2	5.2
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			0	0	0	0	0	0	0
Gas works gas	10 ⁶ m ³	0	0.031	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
Anthracite	10 ³ t		0	0.7	0.5	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	1.2	0.9	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
Lignite	10 ³ t	18.1	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
Wood	10 ³ m ³			0.5	0.7	1.4	4.2	10.6	13.5	10.9
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	9.37	0	0	0
Coke oven coke	10 ³ t	4.8	9.6	6.4	6.4	7	3	5.2	4	4.5
Liquified petroleum gas	10 ³ t	0.6	1.6	1.3	1.5	1.2	1.4	1.5	1.4	1.2
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t		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
Residual fuel oil	10 ³ t	29.1	32.4	22.9	23.6	12.2	9.8	7.7	9.1	11.4
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			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

1A2f Non-Metallic Minerals										
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016
Anthracite	10 ³ t		0.1	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	1	0	0	0	0
Lignite	10 ³ t	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
Wood	10 ³ m ³			0	0	0	0	0	0	0
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0
Coke oven coke	10 ³ t	7.6	7.7	0.1	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
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t		0.1	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
Residual fuel oil	10 ³ t	2.2	3.8	2.2	1.8	1.8	0.1	0	0	0
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	5.4
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			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

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction										
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016
Anthracite	10 ³ t		0	0	0	0	1.3	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
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	3	5	1.1	18.4	0	4.5	1.5	2.7	2.7
Lignite	10 ³ t	2	0	0	0	0	1.3	0	0	0
Natural gas	10 ⁶ m ³	195.9	124.4	76.4	67.6	54.1	39.3	36.3	40.7	38.4
Wood	10 ³ m ³			0.3	0.2	0.5	0.2	0.7	0.9	2.3
Biogas	TJ			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
Coke oven coke	10 ³ t	0	0	17.3	18.7	19.5	19.4	21.3	20.6	24.2
Liquified petroleum gas	10 ³ t	4.1	4.6	3.2	2.8	3.1	2.7	2.4	1.6	1.4
Motor Gasoline	10 ³ t			0	0	0	0	0	0	0
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t		15	14.3	13.5	12	12.3	11.6	11.1	10.4
Gas/Diesel oil	10 ³ t	24.9	7	4.3	3.5	3.1	2.6	2.5	2.7	2.8
Residual fuel oil	10 ³ t	160.9	53.1	7.3	5.6	5.5	4.4	4.9	3.9	3
Petroleum coke	10 ³ t	16.3	171.6	115.3	93.3	93.7	146.4	154.7	167.2	169.8
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			0	0	0	0	0	0	0
Gas works gas	10 ⁶ m ³	0.1	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

1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo)										
Fuel consumption	Unit	2001	2005	2010	2011	2012	2013	2014	2015	2016
Anthracite	10 ³ t		0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0.1	4.2	0	0	0	0	0	0	0
Lignite	10 ³ t	0.1	0.2	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
Wood	10 ³ m ³			39.4	44.5	45.6	44.4	35.3	27.4	31.7
Biogas	TJ			0	0	0	0	0	0	0
Wood waste	TJ	1979.4	2087.5	1456.677	1232.8	1306.1	1260.1	1188	579	371.5
Coke oven coke	10 ³ t	0.7	1	0.1	0.1	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
Motor Gasoline	10 ³ t	7.8	6.9	5.1	4.7	4.2	4.1	4.1	4	4.1
Petroleum	10 ³ t							0	0	0
Diesel	10 ³ t	68	110.6	102.2	98.3	90	87.4	78.6	79.2	76.9
Gas/Diesel oil	10 ³ t	8.2	23	12.2	11.6	10.7	9.8	8.4	8.7	3.4
Residual fuel oil	10 ³ t	22.6	17.7	8.4	5.8	5.7	3.6	3.3	3.8	3.5
Petroleum coke	10 ³ t	0	0	0	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0	0	0	0
Other oil derivatives	10 ³ t			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

1A2g vii Off-road vehicles and other machinery												
Fuel consumption	Jedinica	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
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
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

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
Anthracite	MJ/kg		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	24.77	25.24	26.47	27.07	26.2	26.7	27.39
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	18.2	18.5	17.6	17.1	17.8	16.74	16.89	17	17
Lignite	MJ/kg	12.2	12.1				10.5	0	0	0
Natural gas	MJ/m3	34.0	34.0	34.0	34.0	34.0	34.0	34.6	34.6	34.8
Wood	MJ/m3	9.0	9.0	9.0	9.0	9.0	9.0	9	9	9
Biogas	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1
Wood waste	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	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
Liquified petroleum gas	MJ/kg	46.9	46.9	46.9	46.9	46.9	46.9	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
Petroleum	MJ/kg							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
Gas/Diesel oil	MJ/kg	42.7	42.7	42.7	42.7	42.7	42.7	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
Petroleum coke	MJ/kg	31.0	31.0	31.0	31.0	31.0	31.0	31	31	31
Refinery gas	MJ/kg							0	0	0
Other oil derivatives	MJ/kg							0	0	0
Gas works gas	MJ/m3	19.5	21.47					0	0	0
Other fossil fuels	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0	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 derivatives	0	3	0.6
Gas works gas	44.4	1	0.1
Other fossil fuels	143	30	4

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

Domestic aviation		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption											
Aviation gasoline	1000 t	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.30	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	11.00	9.00	10.00	9.00	9.00	8.70	9.50	9.50
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	528.15	440.23	484.19	440.23	440.23	427.04	431.00	435.46
Emissions											
EF CO ₂ - aviation gasoline	t/TJ	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
EF CO ₂ - jet kerosene	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO ₂ - motor gasoline	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
CO₂ Emission	Gg	6.60	25.45	37.70	31.41	34.55	31.41	31.41	30.47	30.80	31.11
EF CH ₄ - gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH ₄ - jet kerosene	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH ₄ - motor gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CH₄ Emission	Mg	0.05	0.18	0.26	0.22	0.24	0.22	0.22	0.21	0.22	0.22
EF N ₂ O - gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - jet kerosene	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N ₂ O - motor gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N₂O Emission	Mg	0.18	0.71	1.06	0.88	0.97	0.88	0.88	0.85	0.86	0.87

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

1A3bi	CARS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
	FUEL CONSUMPTION											
	Gasoline	t	722.22	715.13	648.88	593.09	581.06	544.15	532.54	487.61	486.99	490.03
	Diesel oil	t	36.02	184.56	402.78	520.28	529.06	556.27	490.57	598.66	679.22	706.37
	LPG	t	#DIV/0!	9.80	22.10	58.70	43.10	54.80	56.30	60.40	67.00	70.70
	CNG	106 m3				0.04	0.02	0.03	0.06	0.16	0.16	0.38
	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	34.6	34.6
	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	2005	2010	2011	2012	2013	2014	2015	2016
	FUEL CONSUMPTION											
	Gasoline	t	28.854491	32.403256	22.056554	15.3715	14.1183	10.0429	9.25653	9.51087	9.44943	8.68463
	Diesel oil	t	87.873625	158.77765	284.75959	258.5	249.425	228.839	217.86	187.056	195.302	205.195
	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	34.6	34.6
	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	2005	2010	2011	2012	2013	2014	2015	2015
	FUEL CONSUMPTION											
	Gasoline	t	2.2670	1.2417	1.2736	1.0036	0.7871	0.6261	0.5703	0.7190	0.6133	0.4523
	Diesel oil	t	242.3113	214.4574	268.0618	321.2182	308.2179	280.4962	393.8747	334.4795	343.2799	368.0312
	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
	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	34.6	34.6
	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

1A3biv	MOTORCYCLES		1990	2000	2005	2010	2011	2012	2013	2014	2015	2015
	FUEL CONSUMPTION											
	Gasoline	t	6.163	15.429	21.292	27.137	26.036	23.382	22.330	23.259	22.944	22.733
	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	34.6	34.6
	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	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption											
Gasoline (1000 t)	1000 t	0.10	0.10								
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59								
Diesel (1000 t)	1000 t	36.10	27.20	30.50	28.50	26.40	24.80	23.40	21.20	17.50	18.30
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	0.20									
NCV for fuel oil (MJ/kg)	MJ/kg	40.19									
Light heating oil (1000 t)	1000 t	1.10									
NCV for light heating oil (MJ/	MJ/kg	42.71									
Brown coal (1000 t)	1000 t	10.00									
NCV for brown coal (MJ/kg)	MJ/kg	16.74									
Lignite (1000 t)	1000 t	4.30									
NCV for lignite (MJ/kg)	MJ/kg	10.90									
Jet Kerosene (1000 t)	1000 t	0.10									
NCV for jet kerosene (MJ/m3)	MJ/kg	43.94									
Total fuel consumption (TJ)	TJ	1,819.97	1,166.17	1,302.66	1,217.24	1,127.54	1,059.21	999.41	905.45	747.43	781.59
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	96.53	90.20	83.55	78.49	74.06	67.09	55.38	57.92
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	4.32	4.04	3.74	3.52	3.32	3.01	2.48	2.59
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	37.26	34.81	32.25	30.29	28.58	25.90	21.38	22.35

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

National navigation	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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	31.80	34.80	35.40	33.50	38.50	42.00	41.20	41.80
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	1,358.18	1,566.69	1,584.28	1,507.15	1,644.34	1,856.88	1,759.65	1,785.28
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	100.64	116.36	117.63	111.93	121.85	137.65	130.39	132.29
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	9.51	10.97	11.09	10.55	11.51	13.00	12.32	12.50
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	2.72	3.13	3.17	3.01	3.29	3.62	3.52	3.57

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

Commercial/Institutional	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption										
Petroleum (1000 t)	3.80									
NCV for jet kerosene (MJ/kg)	43.94									
Light heating oil (1000 t)	90.30	120.50	131.60	73.80	64.80	50.00	44.20	36.10	44.60	44.30
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	6.60	8.00	9.70	9.50	4.60	3.20	2.70	1.50
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	20.10	12.90	13.70	12.10	12.10	12.10	12.30	12.60
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) (MU)	24.50	9.50	0.20	2.20	5.20	4.90	0.50	0.10		0.10
NCV for brown coal (MJ/kg)	16.74	17.80	18.50	17.60	17.10	17.80	18.00	16.89	16.89	17.00
Lignite (1000 t)	40.00	1.20	0.60	0.30	0.10			0.10	0.10	0.00
NCV for lignite (MJ/kg)	10.90	12.00	12.10	11.60	11.60	11.60		10.50	10.50	10.50
Briquettes (1000 t)	2.90									
NCV for briquettes (MJ/kg)	16.74									
Gas work gas (1000000 m3)	4.90	1.50	3.43	2.84	2.49	1.87	1.49	1.14	0.39	
NCV for gas work gas (MJ/m3)	15.82	19.49	21.47	18.72	17.20	17.20	17.10	17.10	17.10	
Natural gas (1000000 m3)	124.30	98.20	151.20	192.70	173.50	162.00	166.00	159.80	204.80	217.90
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
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	0.00	129.80	157.85	140.00	143.00	177.98	213.50	176.90
Bio gas (TJ)				102.26	110.60	86.07	75.83	103.20	116.59	119.11
Total fuel consumption (TJ)	12,190.9	9,506.6	12,053.9	10,957.7	10,100.1	8,938.2	8,540.3	8,070.2	10,014.1	10,423.8
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 - 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 - 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	789.25	690.73	641.00	562.78	529.07	496.89	614.15	634.03

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

Commercial/Institutional	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
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	89.75	110.66	113.30	99.01	95.31	101.22	123.12	114.07
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	4.16	3.40	3.33	2.82	2.46	2.34	2.84	2.71

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

Residential	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption										
Fuel consumption - mobile										
Gasoline (1000 t)	4.00	12.10	8.10	8.20	8.20	7.70	7.40	7.50	7.50	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	1.00	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	43.96	
Light heating oil (1000 t)	215.90	231.50	252.80	138.80	122.00	94.50	83.50	68.30	84.50	84.00
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	15.40	10.40	11.90	12.30	7.10	5.10	4.30	2.40
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	60.90	72.20	74.40	56.90	54.20	47.40	47.60	48.80
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	14.00	6.10	2.30	4.10	2.60	2.00	1.20	3.20
NCV for brown coal (MJ/kg)	16.74	17.80	18.50	17.60	17.10	17.80	18.00	16.89	17.00	17.00
Lignite (1000 t)	207.30	15.00	11.70	9.40	9.00	4.80	11.50	7.40	7.00	4.10
NCV for lignite (MJ/kg)	10.90	12.00	12.10	11.60	11.60	10.70	10.50	10.50	10.50	10.50
Hard coal (1000 t)						0.20				
NCV for hard coal (MJ/kg)						26.46				
Briquettes (1000 t)	6.10									
NCV for briquettes (MJ/kg)	16.74									
Gas work gas (1000000 m3)	24.40	9.90	10.24	7.20	4.98	3.75		1.06	0.19	
NCV for gas work gas (MJ/m3)	15.82	19.49	21.47	17.20	17.20	17.10		17.10	17.10	
Natural gas (1000000 m3)	230.00	496.60	687.80	732.90	670.20	630.20	601.30	524.10	540.00	560.50
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
Solid Biomass-Wood (TJ)	42,170.0	39,690.0	49,824.0	49,539.0	48,344.0	48,329.0	48,003.0	42,254.0	48,622.7	47,220.8
Charcoal (TJ)	0.00	0.00	0.00	154.00	139.26	83.74	139.00	139.89		
Total fuel consumption (TJ)	70,745.6	70,417.3	88,506.4	85,088.7	81,086.5	77,614.7	75,512.0	66,345.2	73,752.1	73,125.9
Residential										
Emissions i+ii										
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
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	7,997.56	7,703.87	7,398.41	7,172.20	7,027.67	6,173.41	6,948.26	6,833.12

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

Residential										
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	15,317.9	15,167.1	14,767.0	14,724.3	14,636.1	12,874.1	14,760.7	14,344.6
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	209.94	205.70	200.15	199.05	197.23	173.47	199.20	193.62

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

Agriculture/forestry/fishing	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fuel consumption										
Other kerosene (1000 t)	0.10									
NCV for other kerosene (MJ/kg)	43.94									
Diesel + light heating oil (1000 t)	232.60	237.60	197.40	200.10	200.20	186.30	182.20	182.20	182.60	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	8,431.0	8,546.3	8,550.5	7,956.9	7,781.8	7,781.8	7,798.8	7,726.2
Fuel oil (1000 t)	12.30	13.40	4.70	4.40	4.40	4.10	3.50	2.50	2.10	1.20
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.40	2.60	2.70	2.70	2.70	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	23.20	22.20	21.50	20.70	21.00	21.70	21.40	27.80
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
Fuel consumption - stationary (TJ)	1,550.7	1,153.5	1,104.3	1,058.2	1,034.4	985.8	971.9	968.5	942.1	1,132.9
Total fuel consumption (TJ)	11,489.4	11,301.4	9,535.3	9,604.5	9,585.0	8,942.7	8,753.7	8,750.3	8,740.9	8,859.1
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	624.73	633.28	633.60	589.60	576.63	576.63	577.89	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	66.86	64.02	62.68	59.63	58.34	57.29	55.47	65.40
Total CO2 emission (Gg)	835.42	828.99	691.59	697.30	696.28	649.24	634.97	633.92	633.36	637.92
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	34.99	35.47	35.48	33.02	32.29	32.29	32.37	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	6.47	6.18	6.06	5.75	5.56	5.34	5.13	5.91
Total CH4 emission (Mg)	52.07	50.57	41.45	41.64	41.54	38.77	37.86	37.64	37.50	37.97
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	241.13	244.42	244.55	227.57	222.56	222.56	223.05	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	0.20	0.19	0.19	0.18	0.17	0.15	0.14	0.14
Total N2O emission (Mg)	284.53	290.61	241.33	244.62	244.74	227.75	222.73	222.71	223.18	221.11

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	2005	2010	2011	2012	2013	2014	2015	2016
1. Exploration	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Well Drilling	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
EMISSION FACTOR													
CO ₂													
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
CH ₄													
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
N ₂ O													
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	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
Conventional oil	10 ³ m ³ total oil production	Venting	1.B.2.a.i	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
EMISSION FACTOR													
CO ₂													
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
CH ₄													
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
N ₂ O													
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07
3. Transport	Unit	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	8243.94	7454.46	6184.73	5182.86	6275.87	5780.74	7217.42	8020.01
Tanker Trucks and Rail	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	275.30	273.51	124.13	85.04	42.67	41.30	49.84969	50.01066	95.35354
Natural gas liquids transport-LPG	10 ³ m ³ LPG	All	1.B.2.a.iii.3										
EMISSION FACTOR													
CO ₂													
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
CH ₄													
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
N ₂ O													
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	5803.6	3769.19	3904.65	3614.3	3526.51	2838.837	3328.372	3748.953
EMISSION FACTOR													
CO ₂													
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
CH ₄													
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
N ₂ O													
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	2005	2010	2011	2012	2013	2014	2015	2016
1. Exploration	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Well Drilling	10 ³ m ³ total natural gas production		1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
Well Testing	10 ³ m ³ total natural gas production		1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
Well Servicing	10 ³ m ³ total natural gas production		1.B.2.a.ii	1982.30	1638.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
EMISSION FACTOR													
CO ₂													
Well Drilling	Gg/10 ³ m ³ total natural gas 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 natural gas 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 natural gas 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
CH ₄													
Well Drilling	Gg/10 ³ m ³ total natural gas 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 natural gas 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 natural gas 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
N ₂ O													
Well Drilling	Gg/10 ³ m ³ total natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Well Testing	Gg/10 ³ m ³ total natural gas 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 natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2. Production	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Gas production	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
EMISSION FACTOR													
CO ₂													
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03
CH ₄													
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07
N ₂ O													
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Default weighted	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
Default weighted	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
Default weighted	10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
EMISSION FACTOR													
CO ₂													
Default weighted	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04
Default weighted	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03
Default weighted	Gg/10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02
CH ₄													
Default weighted	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04
Default weighted	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06
Default weighted	Gg/10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N ₂ O													
Default weighted	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Default weighted	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.3E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
Default weighted	Gg/10 ⁶ m ³ gas produced	Raw CO ₂ venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Transmission and Storage	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Transmission	10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2686.6	2704.8	2909.9	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4
Transmission	10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	2686.6	2704.8	2909.9	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4
Storage	10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2686.6	2704.8	2909.9	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4
EMISSION FACTOR													
CO ₂													
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07	8.80E-07
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06	3.10E-06
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07	1.10E-07
CH ₄													
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04	2.73E-04
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N ₂ O													
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5. Distribution of Utility Sales	Unit	Emission source	IPCC Code										
ACTIVITY DATA													
Gas distribution	10 ⁶ m ³ of utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	609.3	862.2	944.6	865.2	812.9	788.3	705.6	766.2	806.2
EMISSION FACTOR													
CO ₂													
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05
CH ₄													
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03
N ₂ O													
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

1. B. 2. a. Oil				1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
2. Production	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1411.51	1100.00	837.67	772.56	697.56	698.49	689.77	779.30	857.09
EMISSION FACTOR													
N ₂ O													
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07
3. Transport	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Pipelines	10 ³ m ³ total oil transported by pipelines	All	1.B.2.a.iii.3	11229.85	5551.99	8243.94	7454.46	6184.73	5182.86	6275.87	5780.74	7217.42	8020.01
Tanker Trucks and R	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	275.30	273.51	124.13	85.04	42.67	41.30	49.85	50.01	95.35
Natural gas liquids transport-LPG	10 ³ m ³ LPG	All	1.B.2.a.iii.3										
EMISSION FACTOR													
CO ₂													
Tanker Trucks and R	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06
CH ₄	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N ₂ O	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tanker Trucks and R	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1. B. 2. c. 2 ii Venting and Flaring - Gas				1990	2000	2005	2010	2011	2012	2013	2014	2015	2016
2. Production	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
EMISSION FACTOR													
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Default weighted total	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20
EMISSION FACTOR													
N ₂ O													
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
4. Transmission and storage	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Transmission	10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2686.6	2704.8	2909.9	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4
EMISSION FACTOR													
N ₂ O													
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Distribution of Natural Gas	Unit	mission source	IPCC Code										
ACTIVITY DATA													
Gas distribution	10 ⁶ m ³ or utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	609.3	862.2	944.6	865.2	812.9	788.3	705.6	766.2	806.2
EMISSION FACTOR													
N ₂ O													
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

Table A4-1: National Energy balance for 2016, natural units

ENERGY BALANCE 2016 natural units	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ⁶ m ³
Production					737.1	1647.2
Import	0.1	1080.6	40.1	4.1	2513.4	1264.7
Export		35.8	0.3			389.4
Import-processing						
Export-processing						
Stock change		-24.6	6.0		27.1	88.9
Bunkers						
Energy supplied	0.1	1020.2	45.8	4.1	3277.6	2611.4
Production						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants						
public cogeneration plants						
public heating plants						
industrial cogeneration plants						
– in refineries						
– in gas production						
Industrial heating plants						
Petroleum refineries						
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		973.9				66.1
public cogeneration plants						407.9
public heating plants						71.0
industrial cogeneration plants			39.8			276.8
– in refineries						40.1
– in gas production						34.3
Industrial heating plants						59.0
Petroleum refineries					3224.1	103.4
NGL-plant					53.5	7.1
Coke plant						
Gas works						
Total transformation sector		973.9	39.8		3277.6	991.3
Energy sector own use						
Oil and gas extraction						55.2
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						54.6
NGL-plant						13.4
Gas works						
Total energy sector own use						123.2
Losses						33.4
Final energy demand	0.1	46.3	6.0	4.1		1463.5
Non energy use						456.0
Energy sector						
Petrochemical industry						456.0
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	0.1	46.3	6.0	4.1		1007.5
Industry	0.1	46.3	2.7			196.9
Iron and steel	0.1					12.0
Non-ferrous metals						2.6
Non-metallic minerals						44.7
Chemical						7.3
Construction materials		46.3	2.7			38.4
Pulp and paper						6.2
Food production						50.9
Not elsewhere specified						34.8
Transport						4.4
Rail						
Road						0.1
Air						
– international						
– domestic						
Sea and River						
Public transport						4.3
Not elsewhere specified						
Other sectors			3.3	4.1		806.2
Households			3.2	4.1		560.5
Services			0.1			217.9
Agriculture						27.8
Construction						

Table A4-1: National Energy balance for 2016, natural units, cont.

ENERGY BALANCE 2016 natural units	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
	TJ	10 ³ m ³	TJ	TJ	TJ	10 ³ m ³	10 ³ t	TJ
Production	65625.6	5856.0	9430.6	874.9	378.5	115519.0	1.1	11443.1
Import		49.8					0.3	750.9
Export		752.9					0.6	6276.5
Import-processing								
Export-processing								
Stock change							0.4	172.0
Bunkers								
Energy supplied	65625.6	5152.9	9430.6	874.9	378.5	115519.0	1.2	6089.5
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	65625.6							
– small HPP	1063.8							
Wind power plants			9430.6					
Solar power plants				609.1				
Geothermal power plants								
thermal power plants						15174.0		
public cogeneration plants						90613.0		3730.2
public heating plants								2.8
industrial cogeneration plants						7180.0		
– in refineries								
– in gas production								
Industrial heating plants								252.9
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	65625.6		9430.6	609.1		112967.0		3985.9
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								
NGL-plant								
Gas works								
Total energy sector own use								
Losses						2552.0		
Final energy demand		5152.9		265.8	378.5		1.2	2103.6
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		5152.9		265.8	378.5		1.2	2103.6
Industry		45.7						565.1
Iron and steel		0.4						
Non-ferrous metals		0.4						
Non-metallic minerals								
Chemical								
Construction materials		2.3						445.3
Pulp and paper								
Food production		10.9						
Not elsewhere specified		31.7						119.8
Transport							1.2	
Rail								
Road							1.2	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		5107.2		265.8	378.5			1538.5
Households		5094.0		188.9				1374.8
Services		13.2		76.9	209.0			163.7
Agriculture					169.5			
Construction								

Table A4-1: National Energy balance for 2016, 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
	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t
Production		248.1	863.8			115.3	1257.2	176.6	5.3	596.4
Import	31.0	53.9	193.7	0.5	3.5	22.0	947.2	61.4		46.2
Export	1.1	155.2	517.2			9.8	607.8	67.0	5.3	446.8
Import-processing										
Export-processing										
Stock change	-0.7	-2.5	-6.9			-0.2	2.6	-6.5		-29.8
Bunkers							2.7			1.5
Energy supplied	29.2	144.3	533.4	0.5	3.5	127.3	1596.5	164.5		164.5
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		207.7	863.8			115.3	1257.2	176.6	5.3	596.4
NGL-plant		40.4								
Coke plant										
Gas works										
Total production		248.1	863.8			115.3	1257.2	176.6	5.3	596.4
Transformation sector										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								1.1		
public cogeneration plants										
public heating plants								3.7		3.7
industrial cogeneration plants										54.4
– in refineries										54.4
– in gas production										
Industrial heating plants										59.0
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								4.8		117.1
Energy sector own use										
Oil and gas extraction										
Coal production										
Electric energy supply industry										
hydro power plants										
thermal power plants										
public cogeneration plants										
industrial cogeneration plants										
Wind power										
Petroleum refineries										31.9
NGL-plant										
Gas works										
Total energy sector own use										31.9
Losses										
Final energy demand	29.2	144.3	533.4	0.5	3.5	127.3	1596.5	159.7		15.5
Non energy use										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	29.2	144.3	533.4	0.5	3.5	127.3	1596.5	159.7		15.5
Industry	29.2	7.7			3.5		10.4	15.1		10.4
Iron and steel	0.3	0.8						0.5		0.5
Non-ferrous metals	0.2	0.5						1.1		
Non-metallic minerals		0.2								
Chemical					3.5			0.2		
Construction materials	24.2	1.4					10.4	2.8		3.0
Pulp and paper		0.1								
Food production	4.5	1.2						7.1		5.7
Not elsewhere specified		3.5						3.4		1.2
Transport		70.7	521.9	0.5		127.3	1339.7			
Rail							18.3			
Road		70.7	521.9				1255.5			
Air				0.5		127.3				
– international				0.1		117.8				
– domestic				0.4		9.5				
Sea and River							41.8			
Public transport							24.1			
Not elsewhere specified										
Other sectors		65.9	11.5				246.4	144.6		5.1
Households		48.8						84.0		2.4
Services		12.6						44.3		1.5
Agriculture		2.5	7.4				169.5	11.4		1.2
Construction		2.0	4.1				76.9	4.9		

Table A4-1: National Energy balance for 2016, natural units, cont.

ENERGY BALANCE 2016 natural units	Naphta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t	10 ³ t
Production	82.9		0.8	11.4		53.0		208.1
Import		2.7	119.7	35.2	8.0	186.3		
Export	67.1	0.1	4.5	12.6	0.1	6.4		178.9
Import-processing								
Export-processing								
Stock change	2.9			0.5		-22.0		-21.3
Bunkers								
Energy supplied	18.7	2.6	116.0	34.5	7.9	210.9		7.9
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	64.2		0.8	11.4		53.0		208.1
NGL-plant	18.7							
Coke plant								
Gas works								
Total production	82.9		0.8	11.4		53.0		208.1
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	18.7							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	18.7							
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						35.6		
NGL-plant								
Gas works								
Total energy sector own use						35.6		
Losses								
Final energy demand	0.0	2.6	116.0	34.5	7.9	175.3		7.9
Non energy use		2.6	116.0	34.5	7.9			7.9
Energy sector				2.3				
Petrochemical industry								
Other industry		2.6	11.3	6.7	7.9			7.9
Construction			104.7	1.0				
Transport				23.0				
Agriculture				1.5				
Energy consumption	0.0					175.3		0.0
Industry						175.3		
Iron and steel						0.1		
Non-ferrous metals								
Non-metallic minerals						5.4		
Chemical								
Construction materials						169.8		
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 2016, natural units, cont.

ENERGY BALANCE 2016 natural units	Refinery gas 10 ³ t	Refinery semiproducts 10 ³ t	Additives 10 ³ t	Gas works gas 10 ³ m ³	Electricity GWh	Steam and hot water TJ	waste, non renewable TJ
Production	155.3				12818.6	25701.1	413.4
Import		421.2	59.8		8731.3		
Export					3200.4		
Import-processing							
Export-processing							
Stock change		-39.2	8.8				
Bunkers							
Energy supplied	155.3	382.0	68.6		18349.5	25701.1	413.4
Production							
hydro power plants					7057.6		
– small HPP					114.4		
Wind power plants					1014.2		
Solar power plants					65.5		
Geothermal power plants							
thermal power plants					2893.5		
public cogeneration plants					1457.2	9095.3	
public heating plants						2316.0	
industrial cogeneration plants					330.6	9491.6	
– in refineries					94.9	3120.4	
– in gas production					82.2	468.3	
Industrial heating plants						4137.3	
Petroleum refineries	155.3						
NGL-plant							
Coke plant							
Gas works							
Total production	155.3				12818.6	25040.2	
Transformation sector							
hydro power plants							
– small HPP							
Wind power plants							
Solar power plants							
Geothermal power plants							
thermal power plants							
public cogeneration plants							
public heating plants							
industrial cogeneration plants	16.3						
– in refineries	16.3						
– in gas production							
Industrial heating plants	5.8						
Petroleum refineries		382.0	68.6				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	22.1	382.0	68.6				
Energy sector own use							
Oil and gas extraction					136.5	382.0	
Coal production						160.1	
Electric energy supply industry					18.9		
hydro power plants					383.7		
thermal power plants					242.1		
public cogeneration plants					181.5	473.5	
industrial cogeneration plants							
Wind power					4.1		
Petroleum refineries	133.2				261.6	4916.9	
NGL-plant					26.0	86.3	
Gas works							
Total energy sector own use	133.2				1254.4	6018.8	
Losses					1806.5	1487.0	
Final energy demand	0.0		0.0		15288.6	18195.3	413.4
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption	0.0		0.0		15288.6	18195.3	413.4
Industry					3355.1	10767.5	413.4
Iron and steel					257.6	69.5	
Non-ferrous metals					32.0		
Non-metallic minerals					142.5	91.8	
Chemical					309.2	4350.1	
Construction materials					481.5		413.4
Pulp and paper					226.6	1330.7	
Food production					700.7	3074.0	
Not elsewhere specified					1205.0	1851.4	
Transport					302.1		
Rail					154.3		
Road							
Air					26.7		
– international							
– domestic					26.7		
Sea and River					23.5		
Public transport					63.1		
Not elsewhere specified					34.5		
Other sectors					11631.4	7427.8	
Households					6128.0	5651.6	
Services					5363.6	1580.7	
Agriculture					61.6	195.5	
Construction					78.2		

Table A4-2: National Energy balance for 2016, energy units

<i>PI</i>	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production	-	-	-	-	31.47	57.523
Import	0.00	27.08	0.68	0.04	107.32	44.012
Export	-	0.90	0.01	-	-	13.551
Import-processing	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-
Stock change	-	0.62	0.10	-	1.16	3.094
Bunkers	-	-	-	-	-	-
Energy supplied	0.00	25.57	0.78	0.04	139.95	91.08
<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	0.00	25.57	0.78	0.04	139.95	91.08
<i>Transformation sector</i>	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-
thermal power plants	-	24.30	-	-	-	2.30
public cogeneration plants	-	-	-	-	-	14.19
public heating plants	-	-	-	-	-	2.47
industrial cogeneration plants	-	-	0.68	-	-	9.63
- in refineries	-	-	-	-	-	1.40
- in gas production	-	-	-	-	-	1.19
Industrial heating plants	-	-	-	-	-	2.05
Petroleum refineries	-	-	-	-	137.67	3.60
NGL-plant	-	-	-	-	2.28	0.45
Coke plant	-	-	-	-	-	-
Gas works	-	-	-	-	-	-
Total transformation sector	-	24.30	0.68	-	139.95	34.70
<i>Energy sector own use</i>	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	1.92
Coal production	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	1.90
NGL-plant	-	-	-	-	-	0.47
Gas works	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	4.29
Losses	-	-	-	-	-	1.16
Final energy demand	0.00	1.27	0.10	0.04	0.00	50.93
Non energy use	-	-	-	-	-	15.87
Energy sector	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	15.87
Other industry	-	-	-	-	-	-
Construction	-	-	-	-	-	-
Transport	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-
Energy consumption	0.00	1.27	0.10	0.04	0.00	35.06
Industry	0.00	1.27	0.05	-	-	6.85
Iron and steel	0.00	-	-	-	-	0.42
Non-ferrous metals	-	-	-	-	-	0.09
Non-metallic minerals	-	-	-	-	-	1.56
Chemical	-	-	-	-	-	0.25
Construction materials	-	1.27	0.05	-	-	1.34
Pulp and paper	-	-	-	-	-	0.22
Food production	-	-	-	-	-	1.77
Not elsewhere specified	-	-	-	-	-	1.21
Transport	-	-	-	-	-	0.15
Rail	-	-	-	-	-	-
Road	-	-	-	-	-	0.00
Air	-	-	-	-	-	-
- international	-	-	-	-	-	-
- domestic	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-
Public transport	-	-	-	-	-	0.15
Not elsewhere specified	-	-	-	-	-	-
Other sectors	-	-	0.06	0.04	-	28.06
Households	-	-	0.05	0.04	-	19.51
Services	-	-	0.00	-	-	7.58
Agriculture	-	-	-	-	-	0.97
Construction	-	-	-	-	-	-

Table A4-2: National Energy balance for 2016, energy units, cont.

<i>PI</i>	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
Production	65.63	52.704	9.431	0.875	0.379	1.9520	0.041	11.443
Import	-	0.45	-	-	-	-	0.01	0.75
Export	-	6.78	-	-	-	-	0.02	6.28
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	-	-	-	-	-	-	0.01	0.17
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	65.63	46.38	9.43	0.87	0.38	1.9520	0.04	6.09
<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	65.63	46.38	9.43	0.87	0.38	1.9520	0.04	6.09
<i>Transformation sector</i>	-	-	-	-	-	-	-	-
hydro power plants	65.63	-	-	-	-	-	-	-
- small HPP	1.06	-	-	-	-	-	-	-
Wind power plants	-	-	9.43	-	-	-	-	-
Solar power plants	-	-	-	0.61	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	0.2594	-	-
public cogeneration plants	-	-	-	-	-	1.5032	-	3.73
public heating plants	-	-	-	-	-	-	-	0.00
industrial cogeneration plants	-	-	-	-	-	0.1460	-	-
- in refineries	-	-	-	-	-	-	-	-
- in gas production	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	0.25
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	65.63	-	9.43	0.61	-	1.9086	-	3.99
<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	-	-	-	-	-	0.0434	-	-
Final energy demand	-	46.38	-	0.27	0.38	0.0000	0.04	2.10
<i>Non energy use</i>	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-
Energy consumption	-	46.38	-	0.27	0.38	0.0000	0.04	2.10
Industry	-	0.41	-	-	-	-	-	0.57
Iron and steel	-	0.00	-	-	-	-	-	-
Non-ferrous metals	-	0.00	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	-	-	-	-
Construction materials	-	0.02	-	-	-	-	-	0.45
Pulp and paper	-	-	-	-	-	-	-	-
Food production	-	0.10	-	-	-	-	-	-
Not elsewhere specified	-	0.29	-	-	-	-	-	0.12
Transport	-	-	-	-	-	-	0.04	-
Rail	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	0.04	-
Air	-	-	-	-	-	-	-	-
- International	-	-	-	-	-	-	-	-
- domestic	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
Other sectors	-	45.96	-	0.27	0.38	-	-	1.54
Households	-	45.85	-	0.19	-	-	-	1.37
Services	-	0.12	-	0.08	0.21	-	-	0.16
Agriculture	-	-	-	-	0.17	-	-	-
Construction	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2016, 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	0.91	2.53	8.64	0.02	0.15	0.97	40.45	2.62	-	1.86
Export	0.03	7.28	23.06	-	-	0.43	25.96	2.86	0.21	17.96
Import-processing	-	-	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-	-	-
Stock change	- 0.02	- 0.12	- 0.31	-	-	- 0.01	- 0.11	- 0.28	-	- 1.20
Bunkers	-	-	-	-	-	-	- 0.12	-	-	- 0.06
Energy supplied	0.86	4.87	14.73	0.02	0.15	0.53	14.49	0.52	0.21	17.36
<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	-	9.74	38.52	-	-	5.07	53.70	7.54	0.21	23.97
NGL-plant	-	1.89	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total production	-	11.63	38.52	-	-	5.07	53.70	7.54	0.21	23.97
Gross production	0.86	6.77	23.78	0.02	0.15	5.60	68.19	7.03	-	6.61
<i>Transformation sector</i>	-	-	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	0.05	-	-
public cogeneration plants	-	-	-	-	-	-	-	-	-	-
public heating plants	-	-	-	-	-	-	-	0.16	-	0.15
industrial cogeneration plants	-	-	-	-	-	-	-	-	-	2.19
- in refineries	-	-	-	-	-	-	-	-	-	2.19
- in gas production	-	-	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-	-	2.37
Petroleum refineries	-	-	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total transformation sector	-	-	-	-	-	-	-	0.21	-	4.71
<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	-	-	-	-	-	-	-	-	-	1.28
NGL-plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	-	-	-	-	1.28
<i>Losses</i>	-	-	-	-	-	-	-	-	-	-
Final energy demand	0.86	6.77	23.78	0.02	0.15	5.60	68.19	6.82	-	0.62
<i>Non energy use</i>	-	-	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-
Energy consumption	0.86	6.77	23.78	0.02	0.15	5.60	68.19	6.82	-	0.62
Industry	0.86	0.36	-	-	0.15	-	0.44	0.64	-	0.42
Iron and steel	0.01	0.04	-	-	-	-	-	0.02	-	0.02
Non-ferrous metals	0.01	0.02	-	-	-	-	-	0.05	-	-
Non-metallic minerals	-	0.01	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	0.15	-	-	0.01	-	-
Construction materials	0.71	0.07	-	-	-	-	0.44	0.12	-	0.12
Pulp and paper	-	0.00	-	-	-	-	-	-	-	-
Food production	0.13	0.06	-	-	-	-	-	0.30	-	0.23
Not elsewhere specified	-	0.16	-	-	-	-	-	0.15	-	0.05
Transport	-	3.32	23.27	0.02	-	5.60	57.22	-	-	-
Rail	-	-	-	-	-	-	0.78	-	-	-
Road	-	3.32	23.27	-	-	-	53.62	-	-	-
Air	-	-	-	0.02	-	5.60	-	-	-	-
- international	-	-	-	0.00	-	5.18	-	-	-	-
- domestic	-	-	-	0.02	-	0.42	-	-	-	-
Sea and River	-	-	-	-	-	-	1.79	-	-	-
Public transport	-	-	-	-	-	-	1.03	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Other sectors	-	3.09	0.51	-	-	-	10.52	6.18	-	0.20
Households	-	2.29	-	-	-	-	-	3.59	-	0.10
Services	-	0.59	-	-	-	-	-	1.89	-	0.06
Agriculture	-	0.12	0.33	-	-	-	7.24	0.49	-	0.05
Construction	-	0.09	0.18	-	-	-	3.28	0.21	-	-

Table A4-2: National Energy balance for 2016, energy units, cont.

<i>PI</i>	Naphta	White spirit	Bitumen	Lubricants	Paraffin and wax	Petroleum coke	Etan	Other derivatives
Production	-	-	-	-	-	-	-	-
Import	-	0.09	4.01	1.18	0.27	5.78	-	-
Export	2.99	0.00	0.15	0.42	0.00	0.20	-	7.19
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	0.13	-	-	0.02	-	0.68	-	0.86
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	- 2.86	0.09	3.86	0.77	0.26	4.89	-	8.05
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	2.86	-	0.03	0.38	-	1.64	-	8.36
NGL-plant	0.83	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total production	3.70	-	0.03	0.38	-	1.64	-	8.36
Gross production	0.83	0.09	3.89	1.16	0.26	6.54	-	0.32
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	0.83	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	0.83	-	-	-	-	-	-	-
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	-	-	-	-	-	1.10	-	-
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	1.10	-	-
Losses	-	-	-	-	-	-	-	-
Final energy demand	- 0.00	0.09	3.89	1.16	0.26	5.43	-	0.32
Non energy use	-	0.0871	3.8860	1.1558	0.2647	-	-	0.3175
Energy sector	-	-	-	0.08	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-
Other industry	-	0.09	0.38	0.22	0.26	-	-	0.32
Construction	-	-	3.51	0.03	-	-	-	-
Transport	-	-	-	0.77	-	-	-	-
Agriculture	-	-	-	0.05	-	-	-	-
Energy consumption	- 0.00	-	-	-	-	5.43	-	-
Industry	-	-	-	-	-	5.43	-	-
Iron and steel	-	-	-	-	-	0.00	-	-
Non-ferrous metals	-	-	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	0.17	-	-
Chemical	-	-	-	-	-	-	-	-
Construction materials	-	-	-	-	-	5.26	-	-
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 2016, energy units, cont.

<i>PI</i>	Refinery gas	Refinery semiproducts	Additives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production	-	-	-	-	-	0.66	0.41
Import	-	17.99	2.55	-	31.43	-	-
Export	-	-	-	-	11.52	-	-
Import-processing	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-
Stock change	-	1.67	0.38	-	-	-	-
Bunkers	-	-	-	-	-	-	-
Energy supplied	-	16.31	2.93	-	19.91	0.66	0.41
<i>Production</i>	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	25.41	-	-
- small HPP	-	-	-	-	0.41	-	-
Wind power plants	-	-	-	-	3.65	-	-
Solar power plants	-	-	-	-	0.24	-	-
Geothermal power plants	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	10.42	-	-
public cogeneration plants	-	-	-	-	5.25	9.10	-
public heating plants	-	-	-	-	-	2.32	-
industrial cogeneration plants	-	-	-	-	1.19	9.49	-
- in refineries	-	-	-	-	0.34	3.12	-
- in gas production	-	-	-	-	0.30	0.47	-
Industrial heating plants	-	-	-	-	-	4.14	-
Petroleum refineries	6.62	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total production	6.62	-	-	-	46.15	25.04	-
Gross production	6.62	16.31	2.93	-	66.06	25.70	0.41
<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	0.69	-	-	-	-	-	-
- in refineries	0.69	-	-	-	-	-	-
- in gas production	-	-	-	-	-	-	-
Industrial heating plants	0.25	-	-	-	-	-	-
Petroleum refineries	-	16.31	2.93	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total transformation sector	0.94	16.31	2.93	-	-	-	-
<i>Energy sector own use</i>	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	0.49	0.38	-
Coal production	-	-	-	-	-	0.16	-
Electric energy supply industry	-	-	-	-	0.07	-	-
hydro power plants	-	-	-	-	1.38	-	-
thermal power plants	-	-	-	-	0.87	-	-
public cogeneration plants	-	-	-	-	0.65	0.47	-
industrial cogeneration plants	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	0.01	-	-
Petroleum refineries	5.67	-	-	-	0.94	4.92	-
NGL-plant	-	-	-	-	0.09	0.09	-
Gas works	-	-	-	-	-	-	-
Total energy sector own use	5.67	-	-	-	4.52	6.02	-
Losses	-	-	-	-	6.50	1.49	-
Final energy demand	0.00	-	0.00	-	55.04	18.20	0.41
Non energy use	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-
Energy consumption	0.00	-	0.00	-	55.04	18.20	0.41
Industry	-	-	-	-	12.08	10.77	0.41
Iron and steel	-	-	-	-	0.93	0.07	-
Non-ferrous metals	-	-	-	-	0.12	-	-
Non-metallic minerals	-	-	-	-	0.51	0.09	-
Chemical	-	-	-	-	1.11	4.35	-
Construction materials	-	-	-	-	1.73	-	0.41
Pulp and paper	-	-	-	-	0.82	1.33	-
Food production	-	-	-	-	2.52	3.07	-
Not elsewhere specified	-	-	-	-	4.34	1.85	-
Transport	-	-	-	-	1.09	-	-
Rail	-	-	-	-	0.56	-	-
Road	-	-	-	-	-	-	-
Air	-	-	-	-	0.10	-	-
- international	-	-	-	-	-	-	-
- domestic	-	-	-	-	0.10	-	-
Sea and River	-	-	-	-	0.08	-	-
Public transport	-	-	-	-	0.23	-	-
Not elsewhere specified	-	-	-	-	0.12	-	-
Other sectors	-	-	-	-	41.87	7.43	-
Households	-	-	-	-	22.06	5.65	-
Services	-	-	-	-	19.31	1.58	-
Agriculture	-	-	-	-	0.22	0.20	-
Construction	-	-	-	-	0.28	-	-

Annex 5: Any additional information

Annex 5-1: Archiving, inventory data record sheet

5.1.1. Inventory data record sheet

Year: 2016

MODULE: ENERGY	
SUBMODULE: CO ₂ from Fuel Combustion by Source Categories	
WORKSHEET: 1_1A1A_PUBLIC_ELE_HEAT_1990-2016	SHEET: 1A1ai, 1A1aii, 1A1aiii
STEP: 1, 2, 3, 4, 5, 6	PAGE: 1 of 1
<p>DIRECT DATA SOURCE:</p> <p>A. ACTIVITY DATA:</p> <p>Institution/organization: Energy Institute "Hrvoje Požar"</p> <p>Publications: National Energy Balance for 2015; Annual Energy Report: "Energy in Croatia 2016"</p> <p>Contact person: dr.sc. Branko Vuk (phone: +385 1 6326 149, +385 1 6326 206)</p> <p>Data: Fuel consumption data and net calorific values</p> <p>B. METHODOLOGY/EMISSION FACTOR:</p> <p>Publications:</p> <p>IPCC (2006): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Energy</p> <p>Default values for carbon emission factors and fractions of carbon stored were used</p>	
<p>ORIGINAL DATA SOURCE:</p> <p>A. ACTIVITY DATA:</p> <p>Fuel consumption data and net calorific values for 1A1 sector were provided by National energy balance</p>	
<p>METHOD:</p> <p>Tier 1 method based on fuel consumption data and net calorific values</p>	
<p>ADDITIONAL INTERCALCULATION:</p> <p>Not necessary</p>	
<p>DATA ARCHIVATION:</p> <p>Hard copy and electronic copy</p>	
<p>DATA GAPS:</p>	
<p>SUGGESTION FOR THE FUTURE:</p>	
<p>NOTES:</p> <p>Default value for carbon emission factor, fraction of carbon stored and fraction of carbon oxidized were used.</p>	
<p>RESPONSIBILITY:</p> <p>Iva Švedek</p> <p>EKONERG Ltd.</p>	

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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.	NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NE,NO	NE,NO
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 2018 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⁾	16788.34	4355.72	2885.89	NO	1240.24	10.45	NO	NO	25280.64
1. Energy	20758.79	842.81	230.24						21831.84
A. Fuel combustion (sectoral approach)	20078.93	413.91	229.55						20722.40
1. Energy industries	7071.41	5.42	17.49						7094.31
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	679.85	428.90	0.69						1109.45
1. Solid fuels	NO	59.64	NO,NA						59.64
2. Oil and natural gas	679.85	369.26	0.69						1049.80
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2632.62	9.53	787.80	NO	1240.24	10.45	NO	NO	4680.65
A. Mineral industry	1280.88								1280.88
B. Chemical industry	778.44	5.63	754.43	NO	NO	NO	NO	NO	1538.49
C. Metal industry	338.56	3.90	NO	NO	1240.24	NO	NO	NO	1582.70
D. Non-energy products from fuels and solvent use	234.75	NA	NA						234.75
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	2586.16	1762.15						4398.33
A. Enteric fermentation		2171.55							2171.55
B. Manure management		414.61	361.58						776.19
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1400.57						1400.57
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.02								50.02
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry⁽¹⁾	-6653.63	1.23	38.80						-6613.59
A. Forest land	-6723.94	1.12	0.74						-6722.08
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	206.89	NO	27.76						234.66
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-301.54								-301.54
H. Other	NO	NO	NO						NO
5. Waste	0.54	915.99	66.89						983.41
A. Solid waste disposal	NA,NO	348.61							348.61
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		567.38	66.88						634.26
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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
CO ₂ emissions from biomass	5126.24								5126.24
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									31894.24
Total CO ₂ equivalent emissions with land use, land-use change and forestry									25280.64
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 A5.2-3: GHG emission in Croatia, 1991

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1991
Submission 2018 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⁾	9425.29	4211.21	2738.64	NO	850.75	10.33	NO	NO	17236.23
1. Energy	15252.77	792.47	199.29						16244.53
A. Fuel combustion (sectoral approach)	14586.28	442.21	198.78						15227.28
1. Energy industries	4738.14	3.97	12.00						4754.11
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	666.49	350.26	0.50						1017.26
1. Solid fuels	NO	53.15	NO,NA						53.15
2. Oil and natural gas	666.49	297.11	0.50						964.10
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1999.93	8.91	696.33	NO	850.75	10.33	NO	NO	3566.25
A. Mineral industry	863.47								863.47
B. Chemical industry	688.84	5.18	662.95	NO	NO	NO	NO	NO	1356.98
C. Metal industry	273.84	3.73	NO	NO	850.75	NO	NO	NO	1128.32
D. Non-energy products from fuels and solvent use	173.77	NA	NA						173.77
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	2479.56	1739.33						4269.83
A. Enteric fermentation		2052.95							2052.95
B. Manure management		426.61	348.58						775.19
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1390.75						1390.75
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-7878.89	3.18	40.42						-7835.28
A. Forest land	-8497.54	3.00	1.98						-8492.55
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	215.41	NO	28.20						243.61
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	927.08	63.27						990.89
A. Solid waste disposal	NA,NO	362.83							362.83
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		564.25	63.27						627.52
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
CO ₂ emissions from biomass	5986.51								5986.51
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									25071.51
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17236.23
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 A5.2-4: GHG emission in Croatia, 1992

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1992

Submission 2018 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⁾	8560.77	3781.41	2781.98	NO	NO	10.42	NO	NO	15134.57
1. Energy	14532.35	697.58	179.24						15409.17
A. Fuel combustion (sectoral approach)	13856.50	377.02	178.79						14412.31
1. Energy industries	5404.66	4.57	15.42						5424.64
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	675.85	320.55	0.46						996.86
1. Solid fuels	NO	41.30	NO,NA						41.30
2. Oil and natural gas	675.85	279.26	0.46						955.56
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2034.15	7.77	898.81	NO	NO	10.42	NO	NO	2951.14
A. Mineral industry	938.79								938.79
B. Chemical industry	859.01	5.32	865.43	NO	NO	NO	NO	NO	1729.76
C. Metal industry	118.53	2.45	NO	NO	NO	NO	NO	NO	120.98
D. Non-energy products from fuels and solvent use	117.83	NA	NA						117.83
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	2122.97	1591.08						3779.57
A. Enteric fermentation		1759.69							1759.69
B. Manure management		363.28	282.34						645.62
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1308.74						1308.74
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⁾	-8071.78	15.15	49.19						-8007.43
A. Forest land	-8795.68	13.64	9.00						-8773.04
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	218.37	NO	28.64						247.01
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	937.94	63.65						1002.13
A. Solid waste disposal	NA,NO	376.81							376.81
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		561.13	63.64						624.77
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	NE								NE
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									23142.01
Total CO ₂ equivalent emissions with land use, land-use change and forestry									15134.57
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 A5.2-4: GHG emission in Croatia, 1993

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1993

Submission 2018 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⁾	8646.84	3859.32	2415.58	NO	NO	10.53	NO	NO	14932.27
1. Energy	15321.31	727.77	193.62						16242.70
A. Fuel combustion (sectoral approach)	14434.43	393.46	193.16						15021.06
1. Energy industries	5929.31	4.88	17.13						5951.31
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	886.88	334.31	0.46						1221.65
1. Solid fuels	NO	39.52	NO,NA						39.52
2. Oil and natural gas	886.88	294.79	0.46						1182.12
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1729.73	6.42	685.77	NO	NO	10.53	NO	NO	2432.45
A. Mineral industry	804.89								804.89
B. Chemical industry	738.35	5.32	652.39	NO	NO	NO	NO	NO	1396.07
C. Metal industry	58.10	1.10	NO	NO	NO	NO	NO	NO	59.20
D. Non-energy products from fuels and solvent use	128.39	NA	NA						128.39
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	10.53	NO	NO	43.91
H. Other	NA	NA	NA						NA
3. Agriculture	52.14	2140.87	1410.11						3603.12
A. Enteric fermentation		1753.83							1753.83
B. Manure management		387.04	286.84						673.89
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1123.26						1123.26
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⁾	-8456.87	34.39	62.22						-8360.26
A. Forest land	-8955.33	32.81	21.64						-8900.88
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	221.34	NO	29.08						250.42
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	949.86	63.86						1014.26
A. Solid waste disposal	NA,NO	391.85							391.85
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		558.01	63.86						621.87
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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
CO ₂ emissions from biomass	5493.15								5493.15
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									23292.53
Total CO ₂ equivalent emissions with land use, land-use change and forestry									14932.27
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 A5.2-6: GHG emission in Croatia, 1994

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1994

Submission 2018 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⁾	7787.89	3618.12	2433.93	NO	NO	10.64	NO	NO	13850.58
1. Energy	14364.19	662.15	188.53						15214.87
A. Fuel combustion (sectoral approach)	13571.13	359.88	188.11						14119.12
1. Energy industries	4630.04	3.27	12.05						4645.37
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	793.06	302.27	0.42						1095.75
1. Solid fuels	NO	35.44	NO,NA						35.44
2. Oil and natural gas	793.06	266.83	0.42						1060.31
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1948.92	6.71	739.82	NO	NO	10.64	NO	NO	2706.09
A. Mineral industry	976.59								976.59
B. Chemical industry	755.10	5.08	706.44	NO	NO	NO	NO	NO	1466.61
C. Metal industry	80.11	1.63	NO	NO	NO	NO	NO	NO	81.74
D. Non-energy products from fuels and solvent use	137.13	NA	NA						137.13
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	1968.97	1392.11						3408.65
A. Enteric fermentation		1575.44							1575.44
B. Manure management		393.53	268.33						661.86
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1123.77						1123.77
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8573.32	11.51	47.09						-8514.73
A. Forest land	-8954.68	10.68	7.04						-8936.96
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	224.01	NO	29.50						253.52
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	968.78	66.39						1035.71
A. Solid waste disposal	NA,NO	408.74							408.74
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		560.05	66.38						626.43
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	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	NE								NE
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									22365.31
Total CO ₂ equivalent emissions with land use, land-use change and forestry									13850.58
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 A5.2-7: GHG emission in Croatia, 1995

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1995
Submission 2018 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⁾	7934.57	3555.48	2345.56	29.32	NO	11.12	NO	NO	13876.05
1. Energy	15263.42	679.03	179.50						16121.96
A. Fuel combustion (sectoral approach)	14331.09	379.67	179.10						14889.86
1. Energy industries	5226.83	4.04	12.35						5243.22
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	932.34	299.36	0.40						1232.10
1. Solid fuels	NO	28.23	NO,NA						28.23
2. Oil and natural gas	932.34	271.14	0.40						1203.87
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1729.84	6.06	711.45	29.32	NO	11.12	NO	NO	2487.80
A. Mineral industry	759.97								759.97
B. Chemical industry	777.86	5.28	678.08	NO	NO	NO	NO	NO	1461.22
C. Metal industry	38.37	0.78	NO	NO	NO	NO	NO	NO	39.15
D. Non-energy products from fuels and solvent use	153.65	NA	NA						153.65
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	1879.73	1337.90						3263.93
A. Enteric fermentation		1500.78							1500.78
B. Manure management		378.96	250.54						629.49
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1087.36						1087.36
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⁾	-9105.53	7.54	44.65						-9053.34
A. Forest land	-9450.63	7.03	4.63						-9438.97
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	227.20	NO	29.94						257.15
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	983.11	72.06						1055.70
A. Solid waste disposal	NA,NO	429.46							429.46
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		553.65	72.05						625.70
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	348.25	0.28	2.85						351.38
Aviation	245.16	0.04	2.04						247.25
Navigation	103.08	0.24	0.81						104.13
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	5212.59								5212.59
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									22929.38
Total CO ₂ equivalent emissions with land use, land-use change and forestry									13876.05
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 A5.2-8: GHG emission in Croatia, 1996

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1996

Submission 2018 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⁾	8821.35	3550.20	2357.45	49.77	NO	11.57	NO	NO	14790.34
1. Energy	15828.26	710.25	229.77						16768.29
A. Fuel combustion (sectoral approach)	14930.29	422.54	229.39						15582.21
1. Energy industries	5054.87	4.06	12.92						5071.84
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	897.98	287.71	0.39						1186.08
1. Solid fuels	NO	22.77	NO,NA						22.77
2. Oil and natural gas	897.98	264.95	0.39						1163.31
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1747.97	5.36	665.28	49.77	NO	11.57	NO	NO	2479.96
A. Mineral industry	844.58								844.58
B. Chemical industry	720.79	5.04	631.91	NO	NO	NO	NO	NO	1357.75
C. Metal industry	19.30	0.32	NO	NO	NO	NO	NO	NO	19.62
D. Non-energy products from fuels and solvent use	163.29	NA	NA						163.29
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	1821.27	1342.38						3216.09
A. Enteric fermentation		1435.18							1435.18
B. Manure management		386.09	241.45						627.54
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1100.93						1100.93
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⁾	-8807.86	16.53	51.25						-8740.08
A. Forest land	-9209.26	15.14	9.99						-9184.13
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	230.24	NO	30.38						260.62
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	996.78	68.76						1066.07
A. Solid waste disposal	NA,NO	452.53							452.53
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		544.25	68.75						613.00
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									23530.42
Total CO ₂ equivalent emissions with land use, land-use change and forestry									14790.34
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 2018 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⁾	10410.30	3493.97	2545.56	71.93	NO	11.43	NO	NO	16533.19
1. Energy	16704.89	676.89	226.29						17608.07
A. Fuel combustion (sectoral approach)	15858.22	395.32	225.90						16479.44
1. Energy industries	5557.44	4.47	15.14						5577.04
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	846.67	281.56	0.39						1128.63
1. Solid fuels	NO	16.65	NO,NA						16.65
2. Oil and natural gas	846.67	264.91	0.39						1111.97
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1917.84	5.70	698.63	71.93	NO	11.43	NO	NO	2705.54
A. Mineral industry	954.10								954.10
B. Chemical industry	766.07	4.96	665.26	NO	NO	NO	NO	NO	1436.29
C. Metal industry	40.11	0.74	NO	NO	NO	NO	NO	NO	40.85
D. Non-energy products from fuels and solvent use	157.56	NA	NA						157.56
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	1768.54	1499.06						3335.99
A. Enteric fermentation		1378.94							1378.94
B. Manure management		389.60	233.87						623.46
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1265.20						1265.20
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⁾	-8282.64	17.63	52.24						-8212.77
A. Forest land	-8625.26	16.28	10.73						-8598.25
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	231.62	NO	30.80						262.42
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	1025.21	69.34						1096.37
A. Solid waste disposal	NA,NO	478.90							478.90
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		546.31	69.30						615.62
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	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
CO ₂ emissions from biomass	5428.42								5428.42
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									24745.97
Total CO ₂ equivalent emissions with land use, land-use change and forestry									16533.19
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 A5.2-10: GHG emission in Croatia, 1998

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 1998

Submission 2018 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⁾	11217.48	3479.95	2210.55	101.88	NO	11.99	NO	NO	17021.85
1. Energy	17546.74	664.38	209.96						18421.08
A. Fuel combustion (sectoral approach)	16792.20	399.23	209.59						17401.01
1. Energy industries	6212.63	5.18	16.82						6234.63
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	754.55	265.15	0.37						1020.07
1. Solid fuels	NO	17.44	NO,NA						17.44
2. Oil and natural gas	754.55	247.71	0.37						1002.62
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1803.55	5.05	534.20	101.88	NO	11.99	NO	NO	2456.67
A. Mineral industry	1027.37								1027.37
B. Chemical industry	614.83	4.67	500.83	NO	NO	NO	NO	NO	1120.33
C. Metal industry	28.85	0.38	NO	NO	NO	NO	NO	NO	29.22
D. Non-energy products from fuels and solvent use	132.51	NA	NA						132.51
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	1721.96	1326.62						3092.84
A. Enteric fermentation		1328.58							1328.58
B. Manure management		393.38	225.96						619.34
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1100.66						1100.66
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⁾	-8180.77	45.11	72.32						-8063.33
A. Forest land	-8433.82	39.83	26.26						-8367.73
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	236.26	NO	31.20						267.46
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	1043.45	67.45						1114.59
A. Solid waste disposal	NA,NO	506.52							506.52
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		536.93	67.38						604.31
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	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	NE								NE
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									25085.18
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17021.85
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 A5.2-11: GHG emission in Croatia, 1999

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 1999
Submission 2018 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⁾	11636.82	3456.58	2408.63	122.08	NO	11.99	NO	NO	17636.10
1. Energy	18065.30	640.80	264.32						18970.42
A. Fuel combustion (sectoral approach)	17327.30	393.95	263.98						17985.23
1. Energy industries	6439.06	5.45	17.42						6461.94
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	738.00	246.85	0.34						985.19
1. Solid fuels	NO	5.25	NO,NA						5.25
2. Oil and natural gas	738.00	241.59	0.34						979.93
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2121.57	5.14	623.78	122.08	NO	11.99	NO	NO	2884.56
A. Mineral industry	1284.91								1284.91
B. Chemical industry	731.71	4.71	590.41	NO	NO	NO	NO	NO	1326.83
C. Metal industry	26.86	0.42	NO	NO	NO	NO	NO	NO	27.28
D. Non-energy products from fuels and solvent use	78.09	NA	NA						78.09
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	1724.25	1402.69						3177.43
A. Enteric fermentation		1296.21							1296.21
B. Manure management		428.04	231.61						659.65
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1171.08						1171.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-8604.92	5.91	45.21						-8553.80
A. Forest land	-8828.81	4.26	2.81						-8821.74
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	239.62	NO	31.63						271.25
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	1080.48	72.62						1157.48
A. Solid waste disposal	NA,NO	538.62							538.62
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		541.86	72.54						614.41
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	NE								NE
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									26189.90
Total CO ₂ equivalent emissions with land use, land-use change and forestry									17636.10
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 2018 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⁾	12205.78	3473.92	2587.81	147.90	NO	11.62	NO	NO	18427.03
1. Energy	17485.25	591.18	274.34						18350.77
A. Fuel combustion (sectoral approach)	16692.57	352.94	274.02						17319.53
1. Energy industries	5816.84	3.94	18.63						5839.41
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	792.67	238.23	0.32						1031.23
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	792.67	238.23	0.32						1031.23
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2263.47	3.60	727.52	147.90	NO	11.62	NO	NO	3154.12
A. Mineral industry	1423.08								1423.08
B. Chemical industry	733.51	3.12	694.15	NO	NO	NO	NO	NO	1430.78
C. Metal industry	26.78	0.48	NO	NO	NO	NO	NO	NO	27.26
D. Non-energy products from fuels and solvent use	80.10	NA	NA						80.10
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	1663.54	1406.99						3131.40
A. Enteric fermentation		1248.80							1248.80
B. Manure management		414.74	218.26						633.00
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1188.72						1188.72
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⁾	-7609.96	96.91	108.93						-7404.12
A. Forest land	-7919.18	87.11	57.44						-7774.63
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	244.43	NO	31.99						276.42
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	1118.69	70.02						1194.86
A. Solid waste disposal	NA,NO	570.36							570.36
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		548.33	69.91						618.24
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	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
CO ₂ emissions from biomass	4694.77								4694.77
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									25831.14
Total CO ₂ equivalent emissions with land use, land-use change and forestry									18427.03
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									NA
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2001
Submission 2018 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⁾	12986.73	3478.68	2519.67	161.46	NO	11.69	NO	NO	19158.23
1. Energy	18495.16	632.36	271.56						19399.08
A. Fuel combustion (sectoral approach)	17634.30	378.20	271.25						18283.76
1. Energy industries	6381.66	4.46	20.96						6407.08
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	860.87	254.15	0.31						1115.32
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	860.87	254.15	0.31						1115.32
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2372.76	3.69	615.94	161.46	NO	11.69	NO	NO	3165.54
A. Mineral industry	1643.76								1643.76
B. Chemical industry	641.21	3.67	582.57	NO	NO	NO	NO	NO	1227.45
C. Metal industry	6.56	0.02	NO	NO	NO	NO	NO	NO	6.58
D. Non-energy products from fuels and solvent use	81.23	NA	NA						81.23
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	1689.65	1493.24						3274.99
A. Enteric fermentation		1261.76							1261.76
B. Manure management		427.89	218.79						646.68
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1274.46						1274.46
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⁾	-7979.97	19.00	64.28						-7896.70
A. Forest land	-8488.22	16.02	10.56						-8461.63
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	417.59	NO	41.45						459.04
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	1133.99	74.65						1215.33
A. Solid waste disposal	NA,NO	608.04							608.04
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		525.96	74.53						600.49
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	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
CO ₂ emissions from biomass	5187.98								5187.98
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									27054.93
Total CO ₂ equivalent emissions with land use, land-use change and forestry									19158.23
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 A5.2-14: GHG emission in Croatia, 2002

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2002

Submission 2018 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⁾	13885.90	3464.82	2422.41	185.34	NO	12.01	NO	NO	19970.48
1. Energy	19663.59	623.39	227.25						20514.22
A. Fuel combustion (sectoral approach)	18783.12	364.00	226.94						19374.05
1. Energy industries	7273.79	4.90	24.91						7303.60
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	880.47	259.39	0.31						1140.17
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	880.47	259.39	0.31						1140.17
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2305.85	3.42	600.22	185.34	NO	12.01	NO	NO	3106.84
A. Mineral industry	1638.10								1638.10
B. Chemical industry	566.41	3.41	566.85	NO	NO	NO	NO	NO	1136.67
C. Metal industry	5.86	0.01	NO	NO	NO	NO	NO	NO	5.86
D. Non-energy products from fuels and solvent use	95.49	NA	NA						95.49
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	1656.94	1451.68						3189.38
A. Enteric fermentation		1222.20							1222.20
B. Manure management		434.74	212.53						647.27
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1239.15						1239.15
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⁾	-8168.07	6.39	64.72						-8096.96
A. Forest land	-8679.09	5.62	3.70						-8669.77
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	487.00	NO	50.95						537.95
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	1174.67	78.55						1257.00
A. Solid waste disposal	NA,NO	651.26							651.26
B. Biological treatment of solid waste		NO,NE,IE	NO,NE,IE						NO,NE,IE
C. Incineration and open burning of waste	3.78	NA,NO	0.07						3.85
D. Waste water treatment and discharge		523.41	78.48						601.89
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									28067.43
Total CO ₂ equivalent emissions with land use, land-use change and forestry									19970.48
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 A5.2-15: GHG emission in Croatia, 2003

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2003
Submission 2018 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⁾	15857.18	3628.80	2358.30	212.23	NO	12.28	NO	NO	22068.78
1. Energy	20998.81	674.14	241.73						21914.68
A. Fuel combustion (sectoral approach)	20162.49	413.37	241.44						20817.29
1. Energy industries	7946.52	5.84	25.93						7978.29
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	836.32	260.78	0.29						1097.38
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	836.32	260.78	0.29						1097.38
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2314.88	3.29	569.43	212.23	NO	12.28	NO	NO	3112.11
A. Mineral industry	1619.95								1619.95
B. Chemical industry	588.45	3.26	536.06	NO	NO	NO	NO	NO	1127.77
C. Metal industry	9.88	0.02	NO	NO	NO	NO	NO	NO	9.90
D. Non-energy products from fuels and solvent use	96.60	NA	NA						96.60
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	1694.36	1371.65						3137.80
A. Enteric fermentation		1239.01							1239.01
B. Manure management		455.35	214.77						670.11
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1156.88						1156.88
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	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⁾	-7529.11	39.55	97.53						-7392.03
A. Forest land	-8169.61	35.95	23.70						-8109.96
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	553.34	NO	60.50						613.84
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	1217.47	77.96						1296.23
A. Solid waste disposal	NA,NO	699.56							699.56
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		517.91	77.94						595.85
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									29460.81
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22068.78
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 A5.2-16: GHG emission in Croatia, 2004

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2004
Submission 2018 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⁾	15490.36	3759.95	2603.36	240.33	NO	12.57	NO	NO	22106.56
1. Energy	20426.78	661.10	283.42						21371.30
A. Fuel combustion (sectoral approach)	19540.93	402.09	283.14						20226.16
1. Energy industries	6830.91	4.86	23.51						6859.28
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	885.85	259.01	0.28						1145.14
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	885.85	259.01	0.28						1145.14
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2541.68	3.93	685.03	240.33	NO	12.57	NO	NO	3483.54
A. Mineral industry	1731.21								1731.21
B. Chemical industry	680.69	3.93	651.66	NO	NO	NO	NO	NO	1336.28
C. Metal industry	15.36	NA,NO	NO	NO	NO	NO	NO	NO	15.36
D. Non-energy products from fuels and solvent use	114.42	NA	NA						114.42
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	1821.53	1475.37						3372.84
A. Enteric fermentation		1329.13							1329.13
B. Manure management		492.40	227.83						720.23
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1247.54						1247.54
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⁾	-7554.39	2.92	81.91						-7469.56
A. Forest land	-8243.75	1.95	1.29						-8240.51
B. Cropland	299.12	NO	4.46						303.58
C. Grassland	-161.07	0.97	1.05						-159.06
D. Wetlands	33.04	NO	5.14						38.18
E. Settlements	622.90	NO	69.97						692.87
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	1270.47	77.62						1348.44
A. Solid waste disposal	NA,NO	746.36							746.36
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		524.11	77.61						601.73
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	NE								NE
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									29576.13
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22106.56
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 2018 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⁾	15744.49	3704.96	2554.67	265.80	NO	13.03	NO	NO	22282.95
1. Energy	20811.67	681.29	237.60						21730.56
A. Fuel combustion (sectoral approach)	19942.81	421.47	237.33						20601.60
1. Energy industries	6853.44	4.61	22.86						6880.91
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	868.86	259.83	0.27						1128.96
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	868.86	259.83	0.27						1128.96
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2592.24	3.96	670.31	265.80	NO	13.03	NO	NO	3545.33
A. Mineral industry	1785.37								1785.37
B. Chemical industry	677.70	3.96	636.93	NO	NO	NO	NO	NO	1318.58
C. Metal industry	11.81	NA,NO	NO	NO	NO	NO	NO	NO	11.81
D. Non-energy products from fuels and solvent use	117.36	NA	NA						117.36
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	1760.48	1474.85						3320.79
A. Enteric fermentation		1307.40							1307.40
B. Manure management		453.08	208.39						661.46
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1266.46						1266.46
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⁾	-7745.04	2.74	91.28						-7651.02
A. Forest land	-8298.19	2.16	1.43						-8294.60
B. Cropland	274.18	NO	4.93						279.11
C. Grassland	-137.40	0.57	0.62						-136.20
D. Wetlands	31.30	NO	4.86						36.16
E. Settlements	684.52	NO	79.44						763.96
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	1256.50	80.63						1337.28
A. Solid waste disposal	NA,NO	735.33							735.33
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		521.16	80.63						601.79
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	NE								NE
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									29933.97
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22282.95
Total CO ₂ equivalent emissions, including indirect CO ₂ , without 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 2018 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⁾	16197.64	3824.45	2512.70	292.57	NO	13.01	NO	NO	22840.38
1. Energy	20908.30	667.30	239.63						21815.23
A. Fuel combustion (sectoral approach)	20009.09	388.81	239.36						20637.26
1. Energy industries	6674.57	4.82	22.56						6701.94
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	899.21	278.50	0.27						1177.98
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	899.21	278.50	0.27						1177.98
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2735.93	3.85	662.88	292.57	NO	13.01	NO	NO	3708.24
A. Mineral industry	1917.28								1917.28
B. Chemical industry	675.08	3.85	629.50	NO	NO	NO	NO	NO	1308.44
C. Metal industry	13.85	NA,NO	NO	NO	NO	NO	NO	NO	13.85
D. Non-energy products from fuels and solvent use	129.72	NA	NA						129.72
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	1794.47	1423.95						3299.09
A. Enteric fermentation		1294.90							1294.90
B. Manure management		499.57	214.99						714.57
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1208.95						1208.95
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⁾	-7527.99	6.06	103.15						-7418.79
A. Forest land	-8128.89	5.46	3.60						-8119.82
B. Cropland	219.14	NO	5.41						224.55
C. Grassland	-109.11	0.60	0.65						-107.87
D. Wetlands	29.56	NO	4.59						34.14
E. Settlements	747.22	NO	88.91						836.12
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	1352.76	83.09						1436.60
A. Solid waste disposal	NA,NO	827.25							827.25
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		525.52	83.08						608.60
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	NE								NE
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									30259.16
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22840.38
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 2018 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⁾	18082.21	3854.72	2618.74	326.74	NO	13.05	NO	NO	24895.45
1. Energy	22159.97	664.94	246.24						23071.16
A. Fuel combustion (sectoral approach)	21290.36	375.42	245.98						21911.77
1. Energy industries	7868.62	5.57	27.11						7901.30
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	869.60	289.52	0.26						1159.39
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	869.60	289.52	0.26						1159.39
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2806.28	3.61	727.95	326.74	NO	13.05	NO	NO	3877.63
A. Mineral industry	1948.84								1948.84
B. Chemical industry	710.05	3.61	694.57	NO	NO	NO	NO	NO	1408.23
C. Metal industry	13.10	NA,NO	NO	NO	NO	NO	NO	NO	13.10
D. Non-energy products from fuels and solvent use	134.30	NA	NA						134.30
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	1708.10	1438.41						3235.84
A. Enteric fermentation		1231.08							1231.08
B. Manure management		477.02	199.90						676.92
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1238.52						1238.52
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⁾	-6974.02	31.76	121.20						-6821.05
A. Forest land	-7452.19	29.59	19.51						-7403.09
B. Cropland	145.24	NO	5.36						150.60
C. Grassland	-67.22	2.17	2.37						-62.68
D. Wetlands	27.37	NO	4.29						31.66
E. Settlements	658.38	NO	89.67						748.05
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	1446.30	84.93						1531.88
A. Solid waste disposal	NA,NO	914.38							914.38
B. Biological treatment of solid waste		1.10	0.78						1.88
C. Incineration and open burning of waste	0.65	NA,NO	0.01						0.66
D. Waste water treatment and discharge		530.82	84.14						614.95
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									31716.50
Total CO ₂ equivalent emissions with land use, land-use change and forestry									24895.45
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 2018 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⁾	16536.66	3834.05	2635.30	338.04	NO	11.98	NO	NO	23356.02
1. Energy	20984.97	651.47	243.14						21879.58
A. Fuel combustion (sectoral approach)	20214.14	373.83	242.89						20830.85
1. Energy industries	6820.96	4.79	24.21						6849.97
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	770.84	277.64	0.25						1048.73
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	770.84	277.64	0.25						1048.73
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2703.06	3.42	743.36	338.04	NO	11.98	NO	NO	3799.85
A. Mineral industry	1856.99								1856.99
B. Chemical industry	689.19	3.42	709.98	NO	NO	NO	NO	NO	1402.59
C. Metal industry	24.15	NA,NO	NO	NO	NO	NO	NO	NO	24.15
D. Non-energy products from fuels and solvent use	132.72	NA	NA						132.72
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	1634.29	1456.42						3187.31
A. Enteric fermentation		1194.35							1194.35
B. Manure management		439.94	184.55						624.49
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1271.86						1271.86
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⁾	-7248.64	9.58	106.40						-7132.66
A. Forest land	-7662.78	8.64	5.70						-7648.44
B. Cropland	144.55	NO	5.32						149.86
C. Grassland	-123.13	0.94	1.02						-121.17
D. Wetlands	25.54	NO	4.00						29.54
E. Settlements	663.13	NO	90.36						753.49
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	1535.30	85.98						1621.94
A. Solid waste disposal	NA,NO	1010.07							1010.07
B. Biological treatment of solid waste		1.07	0.77						1.84
C. Incineration and open burning of waste	0.67	NA,NO	0.01						0.68
D. Waste water treatment and discharge		524.15	85.21						609.36
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	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO ₂ ⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									30488.68
Total CO₂ equivalent emissions with land use, land-use change and forestry									23356.02
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2009
Submission 2018 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⁾	14740.05	3925.12	2409.19	341.35	0.26	8.03	NO	NO	21423.99
1. Energy	19811.20	656.04	236.78						20704.02
A. Fuel combustion (sectoral approach)	19104.53	386.45	236.55						19727.53
1. Energy industries	6403.19	4.77	21.01						6428.97
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	706.67	269.59	0.23						976.50
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	706.67	269.59	0.23						976.50
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2107.18	3.06	626.21	341.35	0.26	8.03	NO	NO	3086.09
A. Mineral industry	1460.61								1460.61
B. Chemical industry	532.93	3.06	593.37	NO	NO	NO	NO	NO	1129.36
C. Metal industry	11.56	NA,NO	NO	NO	NO	NO	NO	NO	11.56
D. Non-energy products from fuels and solvent use	102.09	NA	NA						102.09
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	1671.94	1355.30						3104.20
A. Enteric fermentation		1197.95							1197.95
B. Manure management		474.00	188.24						662.24
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1167.05						1167.05
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⁾	-7255.45	5.10	103.60						-7146.76
A. Forest land	-7847.50	4.87	3.21						-7839.42
B. Cropland	89.46	NO	5.32						94.78
C. Grassland	-70.78	0.22	0.24						-70.32
D. Wetlands	23.71	NO	3.71						27.41
E. Settlements	714.68	NO	91.11						805.79
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	1588.98	87.31						1676.45
A. Solid waste disposal	NA,NO	1097.72							1097.72
B. Biological treatment of solid waste		0.90	0.64						1.54
C. Incineration and open burning of waste	0.16	NA,NO	NA,NO,IE						0.16
D. Waste water treatment and discharge		490.36	86.67						577.02
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
CO ₂ emissions from biomass	5577.15								5577.15
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									28570.76
Total CO ₂ equivalent emissions with land use, land-use change and forestry									21423.99
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 A5.2-22: GHG emission in Croatia, 2010

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2010
Submission 2018 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⁾	14131.11	3974.51	2481.77	378.87	0.03	8.95	NO	NO	20975.25
1. Energy	18987.46	681.21	235.26						19903.93
A. Fuel combustion (sectoral approach)	18312.02	410.82	235.04						18957.88
1. Energy industries	5925.02	4.34	21.72						5951.08
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	675.43	270.39	0.22						946.04
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	675.43	270.39	0.22						946.04
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2169.54	2.91	796.30	378.87	0.03	8.95	NO	NO	3356.61
A. Mineral industry	1432.29								1432.29
B. Chemical industry	615.36	2.91	765.22	NO	NO	NO	NO	NO	1383.49
C. Metal industry	27.55	NA,NO	NO	NO	NO	NO	NO	NO	27.55
D. Non-energy products from fuels and solvent use	94.34	NA	NA						94.34
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	1676.77	1264.96						3029.76
A. Enteric fermentation		1204.84							1204.84
B. Manure management		471.93	184.46						656.39
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1080.49						1080.49
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⁾	-7113.97	1.76	101.74						-7010.47
A. Forest land	-7652.18	1.64	1.08						-7649.46
B. Cropland	155.08	NO	5.28						160.35
C. Grassland	-79.96	0.12	0.13						-79.71
D. Wetlands	21.87	NO	3.42						25.29
E. Settlements	678.64	NO	91.84						770.48
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	1611.87	83.50						1695.42
A. Solid waste disposal	NA,NO	1098.53							1098.53
B. Biological treatment of solid waste		0.97	0.69						1.66
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		512.37	82.81						595.18
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									27985.72
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20975.25
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 2018 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⁾	14679.21	3979.93	2555.11	396.20	0.02	9.37	NO	NO	21619.83
1. Energy	18764.79	648.39	221.65						19634.83
A. Fuel combustion (sectoral approach)	18084.55	399.28	221.45						18705.28
1. Energy industries	6297.13	5.02	23.00						6325.15
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	680.24	249.11	0.20						929.55
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	680.24	249.11	0.20						929.55
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1931.66	1.94	786.76	396.20	0.02	9.37	NO	NO	3125.93
A. Mineral industry	1220.06								1220.06
B. Chemical industry	593.19	1.94	754.16	NO	NO	NO	NO	NO	1349.28
C. Metal industry	29.45	NA,NO	NO	NO	NO	NO	NO	NO	29.45
D. Non-energy products from fuels and solvent use	88.96	NA	NA						88.96
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	1667.80	1347.85						3120.82
A. Enteric fermentation		1201.06							1201.06
B. Manure management		466.73	176.47						643.21
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1171.37						1171.37
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⁾	-6122.46	18.63	114.43						-5989.40
A. Forest land	-6634.88	15.20	10.02						-6609.67
B. Cropland	131.77	NO	5.37						137.15
C. Grassland	-59.41	3.43	3.74						-52.25
D. Wetlands	20.03	NO	3.12						23.15
E. Settlements	679.66	NO	92.18						771.84
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	1643.18	84.42						1727.65
A. Solid waste disposal	NA,NO	1131.57							1131.57
B. Biological treatment of solid waste		1.01	0.72						1.73
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		510.60	83.70						594.30
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	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
CO ₂ emissions from biomass	5834.61								5834.61
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									27609.23
Total CO ₂ equivalent emissions with land use, land-use change and forestry									21619.83
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 A5.2-24: GHG emission in Croatia, 2012

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2012
Submission 2018 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⁾	13363.01	3903.35	2421.76	397.28	0.03	9.18	NO	NO	20094.60
1. Energy	17363.42	610.71	213.31						18187.43
A. Fuel combustion (sectoral approach)	16791.33	395.19	213.13						17399.64
1. Energy industries	5895.66	4.88	21.78						5922.32
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	572.09	215.52	0.18						787.79
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	572.09	215.52	0.18						787.79
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1778.24	0.15	694.87	397.28	0.03	9.18	NO	NO	2879.74
A. Mineral industry	1191.09								1191.09
B. Chemical industry	502.01	0.15	652.54	NO	NO	NO	NO	NO	1154.70
C. Metal industry	2.02	NA,NO	NO	NO	NO	NO	NO	NO	2.02
D. Non-energy products from fuels and solvent use	83.12	NA	NA						83.12
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	1636.61	1299.34						3037.18
A. Enteric fermentation		1187.66							1187.66
B. Manure management		448.95	171.26						620.21
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1128.08						1128.08
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⁾	-5879.96	38.88	127.61						-5713.48
A. Forest land	-6371.27	36.09	23.80						-6311.38
B. Cropland	205.07	NO	5.46						210.53
C. Grassland	-96.43	2.79	3.04						-90.60
D. Wetlands	18.18	NO	2.83						21.01
E. Settlements	674.66	NO	92.49						767.15
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	1617.00	86.64						1703.72
A. Solid waste disposal	NA,NO	1140.22							1140.22
B. Biological treatment of solid waste		1.87	1.34						3.21
C. Incineration and open burning of waste	0.08	NA,NO	NA,NO,IE						0.08
D. Waste water treatment and discharge		474.91	85.30						560.22
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									25808.08
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20094.60
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 2018 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⁾	12215.82	3790.44	1874.04	408.91	0.06	6.05	NO	NO	18295.33
1. Energy	16609.97	596.43	209.27						17415.67
A. Fuel combustion (sectoral approach)	16066.05	391.71	209.09						16666.85
1. Energy industries	5274.69	4.16	20.92						5299.77
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	543.92	204.72	0.18						748.82
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	543.92	204.72	0.18						748.82
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1903.55	0.15	282.55	408.91	0.06	6.05	NO	NO	2601.28
A. Mineral industry	1298.28								1298.28
B. Chemical industry	509.33	0.15	240.45	NO	NO	NO	NO	NO	749.94
C. Metal industry	16.88	NA,NO	NO	NO	NO	NO	NO	NO	16.88
D. Non-energy products from fuels and solvent use	79.06	NA	NA						79.06
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				408.91	0.06	NO	NO	NO	408.97
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	1581.85	1191.93						2848.39
A. Enteric fermentation		1154.55							1154.55
B. Manure management		427.29	162.58						589.87
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1029.35						1029.35
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⁾	-6372.36	1.93	102.35						-6268.08
A. Forest land	-6711.20	1.46	0.96						-6708.78
B. Cropland	171.37	NO	5.54						176.91
C. Grassland	-61.65	0.47	0.51						-60.66
D. Wetlands	16.33	NO	2.53						18.86
E. Settlements	673.80	NO	92.80						766.60
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	1610.08	87.94						1698.06
A. Solid waste disposal	NA,NO	1142.37							1142.37
B. Biological treatment of solid waste		2.85	2.04						4.89
C. Incineration and open burning of waste	0.04	NA,NO	NA,NO,IE						0.04
D. Waste water treatment and discharge		464.86	85.90						550.76
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									24563.41
Total CO ₂ equivalent emissions with land use, land-use change and forestry									18295.33
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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2014
Submission 2018 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⁾	11456.57	3738.63	1789.44	413.90	0.06	6.77	NO	NO	17405.36
1. Energy	15725.63	536.38	197.82						16459.83
A. Fuel combustion (sectoral approach)	15200.29	345.17	197.65						15743.10
1. Energy industries	4769.85	3.23	17.95						4791.03
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	525.34	191.22	0.17						716.73
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	525.34	191.22	0.17						716.73
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2055.53	0.17	285.50	413.90	0.06	6.77	NO	NO	2761.92
A. Mineral industry	1392.21								1392.21
B. Chemical industry	559.83	0.17	266.39	NO	NO	NO	NO	NO	826.40
C. Metal industry	28.58	NA,NO	NO	NO	NO	NO	NO	NO	28.58
D. Non-energy products from fuels and solvent use	74.91	NA	NA						74.91
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				413.90	0.06	NO	NO	NO	413.96
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	1556.77	1115.77						2742.00
A. Enteric fermentation		1126.94							1126.94
B. Manure management		429.82	160.23						590.06
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	955.53						955.53
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⁾	-6394.10	0.32	101.25						-6292.53
A. Forest land	-6411.08	0.22	0.14						-6410.71
B. Cropland	43.70	0.08	5.67						49.45
C. Grassland	-54.17	0.03	0.03						-54.11
D. Wetlands	14.49	NO	2.24						16.72
E. Settlements	671.02	NO	93.17						764.19
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	1644.99	89.11						1734.14
A. Solid waste disposal	NA,NO	1178.42							1178.42
B. Biological treatment of solid waste		2.86	2.05						4.90
C. Incineration and open burning of waste	0.04	NA,NO	NA,NO,IE						0.04
D. Waste water treatment and discharge		463.72	87.06						550.78
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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
CO₂ emissions from biomass	5249.83								5249.83
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N₂O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									23697.89
Total CO₂ equivalent emissions with land use, land-use change and forestry									17405.36
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									NA
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS

(Sheet 1 of 1)

Inventory 2015

Submission 2018 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⁾	12500.76	3963.16	1928.75	419.90	0.03	5.22	NO	NO	18817.82
1. Energy	15924.56	595.07	208.40						16728.04
A. Fuel combustion (sectoral approach)	15597.65	392.91	208.21						16198.77
1. Energy industries	4771.67	4.13	19.62						4795.41
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	326.91	202.17	0.19						529.27
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	326.91	202.17	0.19						529.27
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2002.62	0.17	341.79	419.90	0.03	5.22	NO	NO	2769.73
A. Mineral industry	1340.51								1340.51
B. Chemical industry	572.28	0.17	311.55	NO	NO	NO	NO	NO	883.99
C. Metal industry	13.63	NA,NO	NO	NO	NO	NO	NO	NO	13.63
D. Non-energy products from fuels and solvent use	76.21	NA	NA						76.21
E. Electronic industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				419.90	0.03	NO	NO	NO	419.93
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	1630.39	1175.47						2875.21
A. Enteric fermentation		1186.26							1186.26
B. Manure management		444.13	167.60						611.73
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1007.87						1007.87
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⁾	-5495.81	13.96	111.04						-5370.80
A. Forest land	-5458.51	9.82	6.48						-5442.21
B. Cropland	189.87	2.58	7.42						199.86
C. Grassland	-118.11	1.57	1.70						-114.84
D. Wetlands	12.64	NO	1.94						14.58
E. Settlements	684.40	NO	93.50						777.90
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	1723.56	92.05						1815.65
A. Solid waste disposal	NA,NO	1253.82							1253.82
B. Biological treatment of solid waste		6.16	4.41						10.57
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO,IE						0.05
D. Waste water treatment and discharge		463.58	87.64						551.22
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:⁽²⁾									
International bunkers	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	NE								NE
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									24188.62
Total CO ₂ equivalent emissions with land use, land-use change and forestry									18817.82
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 A5.2-27: GHG emission in Croatia, 2016

SUMMARY 2 SUMMARY REPORT FOR CO₂ EQUIVALENT EMISSIONS
(Sheet 1 of 1)Inventory 2016
Submission 2018 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⁾	12681.13	3959.84	1814.96	419.67	NO	6.39	NO	NO	18881.99
1. Energy	16275.96	585.59	212.90						17074.45
A. Fuel combustion (sectoral approach)	15987.55	382.61	212.69						16582.85
1. Energy industries	4888.84	5.45	23.03						4917.32
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	288.41	202.98	0.21						491.60
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	288.41	202.98	0.21						491.60
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1868.41	0.15	165.56	419.67	NO	6.39	NO	NO	2460.19
A. Mineral industry	1238.07								1238.07
B. Chemical industry	547.86	0.15	109.54	NO	NO	NO	NO	NO	657.56
C. Metal industry	1.05	NO,NA	NO	NO	NO	NO	NO	NO	1.05
D. Non-energy products from fuels and solvent use	81.42	NA	NA						81.42
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				419.67	NO	NO	NO	NO	419.67
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	76.18	1616.92	1237.84						2930.94
A. Enteric fermentation		1175.51							1175.51
B. Manure management		441.42	164.19						605.61
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1073.64						1073.64
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	11.22								11.22
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⁾	-5539.47	8.92	108.38						-5422.17
A. Forest land	-5551.34	7.42	4.89						-5539.03
B. Cropland	307.40	0.05	5.83						313.28
C. Grassland	-215.63	1.44	1.57						-212.62
D. Wetlands	10.79	NO	1.65						12.44
E. Settlements	672.72	NO	94.44						767.17
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	1748.25	90.28						1838.58
A. Solid waste disposal	NO,NA	1278.72							1278.72
B. Biological treatment of solid waste		2.74	1.96						4.71
C. Incineration and open burning of waste	0.05	NO,NA	NO,IE,NA						0.05
D. Waste water treatment and discharge		466.79	88.31						555.11
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	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
CO ₂ emissions from biomass	5893.14								5893.14
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
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									24304.16
Total CO ₂ equivalent emissions with land use, land-use change and forestry									18881.99
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	27.3900	94.60	1
Kameni ugljen- Termoelektrane	Other bituminouse coal Thermal power plant	GJ/t	24.9500	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	17.0000	96.10	1
Lignit	Lignite	GJ/t	10.5000	101.00	1
Briketi kamenog ugljena	Brown coal briquettes	GJ/t	<u>20.7000</u>	97.50	1
Koks	Coke oven coke	GJ/t	29.3100	107.00	1
Prirodni plin	Natural Gas	GJ/10 ³ m ³	34.8000	56.10	1
Gradski plin	Gas Works Gas	GJ/t	<u>38.7000</u>	44.40	1
Koksni plin	Coke Oven Gas	GJ/t	<u>38.7000</u>	44.40	1
Rafinerijski plin	Refinery Gas	GJ/t	42.6000	57.60	1

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

Napomene:

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

Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2016.

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)	reported in the UNECE Convention on Long-range Transboundary Air Pollution	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		202.16	202.43	-0.28	0%	202.4346397	0.28	0%	In LRTAP report International aviation is reported in total country emissions
1. Energy	CO	201.66	201.93	-0.27	0.00	201.93	0.27	0.00	In LRTAP report International aviation is reported in total country emissions
A. Fuel combustion (sector)	CO	180.92	181.18	-0.26	0.00	181.18	0.26	0.00	In LRTAP report International aviation is reported in total country emissions
1. Energy industries	CO	1.25	1.25	0.00	0.00	1.25	0.00	0.00	
2. Manufacturing industries and construction	CO	12.07	12.07	0.00	0.00	12.07	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
4. Other sectors	CO	131.07	131.07	0.00	0.00	131.07	0.00	0.00	
5. Other	CO	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuel use	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	20.74	20.75	-0.01	0.00	20.75	0.01	0.00	
2. Industrial processes and other	CO	0.50		0.50	#DIV/0!	0.50	0.00	0.00	
A. Mineral industry	CO	NO,NA		NO	NO	0.00	NO	NO	
B. Chemical industry	CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. Metal industry	CO	0.04	0.04	0.00	0.00	0.04	0.00	0.00	
D. Non-energy products from other processes	CO	0.46	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 and other biomass	CO	NO	NO	NO	NO	NO	NO	NO	
J. Other	CO	NO	NO	NO	NO	NO	NO	NO	
5. Waste	CO	0.00		0.00	#DIV/0!	0.00	0.00	#DIV/0!	
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	0.00001	0.00073	0.00	-0.99	0.00	0.00	0.99	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	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		13.82	14.71	-0.89	-6%	13.82	0.28	1.99	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy	SO2	13.82	14.51	-0.69	-0.05	13.82	0.27	1.99	In LRTAP report International aviation is reported in total country emisisions while i
A. Fuel combustion (sectoral approach)	SO2	10.41	10.44	-0.03	0.00	10.41	0.26	2.54	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy industries	SO2	6.35	6.35	0.00	0.00	6.35	0.00	0.00	
2. Manufacturing industries and construction	SO2	2.91	2.91	0.00	0.00	2.91	0.00	0.00	
3. Transport	SO2	0.09	0.12	-0.03	-0.24	0.09	0.00	0.00	In LRTAP report International aviation is reported in total country emisisions while i
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	
A. Mineral industry	SO2			NO	NO		NO	NO	
B. Chemical industry	SO2	NO	NO	NO	NO	NO	NO	NO	
C. Metal industry	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
D. Non-energy products from fuels and solvent use	SO2		NO	NO	NO		NO	NO	
G. Other product manufacture and use	SO2	NO	NO	NO	NO	NO	NO	NO	
H. Other	SO2		NE,NA	NO	NO		NO	NO	
3. Agriculture	SO2	NO	NO	NO	NO	NO	NO	NO	
B. Manure management	SO2	NO	NO	NO	NO	NO	NO	NO	
D. Agricultural soils	SO2	NO	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	SO2	NO	NO	NO	NO	NO	NO	NO	
J. Other	SO2	NO	NO	NO	NO	NO	NO	NO	
5. Waste	SO2	0.00		0.00	#DIV/0!	0.00	0.00	-35.19	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	0.00003	0.00061	0.00	-0.95	0.00	0.00	2387.72	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)	reported in the UNECE Convention on Long-range Transboundary Air Pollution	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		51.53	52.37	-0.84	-2%	52.37	-0.84	-2%	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy		48.72	48.85	-0.13	0.00	48.85	-0.13	0.00	In LRTAP report International aviation is reported in total country emisisions while i
A. Fuel combustion (sectoral approach)	NOx	48.56	48.69	-0.13	0.00	48.69	-0.13	0.00	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy industries	NOx	6.93	6.93	0.00	0.00	6.93	0.00	0.00	
2. Manufacturing industries and construction	NOx	6.58	6.58	0.00	0.00	6.58	0.00	0.00	
3. Transport	NOx	24.99	25.12	-0.13	0.00	25.12	-0.13	0.00	In LRTAP report International aviation is reported in total country emisisions while i
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	0.96	0.96	0.00	0.00	0.96	0.00	0.00	
A. Mineral industry	NOx	NO	NO	NO	NO	NO	NO	NO	
B. Chemical industry	NOx	0.94	0.94	0.00	0.00	0.94	0.00	0.00	
C. Metal industry	NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
D. Non-energy products from fuels and solvent use	NOx	0.02	0.02	0.00	0.00	0.02	0.02	0.00	
G. Other product manufacture and use	NOx	NO	NO	NO	NO	NO	NO	NO	
H. Other	NOx		NE,NA	NO	NO	NE,NA	NO	NO	
3. Agriculture	NOx	2.43	2.56	0.13	0.00	2.56	0.13	0.00	Emission occurred in NFR can not be enetered in CRF
B. Manure management	NOx	NO	0.13	0.00	0.00	0.13	0.13	1.00	Emission occurred in NFR can not be enetered in CRF
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	0.00	NO	NO	NO	NO	NO	NO	
A. Solid waste disposal	NOx	NO,NA		NO	NO	0.00	NO	NO	
B. Biological treatment of solid waste	NOx	NE,NA		NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NOx	0.00013	0.00436	0.00	-0.97	0.00	0.00	-0.97	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NOx	NO,NA		NO	NO	0.00	NO	NO	
E. Other	NOx	NO		NO	NO	0.00	NO	NO	
6. Other	NOx	NO		NO	NO	0.00	NO	NO	

Pollutant:	NM VOC								
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)	reported in the UNECE Convention on Long-range Transboundary	Absolute difference in kt (1) 2	Relative difference in % (2) 3	Explanations for differences
Total (Net Emissions)		68.62	69.87	-1.25	-2%	69.87	-1.25	-2%	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy	NM VOC	27.60	28.77	-1.17	-0.04	28.77	-1.17	-0.04	In LRTAP report International aviation is reported in total country emisisions while i
A. Fuel combustion (sectoral approach)	NM VOC	24.16	25.25	-1.09	-0.04	25.25	-1.09	-0.04	In LRTAP report International aviation is reported in total country emisisions while i
1. Energy industries	NM VOC	0.36	0.36	0.00	0.00	0.36	0.00	0.00	
2. Manufacturing industries and construction	NM VOC	1.26	1.26	0.00	0.00	1.26	0.00	0.00	
3. Transport	NM VOC	5.59	6.68	-1.09	-0.16	6.68	-1.09	-0.16	In LRTAP report International aviation is reported in total country emisisions while i
4. Other sectors	NM VOC	16.95	16.95	0.00	0.00	16.95	0.00	0.00	
5. Other	NM VOC	NO	NO	NO	NO	NO	NO	NO	
B. Fugitive emissions from fuels	NM VOC	3.52	3.52	0.00	0.00	3.52	0.00	0.00	
1. Solid fuels	NM VOC	NO,NA	NO	NO	NO	NO	NO	NO	
2. Oil and natural gas and other emissions from energy production	NM VOC	3.52	3.52	0.00	0.00	3.52	0.00	0.00	
2. Industrial processes and product use	NM VOC	30.64	30.68	-0.04	0.00	30.68	-0.04	0.00	
A. Mineral industry	NM VOC	NO	0.04	NO	NO	0.04	NO	NO	Emission occurred in NFR can not be enetered in CRF
B. Chemical industry	NM VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
C. Metal industry	NM VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
D. Non-energy products from fuels and solvent use	NM VOC	25.25	24.37	0.89	0.04	24.37	0.89	0.04	
G. Other product manufacture and use	NM VOC	NO	0.89	NO	NO	0.89	NO	NO	
H. Other	NM VOC	5.38	5.38	0.00	0.00	5.38	0.00	0.00	
3. Agriculture	NM VOC	8.37	8.37	0.00	0.00	8.37	0.00	0.00	
B. Manure management	NM VOC	7.74	7.74	0.00	0.00	7.74	0.00	0.00	
D. Agricultural soils	NM VOC	0.63	0.63	0.00	0.00	0.63	0.00	0.00	
F. Field burning of agricultural residues	NM VOC	NO	NO	NO	NO	NO	NO	NO	
J. Other	NM VOC	NO	NO	NO	NO	NO	NO	NO	
5. Waste	NM VOC	2.06	2.06	0.00	0.00	2.06	0.00	0.00	
A. Solid waste disposal	NM VOC	2.05	2.06	0.00	0.00	2.06	0.00	0.00	
B. Biological treatment of solid waste	NM VOC	NE,NA		NO	NO	0.00	NO	NO	
C. Incineration and open burning of waste	NM VOC	0.00004	0.00011	0.00	-0.63	0.00	0.00	-0.63	Data on Cremation are not included in GHG inventory
D. Wastewater treatment and discharge	NM VOC	0.00		0.00	0.00	0.00	0.00	0.00	
E. Other	NM VOC	NO		NO	NO	0.00	NO	NO	
6. Other	NM VOC	NO		NO	NO	0.00	NO	NO	

ANNEX 5-5: REPORTING ON RECALCULATIONS OF THE 2015 AND 1990

Recalculated year	2015							
Greenhouse gas	CO2	Note: Replicate table below if more gases need reporting.						
	(CO2, N2O, CH4)	Previous submission (CO2- eq, kt)	Latest submission (CO2- eq, kt)	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							
Total National Emissions and Removals	CO2		12,826.69	12,500.76	-325.9336257	-3%	-1%	-2% Technical correction
1. Energy	CO2		15,924.56	15,924.56	0	0%	0%	0%
A. Fuel combustion activities	CO2		15,597.65	15,597.65	0	0%	0%	0%
1. Energy industries	CO2		4,771.67	4,771.67	0	0%	0%	0%
2. Manufacturing industries and construction	CO2		2,222.70	2,222.70	0	0%	0%	0%
3. Transport	CO2		5,883.52	5,883.52	0	0%	0%	0%
4. Other sectors	CO2		2,719.76	2,719.76	0	0%	0%	0%
5. Other	CO2	NO,IE		NO,IE	NO	NO	NO	
B. Fugitive Emissions from Fuels	CO2		326.91	326.91	0	0%	0%	0%
1. Solid fuels	CO2	NO		NO	NO	NO	NO	
2. Oil and natural gas	CO2		326.91	326.91	0	0%	0%	0%
C. CO2 transport and storage	CO2	NO		NO	NO	NO	NO	
2. Industrial processes and product use	CO2		1,924.80	2,002.62	77.82081778	1%	0%	0% Technical correction
A. Mineral industry	CO2		1,313.14	1,340.51	27.37069955	0%	0%	0% Technical correction
B. Chemical industry	CO2		537.04	572.28	35.2326	0%	0%	0% Technical correction
C. Metal industry	CO2		13.63	13.63	0	0%	0%	0%
D. Non-energy products from fuels and solvent use	CO2		60.99	76.21	15.21751823	0%	0%	0% correction of error
G. Other product manufacture and use	CO2	NO		NO	NO	NO	NO	
H. Other	CO2	NA		NA	NO	NO	NO	
3. Agriculture	CO2		69.34	69.34	0	0%	0%	0%
A. Enteric fermentation	CO2			NO	NO	NO	NO	
B. Manure management	CO2			NO	NO	NO	NO	
C. Rice cultivation	CO2			NO	NO	NO	NO	
D. Agricultural soils	CO2			NO	NO	NO	NO	
E. Prescribed burning of savannahs	CO2			NO	NO	NO	NO	
F. Field burning of agricultural residues	CO2			NO	NO	NO	NO	
G. Liming	CO2		12.09	12.09	0	0%	0%	0%
H. Urea application	CO2		57.25	57.25	0	0%	0%	0%
I. Other carbon-containing fertilizer	CO2	NA		NA	NO	NO	NO	
J. Other	CO2	NO		NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	CO2		-5,092.05	-5,495.81	-403.7544435	-3%	-2%	-2% Changes in LUC matrix and use of new figures for soil carbon content;
A. Forestland	CO2		-5,607.26	-5,458.51	148.7476733	1%	1%	1% use of new figures for soil carbon content; estimation of CSC in litter pool;
B. Cropland	CO2		121.75	189.87	68.11396717	1%	0%	0% Changes in LUC matrix and use of new figures for soil carbon content;
C. Grassland	CO2		-78.78	-118.11	-39.32246866	0%	0%	0% Changes in LUC matrix and use of new figures for soil carbon content;
D. Wetlands	CO2		5.31	12.64	7.329678676	0%	0%	0% Changes in LUC matrix and use of new figures for soil carbon content;
E. Settlements	CO2		593.11	684.40	91.2851708	1%	0%	0%
F. Other land	CO2	NO		NO	NO	NO	NO	
G. Harvested wood products	CO2		-126.19	-806.10	-679.9084648	-5%	-3%	-4%
H. Other	CO2	NO		NO	NO	NO	NO	
5. Waste	CO2		0.05	0.05	0	0%	0%	0%
A. Solid waste disposal	CO2	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	
6. Other (As specified in summary 1.A)	CO2	NO		NO	NO	NO	NO	
Memo items:	CO2				0	0%	0%	0%
International bunkers	CO2		359.45	359.45	0	0%	0%	0%
Aviation	CO2		354.08	354.08	0	0%	0%	0%
Navigation	CO2		5.37	5.37	0	0%	0%	0%
Multilateral operations	CO2	C		C	NO	NO	NO	
CO2 emissions from biomass	CO2		6,010.65	6,010.65	0	0%	0%	0%
CO2 captured	CO2	NO		NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	CO2	NE		NE	NO	NO	NO	
Indirect N2O				NO	NO	NO	NO	
Indirect CO2				NA,NO	NO	NO	NO	

Recalculated year	2015							
Greenhouse gas	CH4	Note: Replicate table below if more gases need reporting.						
	Gas (CO2, N2O, CH4)	Previous submission (eq, kt)	Latest submission (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	3,444.61	3,963.16	518.5532413	13%	2%	3% Technical correction	
1. Energy	CH4	595.07	595.07	0	0%	0%	0%	
A. Fuel combustion activities	CH4	392.91	392.91	0	0%	0%	0%	
1. Energy industries	CH4	4.13	4.13	0	0%	0%	0%	
2. Manufacturing industries and construction	CH4	3.33	3.33	0	0%	0%	0%	
3. Transport	CH4	12.41	12.41	0	0%	0%	0%	
4. Other sectors	CH4	373.03	373.03	0	0%	0%	0%	
5. Other	CH4	NO,IE	NO,IE	NO	NO	NO		
B. Fugitive Emissions from Fuels	CH4	202.17	202.17	0	0%	0%	0%	
1. Solid fuels	CH4	NO	NO	NO	NO	NO		
2. Oil and natural gas	CH4	202.17	202.17	0	0%	0%	0%	
C. CO2 transport and storage	CH4	NO	NO	NO	NO	NO		
2. Industrial processes and product use	CH4	0.17	0.17	0	0%	0%	0%	
A. Mineral industry	CH4		NO	NO	NO	NO		
B. Chemical industry	CH4	0.17	0.17	0	0%	0%	0%	
C. Metal industry	CH4	NA,NO	NA,NO	NO	NO	NO		
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	1,368.82	1,630.39	261.5765052	7%	1%	1% Technical correction	
A. Enteric fermentation	CH4	1,024.36	1,186.26	161.9042173	4%	1%	1% Technical correction	
B. Manure management	CH4	344.46	444.13	99.6722879	3%	0%	1% Technical correction	
C. Rice cultivation	CH4	NO	NO	NO	NO	NO		
D. Agricultural soils	CH4	NA	NA	NO	NO	NO		
E. Prescribed burning of savannahs	CH4	NA	NA	NO	NO	NO		
F. Field burning of agricultural residues	CH4	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		
4. Land use, land-use change and forestry (net) (4)	CH4	13.96	13.96	0	0%	0%	0%	
A. Forestland	CH4	9.82	9.82	0	0%	0%	0%	
B. Cropland	CH4	2.58	2.58	0	0%	0%	0%	
C. Grassland	CH4	1.57	1.57	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	NO		
H. Other	CH4	NO	NO	NO	NO	NO		
5. Waste	CH4	1,466.58	1,723.56	256.9767362	6%	1%	1% Technical correction	
A. Solid waste disposal	CH4	1,253.82	1,253.82	0	0%	0%	0%	
B. Biological treatment of solid waste	CH4	6.16	6.16	0	0%	0%	0%	
C. Incineration and open burning of waste	CH4	NA,NO	NA,NO	NO	NO	NO		
D. Waste water treatment and discharge	CH4	206.60	463.58	256.9767362	6%	1%	1% Technical correction	
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	0.70	0.07	-0.626723738	0%	0%	0% Wrong EF was used	
Aviation	CH4	0.01	0.06	0.048432213	0%	0%	0% Wrong EF was used	
Navigation	CH4	C	0.01	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	2015							
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	1,813.95	1,928.75	114.8034386	3%	0%	1%	
1. Energy	N2O	208.40	208.40	0	0%	0%	0%	
A. Fuel combustion activities	N2O	208.21	208.21	0	0%	0%	0%	
1. Energy industries	N2O	19.62	19.62	0	0%	0%	0%	
2. Manufacturing industries and construction	N2O	5.98	5.98	0	0%	0%	0%	
3. Transport	N2O	55.89	55.89	0	0%	0%	0%	
4. Other sectors	N2O	126.72	126.72	0	0%	0%	0%	
5. Other	N2O	NO,IE	NO,IE	NO	NO	NO	NO	
B. Fugitive Emissions from Fuels	N2O	0.19	0.19	0	0%	0%	0%	
1. Solid fuels	N2O	NA,NO	NA,NO	NO	NO	NO	NO	
2. Oil and natural gas	N2O	0.19	0.19	0	0%	0%	0%	
C. CO2 transport and storage	N2O	NO		NO	NO	NO	NO	
2. Industrial processes and product use	N2O	315.35	341.79	26.43558	1%	0%	0%	Techical correction
A. Mineral industry	N2O			NO	NO	NO	NO	
B. Chemical industry	N2O	311.55	311.55	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	3.81	30.24	26.43558	1%	0%	0%	emissions from 2.G.3.b were added
H. Other	N2O	NA	NA	NO	NO	NO	NO	
3. Agriculture	N2O	1,117.17	1,175.47	58.30664326	1%	0%	0%	Techical correction
A. Enteric fermentation	N2O			NO	NO	NO	NO	
B. Manure management	N2O	146.73	167.60	20.87081347	1%	0%	0%	Techical correction
C. Rice cultivation	N2O			NO	NO	NO	NO	
D. Agricultural soils	N2O	970.44	1,007.87	37.43582979	1%	0%	0%	correction of error
E. Prescribed burning of savannahs	N2O	NA	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	86.37	111.04	24.6679527	1%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content; estimation of new figures for soil carbon content; estimation of CSC in litter pool;
A. Forestland	N2O	6.48	6.48	0	0%	0%	0%	use of new figures for soil carbon content; estimation of CSC in litter pool;
B. Cropland	N2O	7.78	7.42	-0.357156266	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content; estimation of new figures for soil carbon content; estimation of CSC in litter pool;
C. Grassland	N2O	1.70	1.70	0	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
D. Wetlands	N2O	0.64	1.94	1.306137405	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
E. Settlements	N2O	69.78	93.50	23.71897156	1%	0%	0%	
F. Other land	N2O	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	N2O			NO	NO	NO	NO	
H. Other	N2O	NO	NO	NO	NO	NO	NO	
5. Waste	N2O	86.65	92.05	5.393262605	0%	0%	0%	Techical correction
A. Solid waste disposal	N2O			NO	NO	NO	NO	
B. Biological treatment of solid waste	N2O	4.41	4.41	0	0%	0%	0%	
C. Incineration and open burning of waste	N2O	NA,NO,IE	NA,NO,IE	NO	NO	NO	NO	
D. Waste water treatment and discharge	N2O	82.25	87.64	5.393262605	0%	0%	0%	Techical correction
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	0.92	2.95	2.037612727	0%	0%	0%	
Aviation	N2O	0.87	2.91	2.037612727	0%	0%	0%	Wrong EF was used
Navigation	N2O	0.04	0.04	0	0%	0%	0%	
Multilateral operations	N2O	C	C	NO	NO	NO	NO	
CO2 emissions from biomass	N2O			NO	NO	NO	NO	
CO2 captured	N2O	NO		NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	N2O	NE		NO	NO	NO	NO	
Indirect N2O			NA,NO	NO	NO	NO	NO	
Indirect CO2				NO	NO	NO	NO	

Recalculated year	1990							
Greenhouse gas	CO2	Note: Replicate table below if more gases need reporting.						
	Gas (CO2, N2O, CH4)	Previous submission (eq, kt)	Latest submission (eq, kt)	CO2-Difference (CO2-eq, kt)	Difference(1)	Impact of recalculation on total emissions excluding	Impact of recalculation on total emissions including	Explanation for recalculations
GREENHOUSE GAS SOURCE AND SINK CATEGORY								
Total National Emissions and Removals								
1. Energy	CO2	16,762.70	16,788.34	25.64359359	0%	0%	0%	Techinal correction
A. Fuel combustion activities	CO2	20,758.79	20,758.79	0	0%	0%	0%	
1. Energy industries	CO2	20,078.93	20,078.93	0	0%	0%	0%	
2. Manufacturing industries and construction	CO2	7,071.41	7,071.41	0	0%	0%	0%	
3. Transport	CO2	5,501.67	5,501.67	0	0%	0%	0%	
4. Other sectors	CO2	3,786.94	3,786.94	0	0%	0%	0%	
5. Other	CO2	3,718.91	3,718.91	0	0%	0%	0%	
B. Fugitive Emissions from Fuels	CO2	NO,IE	NO,IE	NO	NO	NO	NO	
1. Solid fuels	CO2	679.85	679.85	0	0%	0%	0%	
2. Oil and natural gas	CO2	NO	NO	NO	NO	NO	NO	
C. CO2 transport and storage	CO2	679.85	679.85	0	0%	0%	0%	
2. Industrial processes and product use	CO2	NO	NO	NO	NO	NO	NO	
A. Mineral industry	CO2	2,580.73	2,632.62	51.88985162	0%	0%	0%	Techinal correction
B. Chemical industry	CO2	1,280.88	1,280.88	0	0%	0%	0%	
C. Metal industry	CO2	771.87	778.44	6.568	0%	0%	0%	Techinal correction
D. Non-energy products from fuels and solvent use	CO2	338.56	338.56	0	0%	0%	0%	
G. Other product manufacture and use	CO2	234.75	234.75	0	0%	0%	0%	
H. Other	CO2	NO	NO	NO	NO	NO	NO	
3. Agriculture	CO2	NA	NA	NO	NO	NO	NO	
A. Enteric fermentation	CO2	50.02	50.02	0	0%	0%	0%	
B. Manure management	CO2			NO	NO	NO	NO	
C. Rice cultivation	CO2			NO	NO	NO	NO	
D. Agricultural soils	CO2			NO	NO	NO	NO	
E. Prescribed burning of savannahs	CO2			NO	NO	NO	NO	
F. Field burning of agricultural residues	CO2			NO	NO	NO	NO	
G. Liming	CO2	NO	NO	NO	NO	NO	NO	
H. Urea application	CO2	50.02	50.02	0	0%	0%	0%	
I. Other carbon-containing fertilizer	CO2	NA	NA	NO	NO	NO	NO	
J. Other	CO2	NO	NO	NO	NO	NO	NO	
4. Land use, land-use change and forestry (net) (4)	CO2	NO	NO	NO	NO	NO	NO	
A. Forestland	CO2	-6,627.38	-6,653.63	-26.24625803	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content; estimation of CSC in litter pool;
B. Cropland	CO2	-6,733.83	-6,723.94	9.888394428	0%	0%	0%	use of new figures for soil carbon content; estimation of CSC in litter pool;
C. Grassland	CO2	189.57	220.04	30.46467659	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content; estimation of CSC in litter pool;
D. Wetlands	CO2	-76.65	-101.85	-25.20151038	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
E. Settlements	CO2	86.39	46.78	-39.61206155	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
F. Other land	CO2	208.68	206.89	-1.785757113	0%	0%	0%	
G. Harvested wood products	CO2	NO	NO	NO	NO	NO	NO	
H. Other	CO2	-301.54	-301.54	0	0%	0%	0%	
5. Waste	CO2	NO	NO	NO	NO	NO	NO	
A. Solid waste disposal	CO2	0.54	0.54	0	0%	0%	0%	
B. Biological treatment of solid waste	CO2	NA,NO	NA,NO	NO	NO	NO	NO	
C. Incineration and open burning of waste	CO2			NO	NO	NO	NO	
D. Waste water treatment and discharge	CO2	0.54	0.54	0	0%	0%	0%	
E. Other	CO2			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			0	0%	0%	0%	
Aviation	CO2	643.85	643.85	0	0%	0%	0%	
Navigation	CO2	496.62	496.62	0	0%	0%	0%	
Multilateral operations	CO2	147.23	147.23	0	0%	0%	0%	
CO2 emissions from biomass	CO2	C	C	NO	NO	NO	NO	
CO2 captured	CO2	5,126.24	5,126.24	0	0%	0%	0%	
Long-term storage of C in waste disposal sites	CO2	NO	NO	NO	NO	NO	NO	
Indirect N2O	CO2	NE	NE	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 (eq, kt)	Latest submission (eq, kt)	Difference (eq, kt)	recalculation on total emissions excluding LULUCF (2) %	recalculation on total emissions including LULUCF (3) %	Explanation for recalculations		
GREENHOUSE GAS SOURCE AND SINK CATEGORY	CH4								
Total National Emissions and Removals	CH4	3,745.42	4,355.72	610.3026994	14%	2%	2% Tehnical correction		
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	NO			
2. Industrial processes and product use	CH4	9.53	9.53	0	0%	0%	0%		
A. Mineral industry	CH4		NO	NO	NO	NO			
B. Chemical industry	CH4	5.63	5.63	0	0%	0%	0%		
C. Metal industry	CH4	3.90	3.90	0	0%	0%	0%		
D. Non-energy products from fuels and solvent use	CH4	NA	NA	NO	NO	NO			
G. Other product manufacture and use	CH4	NO	NO	NO	NO	NO			
H. Other	CH4	NA	NA	NO	NO	NO			
3. Agriculture	CH4	2,305.38	2,586.16	280.7864494	6%	1%	1% Tehnical correction		
A. Enteric fermentation	CH4	1,977.59	2,171.55	193.9546668	4%	1%	1% Tehnical correction		
B. Manure management	CH4	327.78	414.61	86.83178261	2%	0%	0% Tehnical correction		
C. Rice cultivation	CH4	NO	NO	NO	NO	NO			
D. Agricultural soils	CH4	NA	NA	NO	NO	NO			
E. Prescribed burning of savannahs	CH4	NA	NO	NO	NO	NO			
F. Field burning of agricultural residues	CH4	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			
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	NO			
H. Other	CH4	NO	NO	NO	NO	NO			
5. Waste	CH4	586.47	915.99	329.51625	8%	1%	1% Tehnical correction		
A. Solid waste disposal	CH4	348.61	348.61	0	0%	0%	0%		
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	237.86	567.38	329.51625	8%	1%	1% Tehnical correction		
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	0.86	0.43	-0.434105	0%	0%	0% wrong EF was used		
Aviation	CH4	0.52	0.09	-0.434105	0%	0%	0% wrong EF was used		
Navigation	CH4	0.34	0.34	0	0%	0%	0%		
Multilateral operations	CH4	C	NO	NO	NO	NO			
CO2 emissions from biomass	CH4	0.00	NO	NO	NO	NO			
CO2 captured	CH4	NO	NO	NO	NO	NO			
Long-term storage of C in waste disposal sites	CH4	NE	NO	NO	NO	NO			

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	2,805.47	2,885.89	80.42378914	2%	0%	0%	Technical correction
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	NO	
3. Agriculture	N2O	1,683.69	1,762.15	78.46013503	2%	0%	0%	Technical correction
A. Enteric fermentation	N2O			NO	NO	NO	NO	
B. Manure management	N2O	323.85	361.58	37.7343523	1%	0%	0%	Technical correction
C. Rice cultivation	N2O			NO	NO	NO	NO	
D. Agricultural soils	N2O	1,359.84	1,400.57	40.72578273	1%	0%	0%	error corrected
E. Prescribed burning of savannahs	N2O	NA	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	36.72	38.80	2.079555016	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
A. Forestland	N2O	0.74	0.74	0	0%	0%	0%	use of new figures for soil carbon content; estimation of CSC in litter pool;
B. Cropland	N2O	3.90	3.95	0.054958301	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
C. Grassland	N2O	0.12	0.12	0	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
D. Wetlands	N2O	9.80	6.23	-3.569468565	0%	0%	0%	Changes in LUC matrix and use of new figures for soil carbon content;
E. Settlements	N2O	22.17	27.76	5.59406528	0%	0%	0%	
F. Other land	N2O	NO	NO	NO	NO	NO	NO	
G. Harvested wood products	N2O			NO	NO	NO	NO	
H. Other	N2O	NO	NO	NO	NO	NO	NO	
5. Waste	N2O	67.01	66.89	-0.115900902	0%	0%	0%	Technical correction
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	67.00	66.88	-0.115900902	0%	0%	0%	Technical correction
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	1.24	5.29	4.052076456	0%	0%	0%	wrong EF was used
Aviation	N2O	1.15	4.14	2.98528652	0%	0%	0%	wrong EF was used
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	

Recalculated year	2015							
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	0.03	0.03	0	0%	NO	0%	
2.B.9. Fluorochemical 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	0.03	0.03	0	0%	NO	0%	
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	2015							
Greenhouse gas	HFC	<i>Note: Replicate table below if more gases need reporting.</i>						
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	419.89	419.90	0.01287	0%	NO	0%	
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	403.61	403.61	0	0%	NO	0%	
2.F.2. Foam blowing agents	HFC	NO	NO	NO	NO	NO	NO	
2.F.3. Fire protection	HFC	4.69	4.69	0	0%	NO	0%	
2.F.4. Aerosols	HFC	11.59	11.60	0.01287	0%	NO	0%	Error corrected
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	2015							
Greenhouse gas	SF6	<i>Note: Replicate table below if more gases need reporting.</i>						
GREENHOUSE GAS SOURCE AND SINK CATEGORY	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	SF6	0.00	0.00	-0.00000214	-1%	NO	0%	
2.B.9. Flurochemical production	SF6	NO	NO	NO	NO	NO	NO	
2.B.10. Other	SF6	NO	NO	NO	NO	NO	NO	
2.C.3. Aluminium production	SF6	NO	NO	NO	NO	NO	NO	
2.C.4. Magnesium production	SF6	NO	NO	NO	NO	NO	NO	
2.C.7. Other	SF6	NO	NO	NO	NO	NO	NO	
2.E.1. Integrated circuit or semiconductor	SF6	NO	NO	NO	NO	NO	NO	
2.E.2. TFT flat panel display	SF6	NO	NO	NO	NO	NO	NO	
2.E.3. Photovoltaics	SF6	NO	NO	NO	NO	NO	NO	
2.E.4. Heat transfer fluid	SF6	NO	NO	NO	NO	NO	NO	
2.E.5. Other (as specified in table 2(II))	SF6	NO	NO	NO	NO	NO	NO	
2.F.1. Refrigeration and air conditioning	SF6	NO	NO	NO	NO	NO	NO	
2.F.2. Foam blowing agents	SF6	NO	NO	NO	NO	NO	NO	
2.F.3. Fire protection	SF6	NO	NO	NO	NO	NO	NO	
2.F.4. Aerosols	SF6	NO	NO	NO	NO	NO	NO	
2.F.5. Solvents	SF6	NO	NO	NO	NO	NO	NO	
2.F.6. Other applications	SF6	NO	NO	NO	NO	NO	NO	
2.G.1. Electrical equipment	SF6	0.00	0.00	-0.00000214	-1%	NO	0%	New data are included
2.G.2. SF6 and PFCs from other product use	SF6	NO	NO	NO	NO	NO	NO	
2.G.4. Other	SF6	NO	NO	NO	NO	NO	NO	
2.H. Other (please specify)	SF6	NO	NO	NO	NO	NO	NO	

Recalculated year	1990								
Greenhouse gas	PFC	Note: Replicate table below if more gases need reporting.							

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 (CO ₂ -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	24,531.73	8,785.79	0.36	
CO ₂ emissions (total CO ₂ 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	18,556.77	8,545.51	0.46	
CO ₂ 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	CO ₂	14,974.20	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO ₂	9,343.14	7,259.43	77.70%	
1.A.1 Energy industries	CO ₂	5,274.69	4,918.89	93.25%	In inventory data from ETS are
1.A.1.a Public electricity and heat production	CO ₂	3,650.70	3,493.80	95.70%	
1.A.1.b Petroleum refining	CO ₂	1,394.72	1,328.74	95.27%	
1.A.1.c Manufacture of solid fuels and other energy industries	CO ₂	229.27	96.35	42.02%	
1.A.2 Manufacturing industries and construction	CO ₂	2,380.65	2,340.54	98.32%	
1.A.2.a Iron and steel	CO ₂	58.36	19.83	33.98%	
1.A.2.b Non-ferrous metals	CO ₂	19.93	0.00	NO	
1.A.2.c Chemicals	CO ₂	253.20	1,157.79	457.27%	In inventory emissions from
1.A.2.d Pulp, paper and print	CO ₂	113.37	60.63	53.49%	
1.A.2.e Food processing, beverages and tobacco	CO ₂	388.01	170.55	43.96%	
1.A.2.f Non-metallic minerals	CO ₂	96.50	931.73	965.50%	In inventory emissions from
1.A.2.g Other	CO ₂	1,451.29	NO	NO	In inventory emissions from
1.A.3 Transport	CO ₂	5,631.06	NO	NO	
1.A.3.e Other transportation (pipeline transport)	CO ₂	NO	NO	NO	
1.A.4 Other sectors	CO ₂	1,143.88	NO	NO	
1.A.4.a Commercial / Institutional	CO ₂	508.91	NO	NO	
1.A.4.c Agriculture / Forestry / Fisheries	CO ₂	634.97	NO	NO	
1.B Fugitive emissions from Fuels	CO ₂	543.92	NO	NO	
1.C CO₂ Transport and storage	CO ₂	NO	NO	NO	
1.C.1 Transport of CO ₂	CO ₂	NO	NO	NO	
1.C.2 Injection and storage	CO ₂	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO ₂	NO	NO	NO	
2.A Mineral products	CO ₂	1,298.28	1,270.28	97.84%	
2.A.1 Cement Production	CO ₂	1,141.03	1,141.03	100.00%	
2.A.2 Lime production	CO ₂	96.62	74.26	76.85%	
2.A.3 Glass production	CO ₂	29.48	49.87	169.17%	
2.A.4 Other process uses of carbonates	CO ₂	31.15	5.12	16.45%	
2.B Chemical industry	CO ₂	509.33	0.00	NO	
2.B.1 Ammonia production	CO ₂	509.33		NO	
2.B.3 Adipic acid production (CO ₂)	CO ₂	NO		NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	CO ₂	NO		NO	
2.B.5 Carbide production	CO ₂	NO		NO	
2.B.6 Titanium dioxide production	CO ₂	NO		NO	
2.B.7 Soda ash production	CO ₂	NO		NO	
2.B.8 Petrochemical and carbon black production	CO ₂	0.00		NO	
2.C Metal production	CO ₂	16.88	15.80	93.57%	
2.C.1 Iron and steel production	CO ₂	16.88	15.80	93.57%	
2.C.2 Ferroalloys production	CO ₂	NO		NO	
2.C.3 Aluminium production	CO ₂	NO		NO	
2.C.4 Magnesium production	CO ₂	NO		NO	
2.C.5 Lead production	CO ₂	NO		NO	
2.C.6 Zinc production	CO ₂	NO	NO	NO	
2.C.7 Other metal production	CO ₂	NO	NO	NO	
N ₂ O 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	N ₂ O	240.27/19999	240.27	100.00%	
2.B.3. Adipic acid production	N ₂ O	NO	NO	NO	
2.B.4. Caprolactam, glyoxal and glyoxylic acid production	N ₂ O	NO	NO	NO	

Reporting year: 2014					
Total emissions (CO2 -eq)					
		Greenhouse gas inventory emissions [kt CO2eq][3]	Verified emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	
Category[1]	Gas				Comment[2]
Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC)	Total GHG	23,667.17	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	17,819.95	8,121.27	0.46	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2		NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	7,094.18	6,751.28	95.17%	
1.A.1 Energy industries	CO2	4,769.85	4,276.80	89.66%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,075.64	2,969.30	96.54%	
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	
					of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c
1.A.2.c Chemicals	CO2	288.09	1,219.60	423.34%	
1.A.2.d Pulp, paper and print	CO2	71.38	58.79	82.36%	
1.A.2.e Food processing, beverages and tobacco	CO2	399.58	188.06	47.06%	
					In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.f Non-metallic minerals	CO2	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%	
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	525.34	NO	NO	
1.C CO2 Transport and storage	CO2	NO	NO	NO	
1.C.1 Transport of CO2	CO2	NO	NO	NO	
1.C.2 Injection and storage	CO2	NO	NO	NO	
1.C.3 Other 2.A Mineral products	CO2	NO	NO	NO	
2.A Mineral products	CO2	1,392.21	1,354.10	97.26%	
2.A.1 Cement Production	CO2	1,225.09	1,225.09	100.00%	
2.A.2. Lime production	CO2	103.51	74.72	72.19%	
2.A.3. Glass production	CO2	30.48	43.31	142.06%	
2.A.4. Other process uses of carbonates	CO2	33.13	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	
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	28.58	15.89	55.58%	
2.C.1. Iron and steel production	CO2	28.58	15.89	55.58%	
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	266.1946001	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)					
		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	24,157.56	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	17,965.77	8,074.87	0.45	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2		NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	6,994.37	6,652.45	95.11%	
1.A.1 Energy industries	CO2	4,771.67	4,293.86	89.99%	In inventory data from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,148.82	2,969.98	94.32%	
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	
					consumption of natural gas as feedstock for ammonia production is calculated under 2B1. In ETS are
1.A.2.c Chemicals	CO2	294.34	2.99	1.02%	
1.A.2.d Pulp, paper and print	CO2	70.04	43.21	61.69%	
1.A.2.e Food processing, beverages and tobacco	CO2	350.71	20.75	5.92%	
					Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for
1.A.2.f Non-metallic minerals	CO2	81.73	2,280.65	2790.53%	
					Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	CO2	1,363.40	NO	NO	
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	326.91	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	1,340.51	1,306.39	97.45%	
2.A.1 Cement Production	CO2	1,169.23	1,169.23	100.00%	
2.A.2 Lime production	CO2	100.77	73.40	72.84%	
2.A.3 Glass production	CO2	30.68	30.68	100.00%	
2.A.4 Other process uses of carbonates	CO2	39.82	33.07	83.05%	
2.B Chemical industry	CO2	572.28	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	13.63	13.55	99.40%	
2.C.1 Iron and steel production	CO2	13.63	13.55	99.40%	
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	311.348	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)					
		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	24,272.79	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	17,965.46	8,157.76	0.45	
CO2 emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	(Verified emissions/inventory emissions)[3]	
Category[1]					Comment[2]
1.A Fuel combustion activities, total	CO2	7,384.49	NA	NA	
1.A Fuel combustion activities, stationary combustion [4]	CO2	7,096.08	6,321.20	89.08%	
1.A.1 Energy industries	CO2	4,888.84	4,494.58	91.94%	In inventory dana from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	CO2	3,389.36	3,203.95	94.53%	
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%	1A2c
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%	1A2f
					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	288.41	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	1,238.07	1,201.24	97.03%	
2.A.1 Cement Production	CO2	1,076.51	1,076.51	100.00%	
2.A.2 Lime production	CO2	93.33	63.79	68.35%	
2.A.3 Glass production	CO2	32.62	32.62	100.00%	
2.A.4 Other process uses of carbonates	CO2	35.61	28.31	79.53%	
2.B Chemical industry	CO2	547.86	510.22	NO	
2.B.1 Ammonia production	CO2	547.86	510.22	93.13%	
2.B.3 Adipic acid production (CO2)	CO2		NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	CO2	NO	NO	NO	
2.B.5 Carbide production	CO2	NO	NO	NO	
2.B.6 Titanium dioxide production	CO2	NO	NO	NO	
2.B.7 Soda ash production	CO2	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	CO2	NO	NO	NO	
2.C Metal production	CO2	1.05	1.05	100.00%	
2.C.1 Iron and steel production	CO2	1.05	1.05	100.00%	
2.C.2 Ferroalloys production	CO2	NO	NO	NO	
2.C.3 Aluminium production	CO2	NO	NO	NO	
2.C.4 Magnesium production	CO2	NO	NO	NO	
2.C.5 Lead production	CO2	NO	NO	NO	
2.C.6 Zinc production	CO2	NO	NO	NO	
2.C.7 Other metal production	CO2	NO	NO	NO	
N2O emissions					
		Greenhouse gas inventory emissions [kt CO2eq][3]	emissions under Directive 2003/87/EC [kt CO2eq][3]	Ratio in % (Verified emissions/inventory emissions)[3]	
Category[1]	Gas				Comment[2]
2.B.2. Nitric acid production	N2O	109.359	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	

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

Reporting year:	2016		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
Total (Net Emissions)			
1. Energy			
A. Fuel Combustion (sectoral approach)			
1. Energy industries			
2. Manufacturing industries and construction			
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			
C. CO2 transport and storage			

Reporting year:	2016		
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	DESCRIPTION OF METHODS	RECALCULATIONS	REFERENCE
	Please mark the relevant cell where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year	Please mark the relevant cell where this is also reflected in recalculations compared to the previous years' CRF	If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed.
2. Industrial processes and product use			
A. Mineral industry	2.A.2 Lime production, CO2	2.A.2 Lime production, CO2	Table 2.7-1: Technical correction overview, page 35
B. Chemical industry	2.B.1 Ammonia production, CO2	2.B.1 Ammonia production, CO2	Table 2.7-1: Technical correction overview, page 35
C. Metal industry			
D. Non-energy products from fuels and solvent use			
E. Electronic industry			
F. Product uses as substitutes for ODS			
G. Other product manufacture and use			
H. Other			

Reporting year:	2016		
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	3.A Enteric fermentation, CH4	3.A Enteric fermentation, CH4	Table 2.7-1: Technical correction overview, page 35
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			
4. Land use, land-use change and forestry			
A. Forest land		use of new figures for soil carbon content; estimation of CSC in litter pool;	6.4.5
B. Cropland		Changes in LUC matrix and use of new figures for soil carbon content; estimation of CSC in litter pool;	6.5.5
C. Grassland		Changes in LUC matrix and use of new figures for soil carbon content;	6.6.5
D. Wetlands		Changes in LUC matrix and use of new figures for soil carbon content;	6.7.5
E. Settlements			
F. Other land			
G. Harvested wood products			
H. Other			

Reporting year:	2016		
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			
B. Biological treatment of solid waste			
C. Incineration and open burning of waste			
D. Wastewater treatment and discharge	5.D Wastewater treatment and discharge	5.D Wastewater treatment and discharge	Table 2.7-1: Technical correction overview, page 35
E. Other			
6. Other (as specified in Summary 1.A)			
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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