

ANNEXES TO THE NATIONAL INVENTORY REPORT

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ANNEXES TO THE NATIONAL INVENTORY REPORT

ANNEX 1: KEY CATEGORIES

1.1. DESCRIPTION OF METHODOLOGY USED FOR IDENTIFYING KEY CATEGORIES, IF DIFFERENT FROM THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) TIER 1 APPROACH

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

Following the 2006 IPCC Guidelines, Croatia undertook a key category analysis using Tier 1 and Tier 2 Level and Trend methods.

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.

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	
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N ₂ O
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N ₂ O
Fuel Combustion Activities - Energy Industries - Biomass	CH ₄
Fuel Combustion Activities - Energy Industries - Biomass	N ₂ O
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N ₂ O
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N ₂ O
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂
Fuel Combustion Activities - Transport - Domestic Aviation	CH ₄
Fuel Combustion Activities - Transport - Domestic Aviation	N ₂ O
Fuel Combustion Activities - Transport - Road transportation	CO ₂
Fuel Combustion Activities - Transport - Road transportation	CH ₄
Fuel Combustion Activities - Transport - Road transportation	N ₂ O
Fuel Combustion Activities - Transport - Railways	CO ₂
Fuel Combustion Activities - Transport - Railways	CH ₄
Fuel Combustion Activities - Transport - Railways	N ₂ O
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH ₄
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N ₂ O
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N ₂ O
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄
Fuel Combustion Activities - Other Sectors - Solid Fuels	N ₂ O

Source Categories Assessed in Key Source Category Analysis	Direct GHG
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N ₂ O
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O
Fugitive emissions from fuels - Solid Fuels	CH ₄
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄
INDUSTRIAL PROCESSES AND PRODUCT USE	
Mineral industry - Cement Production	CO ₂
Mineral Industry - Lime Production	CO ₂
Mineral Industry - Glass Production	CO ₂
Mineral Industry - Other Process Uses of Carbonates	CO ₂
Chemical Industry - Ammonia Production	CO ₂
Chemical industry - Nitric Acid Production	N ₂ O
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄
Metal Industry - Iron and Steel Production	CO ₂
Metal Industry - Ferroalloys Production	CO ₂
Metal Industry - Ferroalloys Production	CH ₄
Metal Industry - Aluminium Production	CO ₂
Metal Industry - Aluminium Production	PFCs
Non-Energy Products from Fuels and Solvent Use	CO ₂
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs
Other Product Manufacture and Use	N ₂ O
Other Product Manufacture and Use	SF ₆
AGRICULTURE	
Enteric Fermentation	CH ₄
Manure Management	CH ₄
Manure Management	N ₂ O
Direct N ₂ O Emissions From Managed Soils	N ₂ O
Indirect N ₂ O Emissions from Managed soils	N ₂ O
Liming	CO ₂
Urea Application	CO ₂
LAND USE, LAND USE CHANGE AND FORESTRY	
Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O
Biomass Burning	CH ₄
Biomass Burning	N ₂ O
Forest Land Remaining Forest Land	CO ₂
Land Converted to Forest Land	CO ₂
Cropland Remaining Cropland	CO ₂
Land Converted to Cropland	CO ₂
Grassland Remaining Grassland	CO ₂
Land Converted to Grassland	CO ₂
Land Converted to Wetlands	CO ₂
Land Converted to Settlements	CO ₂
Harvested wood products	CO ₂

Source Categories Assessed in Key Source Category Analysis	Direct GHG
WASTE	
Solid Waste Disposal	CH ₄
Biological Treatment of Solid Waste	CH ₄
Biological Treatment of Solid Waste	N ₂ O
Incineration and Open Burning of Waste	CO ₂
Incineration and Open Burning of Waste	N ₂ O
Wastewater Treatment and Discharge	CH ₄
Wastewater Treatment and Discharge	N ₂ O

*NO - source categories not occur in Croatia

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 (%)
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	0.131	13%
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	0.100	23%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	0.073	30%
Enteric Fermentation	CH ₄	2,501.112	0.071	37%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	0.070	44%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.061	51%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	0.050	56%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.048	60%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.047	65%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.035	69%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	0.033	72%
Mineral industry - Cement Production	CO ₂	1,085.790	0.031	75%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	0.023	77%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	0.021	80%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	0.020	82%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	0.019	83%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	0.016	85%
Chemical Industry - Ammonia Production	CO ₂	552.404	0.016	87%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	0.015	88%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	0.012	89%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	0.012	90%
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	0.011	92%
Manure Management	CH ₄	352.871	0.010	93%
Manure Management	N ₂ O	323.845	0.009	93%
Solid Waste Disposal	CH ₄	288.837	0.008	94%
Wastewater Treatment and Discharge	CH ₄	237.864	0.007	95%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.006	96%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.005	96%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	0.004	97%
Mineral Industry - Lime Production	CO ₂	153.440	0.004	97%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	0.004	97%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	0.004	98%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.004	98%
Metal Industry - Aluminium Production	CO ₂	118.797	0.003	98%
Wastewater Treatment and Discharge	N ₂ O	67.000	0.002	99%
Fugitive emissions from fuels - Solid Fuels	CH ₄	59.644	0.002	99%
Urea Application	CO ₂	50.020	0.001	99%
Metal Industry - Iron and Steel Production	CO ₂	45.970	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	0.001	99%

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
Mineral Industry - Glass Production	CO ₂	35.871	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	0.001	100%
Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O	22.743	0.001	100%
Fuel Combustion Activities - Transport - Railways	N ₂ O	13.248	0.000	100%
Other Product Manufacture and Use	SF ₆	10.450	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N ₂ O	8.818	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N ₂ O	5.658	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N ₂ O	5.271	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
Metal Industry - Ferroalloys Production	CH ₄	3.899	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O	2.908	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N ₂ O	2.377	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N ₂ O	1.303	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N ₂ O	1.079	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.000	100%
Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N ₂ O	0.516	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄	0.208	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH ₄	0.174	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH ₄	0.027	0.000	100%
Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction	CH ₄	0.000	0.000	100%

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
- Other Fossil Fuels				
Fuel Combustion Activities - Manufacturing Industries and Construction	N2O	0.000	0.000	100%
- Other Fossil Fuels				
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	0.000	100%
Liming	CO ₂	0.000	0.000	100%
Biological Treatment of Solid Waste	CH ₄	0.000	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	0.000	100%
TOTAL		35,115.977		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) - 2013

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO2	3,505.875	5,379.944	0.220	22%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO2	809.179	2,202.070	0.090	31%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO2	1,767.615	1,793.147	0.073	38%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO2	663.374	1,504.737	0.061	44%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO2	2,455.226	1,257.065	0.051	50%
Mineral industry - Cement Production	CO2	1,085.790	1,141.027	0.047	54%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO2	4,589.960	1,114.294	0.045	59%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO2	2,158.014	974.998	0.040	63%
Solid Waste Disposal	CH4	288.837	947.211	0.039	67%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO2	1,641.149	889.230	0.036	70%
Enteric Fermentation	CH4	2,501.112	839.848	0.034	74%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	828.032	0.034	77%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH4	705.358	687.792	0.028	80%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH4	2,555.636	570.014	0.023	82%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.023	84%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO2	559.853	563.980	0.023	87%
Chemical Industry - Ammonia Production	CO2	552.404	486.290	0.020	89%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO2	1,702.511	464.060	0.019	91%
Indirect N2O Emissions from Managed soils	N2O	376.504	261.665	0.011	92%
Chemical industry - Nitric Acid Production	N2O	754.265	240.275	0.010	93%
Wastewater Treatment and Discharge	CH4	237.864	200.436	0.008	94%
Manure Management	CH4	352.871	177.786	0.007	94%
Non-Energy Products from Fuels and Solvent Use	CO2	413.274	151.603	0.006	95%
Manure Management	N2O	323.845	140.632	0.006	95%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	123.318	0.005	96%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO2	134.383	121.845	0.005	96%
Fuel Combustion Activities - Transport - Domestic Aviation	CO2	156.287	103.981	0.004	97%
Mineral Industry - Lime Production	CO2	153.440	96.726	0.004	97%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO2	411.814	91.630	0.004	98%
Wastewater Treatment and Discharge	N2O	67.000	83.592	0.003	98%
Fuel Combustion Activities - Transport - Railways	CO2	140.079	74.057	0.003	98%
Urea Application	CO2	50.020	60.389	0.002	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO2	0.000	52.367	0.002	99%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	45.694	0.002	99%
Other Product Manufacture and Use	N2O	33.376	42.065	0.002	99%
Mineral Industry - Glass Production	CO2	35.871	29.481	0.001	99%
Mineral Industry - Other Process Uses of Carbonates	CO2	5.775	24.166	0.001	99%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	19.600	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO2	524.388	17.846	0.001	99%
Metal Industry - Iron and Steel Production	CO2	45.970	16.604	0.001	100%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	13.417	0.001	100%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	10.405	0.000	100%
Liming	CO2	0.000	9.601	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.000	100%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.000	100%
Other Product Manufacture and Use	SF6	10.450	6.580	0.000	100%
Biological Treatment of Solid Waste	CH4	0.000	4.575	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	3.956	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH4	1.490	3.353	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	1.902	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	1.690	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	1.260	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	1.199	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.842	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.730	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.000	100%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment	Cumulative Total (%)
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.001	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.000	100%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CO2	173.798	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	100%
Metal Industry - Aluminium Production	CO2	118.797	0.000	0.000	100%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	100%
TOTAL		35,115.977	24,492.777		

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 (%)
Forest Land Remaining Forest Land	CO ₂	5,588.831	0.134	13%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	0.110	24%
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	0.084	33%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	0.061	39%
Enteric Fermentation	CH ₄	2,501.112	0.060	45%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	0.059	51%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	0.052	56%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	0.042	60%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	0.041	64%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	0.039	68%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.030	71%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	0.028	74%
Mineral industry - Cement Production	CO ₂	1,085.790	0.026	77%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	0.019	79%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	0.018	80%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	0.017	82%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	0.016	84%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	0.013	85%
Chemical Industry - Ammonia Production	CO ₂	552.404	0.013	86%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	0.013	88%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	0.010	89%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	0.010	90%
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	0.009	91%
Manure Management	CH ₄	352.871	0.008	91%
Manure Management	N ₂ O	323.845	0.008	92%
Harvested wood products	CO ₂	299.623	0.007	93%
Solid Waste Disposal	CH ₄	288.837	0.007	94%
Land Converted to Settlements	CO ₂	240.310	0.006	94%
Wastewater Treatment and Discharge	CH ₄	237.864	0.006	95%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.005	95%
Cropland Remaining Cropland	CO ₂	194.500	0.005	96%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.004	96%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	0.004	97%
Mineral Industry - Lime Production	CO ₂	153.440	0.004	97%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	0.003	97%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	0.003	98%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	0.003	98%
Metal Industry - Aluminium Production	CO ₂	118.797	0.003	98%
Land Converted to Grassland	CO ₂	106.041	0.003	98%
Wastewater Treatment and Discharge	N ₂ O	67.000	0.002	99%
Fugitive emissions from fuels - Solid Fuels	CH ₄	59.644	0.001	99%
Urea Application	CO ₂	50.020	0.001	99%
Metal Industry - Iron and Steel Production	CO ₂	45.970	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	0.001	99%
Land Converted to Forest Land	CO ₂	39.280	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	0.001	99%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
Mineral Industry - Glass Production	CO ₂	35.871	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	0.001	99%
Other Product Manufacture and Use	N ₂ O	33.376	0.001	100%
Land Converted to Wetlands	CO ₂	29.997	0.001	100%
Land Converted to Cropland	CO ₂	23.477	0.001	100%
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O	22.743	0.001	100%
Fuel Combustion Activities - Transport - Railways	N ₂ O	13.248	0.000	100%
Other Product Manufacture and Use	SF ₆	10.450	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N ₂ O	8.818	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N ₂ O	5.658	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N ₂ O	5.271	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	0.000	100%
Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	4.667	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
Metal Industry - Ferroalloys Production	CH ₄	3.899	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O	2.908	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N ₂ O	2.377	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.000	100%
Grassland Remaining Grassland	CO ₂	2.069	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N ₂ O	1.303	0.000	100%
Biomass Burning	CH ₄	1.230	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N ₂ O	1.079	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.000	100%
Biomass Burning	N ₂ O	0.858	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.000	100%
Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N ₂ O	0.516	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄	0.208	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH ₄	0.174	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH ₄	0.027	0.000	100%
Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N ₂ O	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other	CO ₂	0.000	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 (%)
Fossil Fuels				
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	0.000	100%
Liming	CO ₂	0.000	0.000	100%
Biological Treatment of Solid Waste	CH4	0.000	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	0.000	100%
TOTAL		41,646.861		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2013

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	5,379.944	0.173	17%
Forest Land Remaining Forest Land	CO ₂	5,588.831	5,290.748	0.170	34%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	2,202.070	0.071	41%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	1,793.147	0.058	47%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	1,504.737	0.048	52%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	1,257.065	0.040	56%
Mineral industry - Cement Production	CO ₂	1,085.790	1,141.027	0.037	60%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	1,114.294	0.036	63%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	974.998	0.031	66%
Solid Waste Disposal	CH ₄	288.837	947.211	0.030	69%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	889.230	0.029	72%
Enteric Fermentation	CH ₄	2,501.112	839.848	0.027	75%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	828.032	0.027	78%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	687.792	0.022	80%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	570.014	0.018	82%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.018	84%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	563.980	0.018	85%
Land Converted to Settlements	CO ₂	240.310	545.555	0.018	87%
Chemical Industry - Ammonia Production	CO ₂	552.404	486.290	0.016	89%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	464.060	0.015	90%
Harvested wood products	CO ₂	299.623	264.120	0.008	91%
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	261.665	0.008	92%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	240.275	0.008	93%
Land Converted to Forest Land	CO ₂	39.280	200.746	0.006	93%
Wastewater Treatment and Discharge	CH ₄	237.864	200.436	0.006	94%
Manure Management	CH ₄	352.871	177.786	0.006	95%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	151.603	0.005	95%
Manure Management	N ₂ O	323.845	140.632	0.005	95%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	123.318	0.004	96%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	121.845	0.004	96%
Cropland Remaining Cropland	CO ₂	194.500	113.126	0.004	97%
Land Converted to Grassland	CO ₂	106.041	105.571	0.003	97%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	103.981	0.003	97%
Mineral Industry - Lime Production	CO ₂	153.440	96.726	0.003	98%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	91.630	0.003	98%
Wastewater Treatment and Discharge	N ₂ O	67.000	83.592	0.003	98%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	74.057	0.002	98%
Urea Application	CO ₂	50.020	60.389	0.002	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	52.367	0.002	99%
Land Converted to Cropland	CO ₂	23.477	47.423	0.002	99%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	45.694	0.001	99%

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Level Assessment	Cumulative Total (%)
Other Product Manufacture and Use	N2O	33.376	42.065	0.001	99%
Mineral Industry - Glass Production	CO ₂	35.871	29.481	0.001	99%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	24.166	0.001	99%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	19.600	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	17.846	0.001	100%
Metal Industry - Iron and Steel Production	CO ₂	45.970	16.604	0.001	100%
Land Converted to Wetlands	CO ₂	29.997	14.128	0.000	100%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	13.417	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	10.405	0.000	100%
Direct N ₂ O emissions from N mineralization/immobilization	N2O	4.667	10.298	0.000	100%
Liming	CO ₂	0.000	9.601	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.000	100%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.000	100%
Other Product Manufacture and Use	SF ₆	10.450	6.580	0.000	100%
Biological Treatment of Solid Waste	CH ₄	0.000	4.575	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	3.956	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	3.353	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.000	100%
Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.000	100%
Biomass Burning	CH ₄	1.230	1.928	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	1.902	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.690	0.000	100%
Biomass Burning	N2O	0.858	1.474	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	1.260	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	1.199	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.842	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.730	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄	0.208	0.582	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Last Year (2013) Estimate (Gg eq- CO2)	Level Assessment	Cumulative Total (%)
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.001	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.000	100%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CO2	173.798	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	100%
Metal Industry - Aluminium Production	CO2	118.797	0.000	0.000	100%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	100%
TOTAL		41,646.861	31,089.962		

Table A1.3-5: Key categories analysis – Trend Assessment - Tier 1 (Excluding LULUCF) - 2013

IPCC Source/Sink Categories	Tier 1 Analysis - Trend Assessment					
	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Last Year (2013) Estimate (Gg eq- CO2)	Trend Assessment	% Contribution to trend	Cumulativ e Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO2	3,505.875	5,379.944	0.172	0.169	17%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO2	4,589.960	1,114.294	0.122	0.120	29%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO2	809.179	2,202.070	0.096	0.094	38%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH4	2,555.636	570.014	0.071	0.070	45%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO2	663.374	1,504.737	0.061	0.060	51%
Enteric Fermentation	CH4	2,501.112	839.848	0.053	0.052	57%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.051	0.050	62%
Solid Waste Disposal	CH4	288.837	947.211	0.044	0.043	66%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO2	1,702.511	464.060	0.042	0.042	70%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.033	0.033	73%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO2	1,767.615	1,793.147	0.033	0.032	77%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO2	2,158.014	974.998	0.031	0.031	80%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO2	2,455.226	1,257.065	0.027	0.026	82%
Mineral industry - Cement Production	CO2	1,085.790	1,141.027	0.022	0.022	84%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO2	524.388	17.846	0.020	0.020	86%
Chemical industry - Nitric Acid Production	N2O	754.265	240.275	0.017	0.016	88%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO2	1,641.149	889.230	0.015	0.015	90%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH4	705.358	687.792	0.011	0.011	91%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO2	411.814	91.630	0.011	0.011	92%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO2	559.853	563.980	0.010	0.010	93%
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.001	0.009	0.009	94%
Non-Energy Products from Fuels and Solvent Use	CO2	413.274	151.603	0.008	0.008	95%
Metal Industry - Ferroalloys Production	CO2	173.798	0.000	0.007	0.007	95%
Chemical Industry - Ammonia Production	CO2	552.404	486.290	0.006	0.006	96%
Manure Management	N2O	323.845	140.632	0.005	0.005	96%
Metal Industry - Aluminium Production	CO2	118.797	0.000	0.005	0.005	97%
Manure Management	CH4	352.871	177.786	0.004	0.004	97%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO2	0.000	52.367	0.003	0.003	97%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.002	0.002	98%

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Wastewater Treatment and Discharge	N2O	67.000	83.592	0.002	0.002	98%
Wastewater Treatment and Discharge	CH4	237.864	200.436	0.002	0.002	98%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	121.845	0.002	0.002	98%
Urea Application	CO ₂	50.020	60.389	0.001	0.001	98%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	74.057	0.001	0.001	99%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	123.318	0.001	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	1.260	0.001	0.001	99%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	24.166	0.001	0.001	99%
Other Product Manufacture and Use	N2O	33.376	42.065	0.001	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	45.694	0.001	0.001	99%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	828.032	0.001	0.001	99%
Metal Industry - Iron and Steel Production	CO ₂	45.970	16.604	0.001	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	13.417	0.001	0.001	99%
Mineral Industry - Lime Production	CO ₂	153.440	96.726	0.001	0.001	99%
Liming	CO ₂	0.000	9.601	0.001	0.001	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.001	0.001	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	10.405	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	103.981	0.000	0.000	100%
Biological Treatment of Solid Waste	CH4	0.000	4.575	0.000	0.000	100%
Mineral Industry - Glass Production	CO ₂	35.871	29.481	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.000	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	19.600	0.000	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH4	1.490	3.353	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.730	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 (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	1.199	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	3.956	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.000	0.000	100%
Indirect N2O Emissions from Managed soils	N2O	376.504	261.665	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	1.902	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.000	0.000	100%
Other Product Manufacture and Use	SF6	10.450	6.580	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.842	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	1.690	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Last Year (2013) Estimate (Gg eq- CO2)	Trend Assessment	% Contribution to trend	Cumulativ e Total (%)
TOTAL		35,115.977	24,492.777			

Table A1.3-6: Key categories analysis – Trend Assessment - Tier 1 (Including LULUCF) - 2013

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	5,379.944	0.119	0.140	14%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	1,114.294	0.100	0.117	26%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	2,202.070	0.069	0.081	34%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	570.014	0.058	0.068	41%
Forest Land Remaining Forest Land	CO ₂	5,588.831	5,290.748	0.048	0.057	46%
Enteric Fermentation	CH ₄	2,501.112	839.848	0.044	0.052	51%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	1,504.737	0.043	0.051	56%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.040	0.047	61%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	464.060	0.035	0.041	65%
Solid Waste Disposal	CH ₄	288.837	947.211	0.032	0.037	69%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	974.998	0.027	0.032	72%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	1,257.065	0.025	0.029	75%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.024	0.029	78%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	1,793.147	0.020	0.024	80%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	17.846	0.016	0.019	82%
Land Converted to Settlements	CO ₂	240.310	545.555	0.016	0.019	84%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	889.230	0.014	0.017	86%
Mineral industry - Cement Production	CO ₂	1,085.790	1,141.027	0.014	0.017	87%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	240.275	0.014	0.016	89%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	91.630	0.009	0.011	90%
Land Converted to Forest Land	CO ₂	39.280	200.746	0.007	0.009	91%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.007	0.008	92%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	687.792	0.007	0.008	93%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	151.603	0.007	0.008	93%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	563.980	0.006	0.007	94%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.000	0.006	0.007	95%
Manure Management	N ₂ O	323.845	140.632	0.004	0.005	95%
Metal Industry - Aluminium Production	CO ₂	118.797	0.000	0.004	0.004	96%
Manure Management	CH ₄	352.871	177.786	0.004	0.004	96%
Chemical Industry - Ammonia Production	CO ₂	552.404	486.290	0.003	0.004	97%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	52.367	0.002	0.003	97%
Fugitive emissions from fuels - Solid Fuels	CH ₄	59.644	0.000	0.002	0.002	97%

Tier 1 Analysis - Trend Assessment Including LULUCF

IPCC Source/Sink Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Harvested wood products	CO ₂	299.623	264.120	0.002	0.002	97%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	828.032	0.002	0.002	97%
Wastewater Treatment and Discharge	N ₂ O	67.000	83.592	0.001	0.002	98%
Cropland Remaining Cropland	CO ₂	194.500	113.126	0.001	0.002	98%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	74.057	0.001	0.002	98%
Land Converted to Cropland	CO ₂	23.477	47.423	0.001	0.002	98%
Land Converted to Grassland	CO ₂	106.041	105.571	0.001	0.001	98%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	1.260	0.001	0.001	98%
Urea Application	CO ₂	50.020	60.389	0.001	0.001	98%
Wastewater Treatment and Discharge	CH ₄	237.864	200.436	0.001	0.001	99%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	121.845	0.001	0.001	99%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	24.166	0.001	0.001	99%
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	261.665	0.001	0.001	99%
Mineral Industry - Lime Production	CO ₂	153.440	96.726	0.001	0.001	99%
Metal Industry - Iron and Steel Production	CO ₂	45.970	16.604	0.001	0.001	99%
Other Product Manufacture and Use	N ₂ O	33.376	42.065	0.001	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	13.417	0.001	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	45.694	0.001	0.001	99%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	123.318	0.001	0.001	99%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	103.981	0.001	0.001	99%
Liming	CO ₂	0.000	9.601	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.000	0.000	100%
Land Converted to Wetlands	CO ₂	29.997	14.128	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O	2.908	10.405	0.000	0.000	100%
Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	4.667	10.298	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N ₂ O	8.818	1.987	0.000	0.000	100%
Biological Treatment of Solid Waste	CH ₄	0.000	4.575	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.000	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.000	0.000	100%
Biological Treatment of Solid Waste	N ₂ O	0.000	3.671	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	2.143	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N ₂ O	5.658	7.053	0.000	0.000	100%
Mineral Industry - Glass Production	CO ₂	35.871	29.481	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O	22.743	19.600	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous	CH ₄	1.490	3.353	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 (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Fuels						
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.730	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	1.199	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	3.956	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.000	0.000	100%
Other Product Manufacture and Use	SF6	10.450	6.580	0.000	0.000	100%
Biomass Burning	CH4	1.230	1.928	0.000	0.000	100%
Biomass Burning	N2O	0.858	1.474	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	1.902	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.842	0.000	0.000	100%
Grassland Remaining Grassland	CO2	2.069	2.069	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	1.690	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	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 (2013) Estimate (Gg eq-CO ₂)	Trend Assessment	% Contribution to trend	Cumulative Total (%)
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	0.000	100%
TOTAL		41,646.861	31,089.962			

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-CO2)	Level Assessment Tier 2	Cumulative Total (%)
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH4	2,555.636	0.180	18%
Enteric Fermentation	CH4	2,501.112	0.110	29%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH4	705.358	0.081	37%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO2	559.853	0.059	43%
Indirect N2O Emissions from Managed soils	N2O	376.504	0.058	49%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO2	4,589.960	0.048	54%
Fuel Combustion Activities - Transport - Road transportation	CO2	3,505.875	0.036	57%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.035	61%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	0.034	64%
Non-Energy Products from Fuels and Solvent Use	CO2	413.274	0.030	67%
Solid Waste Disposal	CH4	288.837	0.029	70%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO2	2,455.226	0.025	73%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO2	2,158.014	0.022	75%
Chemical industry - Nitric Acid Production	N2O	754.265	0.022	77%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO2	411.814	0.022	79%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO2	1,767.615	0.018	81%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO2	1,702.511	0.018	83%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO2	1,641.149	0.017	85%
Wastewater Treatment and Discharge	CH4	237.864	0.015	86%
Manure Management	N2O	323.845	0.013	87%
Manure Management	CH4	352.871	0.013	89%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.011	90%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	0.011	91%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO2	809.179	0.008	92%
Wastewater Treatment and Discharge	N2O	67.000	0.007	92%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO2	663.374	0.007	93%
Metal Industry - Ferroalloys Production	CO2	173.798	0.007	94%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	0.006	94%
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.006	95%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO2	524.388	0.005	96%
Mineral industry - Cement Production	CO2	1,085.790	0.004	96%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	0.004	96%
Urea Application	CO2	50.020	0.004	97%
Other Product Manufacture and Use	N2O	33.376	0.003	97%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	0.002	97%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	0.002	98%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	0.002	98%
Chemical Industry - Ammonia Production	CO2	552.404	0.002	98%
Metal Industry - Aluminium Production	CO2	118.797	0.002	98%
Fuel Combustion Activities - Transport - Domestic Aviation	CO2	156.287	0.002	98%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	0.002	99%
Fuel Combustion Activities - Transport - Railways	CO2	140.079	0.001	99%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO2	134.383	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	0.001	99%

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 (%)
Other Product Manufacture and Use	SF6	10.450	0.001	99%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	0.001	99%
Metal Industry - Iron and Steel Production	CO ₂	45.970	0.001	99%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	0.001	100%
Mineral Industry - Lime Production	CO ₂	153.440	0.001	99%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	0.001	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	0.001	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.000	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	99%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.000	100%
Metal Industry - Ferroalloys Production	CH ₄	3.899	0.000	100%
Mineral Industry - Glass Production	CO ₂	35.871	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.000	100%
Incineration and Open Burning of Waste	CO ₂	0.536	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄	0.208	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH ₄	0.174	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH ₄	0.027	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH ₄	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and	0.000	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 (%)
	PFCs			
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	0.000	100%
Liming	CO ₂	0.000	0.000	100%
Biological Treatment of Solid Waste	CH ₄	0.000	0.000	100%
Biological Treatment of Solid Waste	N ₂ O	0.000	0.000	100%
TOTAL		35,115.977		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) - 2013

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
Solid Waste Disposal	CH4	288.837	947.211	0.117	12%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH4	705.358	687.792	0.116	23%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO2	559.853	563.980	0.091	32%
Fuel Combustion Activities - Transport - Road transportation	CO2	3,505.875	5,379.944	0.085	41%
Indirect N2O Emissions from Managed soils	N2O	376.504	261.665	0.063	47%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH4	2,555.636	570.014	0.061	53%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.047	58%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	828.032	0.040	62%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO2	809.179	2,202.070	0.035	65%
Liming	CO2	0.000	9.601	0.033	69%
Enteric Fermentation	CH4	2,501.112	839.848	0.032	72%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO2	1,767.615	1,793.147	0.028	75%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO2	663.374	1,504.737	0.024	77%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO2	2,455.226	1,257.065	0.020	79%
Wastewater Treatment and Discharge	CH4	237.864	200.436	0.019	81%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO2	4,589.960	1,114.294	0.018	83%
Non-Energy Products from Fuels and Solvent Use	CO2	413.274	151.603	0.016	85%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO2	2,158.014	974.998	0.015	86%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO2	1,641.149	889.230	0.014	87%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	123.318	0.014	89%
Wastewater Treatment and Discharge	N2O	67.000	83.592	0.013	90%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	45.694	0.011	91%
Manure Management	N2O	323.845	140.632	0.008	92%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO2	411.814	91.630	0.008	93%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO2	1,702.511	464.060	0.007	94%
Urea Application	CO2	50.020	60.389	0.007	94%
Mineral industry - Cement Production	CO2	1,085.790	1,141.027	0.007	95%
Other Product Manufacture and Use	N2O	33.376	42.065	0.007	96%
Manure Management	CH4	352.871	177.786	0.006	96%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	19.600	0.005	97%
Chemical Industry - Ammonia Production	CO2	552.404	486.290	0.003	97%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	10.405	0.003	97%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.002	98%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO2	134.383	121.845	0.002	98%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.002	98%
Fuel Combustion Activities - Transport - Domestic Aviation	CO2	156.287	103.981	0.002	98%
Chemical industry - Nitric Acid Production	N2O	754.265	240.275	0.002	98%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	13.417	0.001	99%
Fuel Combustion Activities - Transport - Railways	CO2	140.079	74.057	0.001	99%
Other Product Manufacture and Use	SF6	10.450	6.580	0.001	99%
Biological Treatment of Solid Waste	CH4	0.000	4.575	0.001	99%

Tier 2 Analysis - Level Assessment - Excluding LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO2	0.000	52.367	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.001	99%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.001	99%
Mineral Industry - Lime Production	CO2	153.440	96.726	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.001	99%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.001	99%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.001	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.001	99%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	3.956	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO2	5.775	24.166	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH4	1.490	3.353	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO2	524.388	17.846	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	100%
Metal Industry - Iron and Steel Production	CO2	45.970	16.604	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	1.902	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	1.690	0.000	100%
Mineral Industry - Glass Production	CO2	35.871	29.481	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	1.260	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	1.199	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.842	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.730	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO2)	Last Year (2013) Estimate (Gg eq-CO2)	Level Assessment Tier 2	Cumulative Total (%)
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.000	100%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CO2	173.798	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	100%
Metal Industry - Aluminium Production	CO2	118.797	0.000	0.000	100%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	100%
TOTAL		35,115.977	24,492.777		

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

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Level Assessment Tier 2	Cumulative Total (%)
Forest Land Remaining Forest Land	CO2	5,588.831	0.458	46%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH4	2,555.636	0.067	52%
Cropland Remaining Cropland	CO2	194.500	0.065	59%
Enteric Fermentation	CH4	2,501.112	0.041	63%
Land Converted to Settlements	CO2	240.310	0.031	66%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH4	705.358	0.030	69%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO2	559.853	0.022	71%
Indirect N2O Emissions from Managed soils	N2O	376.504	0.022	74%
Land Converted to Cropland	CO2	23.477	0.019	75%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO2	4,589.960	0.018	77%
Direct N2O emissions from N mineralization/immobilization	N2O	4.667	0.018	79%
Land Converted to Grassland	CO2	106.041	0.016	81%
Harvested wood products	CO2	299.623	0.015	82%
Fuel Combustion Activities - Transport - Road transportation	CO2	3,505.875	0.013	83%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.013	85%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	0.013	86%
Non-Energy Products from Fuels and Solvent Use	CO2	413.274	0.011	87%
Solid Waste Disposal	CH4	288.837	0.011	88%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO2	2,455.226	0.009	89%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO2	2,158.014	0.008	90%
Chemical industry - Nitric Acid Production	N2O	754.265	0.008	91%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO2	411.814	0.008	92%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO2	1,767.615	0.007	92%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO2	1,702.511	0.007	93%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO2	1,641.149	0.006	94%
Wastewater Treatment and Discharge	CH4	237.864	0.006	94%
Manure Management	N2O	323.845	0.005	95%
Manure Management	CH4	352.871	0.005	95%
Land Converted to Wetlands	CO2	29.997	0.004	96%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.004	96%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	0.004	96%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO2	809.179	0.003	97%
Wastewater Treatment and Discharge	N2O	67.000	0.003	97%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO2	663.374	0.003	97%
Metal Industry - Ferroalloys Production	CO2	173.798	0.003	97%
Land Converted to Forest Land	CO2	39.280	0.002	98%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	0.002	98%
Chemical Industry - Petrochemical and Carbon Black Production	CO2	219.763	0.002	98%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO2	524.388	0.002	98%
Mineral industry - Cement Production	CO2	1,085.790	0.002	98%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	0.002	99%
Urea Application	CO2	50.020	0.001	99%
Other Product Manufacture and Use	N2O	33.376	0.001	99%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	0.001	99%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	0.001	99%

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Level Assessment Tier 2	Cumulative Total (%)
Fuel Combustion Activities - Transport - Railways	N2O	13.248	0.001	99%
Chemical Industry - Ammonia Production	CO2	552.404	0.001	99%
Metal Industry - Aluminium Production	CO2	118.797	0.001	99%
Fuel Combustion Activities - Transport - Domestic Aviation	CO2	156.287	0.001	99%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	0.001	99%
Fuel Combustion Activities - Transport - Railways	CO2	140.079	0.001	99%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO2	134.383	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	0.000	99%
Other Product Manufacture and Use	SF6	10.450	0.000	99%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	0.000	99%
Metal Industry - Iron and Steel Production	CO2	45.970	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	0.000	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	0.000	100%
Mineral Industry - Lime Production	CO2	153.440	0.000	99%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.000	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	0.000	100%
Grassland Remaining Grassland	CO2	2.069	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	100%
Mineral Industry - Glass Production	CO2	35.871	0.000	100%
Biomass Burning	CH4	1.230	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH4	1.490	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO2	5.775	0.000	100%
Biomass Burning	N2O	0.858	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq- CO2)	Level Assessment Tier 2	Cumulative Total (%)
Incineration and Open Burning of Waste	N2O	0.007	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO2	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	0.000	100%
Liming	CO2	0.000	0.000	100%
Biological Treatment of Solid Waste	CH4	0.000	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	0.000	100%
TOTAL		41,646.861		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) - 2013

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
Forest Land Remaining Forest Land	CO ₂	5,588.831	5,290.748	0.506	51%
Land Converted to Settlements	CO ₂	240.310	545.555	0.051	56%
Cropland Remaining Cropland	CO ₂	194.500	113.126	0.049	61%
Land Converted to Cropland	CO ₂	23.477	47.423	0.048	65%
Direct N ₂ O emissions from N mineralization/immobilization	N ₂ O	4.667	10.298	0.046	70%
Land Converted to Grassland	CO ₂	106.041	105.571	0.036	74%
Land Converted to Forest Land	CO ₂	39.280	200.746	0.026	76%
Solid Waste Disposal	CH ₄	288.837	947.211	0.026	79%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	687.792	0.026	82%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	563.980	0.020	84%
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	5,379.944	0.019	85%
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	261.665	0.014	87%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	570.014	0.014	88%
Harvested wood products	CO ₂	299.623	264.120	0.011	89%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.010	90%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	828.032	0.009	91%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	2,202.070	0.008	92%
Liming	CO ₂	0.000	9.601	0.007	93%
Enteric Fermentation	CH ₄	2,501.112	839.848	0.007	93%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	1,793.147	0.006	94%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	1,504.737	0.005	95%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	1,257.065	0.004	95%
Wastewater Treatment and Discharge	CH ₄	237.864	200.436	0.004	96%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	1,114.294	0.004	96%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	151.603	0.004	96%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	974.998	0.003	97%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	889.230	0.003	97%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	123.318	0.003	97%
Wastewater Treatment and Discharge	N ₂ O	67.000	83.592	0.003	98%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	45.694	0.003	98%
Land Converted to Wetlands	CO ₂	29.997	14.128	0.002	98%
Manure Management	N ₂ O	323.845	140.632	0.002	98%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	91.630	0.002	98%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	464.060	0.002	99%
Urea Application	CO ₂	50.020	60.389	0.002	99%
Mineral industry - Cement Production	CO ₂	1,085.790	1,141.027	0.002	99%
Other Product Manufacture and Use	N ₂ O	33.376	42.065	0.001	99%
Manure Management	CH ₄	352.871	177.786	0.001	99%
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O	22.743	19.600	0.001	99%
Chemical Industry - Ammonia Production	CO ₂	552.404	486.290	0.001	99%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O	2.908	10.405	0.001	99%
Fuel Combustion Activities - Transport - Railways	N ₂ O	13.248	8.518	0.001	99%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO ₂	134.383	121.845	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 (2013) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	103.981	0.000	100%
Chemical industry - Nitric Acid Production	N2O	754.265	240.275	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.000	100%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	13.417	0.000	100%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	74.057	0.000	100%
Other Product Manufacture and Use	SF ₆	10.450	6.580	0.000	100%
Biological Treatment of Solid Waste	CH ₄	0.000	4.575	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	52.367	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.000	100%
Mineral Industry - Lime Production	CO ₂	153.440	96.726	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.000	100%
Biomass Burning	CH ₄	1.230	1.928	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	3.956	0.000	100%
Grassland Remaining Grassland	CO ₂	2.069	2.069	0.000	100%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	24.166	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	3.353	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	17.846	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.000	100%
Metal Industry - Iron and Steel Production	CO ₂	45.970	16.604	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	1.902	0.000	100%
Biomass Burning	N2O	0.858	1.474	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.690	0.000	100%
Mineral Industry - Glass Production	CO ₂	35.871	29.481	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	1.260	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	1.199	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.842	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.730	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 (2013) Estimate (Gg eq-CO ₂)	Level Assessment Tier 2	Cumulative Total (%)
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	100%
Incineration and Open Burning of Waste	CO ₂	0.536	0.042	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.000	100%
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.000	0.000	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	100%
Metal Industry - Aluminium Production	CO ₂	118.797	0.000	0.000	100%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	100%
TOTAL		41,646.861	31,089.962		

Table A1.3-11: Key categories analysis – Trend Assessment - Tier 2 (Excluding LULUCF) - 2013

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	5,379.944	1.239	0.070	7%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	1,114.294	0.882	0.050	12%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	2,202.070	0.692	0.039	16%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	570.014	3.478	0.196	36%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	1,504.737	0.440	0.025	38%
Enteric Fermentation	CH ₄	2,501.112	839.848	0.921	0.052	43%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	0.000	43%
Solid Waste Disposal	CH ₄	288.837	947.211	2.471	0.140	57%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	464.060	0.306	0.017	59%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	1.258	0.071	66%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	1,793.147	0.237	0.013	67%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	974.998	0.224	0.013	69%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	1,257.065	0.192	0.011	70%
Mineral industry - Cement Production	CO ₂	1,085.790	1,141.027	0.065	0.004	70%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	17.846	0.147	0.008	71%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	240.275	0.048	0.003	71%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	889.230	0.108	0.006	72%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	687.792	0.886	0.050	77%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	91.630	0.435	0.025	79%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	563.980	0.748	0.042	83%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.283	0.016	85%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	151.603	0.391	0.022	87%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.000	0.000	0.000	87%
Chemical Industry - Ammonia Production	CO ₂	552.404	486.290	0.017	0.001	87%
Manure Management	N ₂ O	323.845	140.632	0.134	0.008	88%
Metal Industry - Aluminium Production	CO ₂	118.797	0.000	0.000	0.000	88%
Manure Management	CH ₄	352.871	177.786	0.065	0.004	88%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	52.367	0.022	0.001	89%
Fugitive emissions from fuels - Solid Fuels	CH ₄	59.644	0.000	0.000	0.000	89%
Wastewater Treatment and Discharge	N ₂ O	67.000	83.592	0.156	0.009	89%
Wastewater Treatment and Discharge	CH ₄	237.864	200.436	0.090	0.005	90%
Fuel Combustion Activities - Transport - Domestic	CO ₂	134.383	121.845	0.012	0.001	90%

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Navigation - Liquid Fuels						
Urea Application	CO ₂	50.020	60.389	0.082	0.005	91%
Fuel Combustion Activities - Transport - Railways	CO ₂	140.079	74.057	0.010	0.001	91%
Fuel Combustion Activities - Other Sectors - Biomass	CH ₄	143.100	123.318	0.071	0.004	91%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH ₄	33.392	1.260	0.066	0.004	91%
Mineral Industry - Other Process Uses of Carbonates	CO ₂	5.775	24.166	0.009	0.001	91%
Other Product Manufacture and Use	N ₂ O	33.376	42.065	0.079	0.004	92%
Fuel Combustion Activities - Transport - Road transportation	N ₂ O	38.685	45.694	0.124	0.007	93%
Direct N ₂ O Emissions From Managed Soils	N ₂ O	1,162.148	828.032	0.022	0.001	93%
Metal Industry - Iron and Steel Production	CO ₂	45.970	16.604	0.007	0.000	93%
Fuel Combustion Activities - Transport - Road transportation	CH ₄	40.611	13.417	0.036	0.002	93%
Mineral Industry - Lime Production	CO ₂	153.440	96.726	0.002	0.000	93%
Liming	CO ₂	0.000	9.601	0.890	0.050	98%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.039	0.002	98%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N ₂ O	2.908	10.405	0.061	0.003	99%
Fuel Combustion Activities - Transport - Domestic Aviation	CO ₂	156.287	103.981	0.002	0.000	99%
Biological Treatment of Solid Waste	CH ₄	0.000	4.575	0.024	0.001	99%
Mineral Industry - Glass Production	CO ₂	35.871	29.481	0.001	0.000	99%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.015	0.001	99%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N ₂ O	8.818	1.987	0.030	0.002	99%
Chemical Industry - Petrochemical and Carbon Black Production	CH ₄	5.493	0.000	0.007	0.000	99%
Fuel Combustion Activities - Other Sectors - Biomass	N ₂ O	22.743	19.600	0.027	0.002	99%
Biological Treatment of Solid Waste	N ₂ O	0.000	3.671	0.024	0.001	99%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N ₂ O	5.658	7.053	0.023	0.001	99%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N ₂ O	7.502	2.143	0.022	0.001	100%
Metal Industry - Ferroalloys Production	CH ₄	3.899	0.000	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH ₄	1.490	3.353	0.007	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH ₄	3.696	0.730	0.006	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH ₄	4.196	1.199	0.005	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N ₂ O	2.377	0.080	0.011	0.001	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N ₂ O	4.973	1.981	0.011	0.001	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH ₄	7.787	3.956	0.004	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid	N ₂ O	5.271	2.637	0.008	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 (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fuels						
Indirect N ₂ O Emissions from Managed soils	N ₂ O	376.504	261.665	0.006	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH ₄	1.507	1.902	0.003	0.000	100%
Fuel Combustion Activities - Transport - Railways	N ₂ O	13.248	8.518	0.005	0.000	100%
Other Product Manufacture and Use	SF ₆	10.450	6.580	0.003	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH ₄	2.096	0.842	0.002	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N ₂ O	0.516	0.799	0.003	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH ₄	0.208	0.582	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N ₂ O	0.000	0.437	0.003	0.000	100%
Incineration and Open Burning of Waste	CO ₂	0.536	0.042	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N ₂ O	4.291	2.686	0.002	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH ₄	0.000	0.275	0.001	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N ₂ O	1.079	0.980	0.002	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH ₄	2.700	1.690	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N ₂ O	0.876	0.472	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH ₄	0.735	0.396	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH ₄	0.317	0.288	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N ₂ O	1.303	0.867	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH ₄	0.174	0.083	0.000	0.000	100%
Incineration and Open Burning of Waste	N ₂ O	0.007	0.000	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH ₄	0.027	0.018	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	N ₂ O	0.000	0.001	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH ₄	0.000	0.001	0.000	0.000	100%
TOTAL		35,115.977	24,492.777			

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF) - 2013

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fuel Combustion Activities - Transport - Road transportation	CO ₂	3,505.875	5,379.944	0.859	0.024	2%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CO ₂	4,589.960	1,114.294	0.719	0.020	4%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CO ₂	809.179	2,202.070	0.497	0.014	6%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH ₄	2,555.636	570.014	2.825	0.079	14%
Forest Land Remaining Forest Land	CO ₂	5,588.831	5,290.748	9.454	0.266	40%
Enteric Fermentation	CH ₄	2,501.112	839.848	0.770	0.022	43%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CO ₂	663.374	1,504.737	0.314	0.009	43%
Metal Industry - Aluminium Production	PFCs	1,240.239	0.000	0.000	0.000	43%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CO ₂	1,702.511	464.060	0.251	0.007	44%
Solid Waste Disposal	CH ₄	288.837	947.211	1.784	0.050	49%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CO ₂	2,158.014	974.998	0.198	0.006	50%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CO ₂	2,455.226	1,257.065	0.179	0.005	50%
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning	HFCs and PFCs	0.000	564.350	0.926	0.026	53%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CO ₂	1,767.615	1,793.147	0.147	0.004	53%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CO ₂	524.388	17.846	0.116	0.003	54%
Land Converted to Settlements	CO ₂	240.310	545.555	3.039	0.085	62%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CO ₂	1,641.149	889.230	0.104	0.003	62%
Mineral industry - Cement Production	CO ₂	1,085.790	1,141.027	0.041	0.001	62%
Chemical industry - Nitric Acid Production	N ₂ O	754.265	240.275	0.040	0.001	63%
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO ₂	411.814	91.630	0.353	0.010	64%
Land Converted to Forest Land	CO ₂	39.280	200.746	1.992	0.056	69%
Chemical Industry - Petrochemical and Carbon Black Production	CO ₂	219.763	0.001	0.223	0.006	70%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CH ₄	705.358	687.792	0.537	0.015	71%
Non-Energy Products from Fuels and Solvent Use	CO ₂	413.274	151.603	0.330	0.009	72%
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas	CO ₂	559.853	563.980	0.463	0.013	74%
Metal Industry - Ferroalloys Production	CO ₂	173.798	0.000	0.000	0.000	74%
Manure Management	N ₂ O	323.845	140.632	0.117	0.003	74%
Metal Industry - Aluminium Production	CO ₂	118.797	0.000	0.000	0.000	74%
Manure Management	CH ₄	352.871	177.786	0.060	0.002	74%
Chemical Industry - Ammonia Production	CO ₂	552.404	486.290	0.009	0.000	74%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CO ₂	0.000	52.367	0.016	0.000	74%

Tier 2 Analysis - Trend Assessment Including LULUCF

IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fugitive emissions from fuels - Solid Fuels	CH4	59.644	0.000	0.000	0.000	74%
Harvested wood products	CO2	299.623	264.120	0.149	0.004	75%
Direct N2O Emissions From Managed Soils	N2O	1,162.148	828.032	0.037	0.001	75%
Wastewater Treatment and Discharge	N2O	67.000	83.592	0.104	0.003	75%
Cropland Remaining Cropland	CO2	194.500	113.126	1.217	0.034	78%
Fuel Combustion Activities - Transport - Railways	CO2	140.079	74.057	0.009	0.000	78%
Land Converted to Cropland	CO2	23.477	47.423	2.676	0.075	86%
Land Converted to Grassland	CO2	106.041	105.571	0.806	0.023	88%
Fuel Combustion Activities - Other Sectors - Solid Fuels	CH4	33.392	1.260	0.052	0.001	88%
Urea Application	CO2	50.020	60.389	0.055	0.002	88%
Wastewater Treatment and Discharge	CH4	237.864	200.436	0.044	0.001	89%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CO2	134.383	121.845	0.007	0.000	89%
Mineral Industry - Other Process Uses of Carbonates	CO2	5.775	24.166	0.007	0.000	89%
Indirect N2O Emissions from Managed soils	N2O	376.504	261.665	0.092	0.003	89%
Mineral Industry - Lime Production	CO2	153.440	96.726	0.002	0.000	89%
Metal Industry - Iron and Steel Production	CO2	45.970	16.604	0.006	0.000	89%
Other Product Manufacture and Use	N2O	33.376	42.065	0.053	0.001	89%
Fuel Combustion Activities - Transport - Road transportation	CH4	40.611	13.417	0.030	0.001	89%
Fuel Combustion Activities - Transport - Road transportation	N2O	38.685	45.694	0.082	0.002	89%
Fuel Combustion Activities - Other Sectors - Biomass	CH4	143.100	123.318	0.036	0.001	89%
Fuel Combustion Activities - Transport - Domestic Aviation	CO2	156.287	103.981	0.004	0.000	89%
Liming	CO2	0.000	9.601	0.655	0.018	91%
Product Uses as Substitutes for Ozone Depleting Substances - Aerosols	HFCs and PFCs	0.000	9.152	0.028	0.001	91%
Land Converted to Wetlands	CO2	29.997	14.128	0.127	0.004	92%
Fuel Combustion Activities - Energy Industries - Solid Fuels	N2O	2.908	10.405	0.044	0.001	92%
Direct N2O emissions from N mineralization/immobilization	N2O	4.667	10.298	2.693	0.076	99%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	N2O	8.818	1.987	0.025	0.001	99%
Biological Treatment of Solid Waste	CH4	0.000	4.575	0.018	0.000	100%
Product Uses as Substitutes for Ozone Depleting Substances - Fire Protection	HFCs and PFCs	0.000	4.269	0.011	0.000	100%
Chemical Industry - Petrochemical and Carbon Black Production	CH4	5.493	0.000	0.006	0.000	100%
Biological Treatment of Solid Waste	N2O	0.000	3.671	0.018	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	N2O	7.502	2.143	0.018	0.001	100%
Metal Industry - Ferroalloys Production	CH4	3.899	0.000	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	N2O	5.658	7.053	0.015	0.000	100%
Mineral Industry - Glass Production	CO2	35.871	29.481	0.000	0.000	100%
Fuel Combustion Activities - Other Sectors - Biomass	N2O	22.743	19.600	0.014	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	CH4	1.490	3.353	0.005	0.000	100%
Fuel Combustion Activities - Energy Industries - Liquid Fuels	CH4	3.696	0.730	0.004	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels	CH4	4.196	1.199	0.004	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	CH4	7.787	3.956	0.004	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	N2O	4.973	1.981	0.009	0.000	100%
Fuel Combustion Activities - Other Sectors - Solid Fuels	N2O	2.377	0.080	0.009	0.000	100%
Fuel Combustion Activities - Transport - Railways	N2O	13.248	8.518	0.007	0.000	100%
Fuel Combustion Activities - Other Sectors - Liquid Fuels	N2O	5.271	2.637	0.007	0.000	100%
Other Product Manufacture and Use	SF6	10.450	6.580	0.004	0.000	100%
Biomass Burning	CH4	1.230	1.928	0.006	0.000	100%
Biomass Burning	N2O	0.858	1.474	0.002	0.000	100%
Fuel Combustion Activities - Energy Industries - Gaseous Fuels	CH4	1.507	1.902	0.002	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels	CH4	2.096	0.842	0.002	0.000	100%
Grassland Remaining Grassland	CO2	2.069	2.069	0.002	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	N2O	4.291	2.686	0.003	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	N2O	0.000	0.437	0.002	0.000	100%
Fuel Combustion Activities - Energy Industries - Solid Fuels	CH4	0.208	0.582	0.001	0.000	100%
Fuel Combustion Activities - Other Sectors - Gaseous Fuels	N2O	0.516	0.799	0.002	0.000	100%
Incineration and Open Burning of Waste	CO2	0.536	0.042	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Biomass	CH4	2.700	1.690	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels	CH4	0.000	0.275	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	N2O	0.876	0.472	0.001	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	N2O	1.079	0.980	0.001	0.000	100%
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels	CH4	0.735	0.396	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	N2O	1.303	0.867	0.001	0.000	100%
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels	CH4	0.317	0.288	0.000	0.000	100%
Fuel Combustion Activities - Transport - Railways	CH4	0.174	0.083	0.000	0.000	100%
Incineration and Open Burning of Waste	N2O	0.007	0.000	0.000	0.000	100%
Fuel Combustion Activities - Transport - Domestic Aviation	CH4	0.027	0.018	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	Direct GHG	Base Year (1990) Estimate (Gg eq-CO ₂)	Last Year (2013) Estimate (Gg eq-CO ₂)	Trend Assessment Tier 2	% Contribution to Trend	Cumulative Total (%)
Fuel Combustion Activities - Energy Industries - Biomass	N2O	0.000	0.001	0.000	0.000	100%
Fuel Combustion Activities - Energy Industries - Biomass	CH4	0.000	0.001	0.000	0.000	100%
TOTAL		41,646.861	31,089.962			

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

Table Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, 1990)				
A IPCC Source Categories	B GHG	C Key	D If Column C is Yes, Criteria for Identification	E Com.
1. Energy				
Fuel Combustion Activities - Energy Industries - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	L1i
Fuel Combustion Activities - Energy Industries - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	L1i, L2i
Fuel Combustion Activities - Energy Industries - Solid Fuels - CO2	CO2	Yes	L1e, L2e	L1i
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	L1i
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	L1i, L2i
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels - CO2	CO2	Yes	L1e, L2e	L1i
Fuel Combustion Activities - Other Sectors - Biomass - CH4	CH4	Yes	L2e	
Fuel Combustion Activities - Other Sectors - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	L1i
Fuel Combustion Activities - Other Sectors - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	L1i, L2i
Fuel Combustion Activities - Other Sectors - Solid Fuels - CO2	CO2	Yes	L1e,	L1i
Fuel Combustion Activities - Transport - Road transportation - CO2	CO2	Yes	L1e, L2e	L1i, L2i
Fuel Combustion Activities - Transport - Road transportation - N2O	N2O	Yes	L2e	
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas - CH4	CH4	Yes	L1e, L2e	L1i, L2i
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas - CO2	CO2	Yes	L1e, L2e	L1i, L2i
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil - CH4	CH4	Yes	L1e, L2e	L1i, L2i
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil - CO2	CO2	Yes	L1e, L2e	L1i
Fugitive emissions from fuels - Solid Fuels - CH4	CH4	Yes	L2e	
2. Industrial processes and product use				
Chemical Industry - Ammonia Production - CO2	CO2	Yes	L1e,	L1i
Chemical industry - Nitric Acid Production - N2O	N2O	Yes	L1e, L2e	L1i
Chemical Industry - Petrochemical and Carbon Black Production - CO2	CO2	Yes		L1i
Metal Industry - Aluminium Production - PFCs	PFCs	Yes	L1e, L2e	L1i, L2i
Metal Industry - Ferroalloys Production - CO2	CO2	Yes	L2e	
Mineral industry - Cement Production - CO2	CO2	Yes	L1e	L1i
Non-Energy Products from Fuels and Solvent Use - CO2	CO2	Yes	L1e, L2e	L1i, L2i
3. Agriculture				
Direct N2O Emissions From Managed Soils - N2O	N2O	Yes	L1e, L2e	L1i, L2i
Enteric Fermentation - CH4	CH4	Yes	L1e, L2e	L1i, L2i
Indirect N2O Emissions from Managed soils - N2O	N2O	Yes	L1e, L2e	L1i, L2i
Manure Management - CH4	CH4	Yes	L1e, L2e	L1i
Manure Management - N2O	N2O	Yes	L1e, L2e	L1i
4. Land use, land use change and forestry				
Cropland Remaining Cropland - CO2	CO2	Yes		L2i
Direct N2O emissions from N mineralization/immobilization - N2O	N2O	Yes		L2i
Forest Land Remaining Forest Land - CO2	CO2	Yes		L1i, L2i
Harvested wood products - CO2	CO2	Yes		L1i, L2i
Land Converted to Cropland - CO2	CO2	Yes		L2i
Land Converted to Grassland - CO2	CO2	Yes		L2i
Land Converted to Settlements - CO2	CO2	Yes		L1i, L2i
5. Waste				
Solid Waste Disposal - CH4	CH4	Yes	L1e, L2e	L1i, L2i
Wastewater Treatment and Discharge - CH4	CH4	Yes	L1e, L2e	L1i
Wastewater Treatment and Discharge - N2O	N2O	Yes	L2e	

L1e - Level excluding LULUCF Tier1

L1i - Level including LULUCF Tier1

L2e - Level excluding LULUCF Tier2

L2i - Level including LULUCF Tier2

Table A1.3-14: Source Analysis Summary (Croatian Inventory, 2013)

Table Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, 2013)							
A	B	C	D			E	
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification			Com.	
1. Energy							
Fuel Combustion Activities - Energy Industries - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Manufacturing Industries and Construction - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Manufacturing Industries and Construction - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas - CH4	CO2	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil - CH4	CO2	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
Fugitive Emissions from Fuels - Oil and Natural Gas - Natural gas - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
Fuel Combustion Activities - Manufacturing Industries and Construction - Solid Fuels - CO2	CO2	Yes	L1e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Other Sectors - Solid Fuels - CO2	CO2	Yes		T1e, T2e		T1i, T2i	
Fugitive Emissions from Fuels - Oil and Natural Gas - Oil - CO2	CO2	Yes		T1e, T2e		T1i, T2i	
Fuel Combustion Activities - Other Sectors - Biomass - CH4	CH4	Yes	L2e			T2i	
Fuel Combustion Activities - Manufacturing Industries and Construction - Other Fossil Fuels - CO2	CO2	Yes		T2e		T2i	
Fugitive emissions from fuels - Solid Fuels - CH4	CH4	Yes		T2e		T2i	
Fuel Combustion Activities - Transport - Domestic Navigation - Liquid Fuels - CO2	CO2	Yes		T2e		T2i	
Fuel Combustion Activities - Transport - Railways - CO2	CO2	Yes				T2i	
Fuel Combustion Activities - Other Sectors - Solid Fuels - CH4	CH4	Yes				T2i	
Fuel Combustion Activities - Transport - Road transportation - CH4	CH4	Yes				T2i	
Fuel Combustion Activities - Transport - Road transportation - N2O	N2O	Yes				T2i	
Fuel Combustion Activities - Transport - Domestic Aviation - CO2	CO2	Yes				T2i	
Fuel Combustion Activities - Transport - Road transportation - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
Fuel Combustion Activities - Energy Industries - Solid Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Energy Industries - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Other Sectors - Gaseous Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	
Fuel Combustion Activities - Other Sectors - Liquid Fuels - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i,	T1i, T2i	
2. Industrial processes and product use							
Product Uses as Substitutes for Ozone Depleting Substances - Refrigeration and Air Conditioning - HFCs and PFCs	HFCs, PFCs	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i	
Chemical Industry - Ammonia Production - CO2	CO2	Yes	L1e	T2e	L1i	T2i	
Chemical industry - Nitric Acid Production - N2O	N2O	Yes	L1e	T1e, T2e	L1i	T1i, T2i	
Non-Energy Products from Fuels and Solvent Use - CO2	CO2	Yes	L1e, L2e	T1e, T2e	L1i	T1i, T2i	

Table Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, 2013)						
A	B	C	D			E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification			Com.
Metal Industry - Aluminium Production - PFCs	PFCs	Yes		T1e, T2e		T1i, T2i
Chemical Industry - Petrochemical and Carbon Black Production - CO2	CO2	Yes		T1e, T2e		T1i, T2i
Metal Industry - Ferroalloys Production - CO2	CO2	Yes		T1e, T2e		T1i, T2i
Metal Industry - Aluminium Production - CO2	CO2	Yes		T2e		T2i
Mineral industry - Cement Production - CO2	CO2	Yes	L1e	T1e, T2e	L1i	T1i, T2i
Mineral Industry - Other Process Uses of Carbonates - CO2	CO2	Yes				T2i
Mineral Industry - Lime Production - CO2	CO2	Yes				T2i
Metal Industry - Iron and Steel Production - CO2	CO2	Yes				T2i
Other Product Manufacture and Use - N2O	N2O	Yes				T2i
3. Agriculture						
Enteric Fermentation - CH4	CH4	Yes	L1e, L2e	T1e, T2e	L1i,	T1i, T2i
Direct N2O Emissions From Managed Soils - N2O	N2O	Yes	L1e, L2e		L1i,	T2i
Indirect N2O Emissions from Managed soils - N2O	N2O	Yes	L1e, L2e		L1i, L2i	T2i
Manure Management - CH4	CH4	Yes	L1e,	T2e	L1i,	T2i
Manure Management - N2O	N2O	Yes	L1e,	T2e	L1i,	T1i, T2i
Liming - CO2	CO2	Yes	L2e			
Urea Application - CO2	CO2	Yes				T2i
4. Land use, land use change and forestry						
Forest Land Remaining Forest Land - CO2	CO2	Yes			L1i, L2i	T1i, T2i
Land Converted to Settlements - CO2	CO2	Yes			L1i, L2i	T1i, T2i
Harvested wood products - CO2	CO2	Yes			L1i, L2i	T2i
Land Converted to Forest Land - CO2	CO2	Yes			L1i, L2i	T1i, T2i
Cropland Remaining Cropland - CO2	CO2	Yes			L2i	T2i
Land Converted to Cropland - CO2	CO2	Yes			L2i	T2i
Direct N2O emissions from N mineralization/immobilization - N2O	N2O	Yes			L2i	
Land Converted to Grassland - CO2	CO2	Yes			L2i	T2i
5. Waste						
Solid Waste Disposal - CH4	CH4	Yes	L1e, L2e	T1e, T2e	L1i, L2i	T1i, T2i
Wastewater Treatment and Discharge - CH4	CH4	Yes	L1e, L2e	T2e	L1i,	T2i
Wastewater Treatment and Discharge - N2O	N2O	Yes	L2e	T2e		T2i

L1e - Level excluding LULUCF

Tier1 T1e - Trend excluding LULUCF Tier1

L2e - Level excluding LULUCF

Tier2 T2e - Trend excluding LULUCF Tier2

L1i - Level including LULUCF

Tier1 T1i - Trend including LULUCF Tier1

L2i - Level including LULUCF

Tier2 T2i - Trend including LULUCF Tier2

ANNEX 2: ASSESSMENT OF UNCERTAINTY

2.1. DESCRIPTION OF METHODOLOGY USED FOR IDENTIFYING UNCERTAINTIES

Uncertainty estimates are calculated using two methods: Approach 1 (error propagation) and Approach 2 (Monte Carlo simulation). Use of the terminology Approach 1 and Approach 2 follows that defined in the IPCC's General Guidance and Reporting: 2006 IPCC Guidelines for National Greenhouse gas Inventories (2006 Guidelines) and 2000 IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000 GPG).

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 there analysis was performed in the way of uncertainty determination of all input data; which implies the determination of appropriate distribution for every input parameter. For categories of other sectors PDFs were defined only for activity data (AD) and emission factors (EF), after which Monte Carlo simulation was applied. Result is Table 4.3 according to IPCC 2006 Guidelines.

Uncertainty estimates were calculated in Excel spreadsheet application. Data have been divided into six sectors according to modus how the inventory work is organized (Energy, Industrial Processes, Solvent 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).

2.1.1 Estimation of Uncertainty by Monte Carlo Simulation (Approach 2)

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.

Uncertainty distributions

A) Distributions

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

B)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.

C) 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.

For some pollutants and source categories, no information on uncertainty ranges were available in the Guidelines so uncertainty estimates derive from expert judgment or were taken from other inventories (Japan).

D) Uncertainty in the emissions

The central estimate of CO₂-eq emissions in 2013 was estimated at 19,367.59 Gg CO₂-eq including LULUCF.

The central estimate of CO₂-eq emissions in 1990 was estimated at 29,579.31 Gg CO₂-eq including LULUCF.

Monte Carlo analysis shows that with a certainty of 95% we can say that the total emissions of categories for the year 2013 (24,284.2 Gg CO₂-eq) varies between 17,226.93Gg CO₂-eq (2.5% percentile) and 31,341.37Gg CO₂-eq (97.5% percentile).

Figure A2.1-1: Distribution of total CO₂ emission for year 2013

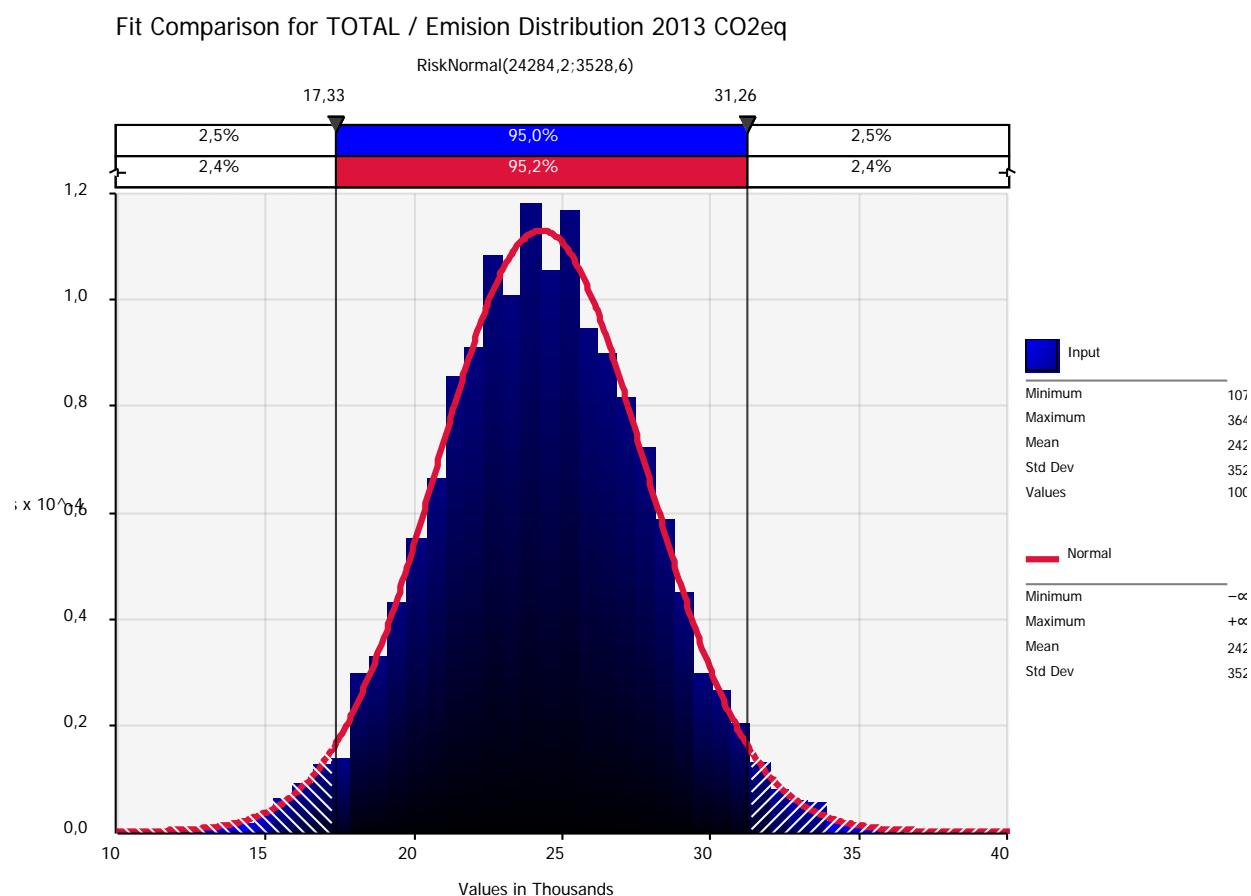


Figure A2.1-1 shows the distribution of total CO₂ emission for year 2013 with a corresponding probability density function (red line) that best matches the simulation results.

Monte Carlo analysis shows that with a certainty of 95% we can say that the total emissions of all categories for the year 1990 (33,589.7 Gg CO₂-eq) varies between 27,605.61Gg CO₂-eq (2.5% percentile) and 39,573.86 Gg CO₂-eq (97.5% percentile).

Figure A2.1-2: Distribution of total CO₂ emission for year 1990

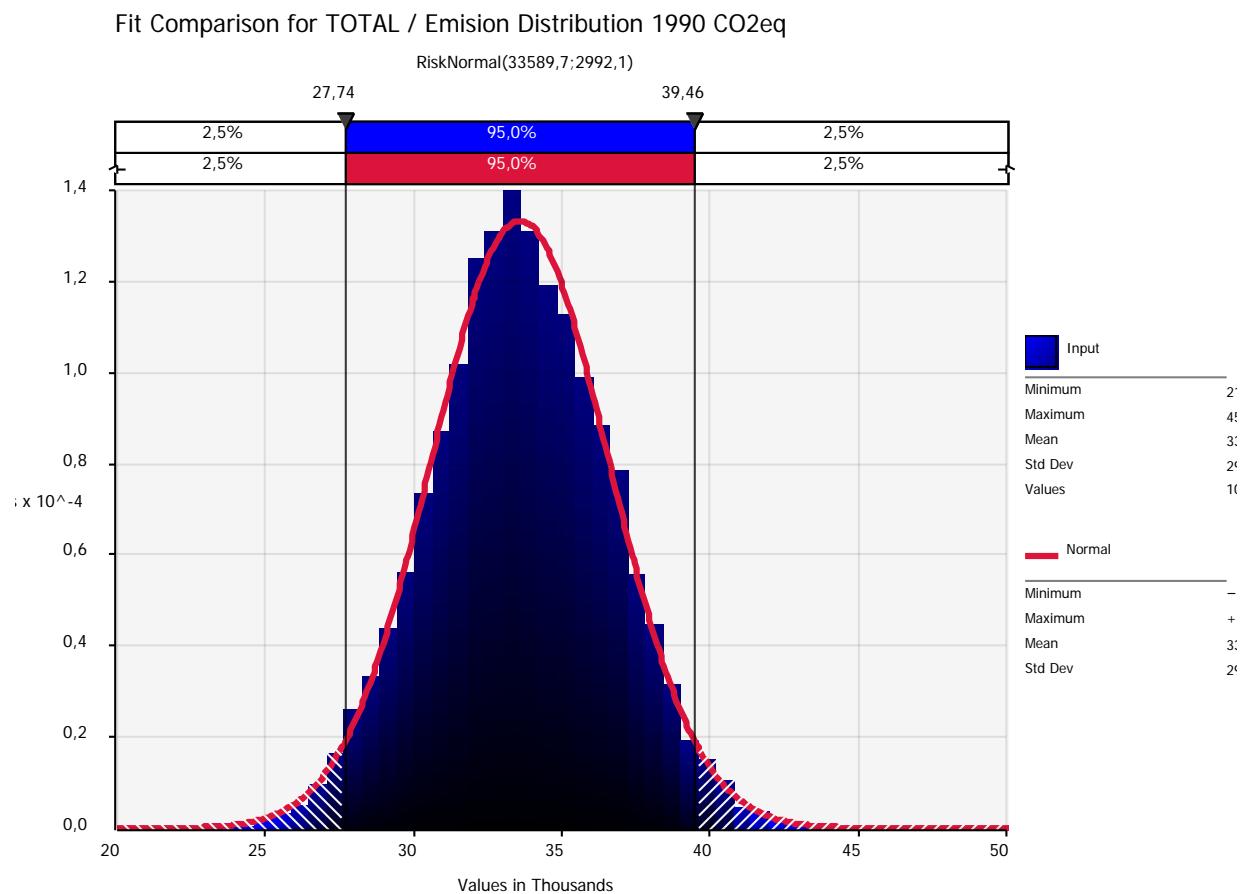


Figure A2.1-2 shows the distribution of total CO₂ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

E) Uncertainty in the trend

The Inventory trend is -17,902%, and the 95% probability range of the trend is -41.4% (2,5% percentile) to 5.7% (97.5% percentile), so the uncertainty introduced in trend varies from -23.52% to 23.57% with respect to the base year emissions.

Figure A2.1-3: Distribution of trend for year 2013 respect to year 1990

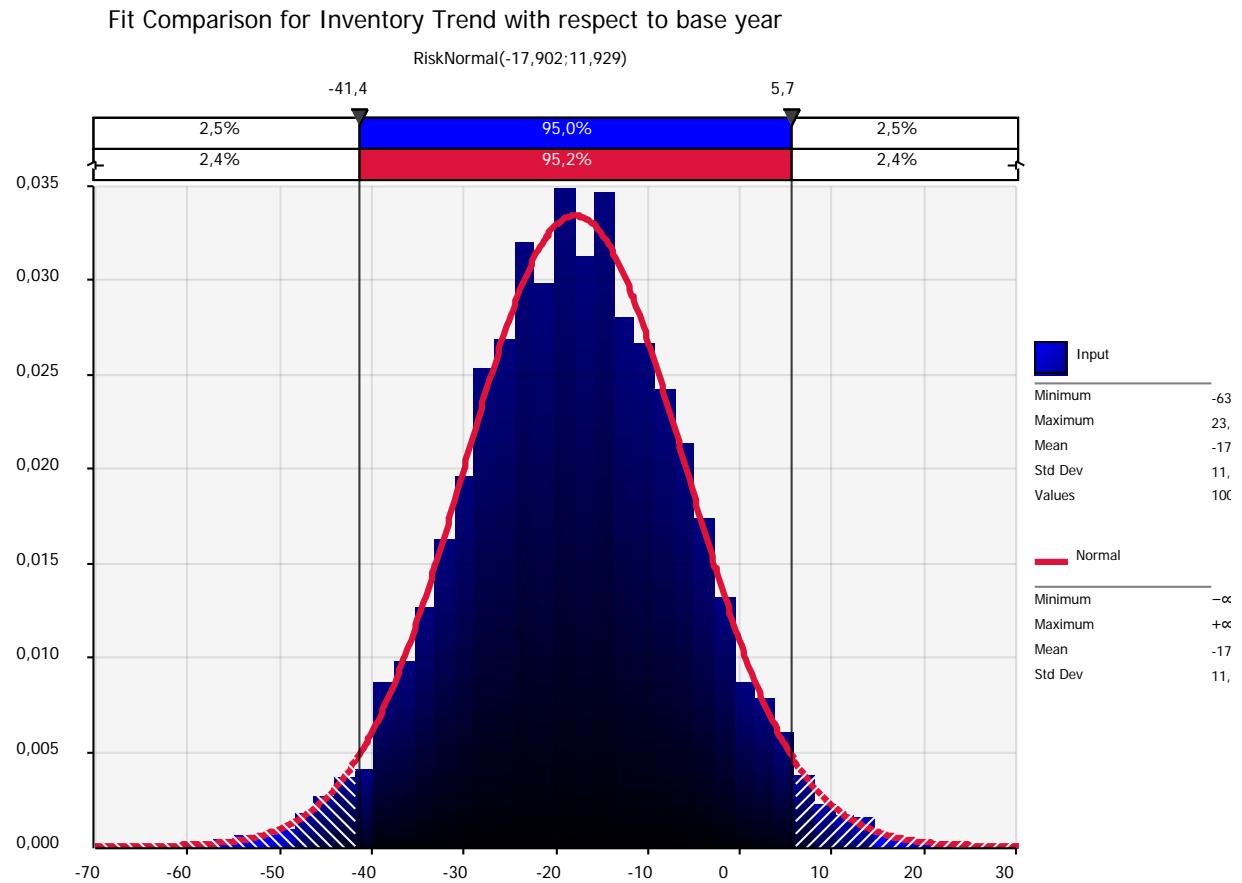


Figure A2.1-3: shows the distribution of trend for year 2013 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2. TABLE 3.3 OF VOLUME 1 OF THE 2006 IPCC GUIDELINES

Table A2:2-1: Uncertainty estimates from the Monte Carlo simulation for year 2013 (IPCC 2006 Table 3.3)

REPORTING OF APPROACH 2 UNCERTAINTY ANALYSIS USING GENERAL REPORTING TABLE FOR UNCERTAINTY Emissions, removals and uncertainties are from National Inventory of Croatia for year 2013													
YEAR 2013													
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IPCC Category	Gas	Base year emissions or removals	Year t emissions or removals	Activity data uncertainty		Emission factor uncertainty		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. Energy													
1.A.1. Fuel combustion/Energy Industries		7,189.55	5,132.17										
Liquid Fuels	CO2	4,589.96	1,114.29	-5	5	-5	5	6.90	7.09	0.00020	-74.81	-2.39	2.73
Liquid Fuels	CH4	3.70	0.73	-5	5	-50	50	50.14	50.57	0.00000	-87.18	-6.97	15.89
Liquid Fuels	N2O	8.82	1.99	-5	5	-200	200	93.65	136.56	0.00000	-68.80	-29.20	479.05
Solid Fuels	CO2	809.18	2,202.07	-5	5	-5	5	6.96	7.16	0.00073	166.77	-25.43	27.96
Solid Fuels	CH4	0.21	0.58	-5	5	-50	50	50.12	50.48	0.00000	-75.56	-13.31	29.01
Solid Fuels	N2O	2.91	10.41	-5	5	-200	200	93.63	137.00	0.00001	197.87	-278.59	4336.21
Gaseous Fuels	CO2	1,767.61	1,793.15	-5	5	-5	5	6.97	7.13	0.00048	1.59	-9.75	10.59
Gaseous Fuels	CH4	1.51	1.90	-5	5	-50	50	50.46	50.91	0.00000	51.95	-83.95	185.54
Gaseous Fuels	N2O	5.66	7.05	-5	5	-200	200	93.62	135.95	0.00000	16.57	-108.92	1673.65
Biomass	CH4		0.00	-5	5	-50	50	50.14	50.60	0.00000			2
Biomass	N2O		0.00	-5	5	-200	200	93.55	137.52	0.00000			2
1.A.2. Fuel combustion/Manufacturing Industries and Construction		5,529.04	2,392.78										
Liquid Fuels	CO2	2,158.01	975.00	-5	5	-5	5	6.83	7.05	0.00014	-54.82	-4.29	4.73
Liquid Fuels	CH4	2.10	0.84	-5	5	-50	50	50.32	50.54	0.00000	-59.82	-22.21	48.33
Liquid Fuels	N2O	4.97	1.98	-5	5	-200	200	93.68	135.77	0.00000	-60.16	-37.22	613.62
Solid Fuels	CO2	1,702.51	464.06	-5	5	-5	5	6.98	7.25	0.00003	-72.74	-2.58	2.89
Solid Fuels	CH4	4.20	1.20	-5	5	-50	50	49.87	50.22	0.00000	-71.43	-15.75	35.75
Solid Fuels	N2O	7.50	2.14	-5	5	-200	200	93.67	135.92	0.00000	-71.43	-26.74	428.16
Gaseous Fuels	CO2	1,641.15	889.23	-5	5	-5	5	6.99	7.08	0.00012	-45.82	-5.25	5.65
Gaseous Fuels	CH4	0.73	0.40	-5	5	-50	50	49.86	50.43	0.00000	-46.06	-29.60	66.10
Gaseous Fuels	N2O	0.88	0.47	-5	5	-200	200	93.60	136.83	0.00000	-46.06	-50.30	827.76
Other Fossil Fuels	CO2		52.37	0	0	0	0						2
Other Fossil Fuels	CH4		0.27	0	0	0	0						2
Other Fossil Fuels	N2O		0.44	0	0	0	0						2
Biomass	CH4	2.70	1.69	-5	5	-50	50	50.06	50.83	0.00000	-37.41	-34.29	75.63
Biomass	N2O	4.29	2.69	-5	5	-200	200	93.57	137.45	0.00000	-37.41	-58.83	901.88
1.A.3. Fuel combustion/Transport		4,032.07	5,749.69										
Railways	CO2	140.08	74.06	-5	5	-5	5	6.99	7.14	0.00000	-47.13	-5.01	5.51
Domestic Aviation	CO2	156.29	103.98	-5	5	-5	5	7.02	7.16	0.00000	-33.47	-6.36	7.00
Domestic Navigation - Liquid Fuels	CO2	134.38	121.85	-5	5	-5	5	6.97	7.22	0.00000	-9.33	-8.52	9.60

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		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-)%	(+)%	(-)%	(+)%	(-)%	(+)%	fraction	(% of base year)	(-)%	(+)%	Approach 2
Road Transportation	CO2	3,505.87	5,379.94	-5	5	-5	5	6.88	7.04	0.00423	53.46	-14.81	16.21	
Railways	CH4	0.17	0.08	-5	5	-50	50	50.08	50.59	0.00000	-52.41	-26.25	59.05	
Domestic Aviation	CH4	0.03	0.02	-5	5	-50	50	49.96	50.07	0.00000	-33.45	-36.97	82.31	
Domestic Navigation - Liquid Fuels	CH4	0.32	0.29	-5	5	-50	50	50.22	50.20	0.00000	-9.16	-50.61	111.91	
Road Transportation	CH4	40.61	13.42	-5	5	-40	-40							
Railways	N2O	13.25	8.52	-5	5	-200	200	93.61	136.73	0.00001	-35.70	-60.45	944.87	
Domestic Aviation	N2O	1.30	0.87	-5	5	-200	200	93.54	136.18	0.00000	-33.45	-62.39	951.96	
Domestic Navigation - Liquid Fuels	N2O	1.08	0.98	-5	5	-200	200	93.58	136.21	0.00000	-9.16	-84.86	1307.77	
Road Transportation	N2O	38.69	45.69	-5	5	-150	150	91.79	121.91	0.00010	18.12	-108.31	1295.63	
1.A.4. Fuel combustion/Other Sectors		3,859.66	2,934.65											
Liquid Fuels	CO2	2,455.23	1,257.06	-5	5	-5	5	6.96	7.01	0.00023	-48.80	-4.89	5.35	
Liquid Fuels	CH4	7.79	3.96	-5	5	-50	50	49.97	50.50	0.00000	-49.19	-28.09	60.28	
Liquid Fuels	N2O	5.27	2.64	-5	5	-200	200	93.76	136.48	0.00000	-49.97	-46.98	775.30	
Solid Fuels	CO2	524.39	17.85	-5	5	-5	5	6.98	7.26	0.00000	-96.60	-0.32	0.35	
Solid Fuels	CH4	33.39	1.26	-5	5	-50	50	50.19	50.95	0.00000	-96.23	-2.08	4.66	
Solid Fuels	N2O	2.38	0.08	-5	5	-200	200	93.63	137.40	0.00000	-96.62	-3.16	48.96	
Gaseous Fuels	CO2	663.37	1,504.74	-5	5	-5	5	7.00	7.17	0.00033	126.83	-21.54	23.47	
Gaseous Fuels	CH4	1.49	3.35	-5	5	-50	50	49.85	50.64	0.00000	125.04	-122.60	267.76	
Gaseous Fuels	N2O	0.52	0.80	-5	5	-200	200	93.64	136.38	0.00000	54.84	-145.33	2167.30	
Biomass	CH4	143.10	123.32	-5	5	-50	50	49.65	50.40	0.00011	-13.82	-48.30	104.52	
Biomass	N2O	22.74	19.60	-5	5	-200	200	93.69	135.66	0.00003	-13.82	-80.70	1280.07	
1.B.1. Fugitive Emissions from Fuels/Solid Fuels		59.64	0.00											
Fugitive emissions from Solid Fuels	CH4	59.64		-5	5	-250	250							
1.B.2. Fugitive Emissions from Fuels/Oil and Natural Gas		4,232.66	1,913.42											
Oil-Production	CO2	159.15	35.46	-5	5	-50	50	49.91	50.26	0.00001	-77.72	-12.31	26.59	
Oil-Exploration	CO2	252.12	56.17	-5	5	-50	50	50.22	50.16	0.00002	-77.72	-12.42	27.94	
Oil-Transport	CO2	0.01	0.00	-5	5	-50	50	50.07	50.54	0.00000	-44.11	-30.77	66.51	
Natural Gas-Processing	CO2	140.88	131.91	-5	5	-100	100	84.90	95.77	0.00045	-6.37	-80.57	529.69	
Natural Gas-Production	CO2	418.92	431.97	-5	5	-100	100	84.83	96.03	0.00487	3.12	-88.69	612.63	
Natural Gas-Transmission and Storage	CO2	0.02	0.02	-5	5	-100	100	84.66	94.54	0.00000	4.59	-89.59	611.14	
Natural Gas-Distribution	CO2	0.04	0.08	-5	5	-100	100	84.73	95.35	0.00000	107.83	-178.78	1255.58	
Oil-Production	CH4	2,420.72	539.32	-5	5	-50	50	50.10	50.58	0.00217	-77.72	-12.26	26.79	
Oil-Exploration	CH4	133.40	29.72	-5	5	-100	100	84.62	95.79	0.00002	-77.72	-19.09	134.66	
Oil-Transport	CH4	1.52	0.85	-5	5	-50	50	50.20	50.39	0.00000	-44.11	-30.66	66.74	
Natural Gas-Production	CH4	604.15	565.69	-5	5	-100	100	84.70	94.83	0.00835	-6.37	-81.11	527.90	
Natural Gas-Processing	CH4	12.51	11.71	-5	5	-100	100	84.57	95.34	0.00000	-6.37	-79.84	580.49	
Natural Gas-Transmission and Storage	CH4	71.63	74.92	-5	5	-100	100	84.73	94.75	0.00015	4.59	-88.99	632.34	

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		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-)%	(+)%	(-)%	(+)%	(-)%	(+)%	fraction	(% of base year)	(-)%	(+)%	Approach 2
Natural Gas-Distribution	CH4	17.07	35.47	-5	5	-100	100	84.57	95.13	0.00003	107.83	-177.49	1257.93	
Oil-Exploration	N2O	0.55	0.12	-5	5	-50	50	50.35	50.45	0.00000	-77.72	-12.27	27.14	
2. Industrial processes and product use														
2.A.1. Mineral industry /Cement Production		1,085.79	1,141.03											
Cement Production	CO2	1,085.79	1,141.03	2	2	2	2	2.82	2.87	0.00003	5.09	-4.13	4.20	
2.A.2. Mineral industry /Lime Production		153.44	96.73											
Lime Production	CO2	153.44	96.73	2	2	2	2	2.85	2.85	0.00000	-36.96	-2.52	2.56	
2.A.3. Mineral industry /Glass Production		35.87	29.48											
Glass Production	CO2	35.87	29.48	2	2	2	2	2.81	2.89	0.00000	-17.81	-3.20	3.36	
2.A.4. Mineral industry /Other Process Uses of Carbonates		5.77	24.17											
Ceramics	CO2	5.77	19.04	7.5	7.5	5	5	8.92	9.32	0.00000	229.78	-39.97	45.47	
Other uses of Soda Ash	CO2		5.12	7.5	7.5	5	5	8.82	9.26	0.00000				
2.B.1. Chemical industry /Ammonia Production		552.40	486.29											
Ammonia Production	CO2	552.10	485.96	2	2	2	2	2.85	2.83	0.00002	8.99	-4.31	4.45	
Ammonia Production	CH4	0.14	0.15	5	5	50	50	50.10	50.34	0.00000	11.00	-61.57	135.24	
Ammonia Production	N2O	0.16	0.18	5	5	200	200	93.60	134.75	0.00000	11.00	-103.78	1591.09	
2.B.2. Chemical industry /Nitric Acid Production		754.27	240.27											
Nitric Acid Production	N2O	754.27	240.27	2	2	2	2	2.81	2.81	0.00000	-68.14	-5.47	7.96	
2.B.8. Chemical industry /Petrochemical and carbon black production		225.26	0.00											
Ethylene Dichloride and Vinyl Chloride Monomer	CO2	13.88												2
Carbon Black	CO2	80.23												2
Ethylene	CO2	125.65												2
Methanol	CO2		0.00	7.5	7.5	30	30	30.46	31.30	0.00000				2
Carbon Black	CH4	0.05												2
Ethylene	CH4	5.45												2
Methanol	CH4		0.00	7.5	7.5	30	30	30.62	31.41	0.00000				2
2.C.1. Metal industry/Iron and steel production		45.97	16.60											
Steel	CO2	45.97	16.60	5	5	5	5	7.12	7.10	0.00000	-63.88	-5.13	6.34	
2.C.2. Metal industry/Ferroalloys Production		177.70	0.00											
Ferroalloys Production	CO2	173.80												2

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		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-)%	(+)%	(-)%	(+)%	(-)%	(+)%	fraction	(% of base year)	(-)%	(+)%	Approach 2
Ferroalloys Production	CH4	3.90												2
<i>2.C.3. Metal industry/Aluminium production</i>		1,359.04	0.00											
CO2 Emissions	CO2	118.80												2
Aluminium production	PFCs	362.33												2
Aluminium production	PFCs	877.91												2
<i>2.D.1. Non-energy products from fuels and solvent use/Lubricant use</i>		288.57	107.14											
Lubricant use	CO2	288.57	107.14	5	5	50	50	50.44	50.61	0.00009	-62.87	-20.35	44.72	
<i>2.D.3. Non-energy products from fuels and solvent use/Other\ Other\ Urea based CC</i>		1.75	5.25											
Other\ Other\ Urea based CC	CO2	1.75	5.25	5	5	5	5	6.94	7.17	0.00000	201.01	-29.24	31.23	
<i>2.D.3. Non-energy products from fuels and solvent use/Other\ Solvent use</i>		122.96	39.21											
Other\ Solvent use	CO2	122.96	39.21	NA	NA	50	50							
<i>2.F.1. Product uses as substitutes for ODS(2)/Refrigeration and Air conditioning</i>		0.00	564.35											
Commercial Refrigeration	HFC-125		56.13	50	50	50	50	62.37	81.09	0.00005				2
Industrial Refrigeration	HFC-125		19.52	50	50	50	50	61.78	78.61	0.00001				2
Stationary Air-Conditioning	HFC-125		16.49	50	50	50	50	62.59	80.55	0.00000				2
Commercial Refrigeration	HFC-134a		2.08	50	50	50	50	62.07	80.28	0.00000				2
Domestic Refrigeration	HFC-134a		0.40	50	50	50	50	63.02	79.52	0.00000				2
Industrial Refrigeration	HFC-134a		5.59	50	50	50	50	62.08	81.60	0.00000				2
Transport Refrigeration	HFC-134a		211.00	50	50	50	50	62.52	81.62	0.00069				2
Mobile Air-Conditioning	HFC-134a		155.51	50	50	50	50	62.50	79.03	0.00037				2
Stationary Air-Conditioning	HFC-134a		4.72	50	50	50	50	62.32	80.92	0.00000				2
Commercial Refrigeration	HFC-143a		84.72	50	50	50	50	62.62	79.81	0.00011				2
Industrial Refrigeration	HFC-143a		0.43	50	50	50	50	62.79	80.18	0.00000				2
Industrial Refrigeration	HFC-23		0.99	50	50	50	50	61.41	80.99	0.00000				2
Industrial Refrigeration	HFC-32		3.60	50	50	50	50	62.55	79.63	0.00000				2
Stationary Air-Conditioning	HFC-32		3.10	50	50	50	50	62.15	80.63	0.00000				2
Domestic Refrigeration	PFC-116		0.06	50	50	50	50	62.67	79.54	0.00000				2
<i>2.F.3. Product uses as substitutes for ODS(2)/Fire Protection</i>			4.27											

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		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-)%	(+)%	(-)%	(+)%	(-)%	(+)%	fraction	(% of base year)	(-)%	(+)%	Approach 2
Fire Protection	HFC-125		0.45	50	50	50	50	63.33	79.46	0.00000				2
Fire Protection	HFC-227ea		3.23	50	50	50	50	62.05	81.91	0.00000				2
Fire Protection	HFC-236fa		0.59	50	50	50	50	62.60	82.23	0.00000				2
<i>2.F.4. Product uses as substitutes for ODS(2)/Aerosols</i>			9.15											
Metered Dose Inhalers	HFC-134a		9.15	50	50	50	50	61.67	79.96	0.00000				2
<i>2.G.1. Other product manufacture and use/Electrical Equipment</i>		10.45	6.58											
Electrical Equipment	SF6	10.45	6.58	50	50	50	50	62.20	80.19	0.00000	-37.03	-42.46	134.07	
<i>2.G.3. Other product manufacture and use/N2O from Product Uses</i>		33.38	42.06											
Other\Propellant for pressure and aerosol products	N2O	0.60	0.03	50	50	50	50	63.07	79.75	0.00000	-95.02	-3.38	10.29	
Medical Applications	N2O	32.78	42.04	50	50	50	50	62.21	81.43	0.00003	28.23	-86.43	264.48	
<i>3. Agriculture</i>														
<i>3.A.1. Enteric fermentation/Cattle</i>		2,344.07	686.26											
Mature dairy cattle	CH4	1,943.45	469.26	10	10	20	20	22.08	22.99	0.00033	-75.85	-8.22	14.25	
Growing cattle	CH4	277.88	136.75	10	10	20	20	21.99	22.98	0.00003	-50.79	-13.39	18.88	
Other mature cattle	CH4	122.74	80.25	10	10	20	20	21.50	23.65	0.00001	-34.62	-17.98	24.59	
<i>3.A.2. Enteric fermentation/Sheep</i>		93.88	120.28											
Sheep	CH4	93.88	120.28	10	10	20	20	21.93	23.12	0.00002	28.13	-35.38	48.67	
<i>3.A.3. Enteric fermentation/Swine</i>		19.87	18.21											
Breeding swine	CH4	5.80	4.37	10	10	20	20	21.72	23.00	0.00000	-24.73	-20.66	27.65	
Market swine	CH4	14.07	13.85	10	10	20	20	21.75	22.37	0.00000	-1.56	-27.31	36.76	
<i>3.A.4. Enteric fermentation/Other livestock</i>		43.30	15.10											
Horses	CH4	4.25	0.82	10	10	20	20	21.83	23.40	0.00000	-80.75	-6.49	11.41	
Mules and Asses	CH4	17.55	5.65	10	10	20	20	21.88	23.12	0.00000	-67.78	-10.81	19.04	
Goats	CH4	21.50	8.63	10	10	20	20	21.63	22.90	0.00000	-59.88	-10.86	15.31	
<i>3.B.1. Manure Management/Cattle</i>		371.28	166.04											
Mature dairy cattle	CH4	205.99	76.50	10	10	20	20	22.01	22.61	0.00001	-62.86	-12.32	22.11	
Growing cattle	CH4	63.85	47.90	10	10	20	20	21.70	22.80	0.00000	-24.97	-20.82	27.58	
Other mature cattle	CH4	9.58	7.98	10	10	20	20	21.73	22.37	0.00000	-16.79	-22.86	31.11	
Mature dairy cattle	N2O	56.94	15.01	10	10	50	100	84.91	94.90	0.00001	-73.65	-22.45	160.95	
Growing cattle	N2O	30.36	15.99	10	10	50	100	84.96	96.46	0.00001	-47.32	-44.74	316.90	

REPORTING OF APPROACH 2 UNCERTAINTY ANALYSIS USING GENERAL REPORTING TABLE FOR UNCERTAINTY Emissions, removals and uncertainties are from National Inventory of Croatia for year 2013														
YEAR 2013														
A	B	C	D	E		F		G		H	I	J	K	
IPCC Category	Gas	Base year emissions or removals	Year t emissions or removals	Activity data uncertainty		Emission factor uncertainty		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)	(-)%	(+)%	Approach 2
Other mature cattle	N2O	4.56	2.66	10	10	50	100	84.57	96.66	0.00000	-41.57	-50.06	344.03	
<i>3.B.2. Manure Management/Sheep</i>		4.38	3.84											
Sheep	CH4	2.22	1.83	10	10	20	20	21.46	22.49	0.00000	-17.44	-22.49	30.87	
Sheep	N2O	2.17	2.01	10	10	50	100	84.87	95.81	0.00000	-7.24	-79.84	565.27	
<i>3.B.3. Manure Management/Swine</i>		76.02	41.62											
Breeding swine	CH4	22.76	12.52	10	10	20	20	21.88	22.83	0.00000	-44.98	-15.17	20.78	
Market swine	CH4	36.33	26.14	10	10	20	20	21.51	23.04	0.00000	-28.04	-19.44	26.78	
Market swine	N2O	6.35	1.09	10	10	50	100	84.73	96.51	0.00000	-82.86	-14.64	104.42	
Breeding swine	N2O	10.58	1.87	10	10	50	100	84.75	95.00	0.00000	-82.36	-15.07	101.73	
<i>3.B.4. Manure Management/Other livestock</i>		33.28	12.63											
Horses	CH4	0.56	0.11	10	10	20	20	21.58	22.49	0.00000	-80.75	-6.54	11.59	
Poultry	CH4	9.76	3.89	10	10	20	20	21.76	22.74	0.00000	-60.16	-10.90	14.98	
Goats	CH4	0.53	0.21	10	10	20	20	21.66	23.35	0.00000	-59.88	-10.78	15.25	
Mules and Asses	CH4	1.29	0.70	10	10	20	20	21.59	23.61	0.00000	-45.50	-18.26	32.81	
Poultry	N2O	19.67	6.76	10	10	50	100	84.70	96.65	0.00000	-65.65	-29.11	203.77	
Horses	N2O	1.20	0.62	10	10	50	100	84.91	95.29	0.00000	-48.00	-44.32	336.87	
Mules and Asses	N2O	0.06	0.03	10	10	50	100	84.88	96.16	0.00000	-46.70	-45.93	330.69	
Goats	N2O	0.21	0.31	10	10	50	100	84.97	95.48	0.00000	47.05	-126.16	889.65	
<i>3.B.5. Manure Management/Indirect N2O emissions</i>		191.75	94.28											
Total N volatilised as NH3 and NOX	N2O	191.75	94.28	10	10	30	30	30.67	32.27	0.00003	-50.83	-17.86	29.00	
<i>3.D.1. Agricultural Soils/Direct N2O Emissions From Managed Soils</i>		1,162.15	828.03											
Urine and dung deposited by grazing animals	N2O	154.83	76.52	10	10	50	50	50.04	51.33	0.00004	-50.58	-27.31	62.91	
Organic N fertilizers	N2O	296.95	156.40	10	10	30	30	30.92	31.86	0.00007	-47.24	-19.41	31.71	
Inorganic N fertilizers	N2O	503.00	414.47	20	20	30	30	34.14	38.91	0.00067	-17.60	-34.04	57.68	
Crop residues	N2O	197.31	170.59	20	20	30	30	34.29	38.17	0.00011	-13.55	-35.80	58.80	
Cultivation of organic soils	N2O	10.06	10.06	10	10	500	500	95.47	166.19	0.00003	0.00	-95.65	2091.17	
<i>3.D.2. Agricultural Soils/Indirect N2O Emissions From Managed Soils</i>		376.50	261.67											
Atmospheric deposition	N2O	129.66	83.13	20	20	250	250	94.45	152.48	0.00075	-35.88	-60.53	1026.90	
Nitrogen leaching and run-off	N2O	246.85	178.53	20	20	400	400	95.36	167.13	0.00757	-27.67	-68.77	1398.18	
<i>3.G. Liming</i>		0.00	9.60											

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YEAR 2013														
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		Gg CO ₂ equivalent	Gg CO ₂ equivalent	(-)%	(+)%	(-)%	(+)%	(-)%	(+)%	fraction	(% of base year)	(-)%	(+)%	Approach 2
Liming	CO2		9.60	50	50	50	50	0.00	0.00	0.00000				1.2
<i>3.H. Urea Application</i>		50.02	60.39											
Urea Application	CO2	50.02	60.39	20	20	50	50	51.33	58.10	0.00003	20.73	-69.71	160.86	
<i>4. Land use, land use change and forestry</i>														
<i>4(III). Direct N2O emissions from N mineralization/immobilization</i>		4.67	10.30											
Direct N2O emissions from N mineralization/immobilization	N2O	4.67	10.30					9111.90	9175.52	0.00000	177.35	-3947.93	3132.84	1.3
<i>4(V). Biomass Burning</i>		2.09	3.40											
Biomass Burning	CO2	IE	IE							0.00000				2
Biomass Burning	CH4	1.23	1.93					132.29	54.12	0.00000	-88.97	-87.55	111.45	1.3
Biomass Burning	N2O	0.86	1.47					49.14	61.84	0.00000	84.80	-106.02	265.85	1.3
<i>4.A.1. Forest land/Forest Land Remaining Forest Land</i>		-5,588.83	-5,290.75											
Forest Land Remaining Forest Land	CO2	-5,588.83	-5,290.75					50.07	196.21	0.86041	-40.61	-1274.09	1209.21	1.3
<i>4.A.2. Forest land/Land Converted to Forest Land</i>		-39.28	-200.75											
Land Converted to Forest Land	CO2	-39.28	-200.75					269.58	189.90	0.00628	535.58	-1427.85	3697.95	1.3
<i>4.B.1. Cropland/Cropland Remaining Cropland</i>		194.50	113.13											
Cropland Remaining Cropland	CO2	194.50	113.13					880.81	840.92	0.02802	-48.66	-1025.83	968.65	1.3
<i>4.B.2. Cropland/Land Converted to Cropland</i>		23.48	47.42											
Land Converted to Cropland	CO2	23.48	47.42					2075.67	1977.49	0.02730	83.11	-3705.52	3418.87	1.3
<i>4.C.1. Grassland/Grassland Remaining Grassland</i>		2.07	2.07											
Grassland Remaining Grassland	CO2	2.07	2.07					94.07	94.14	0.00000	0.05	-119.41	502.19	1.3
<i>4.C.2. Grassland/Land Converted to Grassland</i>		-106.04	-105.57											
Land Converted to Grassland	CO2	-106.04	-105.57					554.31	708.37	0.01311	-67.34	-2556.17	2814.21	1.3
<i>4.D.2. Wetland/Land Converted to Wetlands</i>		30.00	14.13											
Land Converted to Wetlands	CO2	30.00	14.13					176.07	355.34	0.00004	-50.95	-191.40	343.22	1.3
<i>4.E.2. Settlements/Land Converted to Settlements</i>		240.31	545.56											
Land Converted to Settlements	CO2	240.31	545.56					88.86	192.68	0.01741	110.65	-896.24	1328.84	1.3
<i>4.G. Harvested wood products</i>		-299.62	-264.12											
Harvested wood products	CO2	-299.62	-264.12	15	15	50	50	58.98	85.20	0.00107	-0.71	-108.62	501.13	3
<i>5. Waste</i>														

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YEAR 2013														
A	B	C	D	E		F		G		H	I	J	K	
IPCC Category	Gas	Base year emissions or removals	Year t emissions or removals	Activity data uncertainty		Emission factor uncertainty		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)	(-)%	(+)%	Approach 2
<i>5.A.1. Solid waste disposal/Managed waste disposal sites</i>		14.30	701.00											
Anaerobic	CH4	14.30	701.00	50	50	50	50	62.94	81.94	0.01132	5932.88	-4085.19	12256.58	
<i>5.A.2. Solid waste disposal/Unmanaged waste disposal sites</i>		274.54	246.21											
Unmanaged waste disposal sites	CH4	274.54	246.21	50	50	50	50	62.47	81.11	0.00094	-10.32	-61.08	183.41	
<i>5.B.1. Biological treatment of solid waste/Composting</i>		0.00	7.78											
Composting	CH4		4.11	50	50	100	100	86.62	119.88	0.00000				2
Composting	N2O		3.67	50	50	110	110	88.29	131.75	0.00000				2
<i>5.B.2. Biological treatment of solid waste/Aerobic digestion at biogas facilities</i>		0.00	0.47											
Anaerobic digestion at biogas facilities	CH4		0.47	50	50	400	400	95.51	183.72	0.00000				2
<i>5.C.1. Incineration and open burning of waste/Waste incineration</i>		0.54	0.04											
Other\Clinical Waste	CO2	0.12	0.04	50	50	30	30	53.54	63.67	0.00000	-65.71	-20.23	49.19	
Other\Industrial Solid Wastes	CO2	0.41												2
Other\Industrial Solid Wastes	N2O	0.01												2
<i>5.D.1. Wastewater treatment and discharge/Domestic wastewater</i>		237.86	200.44											
Domestic wastewater	CH4	141.22	112.14	30	30	30	30	39.00	45.09	0.00007	-20.59	-37.24	69.30	
Domestic wastewater	CH4	96.64	88.30	30	30	30	30	39.34	45.25	0.00004	-8.64	-42.25	79.30	
<i>5.D.3. Wastewater treatment and discharge/Other</i>		67.00	83.59											
Nitrous Oxide Emissions from Wastewater	N2O	67.00	83.59	50	50	50	50	61.75	78.42	0.00004	24.76	-83.88	248.83	
TOTAL	CO2eq	29,579.31	19,367.59					28.65	28.71	1.00	-17.90	-23.52	23.57	

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 in Monte Carlo simulation for LULUCF sector

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	1995	2000	2005	2010	2011	2012	2013
Fuel consumption	UNIT								
Hard coal	1000 t	253.70	96.20	569.80	887.50	915.60	957.10	855.50	932.60
Fuel oil	1000 t	570.40	327.80	283.40	284.00	15.10	58.50	60.10	18.90
Light heating oil	1000 t	0.30	24.10	0.20	3.00	0.90	0.90	1.20	0.90
Natural gas	1000000 m ³	201.70	114.10	155.80	36.30	24.00	27.00	14.00	2.70
Coke oven gas	1000000 m ³	24.50							
Biogas	PJ				0.11	0.02	0.00	0.01	0.17
Other biomass	PJ					0.00	0.00	0.00	0.00
Net calorific values									
NCV for hard coal	MJ/kg	25.14	27.63	25.58	25.10	24.13	24.25	24.35	24.96
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m ³	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	PJ/PJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NCV for other biomass									
EMISSION FACTORS		1990	1995	2000	2005	2010	2011	2012	2013
EF CO ₂ 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
EF CO ₂ - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO ₂ - Light heating oil	t/TJ	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
EF CO ₂ - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO ₂ - Biogass	t/TJ	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
EF CH ₄ 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
EF CH ₄ - Fuel oil	kg/TJ	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
EF CH ₄ - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH ₄ - Gas coke	kg/TJ	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
EF CH ₄ - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N ₂ O 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
EF N ₂ O - Fuel oil	kg/TJ	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
EF N ₂ O - Natural gas	kg/TJ	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
EF N ₂ O - Biogass	kg/TJ	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

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

ACTIVITY DATA	UNIT	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption									
Hard coal	1000 t								
Fuel oil	1000 t	118.00	337.10	108.60	162.00	108.30	90.90	49.60	27.40
Light heating oil	1000 t	0.00	0.90	0.90	1.50	0.10	0.00	0.60	0.00
Natural gas	1000000 m3	315.50	103.50	363.40	479.00	649.90	652.10	673.90	580.40
Coke oven gas	1000000 m3								
Biogas	PJ				0.00	0.14	0.17	0.34	0.41
Other biomass	TJ					1.90	803.20	1003.50	1146.10
Net calorific values									
NCV for hard coal	MJ/kg	25.14	27.63	25.58	25.10	24.13	24.25	24.35	24.96
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	PJ/PJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NCV for other biomass									
EMISSION FACTORS		1990	1995	2000	2005	2010	2011	2012	2013
EF CO2 t/TJ	t/TJ								
EF CO2 - Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogass	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CH4 kg/TJ	kg/TJ								
EF CH4 - Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	3.67	2.20	2.73	2.87	3.67	3.58	3.51	3.24
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N2O kg/TJ	kg/TJ								
EF N2O - Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

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

ACTIVITY DATA	UNIT	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption									
Hard coal	1000 t					0.00	0.00	0.00	0.00
Fuel oil	1000 t	0.00	35.60	37.00	39.00	23.20	23.50	13.70	4.50
Light heating oil	1000 t	0.00	6.00	4.40	6.70	4.90	5.30	3.10	3.70
Natural gas	1000000 m3	0.00	36.20	53.00	71.30	86.50	76.00	76.60	85.90
Coke oven gas	1000000 m3								
Biogas	PJ					0.00	0.00	0.00	0.00
Other biomass	PJ					0.00	0.00	0.00	0.00
Gas works gas	1000000 m3			1.46					
Liquified petroleum gas	1000 t	0.00	1.50						
Net calorific values									
NCV for hard coal	MJ/kg	25.14	27.63	25.58	25.10	24.13	24.25	24.35	24.96
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
NCV for coke oven gas	MJ/kg	17.91							
NCV for biogas	PJ/PJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NCV for other biomass	PJ/PJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NCV for gas works gas	MJ/m3			21.47					
NCV for LPG	MJ/kg	46.89	46.89						
EMISSION FACTORS		1990	1995	2000	2005	2010	2011	2012	2013
EF CO2 t/TJ	t/TJ								
EF CO2 - Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogas	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CO2 - Gas works gas	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - LPG	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CH4 kg/TJ	kg/TJ								
EF CH4 - Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogass	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF CH4 - Gas works gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - LPG	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O kg/TJ	kg/TJ								
EF N2O - Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - Gas works gas	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

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

Refining - transformation		1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption									
Fuel oil (1000 t)									
Fuel oil (1000 t)	1000 t	227.20	199.50	193.40	254.00	244.30	196.30	153.30	108.40
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	1000 t	0.00	0.00	0.00	9.50	0.00	0.00	2.70	1.50
NCV for LPG (MJ/kg)	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Petroleum coke (1000 t)	1000 t	0.00	0.00	0.00	70.70	55.90	43.90	54.50	40.80
NCV for petroleum coke (MJ)	MJ/kg	33.57	29.31	31.00	31.00	31.00	31.00	31.00	31.00
Refinery gas (1000 t)	1000 t	58.40	27.70	40.70	241.10	161.50	267.10	293.80	175.40
NCV for refinery gas (MJ/kg)	MJ/kg	48.57	48.57	48.57	48.57	48.57	48.57	46.00	46.00
Natural gas (1000000 m3)	1000 t	7.30	7.10	0.20	1.20	16.60	82.40	4.90	150.90
NCV for natural gas (MJ/m3)	MJ/kg	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Total fuel cunsumption (TJ)	TJ	12,215.86	9,604.69	9,756.35	24,596.44	19,959.77	25,024.84	21,658.63	18,890.73
Emission factors									
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - petroleum coke (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - refinery gas (t/TJ)	t/TJ	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60
EF CO2 - natural gas (t/TJ)	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	Gg	884.06	711.62	715.86	1,729.54	1,428.85	1,660.67	1,453.44	1,229.54
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - LPG (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - petroleum coke (kg)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - refinery gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - natural gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	Mg	30.48	25.64	25.30	45.01	39.60	40.80	33.98	27.60
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - petroleum coke (kg)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - refinery gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	Mg	5.79	4.97	4.86	10.63	9.33	8.35	7.61	5.84

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
LPG (1000 t)								
NCV for LPG (MJ/kg)								
Gas Coke (1000000 m3)	107.40							
NCV for gas coke (MJ/m3)	17.91							
Light heating oil (1000 t)		0.10						
NCV for light heating oil (MJ/kg)		42.71						
Natural gas (1000000 m3)								
NCV for natural gas (MJ/m3)								
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Total fuel cunsumption (TJ)	1,923.53	4.27	0.00	0.00	0.00	0.00	0.00	0.00
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	205.82	0.32	0.00	0.00	0.00	0.00	0.00	0.00
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	1.92	0.01	0.00	0.00	0.00	0.00	0.00	0.00
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	0.19	0.00						

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
LPG (1000 t)	11.90		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	0.70	7.10	5.50				
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71				
Natural gas (1000000 m3)	391.10	204.70	140.00	175.50	241.70	156.30	114.40	120.20
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Total fuel cunsumption (TJ)	13,885.29	6,989.70	5,110.13	6,201.91	8,217.80	5,314.20	3,889.60	4,086.80
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	783.41	392.66	292.46	352.16	461.02	298.13	218.21	229.27
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	13.95	7.05	5.72	6.67	8.22	5.31	3.89	4.09
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	1.40	0.71	0.66	0.74	0.82	0.53	0.39	0.41

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2011	2012	2013
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	0.40					
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71					
Natural gas (1000000 m3)	0.90	1.10	0.50					
NCV for natural gas (MJ/m3)	34.00	34.00	34.00					
Other Kerosene prod (petrolej) (1000 t)								
NCV for petroleum (MJ/m3)								
Biogas								22.54
NCV for biogas (TJ/TJ)								1.00
Total fuel cunsumption (TJ)	60.50	54.48	34.08	0.00	0.00	0.00	0.00	0.00
Emissions								
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - other kp (t/TJ)	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15
EF CO2 - biogas (t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO2 Emission (Gg)	3.93	3.36	2.22	0.00	0.00	0.00	0.00	0.00
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - other kp (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - biogas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	0.12	0.09	0.07	0.00	0.00	0.00	0.00	0.00
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - biogas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	0.02	0.01	0.01	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
Anthracite	10 ³ t		0	0.6	1.6	0.2	1.3
Coking coal (kameni ugljen)	10 ³ t	0	1	0	0	0.3	0.2
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	28.7	22.9	35	31.5	15.5	15.7
Wood	10 ³ m ³			0.8	0.7	0.5	0.3
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	0	0	0	0.6
Coke oven coke	10 ³ t	5.2	4.3	3.7	2	1.6	2.5
Liquified petroleum gas	10 ³ t	1.7	4.2	1.4	2.1	2.8	3.8
Motor Gasoline	10 ³ t			0	0	0	0
Diesel	10 ³ t		0	0	0	0	0
Gas/Diesel oil	10 ³ t	4.1	2.7	0.9	1.2	0.7	0.6
Residual fuel oil	10 ³ t	1.3	2.7	1.2	1	1.3	1.1
Petroleum coke	10 ³ t	0	0	0.7	0	0.2	0
Refinery gas	10 ³ t	0	0	0	0	0	0
Other oil derivates	10 ³ t			0	0	0	0
Gas works gas	10 ⁹ m ³	0	0.031	0	0	0	0

1A2b Non-Ferrous metals							
Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10 ³ t		0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0	0	0	0	0	0
Lignite	10 ³ t	0	0	0	0	0	0
Natural gas	10 ⁶ m ³	4.6	1	0.4	1.2	1.1	0.9
Wood	10 ³ m ³			0.6	0.6	0.5	0.4
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	0	0	0	0
Coke oven coke	10 ³ t	0	0	0	0	0	0
Liquified petroleum gas	10 ³ t	0.5	2.1	3.1	3.8	5.1	5.3
Motor Gasoline	10 ³ t			0	0	0	0
Diesel	10 ³ t		0	0	0	0	0
Gas/Diesel oil	10 ³ t	1.4	0.2	0.1	0.2	0.8	0.8
Residual fuel oil	10 ³ t	0.5	4	1.2	1.4	0	0.0
Petroleum coke	10 ³ t	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0
Other oil derivates	10 ³ t			0	0	0	0
Gas works gas	10 ⁹ m ³	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2c Chemicals							
Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10^3 t		0.2	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	1.2	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	0	0	0	0	0	0
Lignite	10^3 t	0	0	0	0	0	0
Natural gas	10^6 m ³	139.3	183.1	227.6	210.2	143.4	129.8
Wood	10^3 m ³			0.1	0.1	0.1	0
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	0	0	0	0
Coke oven coke	10^3 t	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	5.7	0	0.1	0.1	0.1	0.1
Motor Gasoline	10^3 t			0	0	0	0
Diesel	10^3 t		0	0	0	0	0
Gas/Diesel oil	10^3 t	9	0.5	0.4	0.4	0.6	0.6
Residual fuel oil	10^3 t	99.7	73	3.6	4.9	1.3	1.1
Petroleum coke	10^3 t	0	0.7	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0
Other oil derivates	10^3 t			0	0	0	0
Gas works gas	10^9 m ³	0	0	0	0	0	0

1A2d Pulp, paper and print

Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10^3 t		0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	0	0	0	0	0	0
Lignite	10^3 t	0	0	0	0	0	0
Natural gas	10^6 m ³	74.3	69.2	68.8	65.8	58.8	53.3
Wood	10^3 m ³			13.2	0	0	0
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	169.4	151.8	193.2	422.6	145.9302
Coke oven coke	10^3 t	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	0	0.1	0.1	0.1	0.1	0.1
Motor Gasoline	10^3 t			0	0	0	0
Diesel	10^3 t		0	0	0	0	0
Gas/Diesel oil	10^3 t	0.9	1.6	0.1	0.1	0.1	0.1
Residual fuel oil	10^3 t	9.2	11.9	9.5	7.1	4.3	3.5
Petroleum coke	10^3 t	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0
Other oil derivates	10^3 t			0	0	0	0
Gas works gas	10^9 m ³	0	0.031	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2e Food Processing, Beverages and Tobacco							
Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10^3 t		0	0.7	0.5	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	1.2
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	39.2	47.7	39.9	41	35.7	35.7
Lignite	10^3 t	18.1	0	0	0	0	0
Natural gas	10^6 m ³	139.4	173	166.6	156.1	143.6	133.7
Wood	10^3 m ³			0.5	0.7	1.4	4.2
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	0	0	0	9.37
Coke oven coke	10^3 t	4.8	9.6	6.4	6.4	7	3
Liquified petroleum gas	10^3 t	0.6	1.6	1.3	1.5	1.2	1.4
Motor Gasoline	10^3 t			0	0	0	0
Diesel	10^3 t		0	0	0	0	0
Gas/Diesel oil	10^3 t	13.1	13.3	10	9.9	9.9	9.1
Residual fuel oil	10^3 t	29.1	32.4	22.9	23.6	12.2	9.8
Petroleum coke	10^3 t	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0
Other oil derivates	10^3 t			0	0	0	0
Gas works gas	10^9 m ³	0.1	0.1099	0	0	0	0

1A2f Non-Metalic Minerals

Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10^3 t		0.1	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	0	0	0	0	1	0
Lignite	10^3 t	0	0	0	0	0	0
Natural gas	10^6 m ³	54.5	73.4	56.4	55.4	48.4	50.1
Wood	10^3 m ³			0	0	0	0
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	0	0	0	0
Coke oven coke	10^3 t	7.6	7.7	0.1	0	0	0
Liquified petroleum gas	10^3 t	2.8	2.2	0.2	0.2	0.1	0.2
Motor Gasoline	10^3 t			0	0	0	0
Diesel	10^3 t		0.1	0	0	0	0
Gas/Diesel oil	10^3 t	0.3	2.7	0	0.1	0	0
Residual fuel oil	10^3 t	2.2	3.8	2.2	1.8	1.8	0.1
Petroleum coke	10^3 t	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0
Other oil derivates	10^3 t			0	0	0	0
Gas works gas	10^9 m ³	2.5	0.923	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction							
Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10 ³ t		0	0	0	0	1.3
Coking coal (kameni ugljen)	10 ³ t	68.8	168.3	193.4	162	145.9	120.7
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	3	5	1.1	18.4	0	4.5
Lignite	10 ³ t	2	0	0	0	0	1.3
Natural gas	10 ⁶ m ³	195.9	124.4	76.4	67.6	54.1	39.3
Wood	10 ³ m ³			0.3	0.2	0.5	0.2
Biogas	TJ			0	0	0	0
Wood waste	TJ	0	0	370.6	213.6	361.4	391.6
Coke oven coke	10 ³ t	0	0	17.3	18.7	19.5	19.4
Liquified petroleum gas	10 ³ t	4.1	4.6	3.2	2.8	3.1	2.7
Motor Gasoline	10 ³ t			0	0	0	0
Diesel	10 ³ t		15	14.3	13.5	12	12.3
Gas/Diesel oil	10 ³ t	24.9	7	4.3	3.5	3.1	2.6
Residual fuel oil	10 ³ t	160.9	53.1	7.3	5.6	5.5	4.4
Petroleum coke	10 ³ t	16.3	171.6	115.3	93.3	93.7	146.4
Refinery gas	10 ³ t	0	0	0	0	0	0
Other oil derivates	10 ³ t			0	0	0	0
Gas works gas	10 ⁹ m ³	0.1	0	0	0	0	0
Other folsil fuels	TJ			319.1	179.4	340.6	366.2
1A2g viii Other industry (analiza industrije+Opća potrošnja-Gradjevinarstvo)							
Fuel consumption	Jedinica	2001	2005	2010	2011	2012	2013
Anthracite	10 ³ t		0	0	0	0	0
Coking coal (kameni ugljen)	10 ³ t	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10 ³ t	0.1	4.2	0	0	0	0
Lignite	10 ³ t	0.1	0.2	0	0	0	0
Natural gas	10 ⁶ m ³	50.8	65.3	54.4	59.9	52.7	43.4
Wood	10 ³ m ³			39.4	44.5	45.6	44.4
Biogas	TJ			0	0	0	0
Wood waste	TJ	1979.4	2087.5	1456.677	1232.8	1306.1	1260.1
Coke oven coke	10 ³ t	0.7	1	0.1	0.1	0	0
Liquified petroleum gas	10 ³ t	4.4	8	6.8	5.5	5.8	5.5
Motor Gasoline	10 ³ t	7.8	6.9	5.1	4.7	4.2	4.1
Diesel	10 ³ t	68	110.6	102.2	98.3	90	87.4
Gas/Diesel oil	10 ³ t	8.2	23	12.2	11.6	10.7	9.8
Residual fuel oil	10 ³ t	22.6	17.7	8.4	5.8	5.7	3.6
Petroleum coke	10 ³ t	0	0	0	0	0	0
Refinery gas	10 ³ t	0	0	0	0	0	0
Other oil derivates	10 ³ t			0	0	0	0
Gas works gas	10 ⁹ m ³	4.2	2.456	0	0	0	0
1A2g vii Off-road vehicles and other machinery							
Fuel consumption	Jedinica	1990	1995	2000	2005	2010	2011
Motor gasoline	10 ³ t	0.2	8.5	7.6	6.9	5.1	4.7
Diesel	10 ³ t	137.1	43.6	66.1	125.7	116.5	111.8
						102	99.7

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-Bitumenous Coal	10^3 t	42	41.9	53.2
Mrki ugljen-Sub-bituminous Coal	10^3 t	261.2	95.8	28.2
Lignite-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	10^9 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
Anthracite	MJ/kg		29.31	29.31	29.31	29.31	29.31
Coking coal (kameni ugljen)	MJ/kg	25.8	25.1	24.77332	25.24	26.46616	25.20179
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	18.2	18.5	17.6	17.1	17.8	
Lignite	MJ/kg	12.2	12.1				
Natural gas	MJ/m ³	34.0	34.0	34.0	34.0	34.0	34.0
Wood	MJ/m ³			9.0	9.0	9.0	9.0
Biogas	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0
Wood waste	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1.0
Coke oven coke	MJ/kg	29.3	29.3	29.3	29.3	29.3	29.3
Liquified petroleum gas	MJ/kg	46.9	46.9	46.9	46.9	46.9	46.9
Motor Gasoline	MJ/kg	44.6	44.6	44.6	44.6	44.6	44.6
Diesel	MJ/kg	42.7	42.7	42.7	42.7	42.7	42.7
Gas/Diesel oil	MJ/kg	42.7	42.7	42.7	42.7	42.7	42.7
Residual fuel oil	MJ/kg	40.2	40.2	40.2	40.2	40.2	40.2
Petroleum coke	MJ/kg	31.0	31.0	31.0	31.0	31.0	31.0
Refinery gas	MJ/kg						
Other oil derivates	MJ/kg						
Gas works gas	MJ/m ³	19.5	21.47				

Fuel type	EF CO ₂ , t/TJ	EF CH ₄ , kg/TJ	EF N ₂ O, kg/TJ
Anthracite	98.3	10	1.5
Coking coal (kameni ugljen)	94.6	10	1.5
Sub-Bituminous Coal (Mrki ugljen)	96.1	10	1.5
Lignite	101	10	1.5
Natural gas	56.1	1	0.1
Wood	112	30	4
Biogas	79.6	3	0.6
Wood waste	143	30	4
Coke oven coke	107	10	1.5
Liquified petroleum gas	63.1	1	0.1
Motor Gasoline	69.3	3	0.6
Diesel	74.1	3	0.6
Gas/Diesel oil	74.1	3	0.6
Residual fuel oil	77.4	3	0.6
Petroleum coke	97.5	3	0.6
Refinery gas	57.6	1	0.1
Other oil derivates	0	3	0.6
Gas works gas	44.4	1	0.1
Other fossil fuels	143	30	4

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

Domestic aviation		1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption									
Gasoline Motor till 2010/									
Aviation from 2011	1000 t	0.00	0.30	0.10	1.10	0.60	0.60	0.50	0.40
NCV for gasoline	MJ/kg		44.59	44.59	44.59	44.59	44.59	44.59	44.59
Jet kerosene	1000 t	49.68	24.98	17.56	20.32	25.46	28.29	29.91	32.68
NCV for jet kerosene	MJ/kg	44.00	43.96	43.96	43.96	43.96	43.96	43.96	43.96
Total fuel cunsumption	TJ	2,185.83	1,111.64	776.47	942.51	1,146.02	1,270.59	1,337.25	1,454.65
Emissions									
EF CO2 - gasoline	t/TJ	69.30	69.30	69.30	69.30	69.30	70.00	70.00	70.00
EF CO2 - jet kerosene	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
CO2 Emission	Gg	156.29	79.45	55.51	67.28	81.88	90.81	95.58	103.98
EF CH4 - gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH4 - jet kerosene	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CH4 Emission	Mg	1.09	0.56	0.39	0.47	0.57	0.64	0.67	0.73
EF N2O - gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - jet kerosene	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N2O Emission	Mg	4.37	2.22	1.55	1.89	2.29	2.54	2.67	2.91

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

1A3bi	CARS		1990	1995	2000	2005	2010	2011	2012	2013
	FUEL CONSUMPTION									
	Gasoline	t	722.2157	527.6002	715.1262	669.21	593.0877	580.8674	543.8564	532.1749
	Diesel oil	t	36.01507	127.4611	184.565	402.7786	521.119	532.6854	597.1316	525.4241
	LPG	t	#DIV/0!	13.7	9.8	22.1	58.7	43.1	54.8	56.3
	CNG	106 m3					0.7	0.2	0.2	0.2
	Biodiesel	t								
	NCV									
	Gasoline	MJ/kg	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
	LPG	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
	CNG	MJ/106m3	34	34	34	34	34	34	34	34
	Biodiesel	MJ/kg								
	EF CO2									
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 - LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

1A3bii	LIGHT DUTY TRUCKS		1990	1995	2000	2005	2010	2011	2012	2013
	FUEL CONSUMPTION									
	Gasoline	t	28.85449	21.88328	32.40326	11.55513	15.37146	14.31864	10.34877	9.640438
	Diesel oil	t	87.87363	99.68984	158.7776	284.7596	258.916	249.6665	229.1907	218.1508
	LPG	t	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
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
	CNG	MJ/106m3	34	34	34	34	34	34	34	34
	Biodiesel	MJ/kg								
	EF CO2									
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 - LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

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

1A3biii	HEAVY DUTY TRUCKS+BUSSES		1990	1995	2000	2005	2010	2011	2012	2013
	FUEL CONSUMPTION									
	Gasoline	t	2.26696	1.211546	1.241682	1.273779	1.003555	0.786791	0.625716	0.569935
	Diesel oil	t	242.3113	183.2491	214.4574	268.0618	319.9651	304.3482	239.2777	358.7251
	LPG	t	0	0	0	0	0	0	0	0
	CNG	106 m3					1.9	0.6	0.8	1.7
	Biodiesel	t								
	NCV									
	Gasoline	MJ/kg	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
	LPG	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
	CNG	MJ/106m3	34	34	34	34	34	34	34	34
	Biodiesel	MJ/kg	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
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 - LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

1A3biv	MOTORCYCLES		1990	1995	2000	2005	2010	2011	2012	2013
	FUEL CONSUMPTION									
	Gasoline	t	6.162897	7.205024	15.42887	11.46112	27.13728	26.02721	23.36915	22.31473
	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
	Diesel oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
	LPG	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
	CNG	MJ/106m3	34	34	34	34	34	34	34	34
	Biodiesel	MJ/kg	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
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 - LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ)	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

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

		1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption									
Gasoline (1000 t)	1000 t	0.10		0.10					
NCV for gasoline (MJ/kg)	MJ/kg	44.59		44.59					
Diesel (1000 t)	1000 t	36.10	30.70	27.20	30.50	28.50	26.40	24.80	23.40
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	0.20	1.50						
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19						
Light heating oil (1000 t)	1000 t	1.10	1.70						
NCV for light heating oil (MJ/kg)	MJ/kg	42.71	42.71						
Brown coal (1000 t)	1000 t	10.00							
NCV for brown coal (MJ/kg)	MJ/kg	16.74							
Lignite (1000 t)	1000 t	4.30							
NCV for lignite (MJ/kg)	MJ/kg	10.90							
Jet Kerosene (1000 t)	1000 t	0.10							
NCV for jet kerosene (MJ/m ³)	MJ/kg	43.94							
Total fuel cunsumption (TJ)	TJ	1,819.97	1,448.49	1,166.17	1,302.66	1,217.24	1,127.54	1,059.21	999.41
Emissions									
EF CO ₂ - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO ₂ - diesel (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO ₂ - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO ₂ - light heating oil (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO ₂ - brown coal (t/TJ)	t/TJ	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO ₂ - lignite (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO ₂ - jet kerosene (t/TJ)	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO ₂ - petroleum (t/TJ)	t/TJ								
CO₂ Emission (Gg)	Gg	140.08	107.21	86.39	96.53	90.20	83.55	78.49	74.06
EF CH ₄ - gasoline (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH ₄ - diesel (kg/TJ)	kg/TJ	4.15	4.15	3.32	3.32	3.32	3.32	3.32	3.32
EF CH ₄ - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH ₄ - light heating oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH ₄ - brown coal (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF CH ₄ - lignite (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH ₄ - jet kerosene (t/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH ₄ - petroleum (t/TJ)	kg/TJ								
CH₄ Emission (Mg)	Mg	6.97	5.84	3.87	4.32	4.04	3.74	3.52	3.32
EF N ₂ O - gasoline (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - diesel (kg/TJ)	kg/TJ	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60
EF N ₂ O - fuel oil (kg/TJ)	kg/TJ	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)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - brown coal (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - lignite (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - jet kerosene (t/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - petroleum (t/TJ)	kg/TJ								
N₂O Emission (Mg)	Mg	44.46	37.58	33.23	37.26	34.81	32.25	30.29	28.58

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

National navigation	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
Gasoline (1000 t)								
Gasoline (1000 t)	0.10	0.60	0.30					
NCV for gasoline (MJ/kg)	44.59	44.59	44.59					
Diesel (1000 t)	38.70	23.20	25.70	31.80	34.80	35.40	33.50	38.50
NCV for diesel (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	2.10	6.20	1.40		2.00	1.80	1.90	
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	1.50						
NCV for light heating oil (MJ/kg)	42.71	42.71						
Total fuel cunsumption (TJ)	1,810.07	1,330.87	1,167.29	1,358.18	1,566.69	1,584.28	1,507.15	1,644.34
Emissions								
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO2 Emission (Gg)	134.38	99.31	86.62	100.64	116.36	117.63	111.93	121.85
EF CH4 - gasoline (kg/TJ)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - diesel (kg/TJ)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - fuel oil (kg/TJ)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - light heating oil (kg/TJ)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
CH4 Emission (Mg)	12.67	9.32	8.17	9.51	10.97	11.09	10.55	11.51
EF N2O - gasoline (kg/TJ)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - diesel (kg/TJ)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - fuel oil (kg/TJ)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - light heating oil (kg/TJ)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N2O Emission (Mg)	3.48	2.53	2.33	2.72	3.13	3.17	3.01	3.29

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

Commercial/Institutional	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
Petroleum (1000 t)	3.80	0.20						
NCV for jet kerosene (MJ/kg)	43.94							
Light heating oil (1000 t)	92.00	106.30	120.50	131.60	73.80	64.80	50.00	44.20
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	67.60	2.50	3.90	6.60	8.00	9.70	9.50	4.60
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.30	13.80	13.90	20.10	12.90	13.70	12.10	12.10
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Brown coal (1000 t) (MU)	24.50	12.70	9.50	0.20	2.20	5.20	4.90	0.50
NCV for brown coal (MJ/kg)	16.74	17.30	17.80	18.50	17.60	17.10	17.80	18.00
Lignite (1000 t)	40.00	1.60	1.20	0.60	0.30	0.10		
NCV for lignite (MJ/kg)	10.90	10.10	12.00	12.10	11.60	11.60	11.60	
Briquettes (1000 t)	2.90							
NCV for briquettes (MJ/kg)	16.74							
Gas work gas (1000000 m ³)	4.90	1.43	1.50	3.43	2.84	2.49	1.87	1.49
NCV for gas work gas (MJ/m ³)	15.82	15.91	19.49	21.47	18.72	17.20	17.20	17.10
Natural gas (1000000 m ³)	82.00	132.60	98.20	151.20	192.70	173.50	162.00	166.00
NCV for natural gas (MJ/m ³)	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Petroleum coke (1000 t)	1.50							
NCV for petroleum coke (MJ/kg)	29.31							
Anthracite (1000 t)							0.10	
NCV for anthracite(MJ/kg)							29.31	
Solid Biomass-Wood (TJ)					112.10	139.60	146.40	148.00
Bio gass (TJ)					102.26	110.60	86.07	75.83
Total fuel cunsumption (TJ)	10,818.92	10,069.37	9,506.60	12,053.87	10,940.00	10,081.88	8,944.56	8,545.32
Emissions								
EF CO ₂ - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO ₂ - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO ₂ - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO ₂ - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO ₂ - brown coal (t/TJ)	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO ₂ - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO ₂ - briquettes (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO ₂ - gas works gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO ₂ - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO ₂ - petroleum coke (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO ₂ - anthracite (t/TJ)	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30
EF CO ₂ - solid biomass wood (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
EF CO ₂ - landfill gas(t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO₂ Emission (Gg)	778.73	661.70	640.93	789.25	688.75	638.96	563.50	529.63
EF CH ₄ - petroleum (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH ₄ - brown coal (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - lignite (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - briquettes (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH ₄ - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH ₄ - petroleum coke (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ - anthracite (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH ₄ -solid biomass wood (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH ₄ - landfill gas (t/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH₄ Emission (Mg)	92.85	74.66	74.97	89.75	105.35	107.83	100.93	96.81
EF N ₂ O - petroleum (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N ₂ O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N ₂ O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N ₂ O - petroleum coke (t/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N ₂ O - anthracite (t/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N ₂ O - solid biomass wood (kg/TJ)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N ₂ O - landfill gas (t/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N₂O Emission (Mg)	5.76	3.66	3.86	4.16	3.33	3.26	2.85	2.48

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

Residential	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
Fuel consumption - mobile								
Gasoline (1000 t)	4.00	7.80	12.10	8.10	8.20	8.20	7.70	7.40
NCV for gasoline (MJ/kg)	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Fuel consumption - stationary								
Petroleum (1000 t)		7.90	1.60	1.00	0.90	1.00	0.90	0.80
NCV for petroleum (MJ/kg)		43.96	43.96	43.96	43.96	43.96	43.96	43.96
Light heating oil (1000 t)	215.90	198.60	231.50	252.80	138.80	122.00	94.50	83.50
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	48.70	6.50	8.10	15.40	10.40	11.90	12.30	7.10
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	97.90	57.30	51.90	60.90	72.20	74.40	56.90	54.20
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Brown coal (1000 t)	123.10	11.10	12.00	14.00	6.10	2.30	4.10	2.60
NCV for brown coal (MJ/kg)	16.74	17.30	17.80	18.50	17.60	17.10	17.80	18.00
Lignite (1000 t)	207.30	10.80	15.00	11.70	9.40	9.00	4.80	11.50
NCV for lignite (MJ/kg)	10.90	10.10	12.00	12.10	11.60	11.60	10.70	10.50
Hard coal (1000 t)							0.20	
NCV for hard coal (MJ/kg)							26.46	
Anthracite (1000 t)								
NCV for anthracite (MJ/kg)								
Briquettes (1000 t)	6.10							
NCV for briquettes (MJ/kg)	16.74							
Gas work gas (1000000 m3)	24.40	11.81	9.90	10.24	7.20	4.98	3.75	
NCV for gas work gas (MJ/m3)	15.82	15.91	19.49	21.47	17.20	17.20	17.10	
Natural gas (1000000 m3)	230.00	381.30	496.60	687.80	732.90	670.20	630.20	601.30
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Solid Biomass-Wood (TJ)	19,080.00	11,070.00	13,410.00	12,510.00	13462.40	16222.10	17,201.00	16,293.20
Total fuel cunsumption (TJ)	47,655.62	36,648.53	44,137.32	51,192.38	48858.06	48825.32	46,402.96	43,663.16
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
EF CO2 - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - brown coal (t/TJ)-mrki	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO2 - hard coal (t/TJ)-kameni	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
EF CO2 - briquettes (t/TJ)	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
EF CO2 - natural gas (t/TJ)	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
CO2 Emission (Gg)	4,165.80	2,872.79	3,450.36	3,818.39	3646.04	3785.16	3,676.49	3,460.61
EF CH4 - gasoline (kg/TJ)	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
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - brown coal (kg/TJ)	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
EF CH4 - hard coal (kg/TJ)	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
EF CH4 - briquettes (kg/TJ)	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
EF CH4 - natural gas (kg/TJ)	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
CH4 Emission (Mg)	7,228.26	3,584.91	4,346.86	4,123.69	4313.29	5102.54	5,369.12	5,095.32
EF N2O - gasoline (kg/TJ)	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
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - hard coal (kg/TJ)	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
EF N2O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - gas work gas (kg/TJ)	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
EF N2O - solid biomass wood (kg)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
N2O Emission (Mg)	91.59	52.24	62.95	60.69	61.24	71.52	74.45	70.25

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

Agriculture/forestry/fishing	1990	1995	2000	2005	2010	2011	2012	2013
Fuel consumption								
Other kerosene (1000 t)	0.10	0.10						
NCV for other kerosene (MJ/kg)	44.40	44.40						
Diesel + light heating oil (1000 t)	232.60	159.10	237.60	197.40	200.10	200.20	186.30	182.20
NCV for diesel (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel consumption - mobile (TJ)	9,938.79	6,799.60	10,147.90	8,430.95	8,546.27	8,550.54	7,956.87	7,781.76
Fuel oil (1000 t)	12.30	6.20	13.40	4.70	4.40	4.40	4.10	3.50
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.40	3.20	2.60	2.70	2.70	2.70	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
Gas work gas (1000000 m3)								
NCV for gas work gas (MJ/m3)								
Natural gas (1000000 m3)	25.00	15.50	14.50	23.20	22.20	21.50	20.70	21.00
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Fuel consumption - stationary (TJ)	1,550.65	926.23	1,153.46	1,104.30	1,058.24	1,034.44	985.80	971.89
Total fuel cunsumption (TJ)	11,489.44	7,725.83	11,301.36	9,535.25	9,604.51	9,584.98	8,942.68	8,753.65
Agriculture/forestry/fishing								
Emissions								
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - other kerosene (t/TJ)	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO2 emission (Gg) - mobile	736.45	503.84	751.96	624.73	633.28	633.60	589.60	576.63
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas work gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 emission (Gg) - stationary	98.97	58.32	77.03	66.86	64.02	62.68	59.63	58.34
Total CO2 emission (Gg)	835.42	562.16	828.99	691.59	697.30	696.28	649.24	634.97
EF CH4 - gasoline (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - other kerosene (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
CH4 emission (Mg) - mobile	99.39	68.00	101.48	84.31	85.46	85.51	79.57	77.82
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH4 emission (Mg) - stationary	10.22	5.88	8.46	6.47	6.18	6.06	5.75	5.56
Total CH4 emission (Mg)	109.61	73.87	109.94	90.78	91.64	91.56	85.32	83.38
EF N2O - gasoline (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - other kerosene (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
N2O emission (Mg) - mobile	5.96	4.08	6.09	5.06	5.13	5.13	4.77	4.67
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O emission (Mg) - stationary	0.40	0.22	0.38	0.20	0.19	0.19	0.18	0.17
Total N2O emission (Mg)	6.37	4.30	6.47	5.26	5.32	5.32	4.96	4.84

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

		STEP 1		C	D	E					
		Amount of Coal Produced	Emission Factor	Methane Emissions	Conversion Factors	Methane Emissions					
		(millions t)	(m ³ CH ₄ / t)	(millions m ³)	(0.67 Gg 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	1995	2000	2005	2010	2011	2012	2013
1. Exploration	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Well Drilling	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
EMISSION FACTOR												
CO ₂												
Well Drilling	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	9.00E-04	9.00E-04	9.00E-04	9.00E-04	9.00E-04	9.00E-04	9.00E-04	9.00E-04	
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	7.95E-02	7.95E-02	7.95E-02	7.95E-02	7.95E-02	7.95E-02	7.95E-02	7.95E-02	
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	1.70E-05	1.70E-05	1.70E-05	1.70E-05	1.70E-05	1.70E-05	1.70E-05	1.70E-05	
CH ₄												
Well Drilling	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	4.51E-04	4.51E-04	4.51E-04	4.51E-04	4.51E-04	4.51E-04	4.51E-04	4.51E-04	
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	9.55E-04	9.55E-04	9.55E-04	9.55E-04	9.55E-04	9.55E-04	9.55E-04	9.55E-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	
Well Testing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	5.84E-07	5.84E-07	5.84E-07	5.84E-07	5.84E-07	5.84E-07	5.84E-07	5.84E-07	
Well Servicing	Gg/10 ³ m ³ total oil production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	
2. Production												
ACTIVITY DATA												
Conventional oil	10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
Conventional oil	10 ³ m ³ total oil production	Venting	1.B.2.a.i	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
Conventional oil	10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	772.56	697.56	698.49	
EMISSION FACTOR												
CO ₂												
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	1.13E-04	1.13E-04	1.13E-04	1.13E-04	1.13E-04	1.13E-04	1.13E-04	1.13E-04	
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	4.85E-02	4.85E-02	4.85E-02	4.85E-02	4.85E-02	4.85E-02	4.85E-02	4.85E-02	
CH ₄												
Conventional oil	Gg/10 ³ m ³ total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	8.55E-04	8.55E-04	8.55E-04	8.55E-04	8.55E-04	8.55E-04	8.55E-04	8.55E-04	
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	2.95E-05	2.95E-05	2.95E-05	2.95E-05	2.95E-05	2.95E-05	2.95E-05	2.95E-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	
Conventional oil	Gg/10 ³ m ³ total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	
Conventional oil	Gg/10 ³ m ³ total oil production	Flaring	1.B.2.a.ii	7.6E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	
3. Transport												
ACTIVITY DATA												
Pipelines	10 ³ m ³ total oil transported by pipelines	All	1.B.2.a.iii.3	11229.85	3835.98	5551.99	8243.94	7454.46	6184.73	5182.86	6275.87	
Tanker Trucks and L	10 ³ m ³ total oil transported by tanker...	Venting	1.B.2.a.i	943.49	255.18	275.30	273.51	124.13	85.04	42.67	41.30	
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	
Tanker Trucks and L	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	
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	
Tanker Trucks and L	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	
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	
Tanker Trucks and L	Gg/10 ³ m ³ total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	
4. Refining/Storage												
ACTIVITY DATA												
Oil Refining	10 ³ m ³ oil refined	All	1.B.2.a.iii.4	7977.5581	6321.5116	6120.6977	5803.6047	3769.186	3904.6512	3614.3023	3526.5116	
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	
CH ₄												
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	
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	
EMISSIONS												
CO ₂												
Oil Refining	Gg	All	1.B.2.a.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	
CH ₄												
Oil Refining	Gg	All	1.B.2.a.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	
N ₂ O												
Oil Refining	Gg	All	1.B.2.a.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	

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

1. B. 2. b. Natural Gas					1990	1995	2000	2005	2010	2011	2012	2013
1. Exploration	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Well Drilling	10 ³ m ³ total oil production		1.B.2.a.ii	NA								
Well Testing	10 ³ m ³ total oil production		1.B.2.a.ii	NA								
Well Servicing	10 ³ m ³ total oil production		1.B.2.a.ii	NA								
EMISSION FACTOR												
CO2												
Well Drilling	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Testing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Servicing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CH4												
Well Drilling	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Testing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Servicing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N2O												
Well Drilling	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Testing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well Servicing	Flaring and Venting	1.B.2.a.ii	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2. Production												
2. Production	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Gas production	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1982.30	1966.40	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	
Gas production	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1966.40	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	
EMISSION FACTOR												
CO2												
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	9.70E-05								
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1.40E-03								
CH4												
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	1.22E-02								
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	8.80E-07								
N2O												
Gas production	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.2	NA								
Gas production	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.5E-08	2.50E-08							
3. Processing												
3. Processing	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Default weighted total	10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	1982.30	1966.40	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	
Default weighted total	10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	1982.30	1966.40	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	
Default weighted total	10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.bi	1982.30	1966.40	1658.50	2283.40	2727.20	2471.40	2013.10	1856.10	
EMISSION FACTOR												
CO2												
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	2.00E-05								
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.55E-03								
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.bi	6.75E-02								
CH4												
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	2.50E-04								
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	2.40E-06								
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.bi	NA								
N2O												
Default weighted total	Gg/10 ⁶ m ³ gas produced	Fugitives	1.B.2.b.iii.3	NA								
Default weighted total	Gg/10 ⁶ m ³ gas produced	Flaring	1.B.2.b.ii	3.9E-08	3.90E-08							
Default weighted total	Gg/10 ⁶ m ³ gas produced	Raw CO2 venting	1.B.2.bi	NA								
4. Transmission and storage												
4. Transmission and storage	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Transmission	10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	2686.6	2367.9	2704.8	2909.9	3241.5	3165	2971.7	2809.9	
Transmission	10 ⁶ m ³ marketable gas	Venting	1.B.2.bi	2686.6	2367.9	2704.8	2909.9	3241.5	3165	2971.7	2809.9	
Storage	10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	2686.6	2367.9	2704.8	2909.9	3241.5	3165	2971.7	2809.9	
EMISSION FACTOR												
CO2												
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	1.44E-06								
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.bi	5.20E-06								
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	1.85E-07								
CH4												
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	6.33E-04								
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.bi	3.92E-04								
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	4.15E-05								
N2O												
Transmission	Gg/10 ⁶ m ³ marketable gas	Fugitives	1.B.2.b.iii.4	NA								
Transmission	Gg/10 ⁶ m ³ marketable gas	Venting	1.B.2.bi	NA								
Storage	Gg/10 ⁶ m ³ marketable gas	All	1.B.2.b.iii.4	ND								
5. Distribution of Natural Gas												
5. Distribution of Natural Gas	Unit	Emission source	IPCC Code									
ACTIVITY DATA												
Gas distribution	10 ⁶ m ³ of utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	529.4	609.3	862.2	944.6	865.2	812.9	788.3	
EMISSION FACTOR												
CO2												
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	9.55E-05								
CH4												
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	1.80E-03								
N2O												
Gas distribution	Gg/10 ⁶ m ³ of utility sales	All	1.B.2.a.iii.5	ND</td								

3.2. WASTE SECTOR

Emissions of GHGs from Waste in the period 1990 - 2013 are presented in the Table A3.2-1.

Table A3.2-1: Emissions from Waste (1990-2013)

Source	Year	GHG	Emission (kt)	GWP ¹	Emission (kt CO ₂ -eq)	Percent in Waste	Percentage in Total Country Emission
Solid Waste Disposal	1990	CH ₄	11.55	25	288.84	48.61	0.82
	1991		12.09		302.32	50.08	1.11
	1992		12.63		315.75	51.18	1.25
	1993		13.20		329.94	52.30	1.30
	1994		13.82		345.40	52.85	1.43
	1995		14.54		363.40	53.96	1.48
	1996		15.32		383.09	56.13	1.53
	1997		16.20		405.12	57.02	1.54
	1998		17.13		428.27	58.96	1.62
	1999		18.18		454.57	59.38	1.66
	2000		19.24		481.08	60.15	1.78
	2001		20.47		511.70	62.67	1.82
	2002		21.85		546.31	64.05	1.87
	2003		23.39		584.70	66.03	1.92
	2004		24.82		620.62	66.85	2.04
	2005		24.01		600.17	65.96	1.95
	2006		27.14		678.41	67.99	2.19
	2007		29.86		746.53	69.54	2.31
	2008		32.87		821.63	71.61	2.64
	2009		35.57		889.25	75.07	3.06
	2010		35.25		881.13	75.10	3.11
	2011		36.79		919.66	75.94	3.32
	2012		37.50		937.56	77.18	3.68
	2013		37.89		947.21	76.42	3.87
Biological Treatment of Solid Waste	1990	CH ₄	NE	25	NE	NE	NE
	1991		NE		NE	NE	NE
	1992		NE		NE	NE	NE
	1993		NE		NE	NE	NE
	1994		NE		NE	NE	NE
	1995		NE		NE	NE	NE
	1996		NE		NE	NE	NE
	1997		NE		NE	NE	NE
	1998		NE		NE	NE	NE
	1999		NE		NE	NE	NE
	2000		NE		NE	NE	NE
	2001		NE		NE	NE	NE
	2002		NE		NE	NE	NE
	2003		NE		NE	NE	NE
	2004		NE		NE	NE	NE
	2005		NE		NE	NE	NE
	2006		NE		NE	NE	NE

Source	Year	GHG	Emission (kt)	GWP ¹	Emission (kt CO ₂ -eq)	Percent in Waste	Percentage in Total Country Emission
	2007		NE		NE	NE	NE
	2008		NE		NE	NE	NE
	2009		NE		NE	NE	NE
	2010		NE		NE	NE	NE
	2011		NE		NE	NE	NE
	2012		NE		NE	NE	NE
	2013		4.13		4.58	0.37	0.02
Biological Treatment of Solid Waste	1990	N ₂ O	NE	298	NE	NE	NE
	1991		NE		NE	NE	NE
	1992		NE		NE	NE	NE
	1993		NE		NE	NE	NE
	1994		NE		NE	NE	NE
	1995		NE		NE	NE	NE
	1996		NE		NE	NE	NE
	1997		NE		NE	NE	NE
	1998		NE		NE	NE	NE
	1999		NE		NE	NE	NE
	2000		NE		NE	NE	NE
	2001		NE		NE	NE	NE
	2002		NE		NE	NE	NE
	2003		NE		NE	NE	NE
	2004		NE		NE	NE	NE
	2005		NE		NE	NE	NE
	2006		NE		NE	NE	NE
	2007		NE		NE	NE	NE
	2008		NE		NE	NE	NE
	2009		NE		NE	NE	NE
	2010		NE		NE	NE	NE
	2011		NE		NE	NE	NE
	2012		NE		NE	NE	NE
	2013		0.012		3.67	0.30	0.01
Incineration and Open Burning of Waste	1990	CO ₂	0.54	1	0.54	0.090	0.0015
	1991		0.54		0.54	0.089	0.0020
	1992		0.54		0.54	0.087	0.0021
	1993		0.54		0.54	0.085	0.0021
	1994		0.54		0.54	0.082	0.0022
	1995		0.54		0.54	0.080	0.0022
	1996		0.54		0.54	0.078	0.0021
	1997		1.82		1.82	0.257	0.0069
	1998		3.70		3.70	0.509	0.0140
	1999		4.38		4.38	0.572	0.0160
	2000		6.15		6.15	0.769	0.0227
	2001		6.68		6.68	0.818	0.0238
	2002		3.78		3.78	0.443	0.0130
	2003		0.80		0.80	0.091	0.0026
	2004		0.35		0.35	0.038	0.0012
	2005		0.16		0.16	0.018	0.0005
	2006		0.74		0.74	0.074	0.0024

Source	Year	GHG	Emission (kt)	GWP ¹	Emission (kt CO ₂ -eq)	Percent in Waste	Percentage in Total Country Emission
	2007		0.65		0.65	0.061	0.0020
	2008		0.67		0.67	0.058	0.0021
	2009		0.16		0.16	0.014	0.0006
	2010		0.05		0.05	0.004	0.0002
	2011		0.05		0.05	0.004	0.0002
	2012		0.08		0.08	0.007	0.0003
	2013		0.04		0.04	0.003	0.0002
Incineration and Open Burning of Waste	1990	N ₂ O	0.000025	298	0.00745	0.001	0.00002
	1991		0.000025		0.00745	0.001	0.00003
	1992		0.000025		0.00745	0.001	0.00003
	1993		0.000025		0.00745	0.001	0.00003
	1994		0.000025		0.00745	0.001	0.00003
	1995		0.000025		0.00745	0.001	0.00003
	1996		0.000025		0.00745	0.001	0.00003
	1997		0.000103		0.03072	0.004	0.00012
	1998		0.000217		0.06460	0.009	0.00024
	1999		0.000258		0.07690	0.010	0.00028
	2000		0.000365		0.10884	0.014	0.00040
	2001		0.000397		0.11822	0.014	0.00042
	2002		0.000221		0.06574	0.008	0.00023
	2003		0.000040		0.01192	0.001	0.00004
	2004		0.000012		0.00358	0.000	0.00001
	2005		0.000000		0.00013	0.000	0.00000
	2006		0.000035		0.01043	0.001	0.00003
	2007		0.000029		0.00849	0.001	0.00003
	2008		0.000032		0.00941	0.001	0.00003
	2009		0.000000		0.00000	0.000	0.00000
	2010		0.000000		0.00000	0.000	0.00000
	2011		0.000000		0.00000	0.000	0.00000
	2012		0.000000		0.00000	0.000	0.00000
	2013		0.000000		0.00000	0.000	0.00000
Wastewater Treatment and Discharge	1990	CH ₄	9.51	25	237.86	40.03	0.68
	1991		9.50		237.41	39.33	0.87
	1992		9.48		236.95	38.41	0.94
	1993		9.46		236.50	37.49	0.93
	1994		9.65		241.20	36.91	1.00
	1995		9.50		237.46	35.26	0.97
	1996		9.21		230.14	33.72	0.92
	1997		9.37		234.27	32.97	0.89
	1998		9.08		226.95	31.24	0.86
	1999		9.36		233.96	30.56	0.85
	2000		9.70		242.50	30.32	0.90
	2001		8.94		223.54	27.38	0.79
	2002		8.97		224.29	26.30	0.77
	2003		8.88		221.96	25.07	0.73
	2004		9.19		229.78	24.75	0.75
	2005		9.16		228.96	25.16	0.75
	2006		9.41		235.15	23.57	0.76

Source	Year	GHG	Emission (kt)	GWP ¹	Emission (kt CO ₂ -eq)	Percent in Waste	Percentage in Total Country Emission
	2007		9.67		241.72	22.52	0.75
	2008		9.57		239.14	20.84	0.77
	2009		8.30		207.60	17.53	0.71
	2010		8.36		209.10	17.82	0.74
	2011		8.27		206.86	17.08	0.75
	2012		7.73		193.18	15.90	0.76
	2013		8.02		200.44	16.17	0.82
Wastewater Treatment and Discharge	1990	N ₂ O	0.22	298	67.00	11.27	0.19
	1991		0.21		63.39	10.50	0.23
	1992		0.21		63.64	10.32	0.25
	1993		0.21		63.86	10.12	0.25
	1994		0.22		66.41	10.16	0.28
	1995		0.24		72.06	10.70	0.29
	1996		0.23		68.72	10.07	0.27
	1997		0.23		69.26	9.75	0.26
	1998		0.23		67.42	9.28	0.25
	1999		0.24		72.58	9.48	0.26
	2000		0.23		69.92	8.74	0.26
	2001		0.25		74.49	9.12	0.26
	2002		0.26		78.51	9.20	0.27
	2003		0.26		78.00	8.81	0.26
	2004		0.26		77.57	8.36	0.25
	2005		0.27		80.60	8.86	0.26
	2006		0.28		83.51	8.37	0.27
	2007		0.28		84.61	7.88	0.26
	2008		0.29		85.91	7.49	0.28
	2009		0.29		87.52	7.39	0.30
	2010		0.28		83.05	7.08	0.29
	2011		0.28		84.40	6.97	0.30
	2012		0.28		83.99	6.91	0.33
	2013		0.28		83.59	6.74	0.34

**ANNEX 4: THE NATIONAL ENERGY BALANCE FOR THE MOST RECENT
INVENTORY YEAR**

Table A4-1: National Energy balance for 2013, natural units

ENERGY BALANCE 2013 natural units	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
	10 ³ t	10 ⁶ m ³				
Production					600.7	1856.1
Import	2.7	1179.0	41.6	12.8	2461.8	1270.4
Export		10.7				376.1
Import-processing						
Export-processing						
Stock change		-113.6	1.7		-29.7	59.5
Bunkers						
Energy supplied	2.7	1054.7	43.3	12.8	3032.8	2809.9
<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						
<i>Transformation sector</i>						
hydro power plants						
- small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants		932.6			2.7	
public cogeneration plants					580.4	
public heating plants					85.9	
industrial cogeneration plants			35.7		328.2	
- in refineries					65.6	
- in gas production					65.0	
Industrial heating plants					53.7	
Petroleum refineries					2968.4	83.1
NGL-plant					64.4	
Coke plant						
Gas works						2.1
Total transformation sector	932.6	35.7		3032.8	1136.1	
<i>Energy sector own use</i>						
Oil and gas extraction						46.5
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						85.3
NGL-plant						8.7
Gas works						
Total energy sector own use						140.5
<i>Losses</i>						40.7
Final energy demand	2.7	122.1	7.6	12.8		1492.6
<i>Non energy use</i>						487.5
Energy sector						
Petrochemical industry						487.5
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	2.7	122.1	7.6	12.8		1005.1
<i>Industry</i>	2.6	122.1	4.5	1.3		214.9
Iron and steel	1.3	0.2				14.3
Non-ferrous metals						0.9
Non-metallic minerals						46.5
Chemical						9.6
Construction materials	1.3	120.7	4.5	1.3		39.3
Pulp and paper						6.6
Food production		1.2				60.3
Not elsewhere specified						37.4
<i>Transport</i>						1.9
Rail						
Road						0.2
Air						
- international						
- domestic						
Sea and River						
Public transport						1.7
Not elsewhere specified						
<i>Other sectors</i>	0.1		3.1	11.5		788.3
Households			2.6	11.5		601.3
Services	0.1		0.5			166.0
Agriculture						21.0
Construction						

Table A4-1: National Energy balance for 2013, natural units (cont.)

ENERGY BALANCE 2013 <i>natural units</i>	Hydro	Fuel wood	Wind energy	Solar energy	Geothermal	Landfill gas	Biofuels	Other
	energy	TJ	10 ³ m ³	TJ	TJ	TJ	10 ³ m ³	biomass
		TJ						TJ
Production	78875.3	2289.7	5033.7	451.0	286.2	36351.0	33.0	9012.6
Import		15.8					2.3	208.3
Export		512.9					1.8	5601.3
Import-processing								
Export-processing								
Stock change							2.6	87.4
Bunkers								
Energy supplied	78875.3	1792.6	5033.7	451.0	286.2	36351.0	36.1	3707.0
Production								
hydro power plants								
- small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
- in refineries								
- in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Transformation sector								
hydro power plants	78875.3							
- small HPP	1182.3							
Wind power plants		5033.7						
Solar power plants			110.0					
Geothermal power plants								
thermal power plants					8994.0			
public cogeneration plants					21102.0			1146.1
public heating plants						5465.0		
industrial cogeneration plants								
- in refineries								
- in gas production								
Industrial heating plants								1297.9
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	78875.3	5033.7	110.0			35561.0		2444.0
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Wind power								
Petroleum refineries								
NGL-plant								
Gas works								
Total energy sector own use								
Losses						790.0		
Final energy demand	1792.6		341.0	286.2			36.1	1263.0
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption	1792.6		341.0	286.2			36.1	1263.0
Industry	49.5							509.7
Iron and steel	0.3							0.6
Non-ferrous metals	0.4							
Non-metallic minerals								
Chemical								
Construction materials	0.2							391.6
Pulp and paper								
Food production	4.2							9.4
Not elsewhere specified	44.4							108.1
Transport							36.1	
Rail								
Road							36.1	
Air								
- international								
- domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors	1743.1		341.0	286.2				753.3
Households	1730.0		341.0					723.2
Services	13.1				286.2			30.1
Agriculture								
Construction								

Table A4-1: National Energy balance for 2013, natural units (cont.)

ENERGY BALANCE 2013 <i>natural units</i>	Coke oven coke	Liquified petroleum gases	Unleaded motor gasoline	Standard 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		249.8	928.3			108.6	1072.4	169.4		514.3
Import	26.6	39.5	98.5	0.5	0.8	14.7	751.2	36.0		0.3
Export	1.0	144.6	471.6				394.8	49.2		375.9
Import-processing										
Export-processing										
Stock change	-0.7	1.0	21.0			0.5	4.2	12.8		59.2
Bunkers										
Energy supplied	24.9	145.7	576.2	0.5	0.8	123.8	1433.0	169.0		197.9
<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	209.1	928.3				108.6	1072.4	169.4		514.3
NGL-plant	40.7									
Coke plant										
Gas works										
Total production	249.8	928.3				108.6	1072.4	169.4		514.3
<i>Transformation sector</i>										
hydro power plants										
- small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								0.9		18.9
public cogeneration plants										27.4
public heating plants								3.7		4.5
industrial cogeneration plants										59.5
- in refineries										55.4
- in gas production								0.4		6.9
Industrial heating plants										
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								5.0		117.2
<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										
Wind power										
Petroleum refineries	1.5									53.0
NGL-plant										
Gas works										
Total energy sector own use	1.5									53.0
<i>Losses</i>										
Final energy demand	24.9	144.2	576.2	0.5	0.8	123.8	1433.0	164.0		27.7
<i>Non energy use</i>										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	24.9	144.2	576.2	0.5	0.8	123.8	1433.0	164.0		27.7
Industry	24.9	17.2					12.3	16.3		12.5
Iron and steel	2.5	3.8						0.6		0.6
Non-ferrous metals		5.3						0.8		
Non-metallic minerals	0.2									0.1
Chemical	0.1							0.6		0.1
Construction materials	19.4	2.7					12.3	2.6		4.4
Pulp and paper		0.1						0.1		
Food production	3.0	1.4						8.7		5.8
Not elsewhere specified		3.6						2.9		1.5
Transport	56.3	564.7	0.5			123.8	1164.2			
Rail								23.4		
Road		56.3	564.7					1077.2		
Air				0.5		123.8				
- international				0.1		79.2				
- domestic				0.4		44.6				
Sea and River								38.5		
Public transport								25.1		
Not elsewhere specified										
Other sectors	70.7	11.5		0.8		256.5	147.7			15.2
Households		54.2			0.8			83.5		7.1
Services		12.1						44.2		4.6
Agriculture		2.5	7.4				169.1	13.1		3.5
Construction		1.9	4.1				87.4	6.9		

Table A4-1: National Energy balance for 2013, natural units (cont.)

ENERGY BALANCE 2013 <i>natural units</i>	Naphta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
	10 ³ t							
Production	50.5		36.0	13.3		60.4		39.4
Import		3.2	104.6	23.2	5.9	151.5		
Export	29.6		1.0	8.0	0.1	20.2		44.8
Import-processing								
Export-processing								
Stock change	-0.8		-1.6	0.2		-4.5		6.9
Bunkers								
Energy supplied	20.1	3.2	138.0	28.7	5.8	187.2		1.5
<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	30.4		36.0	13.3		60.4		39.4
NGL-plant	20.1							
Coke plant								
Gas works								
Total production	50.5		36.0	13.3		60.4		39.4
<i>Transformation sector</i>								
hydro power plants								
- small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
- in refineries								
- in gas production								
Industrial heating plants								
Petroleum refineries	20.1							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	20.1							
<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								
Wind power								
Petroleum refineries						40.8		
NGL-plant								
Gas works								
Total energy sector own use						40.8		
<i>Losses</i>								
Final energy demand	0.0	3.2	138.0	28.7	5.8	146.4		1.5
Non energy use		3.2	138.0	28.7	5.8			1.5
Energy sector					1.8			
Petrochemical industry		3.2				0.7		
Other industry			32.8	5.5	5.1			1.5
Construction			105.2	1.2				
Transport				18.9				
Agriculture				1.3				
Energy consumption	0.0					146.4		0.0
<i>Industry</i>						146.4		
Iron and steel								
Non-ferrous metals								
Non-metallic minerals								
Chemical								
Construction materials						146.4		
Pulp and paper								
Food production								
Not elsewhere specified								
<i>Transport</i>								
Rail								
Road								
Air								
- international								
- domestic								
Sea and River								
Public transport								
Not elsewhere specified								
<i>Other sectors</i>								
Households								
Services								
Agriculture								
Construction								

Table A4-1: National Energy balance for 2013, natural units (cont.)

ENERGY BALANCE 2013 <i>natural units</i>	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	Industrial waste, non renewable TJ
Production	175.4			4018.8	13431.0	26367.2	366.2
Import		282.4	71.9		6845.3		
Export					2354.8		
Import-processing							
Export-processing							
Stock change		-8.2	-3.3				
Bunkers							
Energy supplied	175.4	274.2	68.6	4018.8	17921.5	26367.2	366.2
Production							
hydro power plants					8105.8		
- small HPP					121.5		
Wind power plants					517.3		
Solar power plants					11.3		
Geothermal power plants							
thermal power plants					2501.2		
public cogeneration plants					1968.8	9117.1	
public heating plants						2620.9	
industrial cogeneration plants					326.6	10077.4	
- in refineries					96.6	3870.6	
- in gas production						737.8	
Industrial heating plants						2812.6	
Petroleum refineries	175.4						
NGL-plant							
Coke plant							
Gas works				4018.8			
Total production	175.4			4018.8	13431.0	24628.0	
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	14.2						
- in refineries	14.2						
- in gas production							
Industrial heating plants							
Petroleum refineries		274.2	68.6				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	14.2	274.2	68.6				
Energy sector own use							
Oil and gas extraction					104.5	737.8	
Coal production						53.1	
Electric energy supply industry					30.2		
hydro power plants					189.9		
thermal power plants					238.5		
public cogeneration plants					97.4	665.3	
industrial cogeneration plants							
Wind power					2.8		
Petroleum refineries	161.2				259.4	3870.6	
NGL-plant					7.3		
Gas works							
Total energy sector own use	161.2				930.0	5326.8	
Losses				115.7	1944.1	1363.9	
Final energy demand	0.0			3903.1	15047.4	19676.5	366.2
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption	0.0			3903.1	15047.4	19676.5	366.2
Industry				152.0	3070.7	10338.5	366.2
Iron and steel				88.0	327.7	42.2	
Non-ferrous metals					86.2		
Non-metallic minerals					125.3	102.0	
Chemical					274.1	3978.4	
Construction materials					450.2		366.2
Pulp and paper					180.6	856.8	
Food production					663.8	3282.9	
Not elsewhere specified				64.0	962.8	2076.2	
Transport					279.9		
Rail					149.3		
Road							
Air					22.6		
- international							
- domestic					22.6		
Sea and River						19.1	
Public transport						63.8	
Not elsewhere specified					25.1		
Other sectors				3751.1	11696.8	9338.0	
Households				2258.1	6229.1	7522.8	
Services				1493.0	5321.0	1629.1	
Agriculture					62.1	186.1	
Construction					84.6		

Table A4-2: National Energy balance for 2013, energy units

<i>PI</i>	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production	-	-	-	-	25.71	63.107
Import	0.08	29.71	0.70	0.13	105.12	43.194
Export	-	0.27	-	-	-	12.787
Import-processing	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-
Stock change	-	2.86	0.03	-	1.27	2.023
Bunkers	-	-	-	-	-	-
Energy supplied	0.08	26.58	0.73	0.13	129.56	95.54
<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	0.08	26.58	0.73	0.13	129.56	95.54
<i>Transformation sector</i>	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-
thermal power plants	-	23.28	-	-	-	0.09
public cogeneration plants	-	-	-	-	-	19.73
public heating plants	-	-	-	-	-	2.92
industrial cogeneration plants	-	-	0.60	-	-	11.16
- in refineries	-	-	-	-	-	2.23
- in gas production	-	-	-	-	-	2.21
Industrial heating plants	-	-	-	-	-	1.83
Petroleum refineries	-	-	-	-	126.75	2.83
NGL-plant	-	-	-	-	2.81	-
Coke plant	-	-	-	-	-	-
Gas works	-	-	-	-	-	0.07
Total transformation sector	-	23.28	0.60	-	129.56	38.63
<i>Energy sector own use</i>	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	1.58
Coal production	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	2.90
NGL-plant	-	-	-	-	-	0.30
Gas works	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	-	4.78
Losses	-	-	-	-	-	1.38
Final energy demand	0.08	3.30	0.13	0.13	-	50.75
Non energy use	-	-	-	-	-	16.58
Energy sector	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	16.58
Other industry	-	-	-	-	-	-
Construction	-	-	-	-	-	-
Transport	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-
Energy consumption	0.08	3.30	0.13	0.13	-	34.17
Industry	0.08	3.30	0.08	0.01	-	7.31
Iron and steel	0.04	0.01	-	-	-	0.49
Non-ferrous metals	-	-	-	-	-	0.03
Non-metallic minerals	-	-	-	-	-	1.58
Chemical	-	-	-	-	-	0.33
Construction materials	0.04	3.27	0.08	0.01	-	1.34
Pulp and paper	-	-	-	-	-	0.22
Food production	-	0.03	-	-	-	2.05
Not elsewhere specified	-	-	-	-	-	1.27
Transport	-	-	-	-	-	0.06
Rail	-	-	-	-	-	-
Road	-	-	-	-	-	0.01
Air	-	-	-	-	-	-
- international	-	-	-	-	-	-
- domestic	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-
Public transport	-	-	-	-	-	0.06
Not elsewhere specified	-	-	-	-	-	-
Other sectors	0.00	-	0.06	0.12	-	26.80
Households	-	-	0.05	0.12	-	20.44
Services	0.00	-	0.01	-	-	5.64
Agriculture	-	-	-	-	-	0.71
Construction	-	-	-	-	-	-

Table A4-2: National Energy balance for 2013, energy units (cont.)

<u>PI</u>	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass	
Production	78.88	20.607	5.034	0.451	0.286	0.6933	1.238	9.013	
Import	-	0.14	-	-	-	-	0.07	0.21	
Export	-	4.62	-	-	-	-	0.07	5.60	
Import-processing	-	-	-	-	-	-	-	-	
Export-processing	-	-	-	-	-	-	-	-	
Stock change	-	-	-	-	-	-	0.10	0.09	
Bunkers	-	-	-	-	-	-	-	-	
Energy supplied	78.88	16.13	5.03	0.45	0.29	0.6933	1.33	3.71	
<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	78.88	16.13	5.03	0.45	0.29	0.6933	1.33	3.71	
<i>Transformation sector</i>	-	-	-	-	-	-	-	-	
hydro power plants	78.88	-	-	-	-	-	-	-	
- small HPP	1.18	-	-	-	-	-	-	-	
Wind power plants	-	-	5.03	-	-	-	-	-	
Solar power plants	-	-	-	0.11	-	-	-	-	
Geothermal power plants	-	-	-	-	-	-	-	-	
thermal power plants	-	-	-	-	-	0.1709	-	-	
public cogeneration plants	-	-	-	-	-	0.4089	-	1.15	
public heating plants	-	-	-	-	-	-	-	-	
industrial cogeneration plants	-	-	-	-	-	0.0984	-	-	
- in refineries	-	-	-	-	-	-	-	-	
- in gas production	-	-	-	-	-	-	-	-	
Industrial heating plants	-	-	-	-	-	-	-	1.30	
Petroleum refineries	-	-	-	-	-	-	-	-	
NGL-plant	-	-	-	-	-	-	-	-	
Coke plant	-	-	-	-	-	-	-	-	
Gas works	-	-	-	-	-	-	-	-	
Total transformation sector	78.88	-	5.03	0.11	-	0.6782	-	2.44	
<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	-	-	-	-	-	0.0151	-	-	
Final energy demand	-	16.13	-	0.34	0.29	-	0.0000	1.33	1.26
Non energy use	-	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-
Energy consumption	-	16.13	-	0.34	0.29	-	0.0000	1.33	1.26
Industry	-	0.45	-	-	-	-	-	-	0.51
Iron and steel	-	0.00	-	-	-	-	-	-	0.00
Non-ferrous metals	-	0.00	-	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	-	-	-	-	-
Construction materials	-	0.00	-	-	-	-	-	-	0.39
Pulp and paper	-	-	-	-	-	-	-	-	-
Food production	-	0.04	-	-	-	-	-	-	0.01
Not elsewhere specified	-	0.40	-	-	-	-	-	-	0.11
Transport	-	-	-	-	-	-	-	1.33	-
Rail	-	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	1.33	-	-
Air	-	-	-	-	-	-	-	-	-
- international	-	-	-	-	-	-	-	-	-
- domestic	-	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-	-
Other sectors	-	15.69	-	0.34	0.29	-	-	-	0.75
Households	-	15.57	-	0.34	-	-	-	-	0.72
Services	-	0.12	-	-	0.29	-	-	-	0.03
Agriculture	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2013, energy units (cont.)

<i>Pl</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	1.85	4.39	0.02	0.04	0.65	32.08	1.54	-	0.01	-
Export	6.78	21.03	-	-	-	16.86	2.10	-	15.11	1.32
Import-processing	-	-	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-	-	-
Stock change	0.05	0.94	-	-	0.02	0.18	0.55	-	2.38	0.04
Bunkers	-	-	-	-	-	-	-	-	-	-
Energy supplied	4.88	15.70	0.02	0.04	0.67	15.40	0.02	-	12.72	1.36
<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	9.80	41.39	-	-	4.77	45.80	7.24	-	20.67	1.36
NGL-plant	1.91	-	-	-	-	-	-	-	-	0.90
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total production	11.71	41.39	-	-	4.77	45.80	7.24	-	20.67	2.25
Gross production	6.83	25.69	0.02	0.04	5.44	61.20	7.22	-	7.95	0.90
<i>Transformation sector</i>	-	-	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	0.04	-	0.76	-
public cogeneration plants	-	-	-	-	-	-	-	-	1.10	-
public heating plants	-	-	-	-	-	-	0.16	-	0.18	-
industrial cogeneration plants	-	-	-	-	-	-	-	-	2.39	-
- in refineries	-	-	-	-	-	-	-	-	2.23	-
- in gas production	-	-	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	0.02	-	0.28	-
Petroleum refineries	-	-	-	-	-	-	-	-	-	0.90
NGL-plant	-	-	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total transformation sector	-	-	-	-	-	-	0.21	-	4.71	0.90
<i>Energy sector own use</i>	-	-	-	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	-	-	-	-	-	-	-
Coal production	-	-	-	-	-	-	-	-	-	-
Electric energy supply industry	-	-	-	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-	-	-
Petroleum refineries	0.07	-	-	-	-	-	-	-	-	2.13
NGL-plant	-	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-	-
Total energy sector own use	0.07	-	-	-	-	-	-	-	2.13	-
<i>Losses</i>	-	-	-	-	-	-	-	-	-	-
Final energy demand	6.76	25.69	0.02	0.04	5.44	61.20	7.00	-	1.11	-
<i>Non energy use</i>	-	-	-	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-
Energy consumption	6.76	25.69	0.02	0.04	5.44	61.20	7.00	-	1.11	-
<i>Industry</i>	0.81	-	-	-	-	0.53	0.70	-	0.50	-
Iron and steel	0.18	-	-	-	-	-	0.03	-	0.02	-
Non-ferrous metals	0.25	-	-	-	-	-	0.03	-	-	-
Non-metallic minerals	0.01	-	-	-	-	-	-	-	0.00	-
Chemical	0.00	-	-	-	-	-	0.03	-	0.00	-
Construction materials	0.13	-	-	-	-	0.53	0.11	-	0.18	-
Pulp and paper	0.00	-	-	-	-	-	0.00	-	-	-
Food production	0.07	-	-	-	-	-	0.37	-	0.23	-
Not elsewhere specified	0.17	-	-	-	-	-	0.12	-	0.06	-
Transport	2.64	25.18	0.02	-	5.44	49.72	-	-	-	-
Rail	-	-	-	-	-	1.00	-	-	-	-
Road	2.64	25.18	-	-	-	46.01	-	-	-	-
Air	-	-	0.02	-	5.44	-	-	-	-	-
- international	-	-	0.00	-	3.48	-	-	-	-	-
- domestic	-	-	0.02	-	1.96	-	-	-	-	-
Sea and River	-	-	-	-	-	1.64	-	-	-	-
Public transport	-	-	-	-	-	1.07	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Other sectors	3.32	0.51	-	0.04	-	10.96	6.31	-	0.61	-
Households	2.54	-	-	0.04	-	-	3.57	-	0.29	-
Services	0.57	-	-	-	-	-	1.89	-	0.18	-
Agriculture	0.12	0.33	-	-	-	-	7.22	0.56	-	0.14
Construction	0.09	0.18	-	-	-	-	3.73	0.29	-	-

Table A4-2: National Energy balance for 2013, energy units (cont.)

<i>PI</i>	Naphta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
Production	-	-	-	-	-	-	-	-
Import	0.11	3.50	0.78	0.20	4.70	-	-	-
Export	-	0.03	0.27	0.00	0.63	-	1.80	-
Import-processing	-	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-	-
Stock change	-	-	0.05	0.01	-	0.14	-	0.28
Bunkers	-	-	-	-	-	-	-	-
Energy supplied	0.11	3.42	0.52	0.19	3.93	-	1.52	-
<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	-	1.21	0.45	-	1.87	-	1.58	8.07
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total production	-	1.21	0.45	-	1.87	-	1.58	8.07
Gross production	0.11	4.62	0.96	0.19	5.80	-	0.06	8.07
<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	-	-	-	-	-	-	-	0.65
- in refineries	-	-	-	-	-	-	-	0.65
- in gas production	-	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-	-
Petroleum refineries	-	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total transformation sector	-	-	-	-	-	-	-	0.65
<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	-	-	-	-	1.26	-	-	7.42
NGL-plant	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	-	1.26	-	-	7.42
<i>Losses</i>	-	-	-	-	-	-	-	-
Final energy demand	0.11	4.62	0.96	0.19	4.54	-	0.06	0.00
Non energy use	0.11	4.62	0.96	0.19	-	-	0.06	-
Energy sector	-	-	-	0.06	-	-	-	-
Petrochemical industry	0.11	-	-	0.02	-	-	-	-
Other industry	-	1.10	0.18	0.17	-	-	0.06	-
Construction	-	3.52	0.04	-	-	-	-	-
Transport	-	-	0.63	-	-	-	-	-
Agriculture	-	-	0.04	-	-	-	-	-
Energy consumption	-	-	-	-	4.54	-	0.00	0.00
<i>Industry</i>	-	-	-	-	4.54	-	-	-
Iron and steel	-	-	-	-	-	-	-	-
Non-ferrous metals	-	-	-	-	-	-	-	-
Non-metallic minerals	-	-	-	-	-	-	-	-
Chemical	-	-	-	-	-	-	-	-
Construction materials	-	-	-	-	4.54	-	-	-
Pulp and paper	-	-	-	-	-	-	-	-
Food production	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
<i>Transport</i>	-	-	-	-	-	-	-	-
Rail	-	-	-	-	-	-	-	-
Road	-	-	-	-	-	-	-	-
Air	-	-	-	-	-	-	-	-
- international	-	-	-	-	-	-	-	-
- domestic	-	-	-	-	-	-	-	-
Sea and River	-	-	-	-	-	-	-	-
Public transport	-	-	-	-	-	-	-	-
Not elsewhere specified	-	-	-	-	-	-	-	-
<i>Other sectors</i>	-	-	-	-	-	-	-	-
Households	-	-	-	-	-	-	-	-
Services	-	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-

Table A4-2: National Energy balance for 2013, energy units (cont.)

<u>PI</u>	Refinery gas	Refinery semiproducts	Additives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production	-	-	-	-	1.74	0.37	0.37
Import	12.06	3.07	-	24.64	-	-	-
Export	-	-	-	8.48	-	-	-
Import-processing	-	-	-	-	-	-	-
Export-processing	-	-	-	-	-	-	-
Stock change	-	0.35	0.14	-	-	-	-
Bunkers	-	-	-	-	-	-	-
Energy supplied	11.71	2.93	-	16.17	1.74	0.37	0.37
<i>Production</i>	-	-	-	-	-	-	-
hydro power plants	-	-	-	29.18	-	-	-
- small HPP	-	-	-	0.44	-	-	-
Wind power plants	-	-	-	1.86	-	-	-
Solar power plants	-	-	-	0.04	-	-	-
Geothermal power plants	-	-	-	-	-	-	-
thermal power plants	-	-	-	9.00	-	-	-
public cogeneration plants	-	-	-	7.09	9.12	-	-
public heating plants	-	-	-	-	2.62	-	-
industrial cogeneration plants	-	-	-	1.18	10.08	-	-
- in refineries	-	-	-	0.35	3.87	-	-
- in gas production	-	-	-	-	0.74	-	-
Industrial heating plants	-	-	-	-	2.81	-	-
Petroleum refineries	-	-	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	0.07	-	-	-	-
Total production	-	-	0.07	48.35	24.63	-	-
Gross production	11.71	2.93	0.07	64.52	26.37	0.37	0.37
<i>Transformation sector</i>	-	-	-	-	-	-	-
hydro power plants	-	-	-	-	-	-	-
- small HPP	-	-	-	-	-	-	-
Wind power plants	-	-	-	-	-	-	-
Solar power plants	-	-	-	-	-	-	-
Geothermal power plants	-	-	-	-	-	-	-
thermal power plants	-	-	-	-	-	-	-
public cogeneration plants	-	-	-	-	-	-	-
public heating plants	-	-	-	-	-	-	-
industrial cogeneration plants	-	-	-	-	-	-	-
- in refineries	-	-	-	-	-	-	-
- in gas production	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	-	-	-	-
Petroleum refineries	11.71	2.93	-	-	-	-	-
NGL-plant	-	-	-	-	-	-	-
Coke plant	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-
Total transformation sector	11.71	2.93	-	-	-	-	-
<i>Energy sector own use</i>	-	-	-	-	-	-	-
Oil and gas extraction	-	-	-	0.38	0.74	-	-
Coal production	-	-	-	-	0.05	-	-
Electric energy supply industry	-	-	-	0.11	-	-	-
hydro power plants	-	-	-	0.68	-	-	-
thermal power plants	-	-	-	0.86	-	-	-
public cogeneration plants	-	-	-	0.35	0.67	-	-
industrial cogeneration plants	-	-	-	-	-	-	-
Industrial heating plants	-	-	-	0.01	-	-	-
Petroleum refineries	-	-	-	0.93	3.87	-	-
NGL-plant	-	-	-	0.03	-	-	-
Gas works	-	-	-	-	-	-	-
Total energy sector own use	-	-	-	3.35	5.33	-	-
Losses	-	-	0.00	7.00	1.36	-	-
Final energy demand	-	-	0.07	54.17	19.68	0.37	0.37
Non energy use	-	-	-	-	-	-	-
Energy sector	-	-	-	-	-	-	-
Petrochemical industry	-	-	-	-	-	-	-
Other industry	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-
Energy consumption	-	-	0.07	54.17	19.68	0.37	0.37
Industry	-	-	0.00	11.05	10.34	0.37	0.37
Iron and steel	-	-	0.00	1.18	0.04	-	-
Non-ferrous metals	-	-	-	0.31	-	-	-
Non-metallic minerals	-	-	-	0.45	0.10	-	-
Chemical	-	-	-	0.99	3.98	-	-
Construction materials	-	-	-	1.62	-	0.37	0.37
Pulp and paper	-	-	-	0.65	0.86	-	-
Food production	-	-	-	2.39	3.28	-	-
Not elsewhere specified	-	-	0.00	3.47	2.08	-	-
Transport	-	-	-	1.01	-	-	-
Rail	-	-	-	0.54	-	-	-
Road	-	-	-	-	-	-	-
Air	-	-	-	0.08	-	-	-
- international	-	-	-	-	-	-	-
- domestic	-	-	-	0.08	-	-	-
Sea and River	-	-	-	0.07	-	-	-
Public transport	-	-	-	0.23	-	-	-
Not elsewhere specified	-	-	-	0.09	-	-	-
Other sectors	-	-	0.06	42.11	9.34	-	-
Households	-	-	0.04	22.42	7.52	-	-
Services	-	-	0.03	19.16	1.63	-	-
Agriculture	-	-	-	0.22	0.19	-	-
Construction	-	-	-	0.30	-	-	-

ANNEX 5: ANY ADDITIONAL INFORMATION

ANNEX 5-1: ARCHIVING, INVENTORY DATA RECORD SHEET**INVENTORY DATA RECORD SHEET****Year:** 2013

MODULE: WASTE	
SUBMODULE: METHANE EMISSIONS FROM SOLID WASTE DISPOSAL SITES	
WORKSHEET: 6-1	SHEET: 1 OF 1 CH ₄ EMISSIONS
STEP: 1 TO 4	PAGE: 1 of 3
DIRECT DATA SOURCE:	
A. ACTIVITY DATA:	
Environmental Pollution Register database and Landfill Inventory database (Croatian Environmental Agency, CEA). Assessment of inappropriate activity data on quantities of MSW disposed to different types of SWDs - <i>Guidelines Development for starting implementation of Waste Management Plan in the Republic of Croatia</i> , EKONERG Ltd.	
<u>Quantities of MSW disposed to SWDSs:</u>	
Managed: 869.76Gg Unmanaged – deep: 396.89 Gg Unmanaged – shallow: 115.63 Gg	
Country-specific methane correction factor (MCF): 0.892 Country-specific fraction of degradable organic carbon (DOC): 0.16 Recovered methane: 4.80Gg	
B. METHODOLOGY/EMISSION FACTOR:	
Publications: IPCC/UNEP/OECD/IEA (2006), 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3. Methodology: First Order Decay method (Tier 2) Methane generation rate constant k=0.05 Fraction of DOC which really degrades: 0.55 (0.5-0.6) Fraction of carbon released as methane: 0.5	
ORIGINAL DATA SOURCE:	
A. ACTIVITY DATA: Environmental Pollution Register database and Landfill Inventory database (CEA)	
METHOD: bottom-up (see publications in original data source)	
ADDITIONAL INTERCALCULATION: Evaluation and compiling of data coming from original data source and adjusting to recommended Intergovernmental Panel on Climate Change (IPCC) methodology.	
DATA ARCHIVATION: Publications: Fundurulja, D., Mužinić, M. (2000) <i>Estimation of the Quantities of Municipal Solid Waste in the Republic of Croatia in the period 1990 – 1998 and 1998 – 2010</i> . Potočnik, V. (2000), Report: The basis for methane emission estimation in Croatia 1990-1998, B. Data on Municipal Solid Waste in Croatia 1990-1998 Environmental Pollution Register Database and Landfill Inventory Database, CEA	
DATA GAPS: MSW quantity estimation were in most cases gained by test weighing in order to estimate average volumes of waste delivered by vehicles and density of MSW. National classification of SWDSs is different from IPCC classification. Scarce data for DOC estimation.	
SUGGESTION FOR THE FUTURE: For the purposes of improvement activity data gathering from solid waste disposal activities it is necessary to improve quality of existing data:	
<ul style="list-style-type: none"> • more accurate determination on waste quantities disposed to different types of SWDSs (managed, unmanaged deep and unmanaged shallow) – based on measurement/weighing or more accurate estimation • providing methodology to determine country-specific MSW composition and periodic analysis of waste composition at major landfills. It will be solved through the project of the CEA: <i>Creating a uniform</i> 	

MODULE: WASTE	
SUBMODULE: METHANE EMISSIONS FROM SOLID WASTE DISPOSAL SITES	
WORKSHEET: 6-1	SHEET: 1 OF 1 CH₄ EMISSIONS
STEP: 1 TO 4	PAGE: 1 of 3
<p><i>methodology for the analysis of the composition of MSW, determine the average composition of MSW in the Republic of Croatia and the projection of the amount of MSW.</i></p> <ul style="list-style-type: none"> modification of Environmental Pollution Register and Landfill Inventory database regarding to MSW with additional information (provided on regular basis) on technical and environmental protection measures implemented at landfills, waste quantities disposed to different types of SWDS (managed, unmanaged deep and unmanaged shallow) and waste composition. collecting the necessary data and information on organic industrial waste (including sludge from waste water treatment) disposed in SWDSs. <p>Adjustment of country-specific to IPCC SWDS classification for entire time series, in order to accurately estimate the MCF. Due to lack of adequate information, interpolation/extrapolation method has been applied for estimation of waste and landfills characteristics over a long period of time. It is necessary to improve the quality of existing data and to reconstruct historical data.</p> <p>More detailed background information related to the sources of AD and EFs are necessary in order to improve transparency. Research should be conducted in order to develop country-specific parameters for the first order decay method to increase the accuracy of the emission estimates.</p> <p>More information for uncertainty estimation is required, regarding more accurate and transparent uncertainty analysis.</p>	
NOTES: -	
RESPONSIBILITY: Andrea Hublin, PhD EKONERG address: Koranska 5, 10000 Zagreb tel.: +385 1 6000 134 e-mail: andrea.hublin@ekonerg.hr	

ANNEX 5-2: GHG EMISSION TREND

Table A5.2-1: GHG emission in Croatia, Base year

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

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

									Inventory 1990
									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
TOTAL (net emissions)⁽¹⁾									
1. Energy	18,530.88	6,954.12	2,843.63	NO	1,240.24	10.45	NO	NO	29,579.31
A. Fuel combustion (sectoral approach)	21,219.16	3,562.67	120.79						24,902.63
1. Energy industries	20,248.04	242.03	120.25						20,610.32
1. Energy industries	7,166.75	5.41	17.38						7,189.55
2. Manufacturing industries and construction	5,501.67	9.73	17.64						5,529.04
3. Transport	3,936.62	41.13	54.31						4,032.07
4. Other sectors	3,642.99	185.77	30.91						3,859.66
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	971.12	3,320.64	0.55						4,292.31
1. Solid fuels	NO	59.64	NO,NA						59.64
2. Oil and natural gas	971.12	3,260.99	0.55						4,232.66
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,804.58	9.53	787.80	NO	1,240.24	10.45	NO	NO	4,852.60
A. Mineral industry	1,280.88								1,280.88
B. Chemical industry	771.87	5.63	754.43	NO	NO	NO	NO	NO	1,531.93
C. Metal industry	338.56	3.90	NO	NO	1,240.24	NO	NO	NO	1,582.70
D. Non-energy products from fuels and solvent use	413.27	NA	NA						413.27
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	2,853.98	1,862.50						4,766.50
A. Enteric fermentation		2,501.11							2,501.11
B. Manure management		352.87	323.85						676.72
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,538.65						1,538.65
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-5,543.42	1.23	5.53						-5,536.67
A. Forest land	-5,628.11	1.12	0.74						-5,626.25
B. Cropland	217.98	NA,NO	4.67						222.64
C. Grassland	-103.97	0.11	0.12						-103.74
D. Wetlands	30.00	NA,NO	NA,NO						30.00
E. Settlements	240.31	NO	NO						240.31
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-299.62								-299.62
H. Other	NO	NO	NO						NO
5. Waste	0.54	526.70	67.01						594.24
A. Solid waste disposal	NA,NO	288.84							288.84
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		237.86	67.00						304.86
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	493.99	0.70	2.02						496.71
Aviation	346.76	0.36	0.87						347.99
Navigation	147.23	0.34	1.15						148.72
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	2,540.16								2,540.16
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									35,115.98
Total CO₂ equivalent emissions with land use, land-use change and forestry									29,579.31
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									35,115.98
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									29,579.31

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1991
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	10,515.59	5,988.33	2,681.93	NO	850.75	10.33	NO	NO	20,046.94
1. Energy	15,591.70	2,695.95	89.75						18,377.40
A. Fuel combustion (sectoral approach)	14,708.90	159.26	89.36						14,957.52
1. Energy industries	4,835.34	3.97	12.00						4,851.31
2. Manufacturing industries and construction	3,919.00	7.08	12.57						3,938.65
3. Transport	2,892.28	31.02	43.88						2,967.17
4. Other sectors	3,062.28	117.18	20.91						3,200.37
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	882.80	2,536.69	0.39						3,419.88
1. Solid fuels	NO	53.15	NO,NA						53.15
2. Oil and natural gas	882.80	2,483.54	0.39						3,366.73
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,987.58	8.91	696.33	NO	850.75	10.33	NO	NO	3,553.90
A. Mineral industry	863.47								863.47
B. Chemical industry	682.27	5.18	662.95	NO	NO	NO	NO	NO	1,350.41
C. Metal industry	273.84	3.73	NO	NO	850.75	NO	NO	NO	1,128.32
D. Non-energy products from fuels and solvent use	167.99	NA	NA						167.99
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	2,740.56	1,825.78						4,617.29
A. Enteric fermentation		2,401.35							2,401.35
B. Manure management		339.22	310.12						649.34
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,515.65						1,515.65
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,115.18	3.18	6.68						-7,105.31
A. Forest land	-7,758.27	3.00	1.98						-7,753.29
B. Cropland	214.29	NA,NO	4.50						218.79
C. Grassland	-76.80	0.18	0.19						-76.42
D. Wetlands	30.17	NA,NO	NA,NO						30.17
E. Settlements	250.75	NO	NO						250.75
F. Other land	NO	NO	NO						NO
G. Harvested wood products	224.69								224.69
H. Other	NO	NO	NO						NO
5. Waste	0.54	539.72	63.40						603.66
A. Solid waste disposal	NA,NO	302.32							302.32
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		237.41	63.39						300.80
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	68.88	0.07	0.17						69.13
Aviation	68.88	0.07	0.17						69.13
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,751.68								1,751.68
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									27,152.25
Total CO₂ equivalent emissions with land use, land-use change and forestry									20,046.94
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									27,152.25
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									20,046.94

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

									Inventory 1992
									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	9,611.10	5,448.14	2,721.60	NO	NO	10.42	NO	NO	17,791.26
1. Energy	14,836.41	2,470.38	80.64						17,387.43
A. Fuel combustion (sectoral approach)	13,962.33	130.38	80.28						14,173.00
1. Energy industries	5,499.07	4.57	15.42						5,519.06
2. Manufacturing industries and construction	3,114.89	5.44	9.58						3,129.91
3. Transport	2,788.08	27.67	37.80						2,853.56
4. Other sectors	2,560.29	92.70	17.49						2,670.47
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	874.08	2,340.00	0.35						3,214.43
1. Solid fuels	NO	41.30	NO,NA						41.30
2. Oil and natural gas	874.08	2,298.70	0.35						3,173.13
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,147.66	7.77	898.81	NO	NO	10.42	NO	NO	3,064.65
A. Mineral industry	938.79								938.79
B. Chemical industry	850.24	5.32	865.43	NO	NO	NO	NO	NO	1,720.98
C. Metal industry	118.53	2.45	NO	NO	NO	NO	NO	NO	120.98
D. Non-energy products from fuels and solvent use	240.10	NA	NA						240.10
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	2,402.14	1,663.53						4,131.18
A. Enteric fermentation		2,111.66							2,111.66
B. Manure management		290.47	254.54						545.01
C. Rice cultivation		NO							NO
D. Agricultural soils			NA	1,409.00					1,409.00
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,439.02	15.15	14.98						-7,408.89
A. Forest land	-8,186.62	13.64	9.00						-8,163.98
B. Cropland	221.14	NA,NO	4.34						225.48
C. Grassland	-83.63	1.51	1.64						-80.49
D. Wetlands	31.89	NA,NO	NA,NO						31.89
E. Settlements	251.11	NO	NO						251.11
F. Other land	NO	NO	NO						NO
G. Harvested wood products	327.10								327.10
H. Other	NO	NO	NO						NO
5. Waste	0.54	552.71	63.65						616.89
A. Solid waste disposal	NA,NO	315.75							315.75
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		236.95	63.64						300.60
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	57.20	0.06	0.14						57.40
Aviation	57.20	0.06	0.14						57.40
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass		1,520.96							1,520.96
CO ₂ captured		NO							NO
Long-term storage of C in waste disposal sites		NE							NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25,200.15
Total CO₂ equivalent emissions with land use, land-use change and forestry									17,791.26
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									25,200.15
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									17,791.26

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1993
(Sheet 1 of 1)									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	9,557.33	5,502.19	2,340.04	NO	NO	10.53	NO	NO	17,410.09
A. Fuel combustion (sectoral approach)	15,660.54	2,529.42	89.79						18,279.75
1. Energy industries	14,572.22	123.56	89.44						14,785.22
1. Energy industries	6,030.66	4.88	17.13						6,052.67
2. Manufacturing industries and construction	3,031.80	5.21	9.17						3,046.18
3. Transport	2,961.47	27.17	46.75						3,035.38
4. Other sectors	2,548.29	86.31	16.39						2,650.99
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,088.31	2,405.86	0.35						3,494.52
1. Solid fuels	NO	39.52	NO,NA						39.52
2. Oil and natural gas	1,088.31	2,366.34	0.35						3,455.00
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,851.82	6.42	685.77	NO	NO	10.53	NO	NO	2,554.54
A. Mineral industry	804.89								804.89
B. Chemical industry	729.48	5.32	652.39	NO	NO	NO	NO	NO	1,387.20
C. Metal industry	58.10	1.10	NO	NO	NO	NO	NO	NO	59.20
D. Non-energy products from fuels and solvent use	259.34	NA	NA						259.34
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	2,365.51	1,473.08						3,890.74
A. Enteric fermentation		2,074.08							2,074.08
B. Manure management		291.43	257.67						549.10
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,215.41						1,215.41
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-8,007.70	34.39	27.54						-7,945.77
A. Forest land	-8,528.92	32.81	21.64						-8,474.48
B. Cropland	208.74	NA,NO	4.18						212.92
C. Grassland	-86.55	1.58	1.72						-83.24
D. Wetlands	33.60	NA,NO	NA,NO						33.60
E. Settlements	251.47	NO	NO						251.47
F. Other land	NO	NO	NO						NO
G. Harvested wood products	113.96								113.96
H. Other	NO	NO	NO						NO
5. Waste	0.54	566.44	63.86						630.84
A. Solid waste disposal	NA,NO	329.94							329.94
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		236.50	63.86						300.36
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	140.58	0.15	0.35						141.08
Aviation	140.58	0.15	0.35						141.08
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,447.04								1,447.04
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25,355.86
Total CO₂ equivalent emissions with land use, land-use change and forestry									17,410.09
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									25,355.86
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									17,410.09

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1994
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	CROATIA
Total (net emissions)⁽¹⁾									
1. Energy	8,844.06	5,070.18	2,323.83	NO	NO	10.64	NO	NO	16,248.71
A. Fuel combustion (sectoral approach)	14,680.04	2,303.13	87.98						17,071.15
1. Energy industries	13,704.59	128.87	87.66						13,921.12
1. Energy industries	4,694.84	3.27	12.05						4,710.17
2. Manufacturing industries and construction	3,202.34	4.85	8.64						3,215.82
3. Transport	3,171.46	29.55	49.51						3,250.53
4. Other sectors	2,635.95	91.20	17.46						2,744.60
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	975.45	2,174.26	0.32						3,150.03
1. Solid fuels	NO	35.44	NO,NA						35.44
2. Oil and natural gas	975.45	2,138.82	0.32						3,114.59
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,977.89	6.71	739.82	NO	NO	10.64	NO	NO	2,735.06
A. Mineral industry	976.59								976.59
B. Chemical industry	749.67	5.08	706.44	NO	NO	NO	NO	NO	1,461.19
C. Metal industry	80.11	1.63	NO	NO	NO	NO	NO	NO	81.74
D. Non-energy products from fuels and solvent use	171.51	NA	NA						171.51
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	2,162.24	1,417.66						3,627.46
A. Enteric fermentation		1,889.85							1,889.85
B. Manure management		272.39	233.38						505.77
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,184.27						1,184.27
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,861.98	11.51	11.96						-7,838.52
A. Forest land	-8,281.22	10.68	7.04						-8,263.49
B. Cropland	224.35	NA,NO	4.02						228.37
C. Grassland	-94.08	0.82	0.90						-92.36
D. Wetlands	35.32	NA,NO	NA,NO						35.32
E. Settlements	260.78	NO	NO						260.78
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-7.13								-7.13
H. Other	NO	NO	NO						NO
5. Waste	0.54	586.60	66.42						653.56
A. Solid waste disposal	NA,NO	345.40							345.40
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		241.20	66.41						307.62
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	329.86	0.52	1.57						331.95
Aviation	190.08	0.20	0.48						190.75
Navigation	139.78	0.32	1.09						141.20
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,462.72								1,462.72
CO ₂ capture	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24,087.23
Total CO₂ equivalent emissions with land use, land-use change and forestry									16,248.71
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									24,087.23
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									16,248.71

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1995
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	8,878.42	4,959.49	2,253.28	57.28	NO	11.12	NO	NO	16,159.59
A. Fuel combustion (sectoral approach)	15,492.70	2,281.65	83.82						17,858.17
1. Energy industries	14,381.82	133.00	83.51						14,598.33
2. Manufacturing industries and construction	5,226.83	4.04	12.35						5,243.22
3. Transport	2,954.66	4.74	8.46						2,967.87
4. Other sectors	3,343.51	30.89	44.76						3,419.16
5. Other	2,856.82	93.34	17.94						2,968.09
B. Fugitive emissions from fuels	NO	NO	NO						NO
1. Solid fuels	1,110.88	2,148.65	0.30						3,259.84
2. Oil and natural gas	NO	28.23	NO,NA						28.23
C. CO ₂ transport and storage	NO	1,110.88	2,120.43	0.30					3,231.61
2. Industrial processes and product use	1,786.96	6.06	711.45	57.28	NO	11.12	NO	NO	2,572.87
A. Mineral industry	759.97								759.97
B. Chemical industry	770.84	5.28	678.08	NO	NO	NO	NO	NO	1,454.19
C. Metal industry	38.37	0.78	NO	NO	NO	NO	NO	NO	39.15
D. Non-energy products from fuels and solvent use	217.78	NA	NA						217.78
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				57.28	NO	NO	NO	NO	57.28
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	2,063.37	1,376.89						3,486.55
A. Enteric fermentation		1,806.40							1,806.40
B. Manure management		256.97	223.41						480.38
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,153.48						1,153.48
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-8,448.06	7.54	9.05						-8,431.47
A. Forest land	-8,814.07	7.03	4.63						-8,802.41
B. Cropland	229.48	NA,NO	3.85						233.33
C. Grassland	-99.94	0.52	0.56						-98.86
D. Wetlands	37.04	NA,NO	NA,NO						37.04
E. Settlements	252.79	NO	NO						252.79
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-53.35								-53.35
H. Other	NO	NO	NO						NO
5. Waste	0.54	600.86	72.07						673.47
A. Solid waste disposal	NA,NO	363.40							363.40
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		237.46	72.06						309.53
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1A)									
Memo items⁽²⁾									
International bunkers	291.72	0.44	1.28						293.44
Aviation	188.64	0.20	0.47						189.31
Navigation	103.08	0.24	0.81						104.13
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,514.24								1,514.24
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24,591.06
Total CO₂ equivalent emissions with land use, land-use change and forestry									16,159.59
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									24,591.06
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									16,159.59

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1996
(Sheet 1 of 1)									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾	9,726.37	4,841.13	2,237.33	80.07	NO	11.57	NO	NO	16,896.47
1. Energy	16,039.92	2,225.39	115.96						18,381.27
A. Fuel combustion (sectoral approach)	14,969.77	156.35	115.66						15,241.79
1. Energy industries	5,054.87	4.06	12.92						5,071.84
2. Manufacturing industries and construction	2,998.35	4.71	8.41						3,011.48
3. Transport	3,659.57	33.33	72.65						3,765.56
4. Other sectors	3,256.98	114.25	21.68						3,392.91
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,070.15	2,069.04	0.30						3,139.48
1. Solid fuels	NO	22.77	NO,NA						22.77
2. Oil and natural gas	1,070.15	2,046.27	0.30						3,116.72
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,777.85	5.36	665.28	80.07	NO	11.57	NO	NO	2,540.13
A. Mineral industry	844.58								844.58
B. Chemical industry	712.81	5.04	631.91	NO	NO	NO	NO	NO	1,349.76
C. Metal industry	19.30	0.32	NO	NO	NO	NO	NO	NO	19.62
D. Non-energy products from fuels and solvent use	201.16	NA	NA						201.16
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				80.07	NO	NO	NO	NO	80.07
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	1,980.61	1,372.17						3,405.23
A. Enteric fermentation		1,732.48							1,732.48
B. Manure management		248.13	214.07						462.20
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,158.10						1,158.10
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-8,144.37	16.53	15.19						-8,112.65
A. Forest land	-8,565.32	15.14	9.99						-8,540.19
B. Cropland	226.36	NA,NO	3.69						230.05
C. Grassland	-104.68	1.39	1.51						-101.78
D. Wetlands	38.76	NA,NO	NA,NO						38.76
E. Settlements	252.84	NO	NO						252.84
F. Other land	NO	NO	NO						NO
G. Harvested wood products	7.68								7.68
H. Other	NO	NO	NO						NO
5. Waste	0.54	613.23	68.72						682.49
A. Solid waste disposal	NA,NO	383.09							383.09
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.54	NA,NO	0.01						0.54
D. Waste water treatment and discharge		230.14	68.72						298.86
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1A)									
Memo items⁽²⁾									
International bunkers	268.66	0.40	1.16						270.21
Aviation	177.80	0.19	0.44						178.43
Navigation	90.86	0.21	0.71						91.78
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,807.68								1,807.68
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25,009.12
Total CO₂ equivalent emissions with land use, land-use change and forestry									16,896.47
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									25,009.12
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									16,896.47

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1997
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	11,449.44	4,794.86	2,428.63	106.14	NO	11.43	NO	NO	18,790.50
A. Fuel combustion (sectoral approach)	16,916.62	2,228.47	129.57						19,274.66
1. Energy industries	15,896.54	158.07	129.26						16,183.87
2. Manufacturing industries and construction	5,557.44	4.47	15.14						5,577.04
3. Transport	3,026.43	5.13	8.98						3,040.54
4. Other sectors	4,004.29	35.32	83.54						4,123.15
5. Other	3,308.37	113.16	21.61						3,443.14
B. Fugitive emissions from fuels	NO	NO	NO						NO
1. Solid fuels	1,020.08	2,070.40	0.30						3,090.79
2. Oil and natural gas	NO	16.65	NO,NA						16.65
C. CO ₂ transport and storage	1,020.08	2,053.75	0.30						3,074.13
D. Other	NO	NA	NA						NO
2. Industrial processes and product use	1,965.56	5.70	698.63	106.14	NO	11.43	NO	NO	2,787.46
A. Mineral industry	954.10								954.10
B. Chemical industry	756.12	4.96	665.26	NO	NO	NO	NO	NO	1,426.34
C. Metal industry	40.11	0.74	NO	NO	NO	NO	NO	NO	40.85
D. Non-energy products from fuels and solvent use	215.23	NA	NA						215.23
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				106.14	NO	NO	NO	NO	106.14
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	1,903.66	1,515.41						3,487.46
A. Enteric fermentation		1,664.27							1,664.27
B. Manure management		239.39	201.04						440.43
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,314.37						1,314.37
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,502.95	17.63	15.73						-7,469.59
A. Forest land	-7,868.69	16.28	10.73						-7,841.68
B. Cropland	243.47	NA,NO	3.53						247.00
C. Grassland	-113.41	1.35	1.47						-110.59
D. Wetlands	40.47	NA,NO	NA,NO						40.47
E. Settlements	254.85	NO	NO						254.85
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-59.65								-59.65
H. Other	NO	NO	NO						NO
5. Waste	1.82	639.39	69.29						710.51
A. Solid waste disposal	NA,NO	405.12							405.12
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	1.82	NA,NO	0.03						1.86
D. Waste water treatment and discharge		234.27	69.26						303.53
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	266.50	0.37	1.06						267.93
Aviation	192.09	0.20	0.48						192.77
Navigation	74.41	0.17	0.58						75.16
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,869.84								1,869.84
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									26,260.09
Total CO₂ equivalent emissions with land use, land-use change and forestry									18,790.50
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									26,260.09
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									18,790.50

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1998
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	12,093.35	4,619.94	2,097.26	139.06	NO	11.99	NO	NO	18,961.59
1. Energy	17,748.42	2,075.16	105.35						19,928.93
A. Fuel combustion (sectoral approach)	16,833.30	153.12	105.06						17,091.49
1. Energy industries	6,212.63	5.18	16.82						6,234.63
2. Manufacturing industries and construction	3,313.18	5.14	9.16						3,327.47
3. Transport	4,139.75	36.22	58.89						4,234.86
4. Other sectors	3,167.75	106.58	20.20						3,294.52
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	915.12	1,922.04	0.28						2,837.44
1. Solid fuels	NO	17.44	NO,NA						17.44
2. Oil and natural gas	915.12	1,904.60	0.28						2,820.00
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,857.97	5.05	534.20	139.06	NO	11.99	NO	NO	2,548.27
A. Mineral industry	1,027.37								1,027.37
B. Chemical industry	606.29	4.67	500.83	NO	NO	NO	NO	NO	1,111.79
C. Metal industry	28.85	0.38	NO	NO	NO	NO	NO	NO	29.22
D. Non-energy products from fuels and solvent use	195.46	NA	NA						195.46
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				139.06	NO	NO	NO	NO	139.06
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	1,839.39	1,354.84						3,238.47
A. Enteric fermentation		1,606.95							1,606.95
B. Manure management		232.44	199.90						432.34
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,154.93						1,154.93
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,560.99	45.11	35.38						-7,480.49
A. Forest land	-7,856.58	39.83	26.26						-7,790.49
B. Cropland	256.21	NA,NO	3.37						259.57
C. Grassland	-117.99	5.29	5.75						-106.95
D. Wetlands	42.19	NA,NO	NA,NO						42.19
E. Settlements	271.45	NO	NO						271.45
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-156.26								-156.26
H. Other	NO	NO	NO						NO
5. Waste	3.70	655.23	67.49						726.42
A. Solid waste disposal	NA,NO	428.27							428.27
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	3.70	NA,NO	0.06						3.76
D. Waste water treatment and discharge		226.95	67.42						294.38
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	290.77	0.41	1.17						292.34
Aviation	208.92	0.22	0.52						209.66
Navigation	81.85	0.19	0.64						82.68
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,750.22								1,750.22
CO ₂ capture	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									26,442.09
Total CO₂ equivalent emissions with land use, land-use change and forestry									18,961.59
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									26,442.09
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									18,961.59

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 1999
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	12,789.51	4,441.17	2,278.24	166.70	NO	11.99	NO	NO	19,687.62
A. Fuel combustion (sectoral approach)	18,258.06	1,963.86	149.17						20,371.09
1. Energy industries	17,368.96	147.63	148.91						17,665.50
1. Energy industries	6,439.06	5.45	17.42						6,461.94
2. Manufacturing industries and construction	2,980.25	4.26	7.69						2,992.21
3. Transport	4,370.68	36.91	104.01						4,511.61
4. Other sectors	3,578.95	101.00	19.78						3,699.74
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	889.11	1,816.22	0.26						2,705.59
1. Solid fuels	NO	5.25	NO,NA						5.25
2. Oil and natural gas	889.11	1,810.97	0.26						2,700.34
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,219.90	5.14	623.78	166.70	NO	11.99	NO	NO	3,027.51
A. Mineral industry	1,284.91								1,284.91
B. Chemical industry	722.89	4.71	590.41	NO	NO	NO	NO	NO	1,318.01
C. Metal industry	26.86	0.42	NO	NO	NO	NO	NO	NO	27.28
D. Non-energy products from fuels and solvent use	185.24	NA	NA						185.24
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				166.70	NO	NO	NO	NO	166.70
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	1,777.73	1,424.82						3,253.04
A. Enteric fermentation		1,544.56							1,544.56
B. Manure management		233.17	201.64						434.81
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,223.19						1,223.19
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,743.32	5.91	7.81						-7,729.60
A. Forest land	-7,986.62	4.26	2.81						-7,979.55
B. Cropland	243.55	NA,NO	3.20						246.75
C. Grassland	-121.64	1.65	1.80						-118.18
D. Wetlands	43.91	NA,NO	NA,NO						43.91
E. Settlements	260.85	NO	NO						260.85
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-183.37								-183.37
H. Other	NO	NO	NO						NO
5. Waste	4.38	688.53	72.65						765.56
A. Solid waste disposal	NA,NO	454.57							454.57
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	4.38	NA,NO	0.08						4.46
D. Waste water treatment and discharge		233.96	72.58						306.54
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)									
Memo items:⁽²⁾									
International bunkers	265.95	0.36	1.02						267.34
Aviation	199.58	0.21	0.50						200.29
Navigation	66.37	0.15	0.53						67.05
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	1,559.35								1,559.35
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									
Total CO₂ equivalent emissions with land use, land-use change and forestry									
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									

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

									Inventory 2000
									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	12,743.58	4,456.44	2,466.14	199.21	NO	11.62	NO	NO	19,876.99
1. Energy	17,657.09	1,923.48	158.51						19,739.09
A. Fuel combustion (sectoral approach)	16,718.48	157.33	158.27						17,034.09
1. Energy industries	5,816.84	3.94	18.63						5,839.41
2. Manufacturing industries and construction	3,103.13	4.44	8.05						3,115.63
3. Transport	4,380.15	35.66	109.75						4,525.56
4. Other sectors	3,418.37	113.29	21.84						3,553.50
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	938.61	1,766.15	0.25						2,705.00
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	938.61	1,766.15	0.25						2,705.00
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,349.61	3.60	727.52	199.21	NO	11.62	NO	NO	3,291.57
A. Mineral industry	1,423.08								1,423.08
B. Chemical industry	724.36	3.12	694.15	NO	NO	NO	NO	NO	1,421.62
C. Metal industry	26.78	0.48	NO	NO	NO	NO	NO	NO	27.26
D. Non-energy products from fuels and solvent use	175.40	NA	NA						175.40
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				199.21	NO	NO	NO	NO	199.21
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	1,708.87	1,438.93						3,208.67
A. Enteric fermentation		1,487.63							1,487.63
B. Manure management		221.24	183.33						404.58
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,255.60						1,255.60
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,330.15	96.91	71.15						-7,162.09
A. Forest land	-7,683.24	87.11	57.44						-7,538.70
B. Cropland	294.42	NA,NO	3.04						297.46
C. Grassland	-110.96	9.80	10.67						-90.49
D. Wetlands	45.63	NA,NO	NA,NO						45.63
E. Settlements	289.31	NO	NO						289.31
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-165.29								-165.29
H. Other	NO	NO	NO						NO
5. Waste	6.15	723.57	70.03						799.76
A. Solid waste disposal	NA,NO	481.08							481.08
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	6.15	NA,NO	0.11						6.26
D. Waste water treatment and discharge		242.50	69.92						312.42
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	228.73	0.31	0.88						229.92
Aviation	171.11	0.18	0.43						171.72
Navigation	57.62	0.13	0.45						58.21
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,751.41								1,751.41
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									27,039.08
Total CO ₂ equivalent emissions with land use, land-use change and forestry									19,876.99
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									27,039.08
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									19,876.99

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

									Inventory 2001
									Submission 2015 v2
									CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	13,977.37	4,321.17	2,399.16	224.96	NO	11.69	NO	NO	20,934.36
A. Fuel combustion (sectoral approach)	18,661.04	1,924.04	152.23						20,737.32
1. Energy industries	17,656.47	128.10	152.00						17,936.57
2. Manufacturing industries and construction	6,381.66	4.46	20.96						6,407.08
3. Transport	3,196.99	4.39	8.06						3,209.43
4. Other sectors	4,442.09	30.61	104.85						4,577.55
5. Other	3,635.73	88.64	18.14						3,742.50
B. Fugitive emissions from fuels	1,004.58	1,795.95	0.23						2,800.75
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	1,004.58	1,795.95	0.23						2,800.75
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,451.68	3.69	615.94	224.96	NO	11.69	NO	NO	3,307.97
A. Mineral industry	1,643.76								1,643.76
B. Chemical industry	633.80	3.67	582.57	NO	NO	NO	NO	NO	1,220.03
C. Metal industry	6.56	0.02	NO	NO	NO	NO	NO	NO	6.58
D. Non-energy products from fuels and solvent use	167.57	NA	NA						167.57
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				224.96	NO	NO	NO	NO	224.96
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	1,639.21	1,539.04						3,270.34
A. Enteric fermentation		1,419.43							1,419.43
B. Manure management		219.78	190.95						410.73
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,348.08						1,348.08
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,234.14	19.00	17.35						-7,197.80
A. Forest land	-7,672.26	16.02	10.56						-7,645.67
B. Cropland	322.75	NA,NO	3.54						326.29
C. Grassland	-148.78	2.98	3.24						-142.57
D. Wetlands	36.33	NA,NO	NA,NO						36.33
E. Settlements	330.11	NO	NO						330.11
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-102.28								-102.28
H. Other	NO	NO	NO						NO
5. Waste	6.68	735.24	74.61						816.53
A. Solid waste disposal	NA,NO	511.70							511.70
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	6.68	NA,NO	0.12						6.80
D. Waste water treatment and discharge		223.54	74.49						298.03
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	261.50	0.39	1.14						263.03
Aviation	171.19	0.18	0.43						171.80
Navigation	90.31	0.21	0.71						91.23
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,432.17								1,432.17
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									28,132.15
Total CO ₂ equivalent emissions with land use, land-use change and forestry									20,934.36
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									28,132.15
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									20,934.36

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2002
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾									
1. Energy									
A. Fuel combustion (sectoral approach)	19,823.80	1,948.70	116.41						21,888.91
1. Energy industries	18,798.68	129.24	116.19						19,044.11
2. Manufacturing industries and construction	7,273.79	4.90	24.91						7,303.60
3. Transport	3,057.13	4.32	7.93						3,069.38
4. Other sectors	4,744.72	29.66	64.79						4,839.17
5. Other	3,723.03	90.36	18.55						3,831.95
B. Fugitive emissions from fuels	NO	NO	NO						NO
1. Solid fuels	1,025.12	1,819.46	0.22						2,844.80
2. Oil and natural gas	NO	NO	NO,NA						NO,NA
C. CO ₂ transport and storage	1,025.12	1,819.46	0.22						2,844.80
2. Industrial processes and product use	2,400.86	3.42	600.22	261.93	NO	12.01	NO	NO	3,278.44
A. Mineral industry	1,638.10								1,638.10
B. Chemical industry	562.20	3.41	566.85	NO	NO	NO	NO	NO	1,132.46
C. Metal industry	5.86	0.01	NO	NO	NO	NO	NO	NO	5.86
D. Non-energy products from fuels and solvent use	194.71	NA	NA						194.71
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				261.93	NO	NO	NO	NO	261.93
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	1,562.39	1,497.45						3,140.60
A. Enteric fermentation		1,349.15							1,349.15
B. Manure management		213.24	183.69						396.93
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,313.76						1,313.76
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,387.35	6.39	8.60						-7,372.36
A. Forest land	-7,791.63	5.62	3.70						-7,782.31
B. Cropland	305.38	NA,NO	4.05						309.42
C. Grassland	-145.24	0.78	0.85						-143.62
D. Wetlands	34.40	NA,NO	NA,NO						34.40
E. Settlements	364.64	NO	NO						364.64
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-154.89								-154.89
H. Other	NO	NO	NO						NO
5. Waste	3.78	770.59	78.57						852.94
A. Solid waste disposal	NA,NO	546.31							546.31
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	3.78	NA,NO	0.07						3.85
D. Waste water treatment and discharge		224.29	78.51						302.79
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	238.64	0.34	0.99						239.98
Aviation	164.63	0.17	0.41						165.22
Navigation	74.01	0.17	0.58						74.76
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	1,450.59								1,450.59
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									29,160.89
Total CO₂ equivalent emissions with land use, land-use change and forestry									21,788.53
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									29,160.89
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									21,788.53

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2003
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	16,663.60	4,297.40	2,206.05	304.77	NO	12.28	NO	NO	23,484.09
1. Energy	21,150.61	1,945.17	124.54						23,220.31
A. Fuel combustion (sectoral approach)	20,173.62	154.15	124.33						20,452.10
1. Energy industries	7,946.52	5.84	25.93						7,978.29
2. Manufacturing industries and construction	3,136.78	4.94	8.93						3,150.65
3. Transport	5,137.72	28.55	66.98						5,233.25
4. Other sectors	3,952.60	114.82	22.50						4,089.92
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	976.98	1,791.02	0.21						2,768.22
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	976.98	1,791.02	0.21						2,768.22
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,443.37	3.29	569.43	304.77	NO	12.28	NO	NO	3,333.13
A. Mineral industry	1,619.95								1,619.95
B. Chemical industry	577.51	3.26	536.06	NO	NO	NO	NO	NO	1,116.83
C. Metal industry	9.88	0.02	NO	NO	NO	NO	NO	NO	9.90
D. Non-energy products from fuels and solvent use	236.02	NA	NA						236.02
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				304.77	NO	NO	NO	NO	304.77
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	1,502.73	1,401.89						2,976.42
A. Enteric fermentation		1,287.71							1,287.71
B. Manure management		215.02	177.78						392.79
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,224.12						1,224.12
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,002.97	39.55	32.18						-6,931.24
A. Forest land	-7,462.63	35.95	23.70						-7,402.98
B. Cropland	293.71	NA,NO	4.55						298.26
C. Grassland	-143.30	3.60	3.92						-135.77
D. Wetlands	32.46	NA,NO	NA,NO						32.46
E. Settlements	363.97	NO	NO						363.97
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-87.19								-87.19
H. Other	NO	NO	NO						NO
5. Waste	0.80	806.66	78.01						885.47
A. Solid waste disposal	NA,NO	584.70							584.70
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.80	NA,NO	0.01						0.82
D. Waste water treatment and discharge		221.96	78.00						299.95
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	232.48	0.33	0.95						233.76
Aviation	163.09	0.17	0.41						163.67
Navigation	69.39	0.16	0.54						70.09
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	1,864.85								1,864.85
CO₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									30,415.34
Total CO ₂ equivalent emissions with land use, land-use change and forestry									23,484.09
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									30,415.34
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									23,484.09

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2004
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	16,600.92	4,291.47	2,474.70	347.89	NO	12.57	NO	NO	23,727.54
1. Energy	20,577.33	1,897.79	172.77						22,647.89
A. Fuel combustion (sectoral approach)	19,555.45	148.92	172.57						19,876.94
1. Energy industries	6,830.91	4.86	23.51						6,859.28
2. Manufacturing industries and construction	3,583.00	5.99	10.74						3,599.72
3. Transport	5,276.57	26.84	116.51						5,419.91
4. Other sectors	3,864.98	111.23	21.82						3,998.03
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,021.88	1,748.87	0.20						2,770.95
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	1,021.88	1,748.87	0.20						2,770.95
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,676.41	3.93	685.03	347.89	NO	12.57	NO	NO	3,725.83
A. Mineral industry	1,731.21								1,731.21
B. Chemical industry	664.88	3.93	651.66	NO	NO	NO	NO	NO	1,320.47
C. Metal industry	15.36	NA,NO	NO	NO	NO	NO	NO	NO	15.36
D. Non-energy products from fuels and solvent use	264.96	NA	NA						264.96
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				347.89	NO	NO	NO	NO	347.89
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	1,536.45	1,531.91						3,144.30
A. Enteric fermentation		1,310.74							1,310.74
B. Manure management		225.71	196.57						422.27
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,335.35						1,335.35
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-6,729.12	2.92	7.40						-6,718.80
A. Forest land	-7,211.81	1.95	1.29						-7,208.57
B. Cropland	279.75	NA,NO	5.06						284.81
C. Grassland	-137.97	0.97	1.05						-135.95
D. Wetlands	30.53	NA,NO	NA,NO						30.53
E. Settlements	404.34	NO	NO						404.34
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-93.96								-93.96
H. Other	NO	NO	NO						NO
5. Waste	0.35	850.39	77.58						928.32
A. Solid waste disposal	NA,NO	620.62							620.62
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.35	NA,NO	0.00						0.35
D. Waste water treatment and discharge		229.78	77.57						307.35
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	263.12	0.37	1.05						264.54
Aviation	189.29	0.20	0.47						189.96
Navigation	73.83	0.17	0.58						74.58
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,861.07								1,861.07
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									30,446.35
Total CO₂ equivalent emissions with land use, land-use change and forestry									23,727.54
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									30,446.35
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									23,727.54

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2005
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	16,746.51	4,156.24	2,430.75	386.12	NO	13.03	NO	NO	23,732.64
1. Energy	20,964.40	1,865.99	123.24						22,953.63
A. Fuel combustion (sectoral approach)	19,963.05	142.02	123.05						20,228.12
1. Energy industries	6,853.44	4.61	22.86						6,880.90
2. Manufacturing industries and construction	3,723.73	5.41	9.90						3,739.05
3. Transport	5,487.76	24.40	69.39						5,581.55
4. Other sectors	3,898.12	107.61	20.89						4,026.62
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,001.35	1,723.97	0.19						2,725.51
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	1,001.35	1,723.97	0.19						2,725.51
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,703.47	3.96	670.31	386.12	NO	13.03	NO	NO	3,776.88
A. Mineral industry	1,785.37								1,785.37
B. Chemical industry	664.65	3.96	636.93	NO	NO	NO	NO	NO	1,305.53
C. Metal industry	11.81	NA,NO	NO	NO	NO	NO	NO	NO	11.81
D. Non-energy products from fuels and solvent use	241.64	NA	NA						241.64
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				386.12	NO	NO	NO	NO	386.12
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	1,454.43	1,548.99						3,088.88
A. Enteric fermentation		1,244.38							1,244.38
B. Manure management		210.04	182.82						392.87
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,366.16						1,366.16
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-7,006.98	2.74	7.62						-6,996.63
A. Forest land	-7,291.19	2.16	1.43						-7,287.60
B. Cropland	225.94	NA,NO	5.57						231.50
C. Grassland	-91.05	0.57	0.62						-89.86
D. Wetlands	28.59	NA,NO	NA,NO						28.59
E. Settlements	413.93	NO	NO						413.93
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-293.19								-293.19
H. Other	NO	NO	NO						NO
5. Waste	0.16	829.13	80.60						909.89
A. Solid waste disposal	NA,NO	600.17							600.17
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.16	NA,NO	0.00						0.16
D. Waste water treatment and discharge		228.96	80.60						309.55
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)									
Memo items:⁽²⁾									
International bunkers	308.25	0.42	1.20						309.86
Aviation	228.43	0.24	0.57						229.24
Navigation	79.82	0.18	0.62						80.62
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,723.86								1,723.86
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									30,729.27
Total CO₂ equivalent emissions with land use, land-use change and forestry									23,732.64
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									30,729.27
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									23,732.64

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2006
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	17,131.30	4,278.28	2,354.94	422.70	NO	13.01	NO	NO	24,200.23
1. Energy	21,063.78	1,968.97	127.76						23,160.52
A. Fuel combustion (sectoral approach)	20,026.59	141.28	127.57						20,295.44
1. Energy industries	6,674.57	4.82	22.56						6,701.94
2. Manufacturing industries and construction	3,855.12	5.75	10.53						3,871.40
3. Transport	5,838.23	24.14	73.92						5,936.29
4. Other sectors	3,658.66	106.57	20.57						3,785.80
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,037.20	1,827.70	0.19						2,865.08
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	1,037.20	1,827.70	0.19						2,865.08
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,834.95	3.85	662.88	422.70	NO	13.01	NO	NO	3,937.39
A. Mineral industry	1,917.28								1,917.28
B. Chemical industry	662.17	3.85	629.50	NO	NO	NO	NO	NO	1,295.53
C. Metal industry	13.85	NA,NO	NO	NO	NO	NO	NO	NO	13.85
D. Non-energy products from fuels and solvent use	241.65	NA	NA						241.65
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				422.70	NO	NO	NO	NO	422.70
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	1,385.83	1,470.46						2,936.96
A. Enteric fermentation		1,165.80							1,165.80
B. Manure management		220.03	186.63						406.66
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,283.83						1,283.83
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-6,848.84	6.06	10.33						-6,832.45
A. Forest land	-7,108.06	5.46	3.60						-7,098.99
B. Cropland	201.63	NA,NO	6.08						207.71
C. Grassland	-103.91	0.60	0.65						-102.66
D. Wetlands	26.66	NA,NO	NA,NO						26.66
E. Settlements	417.75	NO	NO						417.75
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-282.92								-282.92
H. Other	NO	NO	NO						NO
5. Waste	0.74	913.56	83.52						997.82
A. Solid waste disposal	NA,NO	678.41							678.41
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.74	NA,NO	0.01						0.75
D. Waste water treatment and discharge		235.15	83.51						318.65
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	293.77	0.38	1.06						295.22
Aviation	232.14	0.24	0.58						232.97
Navigation	61.63	0.14	0.48						62.25
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,778.82								1,778.82
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									31,032.68
Total CO₂ equivalent emissions with land use, land-use change and forestry									24,200.23
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									31,032.68
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									24,200.23

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2007
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	18,887.63	4,270.26	2,451.99	469.51	NO	13.05	NO	NO	26,092.44
1. Energy	22,250.01	1,982.23	133.57						24,365.81
A. Fuel combustion (sectoral approach)	21,242.62	125.17	133.40						21,501.18
1. Energy industries	7,806.63	5.54	27.07						7,839.24
2. Manufacturing industries and construction	3,853.05	5.80	10.51						3,869.36
3. Transport	6,255.70	23.34	78.16						6,357.20
4. Other sectors	3,327.24	90.49	17.66						3,435.38
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	1,007.39	1,857.06	0.18						2,864.63
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	1,007.39	1,857.06	0.18						2,864.63
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,898.59	3.61	727.95	469.51	NO	13.05	NO	NO	4,112.71
A. Mineral industry	1,948.84								1,948.84
B. Chemical industry	693.88	3.61	694.57	NO	NO	NO	NO	NO	1,392.06
C. Metal industry	13.10	NA,NO	NO	NO	NO	NO	NO	NO	13.10
D. Non-energy products from fuels and solvent use	242.78	NA	NA						242.78
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				469.51	NO	NO	NO	NO	469.51
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	1,264.41	1,477.37						2,831.11
A. Enteric fermentation		1,059.90							1,059.90
B. Manure management		204.51	173.00						377.52
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,304.37						1,304.37
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-6,350.95	31.76	28.48						-6,290.70
A. Forest land	-6,550.79	29.59	19.51						-6,501.69
B. Cropland	113.17	NA,NO	6.60						119.77
C. Grassland	-88.74	2.17	2.37						-84.20
D. Wetlands	24.72	NA,NO	NA,NO						24.72
E. Settlements	435.50	NO	NO						435.50
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-284.81								-284.81
H. Other	NO	NO	NO						NO
5. Waste	0.65	988.24	84.62						1,073.51
A. Solid waste disposal	NA,NO	746.53							746.53
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.65	NA,NO	0.01						0.66
D. Waste water treatment and discharge		241.72	84.61						326.33
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	316.13	0.43	1.19						317.75
Aviation	239.68	0.25	0.60						240.53
Navigation	76.45	0.17	0.59						77.22
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,563.68								1,563.68
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									32,383.15
Total CO₂ equivalent emissions with land use, land-use change and forestry									26,092.44
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									32,383.15
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									26,092.44

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2008
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	17,594.45	4,159.86	2,465.59	490.33	NO	11.98	NO	NO	24,722.21
A. Fuel combustion (sectoral approach)	21,103.70	1,890.38	125.67						23,119.75
1. Energy industries	20,202.28	124.82	125.50						20,452.60
1. Energy industries	6,789.87	4.78	24.20						6,818.84
2. Manufacturing industries and construction	3,872.78	5.59	10.17						3,888.55
3. Transport	6,097.85	21.65	73.27						6,192.77
4. Other sectors	3,441.78	92.80	17.86						3,552.44
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	901.42	1,765.56	0.17						2,667.15
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	901.42	1,765.56	0.17						2,667.15
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,823.93	3.42	743.36	490.33	NO	11.98	NO	NO	4,073.01
A. Mineral industry	1,856.99								1,856.99
B. Chemical industry	677.48	3.42	709.98	NO	NO	NO	NO	NO	1,390.88
C. Metal industry	24.15	NA,NO	NO	NO	NO	NO	NO	NO	24.15
D. Non-energy products from fuels and solvent use	265.30	NA	NA						265.30
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				490.33	NO	NO	NO	NO	490.33
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	1,195.71	1,496.80						2,789.11
A. Enteric fermentation		1,003.82							1,003.82
B. Manure management		191.90	162.79						354.68
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,334.01						1,334.01
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-6,430.45	9.58	13.85						-6,407.02
A. Forest land	-6,609.15	8.64	5.70						-6,594.81
B. Cropland	118.33	NA,NO	7.13						125.46
C. Grassland	-146.85	0.94	1.02						-144.88
D. Wetlands	22.79	NA,NO	NA,NO						22.79
E. Settlements	474.00	NO	NO						474.00
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-289.58								-289.58
H. Other	NO	NO	NO						NO
5. Waste	0.67	1,060.77	85.92						1,147.35
A. Solid waste disposal	NA,NO	821.63							821.63
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.67	NA,NO	0.01						0.68
D. Waste water treatment and discharge		239.14	85.91						325.05
E. Other	NO	NO	NO						NO
6. Other (as specified in summary I.A)									
Memo items:⁽²⁾									
International bunkers	335.71	0.43	1.19						337.33
Aviation	268.20	0.28	0.67						269.16
Navigation	67.50	0.15	0.52						68.17
Multilateral operations	C	C	C						C
CO₂ emissions from biomass	1,555.91								1,555.91
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									31,129.23
Total CO₂ equivalent emissions with land use, land-use change and forestry									24,722.21
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									31,129.23
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									24,722.21

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2009
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	15,720.67	4,099.83	2,234.63	495.65	0.26	8.03	NO	NO	22,559.06
1. Energy	19,946.87	1,825.72	122.06						21,894.64
A. Fuel combustion (sectoral approach)	19,115.65	129.35	121.90						19,366.89
1. Energy industries	6,403.19	4.77	21.01						6,428.96
2. Manufacturing industries and construction	3,157.36	5.28	9.34						3,171.98
3. Transport	6,100.75	20.35	72.72						6,193.82
4. Other sectors	3,454.34	98.95	18.84						3,572.13
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	831.22	1,696.37	0.16						2,527.75
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	831.22	1,696.37	0.16						2,527.75
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,217.23	3.06	626.21	495.65	0.26	8.03	NO	NO	3,350.43
A. Mineral industry	1,460.61								1,460.61
B. Chemical industry	524.80	3.06	593.37	NO	NO	NO	NO	NO	1,121.23
C. Metal industry	11.56	NA,NO	NO	NO	NO	NO	NO	NO	11.56
D. Non-energy products from fuels and solvent use	220.27	NA	NA						220.27
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				495.65	0.26	NO	NO	NO	495.90
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	1,169.11	1,387.67						2,633.75
A. Enteric fermentation		973.54							973.54
B. Manure management		195.58	163.18						358.76
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,224.49						1,224.49
E. Prescribed burning of savannas									
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									
4. Land use, land-use change and forestry⁽¹⁾	-6,520.55	5.10	11.17						-6,504.29
A. Forest land	-6,824.05	4.87	3.21						-6,815.96
B. Cropland	60.66	NA,NO	7.71						68.37
C. Grassland	-98.32	0.22	0.24						-97.86
D. Wetlands	20.86	NA,NO	NA,NO						20.86
E. Settlements	482.95	NO	NO						482.95
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-162.65								-162.65
H. Other	NO	NO	NO						NO
5. Waste	0.16	1,096.84	87.52						1,184.53
A. Solid waste disposal	NA,NO	889.25							889.25
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.16	NA,NO	NA,NO						0.16
D. Waste water treatment and discharge		207.60	87.52						295.12
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	251.31	0.29	0.74						252.35
Aviation	229.46	0.24	0.57						230.28
Navigation	21.85	0.05	0.17						22.07
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,709.23								1,709.23
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									29,063.35
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22,559.06
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									29,063.35
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									22,559.06

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2010
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	CROATIA
Total (net emissions)⁽¹⁾									
1. Energy	15,160.49	4,038.47	2,313.81	543.95	0.03	8.95	NO	NO	22,065.71
A. Fuel combustion (sectoral approach)	19,112.82	1,801.33	121.16						21,035.31
1. Energy industries	18,317.65	140.57	121.02						18,579.24
2. Manufacturing industries and construction	5,904.99	4.33	21.70						5,931.02
3. Transport	3,015.80	5.21	9.09						3,030.11
4. Other sectors	5,890.70	18.27	69.39						5,978.36
5. Other	3,506.16	112.76	20.83						3,639.74
B. Fugitive emissions from fuels	795.17	1,660.76	0.15						2,456.07
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	795.17	1,660.76	0.15						2,456.07
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,239.13	2.91	796.30	543.95	0.03	8.95	NO	NO	3,591.27
A. Mineral industry	1,432.29								1,432.29
B. Chemical industry	594.74	2.91	765.22	NO	NO	NO	NO	NO	1,362.87
C. Metal industry	27.55	NA,NO	NO	NO	NO	NO	NO	NO	27.55
D. Non-energy products from fuels and solvent use	184.55	NA	NA						184.55
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				543.95	0.03	NO	NO	NO	543.99
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	80.05	1,142.24	1,303.85						2,526.14
A. Enteric fermentation		949.79							949.79
B. Manure management		192.45	159.53						351.98
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,144.32						1,144.32
E. Prescribed burning of savannas									
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	13.47								13.47
H. Urea application	66.58								66.58
I. Other carbon-containing fertilizers	NA								NA
J. Other									
4. Land use, land-use change and forestry⁽¹⁾	-6,271.55	1.76	9.45						-6,260.34
A. Forest land	-6,583.46	1.64	1.08						-6,580.74
B. Cropland	135.03	NA,NO	8.24						143.27
C. Grassland	-110.91	0.12	0.13						-110.66
D. Wetlands	18.92	NA,NO	NA,NO						18.92
E. Settlements	502.38	NO	NO						502.38
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-233.51								-233.51
H. Other	NO	NO	NO						NO
5. Waste	0.05	1,090.23	83.05						1,173.33
A. Solid waste disposal	NA,NO	881.13							881.13
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO						0.05
D. Waste water treatment and discharge		209.10	83.05						292.15
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	264.29	0.30	0.76						265.36
Aviation	244.66	0.26	0.61						245.53
Navigation	19.64	0.04	0.15						19.83
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	1,872.38								1,872.38
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									28,326.05
Total CO₂ equivalent emissions with land use, land-use change and forestry									22,065.71
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									28,326.05
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									22,065.71

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2011
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
	CO ₂ equivalent (kt)								
Total (net emissions)⁽¹⁾	15,637.40	3,933.20	2,388.40	563.13	0.02	9.37	NO	NO	22,531.52
1. Energy	18,767.45	1,680.46	111.46						20,559.37
A. Fuel combustion (sectoral approach)	17,977.62	158.11	111.33						18,247.06
1. Energy industries	6,152.17	4.35	21.96						6,178.48
2. Manufacturing industries and construction	2,779.55	4.57	8.00						2,792.12
3. Transport	5,764.05	16.64	57.50						5,838.19
4. Other sectors	3,281.84	132.55	23.87						3,438.26
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	789.83	1,522.35	0.13						2,312.32
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	789.83	1,522.35	0.13						2,312.32
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	2,000.68	1.94	786.76	563.13	0.02	9.37	NO	NO	3,361.89
A. Mineral industry	1,220.06								1,220.06
B. Chemical industry	571.33	1.94	754.16	NO	NO	NO	NO	NO	1,327.43
C. Metal industry	29.45	NA,NO	NO	NO	NO	NO	NO	NO	29.45
D. Non-energy products from fuels and solvent use	179.84	NA	NA						179.84
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				563.13	0.02	NO	NO	NO	563.15
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	98.31	1,105.66	1,383.08						2,587.06
A. Enteric fermentation		917.70							917.70
B. Manure management		187.96	150.64						338.60
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,232.45						1,232.45
E. Prescribed burning of savannas									
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.45								14.45
H. Urea application	83.86								83.86
I. Other carbon-containing fertilizers	NA								NA
J. Other									
4. Land use, land-use change and forestry⁽¹⁾	-5,229.09	18.63	22.69						-5,187.77
A. Forest land	-5,509.41	15.20	10.02						-5,484.20
B. Cropland	114.66	NA,NO	8.94						123.60
C. Grassland	-94.55	3.43	3.74						-87.38
D. Wetlands	17.32	NA,NO	NA,NO						17.32
E. Settlements	501.34	NO	NO						501.34
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-258.46								-258.46
H. Other	NO	NO	NO						NO
5. Waste	0.05	1,126.52	84.40						1,210.97
A. Solid waste disposal	NA,NO	919.66							919.66
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.05	NA,NO	NA,NO						0.05
D. Waste water treatment and discharge		206.86	84.40						291.26
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	330.90	0.44	1.22						332.56
Aviation	254.92	0.27	0.64						255.83
Navigation	75.97	0.17	0.59						76.73
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	2,129.98								2,129.98
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO ₂ equivalent emissions without land use, land-use change and forestry									27,719.29
Total CO ₂ equivalent emissions with land use, land-use change and forestry									22,531.52
Total CO ₂ equivalent emissions, including indirect CO ₂ , without land use, land-use change and forestry									27,719.29
Total CO ₂ equivalent emissions, including indirect CO ₂ , with land use, land-use change and forestry									22,531.52

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2012
(Sheet 1 of 1)									Submission 2015 v2 CROATIA
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
Total (net emissions)⁽¹⁾									
1. Energy	17,103.43	1,472.49	109.75						18,685.67
A. Fuel combustion (sectoral approach)	16,436.54	161.45	109.63						16,707.62
1. Energy industries	5,499.87	3.95	20.37						5,524.18
2. Manufacturing industries and construction	2,409.07	4.69	8.12						2,421.88
3. Transport	5,585.99	13.93	56.63						5,656.55
4. Other sectors	2,941.62	138.88	24.51						3,105.01
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	666.88	1,311.04	0.12						1,978.05
1. Solid fuels	NO	NO	NO.NA						NO.NA
2. Oil and natural gas	666.88	1,311.04	0.12						1,978.05
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,822.81	0.15	694.87	564.96	0.03	9.21	NO	NO	3,092.03
A. Mineral industry	1,191.09								1,191.09
B. Chemical industry	478.93	0.15	652.54	NO	NO	NO	NO	NO	1,131.62
C. Metal industry	1.76	NA.NO	NO	NO	NO	NO	NO	NO	1.76
D. Non-energy products from fuels and solvent use	151.03	NA	NA						151.03
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				564.96	0.03	NO	NO	NO	564.99
G. Other product manufacture and use	NO	NO	42.33	NO	NO	9.21	NO	NO	51.53
H. Other	NA	NA	NA						NA
3. Agriculture	96.45	1,085.57	1,330.56						2,512.58
A. Enteric fermentation		902.73							902.73
B. Manure management		182.84	141.31						324.15
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,189.24						1,189.24
E. Prescribed burning of savannas									
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	9.60								9.60
H. Urea application	86.85								86.85
I. Other carbon-containing fertilizers	NA								NA
J. Other									
4. Land use, land-use change and forestry⁽¹⁾	-5,111.71	38.88	36.45						-5,036.37
A. Forest land	5,411.54	36.09	23.80						5,351.65
B. Cropland	191.56	NA.NO	9.62						201.18
C. Grassland	-134.54	2.79	3.04						-128.71
D. Wetlands	15.73	NA.NO	NA.NO						15.73
E. Settlements	534.71	NO	NO						534.71
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-307.63								-307.63
H. Other	NO	NO	NO						NO
5. Waste	0.08	1,130.74	83.99						1,214.81
A. Solid waste disposal	NA.NO	937.56							937.56
B. Biological treatment of solid waste		IE,NE	IE,NE,NA						IE,NA,NE
C. Incineration and open burning of waste	0.08	NA.NO	NA.NO						0.08
D. Waste water treatment and discharge		193.18	83.99						277.17
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items:⁽²⁾									
International bunkers	262.10	0.27	0.66						263.03
Aviation	262.10	0.27	0.66						263.03
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	2,402.65								2,402.65
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA.NO						
Indirect CO₂⁽³⁾	NA.NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									25,505.09
Total CO₂ equivalent emissions with land use, land-use change and forestry									20,468.71
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									25,505.09
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									20,468.71

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

SUMMARY 2 SUMMARY REPORT FOR CO ₂ EQUIVALENT EMISSIONS									Inventory 2013
(Sheet 1 of 1)									Submission 2015 v2
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂ ⁽¹⁾	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Unspecified mix of HFCs and PFCs	NF ₃	Total
CO₂ equivalent (kt)									
Total (net emissions)⁽¹⁾	13,481.96	3,582.93	1,718.35	577.71	0.06	6.58	NO	NO	19,367.59
1. Energy	16,605.25	1,410.99	106.46						18,122.71
A. Fuel combustion (sectoral approach)	15,949.64	153.31	106.34						16,209.29
1. Energy industries	5,109.51	3.21	19.45						5,132.17
2. Manufacturing industries and construction	2,380.65	4.40	7.72						2,392.78
3. Transport	5,679.83	13.81	56.06						5,749.69
4. Other sectors	2,779.65	131.89	23.12						2,934.65
5. Other	NO	NO	NO						NO
B. Fugitive emissions from fuels	655.61	1,257.68	0.12						1,913.42
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	655.61	1,257.68	0.12						1,913.42
C. CO ₂ transport and storage	NO								NO
2. Industrial processes and product use	1,945.57	0.15	282.52	577.71	0.06	6.58	NO	NO	2,812.59
A. Mineral industry	1,291.40								1,291.40
B. Chemical industry	485.96	0.15	240.46	NO	NO	NO	NO	NO	726.56
C. Metal industry	16.60	NA,NO	NO	NO	NO	NO	NO	NO	16.60
D. Non-energy products from fuels and solvent use	151.60	NA	NA						151.60
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				577.71	0.06	NO	NO	NO	577.77
G. Other product manufacture and use	NO	NO	42.06	NO	NO	6.58	NO	NO	48.64
H. Other	NA	NA	NA						NA
3. Agriculture	69.99	1,017.63	1,230.33						2,317.95
A. Enteric fermentation		839.85							839.85
B. Manure management		177.79	140.63						318.42
C. Rice cultivation		NO							NO
D. Agricultural soils		NA	1,089.70						1,089.70
E. Prescribed burning of savannas									
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	9.60								9.60
H. Urea application	60.39								60.39
I. Other carbon-containing fertilizers	NA								NA
J. Other									
4. Land use, land-use change and forestry⁽¹⁾	-5,138.88	1.93	11.77						-5,125.18
A. Forest land	-5,491.49	1.46	0.96						-5,489.08
B. Cropland	160.55	NA,NO	10.30						170.85
C. Grassland	-103.50	0.47	0.51						-102.52
D. Wetlands	14.13	NA,NO	NA,NO						14.13
E. Settlements	545.56	NO	NO						545.56
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-264.12								-264.12
H. Other	NO	NO	NO						NO
5. Waste	0.04	1,152.22	87.26						1,239.53
A. Solid waste disposal	NA,NO	947.21							947.21
B. Biological treatment of solid waste		4.58	3.67						8.25
C. Incineration and open burning of waste	0.04	NA,NO	NA,NO						0.04
D. Waste water treatment and discharge		200.44	83.59						284.03
E. Other	NO	NO	NO						NO
6. Other (as specified in summary 1.A)									
Memo items⁽²⁾									
International bunkers	290.71	0.63	0.72						292.06
Aviation	290.71	0.63	0.72						292.06
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO ₂ emissions from biomass	2,249.66								2,249.66
CO ₂ captured	NO								NO
Long-term storage of C in waste disposal sites	NE								NE
Indirect N ₂ O			NA,NO						
Indirect CO₂⁽³⁾	NA,NO								
Total CO₂ equivalent emissions without land use, land-use change and forestry									24,492.78
Total CO₂ equivalent emissions with land use, land-use change and forestry									19,367.59
Total CO₂ equivalent emissions, including indirect CO₂, without land use, land-use change and forestry									24,492.78
Total CO₂ equivalent emissions, including indirect CO₂, with land use, land-use change and forestry									19,367.59

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 1990 and 2013 (needed for monitoring and reporting on CO₂ emission)

Fuel		DOV		CO₂ Emission factor (t CO₂/TJ)	Oxidation factor (OF)
		Unit	2013		
Motorni benzin	Motor Gasoline	TJ/Gg	44,5900	69,30	1
Aviobenzin	Aviation Gasoline	TJ/Gg	44,5900	70,00	1
Kerozin (Mlazno gorivo)	Jet Kerosene	TJ/Gg	43,9600	71,50	1
Dizel i ekstra lako loživo ulje (plinsko ulje)	Gas/Diesel Oil	TJ/Gg	42,7100	74,10	1
Loživo ulje i srednje loživo ulje	Residual Fuel Oil	TJ/Gg	40,1900	77,40	1
Ukapljeni naftni plin	Liquefield Petroleum Gases	TJ/Gg	46,8900	63,10	1
Maziva	Lubricants	TJ/Gg	33,5000	73,30	1
Naftni koks	Petroleum Coke	TJ/Gg	31,0000	97,50	1
Petrolej	Petroleum	TJ/Gg	43,9600	73,30	1
Antracit	Anthracite	TJ/Gg	29,3100	98,30	1
Kameni ugljen- <i>Industrija</i>	Other bituminous coal <i>Industry</i>	TJ/Gg	27,0486	94,60	1
Kameni ugljen- <i>Termoelektrane</i>	Other bituminous coal <i>Thermal power plant</i>	TJ/Gg	24,9600	94,60	1
Ugljen za proizvodnju koksa (koksnii ugljen)	Coking coal	TJ/Gg	28,2000	94,60	1
Mrki ugljen (smeđi ugljen) <i>Industrija</i>	Sub bituminous coal <i>Industry</i>	TJ/Gg	16,7400	96,10	1
Lignite	Lignite	TJ/Gg	10,5000	101,00	1
Briketi kamenog ugljena	Brown coal briquettes	TJ/Gg	20,7000	97,50	1
Koks	Coke oven coke	TJ/Gg	29,3100	107,00	1
Prirodni plin	Natural Gas	TJ/10 ⁶ m ³	34,0000	56,10	1
Gradski plin	Gas Works Gas	TJ/10 ⁶ m ³	17,1000	44,40	1
Koksnii plin	Coke Oven Gas	TJ/10 ⁶ m ³	38,7000	44,40	1

ANNEX 5-4: FOREST REFERENCE MANAGEMENT LEVEL (FMRL)

Since its submission of Initial Report submitted during the first commitment period, Croatia performed several changes in its estimation in LULUCF sector and activities connected with forestry sector. Due to these changes and improvements Croatia decided to submit its first technical correction of Forest Reference Management Level within the 2016 report since for NIR 2015 countries are not submitting their data for KP in the CRF database.

One of the reasons for the FMRL technical correction arises from the application of 2006 Guidelines, specifically equation 2.12 that addresses annual carbon loss in biomass due to wood removal in a way that includes R/S factor which differs comparing to the equation 3.2.7 from the previously used GPG 2003.

ANNEX 5-5: APPLICATION OF THE PROVISION OF NATURAL DISTURBANCES

As indicated in Croatia's Initial Report, Croatia intends to apply the provision of natural disturbances for units of lands under Forest Management during the second commitment period in accordance with decision 2/CMP.7.

In cases when magnitude of emissions from natural disturbances is higher than the nationally established threshold value for background and margin levels, Croatia will evaluate and decide whether to exclude or not these emissions.

REFERENCES

Energy sector

1. Central Bureau of Statistics (2013) Statistical Yearbook – for period from 1990 till 2012, Zagreb
2. Croatian Environment Agency (2015) Republic of Croatia Informative Inventory Report for 2013, under Convention on Long-range Transboundary Air Pollution (CLRTAP), EKONERG Ltd., Zagreb
3. FCCC/IRR/2008/HRV Report of the review of the initial report of Croatia, 26 August 2009
4. FCCC/ARR/2008/HRV Report of the initial review of the greenhouse gas inventories of Croatia submitted in 2007 and 2008, 5 November 2009 (advance version)
5. FCCC/ARR/2009/HRV Report of the individual review of the greenhouse gas inventory of Croatia submitted in 2009 Centralized Review Report
6. FCCC/ARR/2010/HRV Report of the individual review of the annual submission of Croatia submitted in 2010, 20 January 2011
7. FCCC/ARR/2012/HRV Report of the individual review of the annual submission of Croatia submitted in 2012, 8 February 2013
8. FCCC/ARR/2012/HRV Report of the individual review of the annual submission of Croatia submitted in 2014, 7 May 2015
9. EEA (2000) COPERT IV Computer Programme to Calculate Emissions from Road Transport, Denmark
10. INA (2012) Data about natural gas scrubbing in Central Gas Station MOLVE and sulphur content in liquid fossil fuels, INA – Oil and Gas Company, data sent by fax or by mail
11. INA (2013) Data about number of active wells, INA – Oil and Gas Company, data sent by mail
12. IPCC/UNEP/WMO (2006) IPCC Guidelines for National Greenhouse Inventories, Volume 2, Energy, Japan
13. IPCC (2000) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, Japan
14. IPCC/UNEP/OECD/IEA (1997) Greenhouse Gas Inventory – Workbook, Revised 1996 IPCC Guidelines for National Greenhouse Inventories, Volume 2, United Kingdom

15. IPCC/UNEP/OECD/IEA (1997) Greenhouse Gas Inventory – Reference Manual, Revised 1996
IPCC Guidelines for National Greenhouse Inventories, Volume 3, United Kingdom
16. Ministry of Economy, Labour and Entrepreneurship (2012) Energy in Croatia 2012, Annual Energy Report, Energy Institute “Hrvoje Požar”, Zagreb
17. Ministry of Environmental and Nature Protection (2012) National Inventory Report 2013, Croatian greenhouse gas inventory for the period 1990 – 2011, EKONERG, Zagreb
18. Ministry of Environmental and Nature Protection (2010) Fifth National Communication of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC), Zagreb
19. Ministry of Environmental and Nature Protection (2006) Second, Third and Fourth National Communication of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC), Zagreb
20. Ministry of Interior (2012) Motor Vehicle Databases for 1990-2012, data on CD
21. Vuk B. National Energy Balances—for period from 1990 till 2012, Energy Institute Hrvoje Požar, Zagreb
22. Vuk B. Industry analysis balance—for period from 2001 till 2012, Energy Institute Hrvoje Požar, Zagreb

Industrial processes and product use

23. Central Bureau of Statistics, Department of Manufacturing and Mining, Annual PRODCOM results (1990 – 2013), Zagreb
24. Central Bureau of Statistics, Statistical Yearbooks (1990-2013), Zagreb
25. CROATIA CEMENT g.i.u (2007) Report: Activity data for CO₂ emission calculations from Portland cement production, in the framework of study Croatian Cement Industry and Climate Change, EKONERG Ltd., Zagreb
26. Croatian Environment Agency (2015) Republic of Croatia Informative Inventory Report for LRTAP Convention for the Year 2013 Submission to the Convention on Long-range Transboundary Air Pollution, EKONERG Ltd., Zagreb
27. FCCC/ARR/2014/HRV Report on the individual review of the annual submission of Croatia submitted in 2014, 15 June 2015

28. IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme. Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds.). Published: IGES, Japan., Volume 2: Energy
29. IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme. Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds.). Published: IGES, Japan., Volume 3: Industrial Processes and Product Use
30. ISTRA CEMENT Ltd. (2008) Report: Activity data for CO₂ emission calculations from Portland and Aluminate cement production, in the framework of survey Programme of Reduction of CO₂ Emission in Istra Cement Ltd., EKONERG Ltd., Zagreb
31. Ministry of Environmental and Nature Protection (2015) National Inventory Report 2014, Croatian greenhouse gas inventory for the period 1990 – 2012, EKONERG, Zagreb
32. Ministry of Environmental and Nature Protection (2014) Sixth National Communication and First Biennial Report of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC), Zagreb
33. PROMINS g.i.u (2008) Report: Activity data for CO₂ emission calculations from lime production, in the framework of study Croatian Lime Industry and Climate Change, EKONERG Ltd., Zagreb

Agriculture

34. Bašić, F., O. Nestroy, I. Kisić, A. Butorac, M. Mesić (1988) Protection from erosion – the key role of soil cultivation in present and changed climate conditions, Croatian Academy of Sciences and Arts – Scientific conference with international participation “The adjustment of agriculture and forestry to climate and its changes”, pages 115-125, Zagreb
35. Butorac, A., (1963) Thermal condition of soil and the most characteristic temperature thresholds for certain sites in main agricultural regions of Croatia, Agricultural Gazette 12/63
36. Central Bureau of Statistics, Statistical Yearbooks (1990-2011), Zagreb
37. Croatian Environment Agency (2012) Republic of Croatia Informative Inventory Report for LRTAP Convention for the Year 2011 Submission to the Convention on Long-range Transboundary Air Pollution, EKONERG Ltd., Zagreb
38. EMEP/CORINAIR Atmospheric Emission Inventory Guidebook 2007

39. IPCC/UNEP/OECD/IEA (1997) Greenhouse Gas Inventory Workbook, Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, United Kingdom
40. IPCC/UNEP/OECD/IEA (1997) Greenhouse Gas Inventory Reference Manual, Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3, United Kingdom
41. FAO database www.fao.org
42. Ministry of Environmental and Nature Protection (2013) National Inventory Report 2013, Croatian greenhouse gas inventory for the period 1990 – 2011, EKONERG Ltd., Zagreb
43. Ministry of Environmental and Nature Protection (2010) Fifth National Communication of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC), Zagreb
44. Response of Croatia to Potential Problems and Further Questions from the ERT formulated in the course of the 2012 review of the greenhouse gas inventories of Croatia submitted in 2012
45. FCCC/ARR/2011/HRV Report of the individual review of the annual submission of Croatia submitted in 2012
46. Znaor, D. and Karoglan Todorović, S.,(2005) Analysis of yields, nitrogen content and N-fixation of Croatian agricultural production in 2002-2003, University of Essex, Colchester. Unpublished

LULUCF

47. Badjun, S. (1965) Physical and mechanical properties of Oakwood from forest district “Lubardenik” Lipovljani, Drvna industrija 16: 2-8.
 48. Badjun, S. (1977) Comparative Wood Quality Appreciation, Drvna industrija 28: 125-131.
 49. Croatian Bureau of Statistics (1999) Statistical Yearbook of the Republic of Croatia, Croatian Bureau of Statistics: 228
 50. Croatian Bureau of Statistics (2011-2012) Statistical Yearbooks of the Republic of Croatia, Croatian Bureau of Statistics
 51. Croatian Environment Agency (2013), <http://www.azo.hr/CORINELandCover>: 2-5
 52. Croatian Forests (2006) Forest Management Area Plan of the Republic of Croatia 2006-2015, Public company “Croatian Forests”
 53. Croatian Geological Institute (2012) Total nitrogen and organic carbon in soils of the Republic of Croatia, Croatian Environment Agency
 54. Croatian Parliament (1993) Law on amendments to the Law on Forests Official Gazette No 76
-

55. Croatian Parliament (2009) Energy Development Strategy of the Republic of Croatia, Official Gazette No 130
 56. Croatian Parliament (2012) Law on Energy, Official Gazette No 120
 57. Environment Agency Austria (2012), National inventory report 2012, Submission under the UNFCCC and the Kyoto Protocol
http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php
 58. Government of the Republic of Croatia (1993) The Regulation on amendments to the Law on Forests, Official Gazette No 14
 59. Government of the Republic of Croatia (2007) Tariff system for the production of electricity from renewable energy sources and cogeneration, Official Gazette No 33
 60. Government of the Republic of Croatia (2013) Draft strategy for management and disposal of property of the Republic of Croatia 2013-2017, <http://www.duudi.hr/wp-content/uploads/2013/04/nacrt-Strategije.pdf> : 43,
 61. Govorčin S., T. Sinković, J. Trajković, B. Šefc (2011) Structural, technical and usable properties of some commercial wood species, Academy of Forestry Sciences: 647.
 62. Horvat, I. (1957) Investigations on technical properties of Slavonian Oakwood, Šumarski list 81: 321-360.
 63. Horvat, I. (1958) Investigations on technical properties of fir-wood (*Abies Alba Mill.*) from Gorski kotar, Drvna industrija 9: 2-10.
 64. Horvat, I. (1969) Some physical and mechanical properties of beechwood from Gorski kotar Žumberak, Petrova gora, Senjsko bilo and Velebit, Drvna industrija 20: 183-194.
 65. Janeš,D., G. Kovač, V. Grgesina, D. Pleskalt (2014): Identifying areas affected by fires according to requirements of Article 3.3 and 3.4 of the Kyoto Protocol
 66. Ministry of Economy (2006) Amendments to the plan of development, construction and modernization of gas transportation system in the Republic of Croatia from 2002 to 2011 - The second investment cycle 2007 – 2011, <http://www.plinacro.hr/default.aspx?id=44>
 67. Ministry of Regional Development, Forestry and Water management (2006) Regulations on the procedure for granting funds from fees for the use of beneficial functions of forests for work performed in private forests, Official Gazette No 66
 68. Ministry of Regional Development, Forestry and Water management (2008) Ordinance on amendments to the Ordinance on the Register of forest owners, Official Gazette No 84
-

69. Ministry of Regional Development, Forestry and Water management (2010) Forest Resources Assessment Croatia 2010 (FRA 2010)
70. Republic of Bulgaria, Ministry of Environment and Water, Executive Environment Agency (2012), National inventory report 2012, Submission under the UNFCCC and the Kyoto Protocol,
http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/6598.php
71. Section of Forestry and Wood Industry Association of Engineers and Technicians People's Republic of Croatia (1949), Small Forestry-technical Manual: 215
72. Sinković, T. (1991) Some physical properties of fir-wood from Gorski kotar, Drvna industrija 42: 17-21.
73. Sinković, T., S. Govorčin, T. Sedlar (2011) Comparison of Physical Properties of Untreated and Heat treated Beech and Hornbeam, Drvna industrija 62: 283-290.
74. Štajduhar, F. (1972) A contribution to Physical and mechanical properties investigation of Beechwood in Croatia, Drvna industrija 23: 43-59.
75. The Intergovernmental Panel on Climate Change (IPCC, 2003), Good Practice Guidelines for Land Use, Land-Use Change and Forestry, Institute for Global Environmental Strategies (IGES)

Waste

76. Central Bureau of Statistics, Statistical Yearbooks (1990-2013)
77. Croatian Environment Agency, Cadastre of Waste - Municipal Solid Waste, Report 2006, Report 2007, Report 2008, Report 2009, Report 2010, Report 2011, Report 2012, Report 2013, Zagreb
78. Croatian Environment Agency (2014) Republic of Croatia Informative Inventory Report for LRTAP Convention for the Year 2013 Submission to the Convention on Long-range Transboundary Air Pollution, EKONERG Ltd., Zagreb
79. Croatian Water Ltd. (2014) Report: Data for methane emission calculations from domestic and commercial wastewater, Zagreb
80. Diaz, L.F. et al. (1996) Solid Waste Management for Economically Developing Countries, ISWA

81. Government of the Republic of Croatia (2005) Croatian Waste Management Strategy
82. FAOSTAT: Statistical Database, <http://www.fao.org>
83. FCCC/ARR/2014/HRV Report on the individual review of the annual submission of Croatia submitted in 2014, 15 June 2015
84. Fundurulja, D., Mužinić, M. (2000) Estimation of the Quantities of Municipal Solid Waste in the Republic of Croatia in the period 1990 – 1998 and 1998 – 2010, Zagreb
85. IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme. Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds.). Published: IGES, Japan., Volume 2: Energy
86. IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme. Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds.). Published: IGES, Japan., Volume 5: Waste
87. Ministry of Environmental and Nature Protection (2000) Report of Environment Condition
88. Ministry of Environmental and Nature Protection (2006) Guidelines Development for starting implementation of Waste Management Plan in the Republic of Croatia, LIFE04 TCY/CRO/000028, EKONERG Ltd., Zagreb
89. Ministry of Environmental and Nature Protection (2015) National Inventory Report 2014, Croatian greenhouse gas inventory for the period 1990 – 2012, EKONERG Ltd., Zagreb
90. Ministry of Environmental and Nature Protection (2014) Sixth National Communication and First Biennial Report of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC), Zagreb
91. Ministry of Environmental and Nature Protection (2007) Waste Management Plan in the Republic of Croatia (2007-2015), Zagreb
92. Potočnik, V. (2000) Report: The basis for methane emission estimation in Croatia 1990-1998, B. Data on Municipal Solid Waste in Croatia 1990-1998, Zagreb

