ANNEXES TO THE NATIONAL INVENTORY REPORT

March, 2023

Content

Annexes to the national inventory report

Annex 1: Key categories

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

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

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

1.1.1. Level assessment

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

1.1.2. Trend Assessment

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

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

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

Source Categories Assessed in Key Source Category Analysis	Direct GHG
ENERGY	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O
1.A.3.a Domestic Aviation	CO_2
1.A.3.a Domestic Aviation	CH_4
1.A.3.a Domestic Aviation	N_2O
1.A.3.b Road Transportation	CO_2
1.A.3.b Road Transportation	CH_4
1.A.3.b Road Transportation	N_2O
1.A.3.c Railways	CO_2
1.A.3.c Railways	CH_4
1.A.3.c Railways	N_2O
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O
1.A.4 Other Sectors - Liquid Fuels	CO_2
1.A.4 Other Sectors - Liquid Fuels	CH_4
1.A.4 Other Sectors - Liquid Fuels	N_2O
1.A.4 Other Sectors - Solid Fuels	CO_2
1.A.4 Other Sectors - Solid Fuels	CH_4
1.A.4 Other Sectors - Solid Fuels	N_2O
1.A.4 Other Sectors - Gaseous Fuels	CO_2
1.A.4 Other Sectors - Gaseous Fuels	CH_4
1.A.4 Other Sectors - Gaseous Fuels	N_2O

Source Categories Assessed in Key Source Category Analysis	Direct GHG
1.A.4 Other Sectors - Biomass	CH_4
1.A.4 Other Sectors - Biomass	N_2O
1.B.1 Fugitive emissions from Solid Fuels	CH_4
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4
1.B.2.c. Venting and flaring	CO_2
1.B.2.c. Venting and flaring	CH_4
1.B.2.c. Venting and flaring	N_2O
INDUSTRIAL PROCESSES AND PRODUCT USE	
2.A.1 Cement Production	CO_2
2.A.2 Lime Production	CO_2
2.A.3 Glass Production	CO_2
2.A.4 Other Process Uses of Carbonates	CO_2
2.B.1 Ammonia Production	CO_2
2.B.1 Ammonia Production	CH_4
2.B.1 Ammonia Production	N_2O
2.B.2 Nitric Acid Production	N_2O
2.B.8 Petrochemical and Carbon Black Production	CO_2
2.B.8 Petrochemical and Carbon Black Production	CH_4
2.C.1 Iron and Steel Production	CO_2
2.C.2 Ferroalloys Production	CO_2
2.C.2 Ferroalloys Production	CH_4
2.C.3 Aluminium Production	CO_2
2.C.3 Aluminium Production	PFCs
2.D Non-energy Products from Fuels and Solvent Use	CO_2
2.F.1 Refrigeration and Air conditioning	F-gases
2.F.3 Fire Protection	F-gases
2.F.4 Aerosols	F-gases
2.G Other Product Manufacture and Use	N_2O
2.G Other Product Manufacture and Use	F-gases
AGRICULTURE	
3.A Enteric Fermentation	CH_4
3.B Manure Management	CH_4
3.B Manure Management	N_2O
3.D.1 Direct N2O Emissions From Managed Soils	N_2O

Source Categories Assessed in Key Source Category Analysis	Direct GHG
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O
3.G Liming	CO_2
3.H Urea Application	CO_2
LAND USE, LAND USE CHANGE AND FORESTRY	
4.A.1 Forest Land Remaining Forest Land	CO_2
4.A.2 Land Converted to Forest Land	CO_2
4.B.1 Cropland Remaining Cropland	CO_2
4.B.2 Land Converted to Cropland	CO_2
4.C.1 Grassland Remaining Grassland	CO_2
4.C.2 Land Converted to Grassland	CO_2
4.D.2 Land Converted to Wetlands	CO_2
4.E.2 Land Converted to Settlements	CO_2
4.G Harvested Wood Products	CO_2
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O
4(V) Biomass Burning	CO_2
4(V) Biomass Burning	CH_4
4(V) Biomass Burning	N_2O
WASTE	
5.A Solid Waste Disposal	CH_4
5.B Biological Treatment of Soild Waste	CH_4
5.B Biological Treatment of Soild Waste	N_2O
5.C Incineration and Open Burning of Waste	CO_2
5.C Incineration and Open Burning of Waste	N_2O
5.D Wastewater Treatment and Discharge	CH_4
5.D Wastewater Treatment and Discharge	N_2O

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-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	0.146	15%
1.A.3.b Road Transportation	CO_2	3,505.880	0.111	26%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	0.078	34%
3.A Enteric Fermentation	CH_4	2,336.027	0.074	41%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	0.067	48%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	0.060	54%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	0.050	59%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	0.049	63%
2.C.3 Aluminium Production	PFCs	1,117.284	0.036	67%
2.A.1 Cement Production	CO_2	1,086.203	0.035	70%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	0.030	74%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	0.024	76%
2.B.2 Nitric Acid Production	N_2O	670.739	0.021	78%
5.D Wastewater Treatment and Discharge	CH_4	659.542	0.021	80%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	0.019	82%
2.B.1 Ammonia Production	CO_2	558.672	0.018	84%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	0.017	85%
3.B Manure Management	CH_4	491.908	0.016	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	0.014	88%
5.A Solid Waste Disposal	CH_4	370.890	0.012	90%
1.A.4 Other Sectors - Biomass	CH_4	354.228	0.011	91%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	0.010	92%
3.B Manure Management	N_2O	284.426	0.009	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	0.008	93%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.006	94%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	0.006	95%
2.C.2 Ferroalloys Production	CO_2	173.798	0.006	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	0.005	96%
2.A.2 Lime Production	CO_2	156.820	0.005	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	0.005	97%
1.A.3.c Railways	CO_2	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	0.004	97%
2.C.3 Aluminium Production	CO_2	118.797	0.004	98%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.002	98%

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.002	98%
3.H Urea Application	CO_2	50.020	0.002	99%
1.A.3.b Road Transportation	N_2O	46.850	0.001	99%
1.A.3.b Road Transportation	CH_4	46.375	0.001	99%
1.A.4 Other Sectors - Biomass	N_2O	44.700	0.001	99%
2.C.1 Iron and Steel Production	CO_2	43.808	0.001	99%
2.A.3 Glass Production	CO_2	43.216	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.001	99%
2.G Other Product Manufacture and Use	N_2O	32.648	0.001	100%
5.C Incineration and Open Burning of Waste	CO_2	23.929	0.001	100%
1.A.3.c Railways	N_2O	11.781	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.000	100%

Tier 1 Analysis - Level Assessment				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO_2	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH_4	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	0.000	100%
TOTAL		31,454.182		

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2021

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.249	25%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.089	34%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.077	41%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.069	48%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.053	54%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.050	59%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.050	64%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.045	68%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.042	72%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.039	76%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.033	80%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.031	83%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.018	84%
3.B Manure Management	CH_4	491.908	421.699	0.018	86%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.017	88%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.016	90%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.015	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.011	92%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.010	93%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.010	94%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.006	95%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.005	95%
2.A.2 Lime Production	CO_2	156.820	122.989	0.005	96%
3.B Manure Management	N_2O	284.426	115.048	0.005	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.005	97%
3.H Urea Application	CO_2	50.020	84.154	0.004	97%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.003	98%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.003	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.002	98%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.002	98%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.002	98%
1.A.3.c Railways	CO_2	140.079	45.257	0.002	99%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.002	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.001	99%
2.A.3 Glass Production	CO_2	43.216	28.853	0.001	99%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	99%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	99%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.001	99%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.000	100%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.000	100%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	100%
3.G Liming	CO_2	0.000	5.099	0.000	100%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	100%

Tier 1 Analysis - Level Assessment					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.3.c Railways	CH_4	0.195	0.057	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.000	100%
TOTAL		31,454.182	24,446.418		

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

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	0.166	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	0.118	28%
1.A.3.b Road Transportation	CO_2	3,505.880	0.090	38%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	0.063	44%
3.A Enteric Fermentation	CH_4	2,336.027	0.060	50%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	0.054	55%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	0.049	60%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	0.041	64%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	0.040	68%
2.C.3 Aluminium Production	PFCs	1,117.284	0.029	71%
2.A.1 Cement Production	CO_2	1,086.203	0.028	74%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	0.025	76%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	0.019	78%
2.B.2 Nitric Acid Production	N_2O	670.739	0.017	80%
5.D Wastewater Treatment and Discharge	CH_4	659.542	0.017	82%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	0.015	83%
2.B.1 Ammonia Production	CO_2	558.672	0.014	85%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	0.014	86%
3.B Manure Management	CH_4	491.908	0.013	87%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	0.011	88%
5.A Solid Waste Disposal	CH_4	370.890	0.010	89%
1.A.4 Other Sectors - Biomass	CH_4	354.228	0.009	90%
4.G Harvested Wood Products	CO_2	317.852	0.008	91%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	0.008	92%
3.B Manure Management	N_2O	284.426	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	0.006	93%
4.E.2 Land Converted to Settlements	CO_2	235.440	0.006	94%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.005	94%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	0.005	95%
2.C.2 Ferroalloys Production	CO_2	173.798	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	0.004	96%
2.A.2 Lime Production	CO_2	156.820	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	0.004	96%
1.A.3.c Railways	CO_2	140.079	0.004	97%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	0.003	97%
2.C.3 Aluminium Production	CO_2	118.797	0.003	97%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	0.002	98%
4.D.2 Land Converted to Wetlands	CO_2	77.232	0.002	98%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.002	98%

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.002	98%
3.H Urea Application	CO_2	50.020	0.001	99%
1.A.3.b Road Transportation	N_2O	46.850	0.001	99%
1.A.3.b Road Transportation	CH_4	46.375	0.001	99%
1.A.4 Other Sectors - Biomass	N_2O	44.700	0.001	99%
2.C.1 Iron and Steel Production	CO_2	43.808	0.001	99%
2.A.3 Glass Production	CO_2	43.216	0.001	99%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.001	99%
2.G Other Product Manufacture and Use	N_2O	32.648	0.001	99%
4.A.2 Land Converted to Forest Land	CO_2	28.890	0.001	100%
4.B.2 Land Converted to Cropland	CO_2	25.846	0.001	100%
5.C Incineration and Open Burning of Waste	CO_2	23.929	0.001	100%
4(V) Biomass Burning	CO_2	14.979	0.000	100%
1.A.3.c Railways	N_2O	11.781	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.000	100%
4.C.2 Land Converted to Grassland	CO_2	9.952	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	0.000	100%
4(V) Biomass Burning	CH_4	1.378	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.000	100%
4(V) Biomass Burning	N_2O	0.763	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.B.2.c. Venting and flaring	CH_4	0.660	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO_2	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH_4	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	0.000	100%
TOTAL		38,744.886		

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2021

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.187	19%
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	5,623.552	0.176	36%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.067	43%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.058	49%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.052	54%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.040	58%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.038	62%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.037	65%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.034	69%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.031	72%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.029	75%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.025	77%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.024	80%
4.G Harvested Wood Products	CO_2	317.852	685.275	0.021	82%
4.E.2 Land Converted to Settlements	CO_2	235.440	629.437	0.020	84%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.014	85%
3.B Manure Management	CH_4	491.908	421.699	0.013	86%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.012	88%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.012	89%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.011	90%
4.C.2 Land Converted to Grassland	CO_2	9.952	305.621	0.010	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.008	92%
4.A.2 Land Converted to Forest Land	CO_2	28.890	266.151	0.008	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.008	93%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.007	94%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.005	95%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	138.401	0.004	95%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.004	96%
4.B.2 Land Converted to Cropland	CO_2	25.846	123.489	0.004	96%
2.A.2 Lime Production	CO_2	156.820	122.989	0.004	96%
3.B Manure Management	N_2O	284.426	115.048	0.004	97%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	109.885	0.003	97%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.003	97%
3.H Urea Application	CO_2	50.020	84.154	0.003	98%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.003	98%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.002	98%
4(V) Biomass Burning	CO_2	14.979	56.681	0.002	98%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.002	98%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.002	99%

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.002	99%
1.A.3.c Railways	CO_2	140.079	45.257	0.001	99%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.001	99%
2.A.3 Glass Production	CO_2	43.216	28.853	0.001	99%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	99%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	99%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.001	99%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	99%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.000	100%
4.D.2 Land Converted to Wetlands	CO_2	77.232	11.933	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.000	100%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.000	100%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	100%
4(V) Biomass Burning	CH_4	1.378	6.529	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	100%
3.G Liming	CO_2	0.000	5.099	0.000	100%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	100%
4(V) Biomass Burning	N_2O	0.763	4.025	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	2.069	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	100%

Tier 1 Analysis - Level Assessment Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.000	100%
TOTAL		38,744.886	31,952.456		

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

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.181	0.169	17%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.170	0.159	33%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.091	0.085	41%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.070	0.066	48%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.054	0.050	53%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.047	0.044	57%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.047	0.044	62%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.044	0.041	66%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.040	0.038	70%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.040	0.038	73%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.038	0.036	77%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.038	0.035	81%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.026	0.024	83%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.021	0.020	85%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.021	0.019	87%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.021	0.019	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.015	0.014	90%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.015	0.014	92%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.008	0.008	92%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.007	0.007	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.007	0.007	94%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.007	0.006	94%
3.B Manure Management	N_2O	284.426	115.048	0.006	0.005	95%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.005	0.005	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.005	0.004	96%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.004	0.004	96%
1.A.3.c Railways	CO_2	140.079	45.257	0.003	0.003	97%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.003	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.003	0.003	97%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.003	0.003	97%
3.B Manure Management	CH_4	491.908	421.699	0.003	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.003	0.002	98%
3.H Urea Application	CO_2	50.020	84.154	0.003	0.002	98%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.002	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.002	0.001	98%

Tier 1 Analysis - Trend Assessment						
IPCC Source/Sink Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.001	0.001	99%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.001	0.001	99%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	0.001	99%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.001	0.001	99%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.001	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.001	0.001	99%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.001	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.001	0.001	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.001	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.001	0.000	99%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	0.000	100%
3.G Liming	CO_2	0.000	5.099	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	0.000	100%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	0.000	100%
2.A.2 Lime Production	CO_2	156.820	122.989	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	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 (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	0.000	100%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	0.000	100%
TOTAL		31,454.182	24,446.418			

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

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.129	0.152	15%
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.117	0.138	29%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.063	0.075	36%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.047	0.055	42%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.039	0.046	47%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.036	0.043	51%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.036	0.042	55%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.035	0.041	59%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.032	0.038	63%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.032	0.037	67%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.027	0.032	70%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.022	0.026	72%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.020	0.023	75%
4.E.2 Land Converted to Settlements	CO_2	235.440	629.437	0.017	0.020	77%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.016	0.019	79%
4.G Harvested Wood Products	CO_2	317.852	685.275	0.016	0.019	81%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.016	0.019	82%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.014	0.017	84%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.012	0.014	85%
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	5,623.552	0.012	0.014	87%
4.C.2 Land Converted to Grassland	CO_2	9.952	305.621	0.011	0.013	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.010	0.012	89%
4.A.2 Land Converted to Forest Land	CO_2	28.890	266.151	0.009	0.011	90%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.006	0.007	91%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.006	0.007	92%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.005	0.006	92%
3.B Manure Management	N_2O	284.426	115.048	0.005	0.005	93%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.004	0.005	93%
4.B.2 Land Converted to Cropland	CO_2	25.846	123.489	0.004	0.005	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.004	0.005	94%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.004	0.004	95%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.004	0.004	95%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.004	0.004	96%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	109.885	0.003	0.003	96%
1.A.3.c Railways	CO_2	140.079	45.257	0.003	0.003	96%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	138.401	0.002	0.003	97%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.002	0.003	97%

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.002	0.002	97%
4.D.2 Land Converted to Wetlands	CO_2	77.232	11.933	0.002	0.002	97%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.002	0.002	98%
4(V) Biomass Burning	CO_2	14.979	56.681	0.002	0.002	98%
3.H Urea Application	CO_2	50.020	84.154	0.002	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.001	0.002	98%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.001	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.001	0.001	98%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.001	0.001	99%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.001	0.001	99%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	0.001	99%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.001	0.001	99%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.001	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	0.001	99%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	0.001	99%
3.B Manure Management	CH_4	491.908	421.699	0.001	0.001	99%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.000	0.001	99%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.000	0.001	99%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.000	0.001	99%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.000	0.000	99%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	0.000	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	0.000	100%
2.A.2 Lime Production	CO_2	156.820	122.989	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	0.000	100%
4(V) Biomass Burning	CH_4	1.378	6.529	0.000	0.000	100%
3.G Liming	CO_2	0.000	5.099	0.000	0.000	100%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	0.000	100%
4(V) Biomass Burning	N_2O	0.763	4.025	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	0.000	100%

Tier 1 Analysis - Trend Assessment Including LULUCF						
IPCC Source/Sink Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment**	**% Contribution to trend**	**Cumulative Total (%)**
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	2.069	0.000	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	0.000	100%
TOTAL		38,744.886	31,952.456			

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 (%)**
2.C.3 Aluminium Production	PFCs	1,117.284	0.154	15%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	0.142	30%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	0.114	41%
3.A Enteric Fermentation	CH_4	2,336.027	0.065	48%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	0.049	52%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	0.038	56%
2.A.1 Cement Production	CO_2	1,086.203	0.038	60%
5.A Solid Waste Disposal	CH_4	370.890	0.033	63%
5.D Wastewater Treatment and Discharge	CH_4	659.542	0.030	66%
1.A.3.b Road Transportation	CO_2	3,505.880	0.029	69%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	0.026	72%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	0.021	74%
1.A.4 Other Sectors - Biomass	CH_4	354.228	0.021	76%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	0.019	78%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	0.017	80%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.016	81%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	0.016	83%
2.B.2 Nitric Acid Production	N_2O	670.739	0.016	84%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	0.013	86%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	0.013	87%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	0.013	88%
1.A.3.b Road Transportation	N_2O	46.850	0.011	89%
1.A.4 Other Sectors - Biomass	N_2O	44.700	0.011	90%
3.B Manure Management	N_2O	284.426	0.011	91%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	0.009	92%
3.B Manure Management	CH_4	491.908	0.009	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	0.008	94%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	0.006	95%
2.C.2 Ferroalloys Production	CO_2	173.798	0.006	95%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.006	96%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	0.005	96%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	0.004	97%
1.A.3.c Railways	N_2O	11.781	0.003	97%
5.C Incineration and Open Burning of Waste	CO_2	23.929	0.003	97%
1.A.3.b Road Transportation	CH_4	46.375	0.003	98%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.002	98%
2.B.1 Ammonia Production	CO_2	558.672	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	0.001	99%
2.C.3 Aluminium Production	CO_2	118.797	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.001	99%
1.A.3.c Railways	CO_2	140.079	0.001	99%
3.H Urea Application	CO_2	50.020	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	0.001	99%
2.G Other Product Manufacture and Use	N_2O	32.648	0.001	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	0.001	100%
2.A.2 Lime Production	CO_2	156.820	0.001	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.001	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	0.000	100%
2.A.3 Glass Production	CO_2	43.216	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO_2	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH_4	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	0.000	100%
TOTAL		31,454.182		

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2021

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.168	17%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.160	33%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.129	46%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.097	56%
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.070	63%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.041	67%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.033	70%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.029	73%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.027	75%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.025	78%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.022	80%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.021	82%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.017	84%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.017	86%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.014	87%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.012	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.011	89%
3.B Manure Management	CH_4	491.908	421.699	0.010	90%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.010	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.009	92%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.008	93%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.006	94%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.005	94%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.005	95%
3.B Manure Management	N_2O	284.426	115.048	0.005	95%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.005	96%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.004	96%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.003	97%
3.H Urea Application	CO_2	50.020	84.154	0.003	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.003	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.002	98%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.002	98%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.002	98%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.002	98%
1.A.3.c Railways	N_2O	11.781	4.629	0.002	98%

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.002	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.001	99%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.001	99%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.001	99%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.001	99%
3.G Liming	CO_2	0.000	5.099	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.001	99%
2.A.2 Lime Production	CO_2	156.820	122.989	0.001	99%
1.A.3.c Railways	CO_2	140.079	45.257	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	100%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	100%

Tier 2 Analysis - Level Assessment - Excluding LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.000	100%
TOTAL		31,454.182	24,446.418		

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

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	0.403	40%
2.C.3 Aluminium Production	PFCs	1,117.284	0.076	48%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	0.070	55%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	0.056	61%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	0.046	65%
3.A Enteric Fermentation	CH_4	2,336.027	0.032	68%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	0.024	71%
4.E.2 Land Converted to Settlements	CO_2	235.440	0.019	73%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	0.019	75%
2.A.1 Cement Production	CO_2	1,086.203	0.019	76%
5.A Solid Waste Disposal	CH_4	370.890	0.016	78%
4.D.2 Land Converted to Wetlands	CO_2	77.232	0.016	80%
5.D Wastewater Treatment and Discharge	CH_4	659.542	0.015	81%
1.A.3.b Road Transportation	CO_2	3,505.880	0.014	83%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	0.013	84%
4.G Harvested Wood Products	CO_2	317.852	0.013	85%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	0.010	86%
1.A.4 Other Sectors - Biomass	CH_4	354.228	0.010	87%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	0.009	88%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	0.008	89%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.008	90%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	0.008	91%
2.B.2 Nitric Acid Production	N_2O	670.739	0.008	91%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	0.007	92%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	0.007	93%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	0.006	93%
1.A.3.b Road Transportation	N_2O	46.850	0.005	94%
1.A.4 Other Sectors - Biomass	N_2O	44.700	0.005	94%
3.B Manure Management	N_2O	284.426	0.005	95%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	0.005	95%
3.B Manure Management	CH_4	491.908	0.005	96%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	0.004	96%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	0.003	96%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	0.003	97%
4.B.2 Land Converted to Cropland	CO_2	25.846	0.003	97%
2.C.2 Ferroalloys Production	CO_2	173.798	0.003	97%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.003	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	0.002	98%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	0.002	98%
4.A.2 Land Converted to Forest Land	CO_2	28.890	0.002	98%

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.A.3.c Railways	N_2O	11.781	0.001	98%
5.C Incineration and Open Burning of Waste	CO_2	23.929	0.001	99%
1.A.3.b Road Transportation	CH_4	46.375	0.001	99%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.001	99%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.001	99%
4.C.2 Land Converted to Grassland	CO_2	9.952	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.001	99%
2.B.1 Ammonia Production	CO_2	558.672	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	0.001	99%
2.C.3 Aluminium Production	CO_2	118.797	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	0.001	99%
1.A.3.c Railways	CO_2	140.079	0.001	99%
3.H Urea Application	CO_2	50.020	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	0.001	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	0.000	100%
2.G Other Product Manufacture and Use	N_2O	32.648	0.000	100%
4(V) Biomass Burning	CO_2	14.979	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	0.000	100%
2.A.2 Lime Production	CO_2	156.820	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	0.000	100%
4(V) Biomass Burning	CH_4	1.378	0.000	100%
2.A.3 Glass Production	CO_2	43.216	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	100%
4(V) Biomass Burning	N_2O	0.763	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF				
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.B.2.c. Venting and flaring	N_2O	0.560	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	100%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	0.000	100%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	0.000	100%
3.G Liming	CO_2	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	CH_4	0.000	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	0.000	100%
TOTAL		38,744.886		

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2021

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	5,623.552	0.421	42%
4.E.2 Land Converted to Settlements	CO_2	235.440	629.437	0.066	49%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.057	54%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.055	60%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.044	64%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	138.401	0.042	69%
4.G Harvested Wood Products	CO_2	317.852	685.275	0.035	72%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.033	75%
4.C.2 Land Converted to Grassland	CO_2	9.952	305.621	0.031	78%
4.B.2 Land Converted to Cropland	CO_2	25.846	123.489	0.025	81%
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.024	83%
4.A.2 Land Converted to Forest Land	CO_2	28.890	266.151	0.020	85%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.014	86.77%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.011	88%
4(V) Biomass Burning	CO_2	14.979	56.681	0.011	89%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.010	90%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.009	91%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.009	92%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.007	92%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.007	93%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.006	94%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.006	94%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	109.885	0.005	95%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.005	95%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.004	96%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.004	96%
3.B Manure Management	CH_4	491.908	421.699	0.003	96%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.003	97%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.003	97%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.003	97%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.002	98%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.002	98%
3.B Manure Management	N_2O	284.426	115.048	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.002	98%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.001	98%
4.D.2 Land Converted to Wetlands	CO_2	77.232	11.933	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.001	99%

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
3.H Urea Application	CO_2	50.020	84.154	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.001	99%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.001	99%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.001	99%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.001	99%
1.A.3.c Railways	N_2O	11.781	4.629	0.001	99%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	99%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	99%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.000	100%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	100%
4(V) Biomass Burning	N_2O	0.763	4.025	0.000	100%
4(V) Biomass Burning	CH_4	1.378	6.529	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.000	100%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	2.069	0.000	100%
3.G Liming	CO_2	0.000	5.099	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	100%
2.A.2 Lime Production	CO_2	156.820	122.989	0.000	100%
1.A.3.c Railways	CO_2	140.079	45.257	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	100%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	100%

Tier 2 Analysis - Level Assessment - Including LULUCF					
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Level Assessment Tier 2**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	100%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.000	100%
TOTAL		38,744.886	31,952.456		

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

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.054	0.235	23%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.091	0.184	42%
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.181	0.073	49%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.170	0.069	56%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.021	0.053	61%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.007	0.037	65%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.038	0.035	69%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.070	0.029	71%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.004	0.023	74%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.007	0.019	76%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.047	0.019	78%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.044	0.018	79%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.040	0.016	81%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.040	0.016	83%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.038	0.015	84%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.005	0.011	85%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.001	0.011	86%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.001	0.010	87%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.001	0.010	88%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.021	0.009	89%
3.B Manure Management	N_2O	284.426	115.048	0.006	0.008	90%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.001	0.008	91%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.003	0.006	91%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.015	0.006	92%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.015	0.006	93%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.001	0.005	93%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	0.005	94%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.002	0.004	94%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.026	0.004	94%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.001	0.004	95%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.000	0.004	95%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	0.003	96%

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.021	0.003	96%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.001	0.003	96%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	0.003	96%
3.H Urea Application	CO_2	50.020	84.154	0.003	0.003	97%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	0.003	97%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	0.002	97%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	0.002	97%
3.B Manure Management	CH_4	491.908	421.699	0.003	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	0.002	98%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.000	0.002	98%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.001	0.001	98%
1.A.3.c Railways	CO_2	140.079	45.257	0.003	0.001	99%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.000	0.001	99%
3.G Liming	CO_2	0.000	5.099	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	0.001	99%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	0.001	99%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.003	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	0.001	99%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	0.001	99%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.003	0.001	99%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.001	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	0.000	100%
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.001	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Excluding LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	0.000	100%
2.A.2 Lime Production	CO_2	156.820	122.989	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.003	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.008	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.007	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.005	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.047	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.002	0.000	100%
TOTAL		31,454.182	24,446.418			

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

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
4.E.2 Land Converted to Settlements	CO_2	235.440	629.437	0.017	0.118	12%
5.A Solid Waste Disposal	CH_4	370.890	1,265.609	0.036	0.106	22%
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases	0.000	1,666.873	0.063	0.085	31%
4.C.2 Land Converted to Grassland	CO_2	9.952	305.621	0.011	0.078	39%
4.A.1 Forest Land Remaining Forest Land	CO_2	6,444.758	5,623.552	0.012	0.059	45%
4.G Harvested Wood Products	CO_2	317.852	685.275	0.016	0.055	50%
4.B.2 Land Converted to Cropland	CO_2	25.846	123.489	0.004	0.053	56%
4.B.1 Cropland Remaining Cropland	CO_2	89.059	138.401	0.002	0.051	61%
4.A.2 Land Converted to Forest Land	CO_2	28.890	266.151	0.009	0.048	65%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	0.129	0.035	69%
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	0.117	0.032	72%
5.D Wastewater Treatment and Discharge	CH_4	659.542	126.234	0.016	0.028	75%
4(V) Biomass Burning	CO_2	14.979	56.681	0.002	0.022	77%
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307	0.032	0.020	79%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440	0.006	0.019	81%
4.D.2 Land Converted to Wetlands	CO_2	77.232	11.933	0.002	0.016	83%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544	0.004	0.015	84%
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	0.047	0.013	85%
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	0.039	0.010	86%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	0.036	0.010	87%
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	109.885	0.003	0.009	88%
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508	0.001	0.009	89%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	0.032	0.008	90%
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	0.004	0.007	91%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	0.027	0.007	91%
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581	0.001	0.007	92%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	0.022	0.006	93%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379	0.004	0.006	93%
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	0.016	0.004	94%
3.B Manure Management	N_2O	284.426	115.048	0.005	0.004	94%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435	0.001	0.004	94%
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	0.000	0.004	95%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	0.014	0.004	95%
1.A.3.b Road Transportation	N_2O	46.850	51.317	0.000	0.004	96%
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870	0.002	0.004	96%
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.000	11.990	0.000	0.004	96%

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	0.000	268.125	0.010	0.003	97%
2.G Other Product Manufacture and Use	N_2O	32.648	16.866	0.000	0.002	97%
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	0.001	0.002	97%
1.A.3.b Road Transportation	CH_4	46.375	9.284	0.001	0.002	97%
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	0.020	0.002	97%
5.B Biological Treatment of Soild Waste	CH_4	0.000	19.512	0.001	0.002	98%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	0.000	0.002	98%
5.C Incineration and Open Burning of Waste	CO_2	23.929	8.243	0.000	0.002	98%
1.A.3.c Railways	N_2O	11.781	4.629	0.000	0.002	98%
2.F.2 Foam blowing agents	Aggregate F-gases	0.000	17.097	0.001	0.001	98%
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	0.012	0.001	98%
3.H Urea Application	CO_2	50.020	84.154	0.002	0.001	99%
5.B Biological Treatment of Soild Waste	N_2O	0.000	7.176	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	0.000	0.001	99%
4(V) Biomass Burning	N_2O	0.763	4.025	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	0.000	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	0.000	0.001	99%
1.A.3.c Railways	CO_2	140.079	45.257	0.003	0.001	99%
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.000	9.530	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	0.000	0.001	99%
3.G Liming	CO_2	0.000	5.099	0.000	0.001	99%
4(V) Biomass Burning	CH_4	1.378	6.529	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O	0.000	1.988	0.000	0.001	99%
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	0.000	0.001	99%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	0.000	0.001	100%
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	0.000	0.001	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	0.001	0.000	100%
2.B.1 Ammonia Production	CO_2	558.672	365.493	0.004	0.000	100%
2.F.3 Fire Protection	Aggregate F-gases	0.000	5.675	0.000	0.000	100%
3.B Manure Management	CH_4	491.908	421.699	0.001	0.000	100%
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	0.000	0.000	100%
2.C.1 Iron and Steel Production	CO_2	43.808	14.259	0.001	0.000	100%
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	0.001	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	0.000	0.000	100%
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	0.000	0.000	100%

Tier 2 Analysis - Trend Assessment Including LULUCF						
IPCC Source Categories	**Direct GHG**	**Base Year (1990) Estimate (Gg eq-CO2)**	**Last Year (2021) Estimate (Gg eq-CO2)**	**Trend Assessment Tier 2**	**% Contribution to Trend**	**Cumulative Total (%)**
2.F.4 Aerosols	Aggregate F-gases	0.000	9.638	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4	0.000	1.575	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	0.000	0.000	100%
4.C.1 Grassland Remaining Grassland	CO_2	2.069	2.069	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	0.000	0.000	100%
1.B.2.c. Venting and flaring	CH_4	0.660	0.020	0.000	0.000	100%
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629	0.000	0.000	100%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	0.000	0.000	100%
1.B.2.c. Venting and flaring	N_2O	0.560	0.123	0.000	0.000	100%
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	0.000	0.000	100%
2.A.3 Glass Production	CO_2	43.216	28.853	0.000	0.000	100%
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568	0.000	0.000	100%
2.A.2 Lime Production	CO_2	156.820	122.989	0.000	0.000	100%
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	0.000	0.000	100%
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	0.000	0.000	100%
1.A.3.c Railways	CH_4	0.195	0.057	0.000	0.000	100%
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	0.000	0.000	100%
1.B.2.c. Venting and flaring	CO_2	0.002	0.000	0.000	0.000	100%
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	0.000	0.000	100%
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802	0.000	0.002	0.000	100%
2.B.1 Ammonia Production	CH_4	0.000	0.000	0.000	0.000	100%
2.B.1 Ammonia Production	N_2O	0.000	0.000	0.000	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	0.000	0.006	0.000	100%
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101	0.000	0.000	0.000	100%
2.C.2 Ferroalloys Production	CO_2	173.798	0.000	0.005	0.000	100%
2.C.2 Ferroalloys Production	CH_4	4.366	0.000	0.000	0.000	100%
2.C.3 Aluminium Production	CO_2	118.797	0.000	0.004	0.000	100%
2.C.3 Aluminium Production	PFCs	1,117.284	0.000	0.035	0.000	100%
5.C Incineration and Open Burning of Waste	N_2O	0.007	0.000	0.000	0.000	100%
5.D Wastewater Treatment and Discharge	N_2O	59.478	0.000	0.002	0.000	100%
TOTAL		38,744.886	31,952.456			

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2023, 1990)

Tier 1 and Tier 2 Analysis - Key Source Analysis Summary (Croatian Inventory, year 1990)					
A	B	C	D		E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification		Com.
1. Energy					
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	Yes	L1e, L2e	L1i	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	Yes	L1e, L2e	L1i, L2i	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	Yes	L1e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	Yes	L1e, L2e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	Yes	L1e, L2e	L1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	Yes	L1e, L2e	L1i	
1.A.3.b Road Transportation	CO_2	Yes	L1e, L2e	L1i, L2i	
1.A.3.b Road Transportation	N_2O	Yes	L2e		
1.A.4 Other Sectors - Biomass	CH_4	Yes	L1e, L2e	L1i	
1.A.4 Other Sectors - Biomass	N_2O	Yes	L2e		
1.A.4 Other Sectors - Gaseous Fuels	CO_2	Yes	L1e	L1i	
1.A.4 Other Sectors - Liquid Fuels	CO_2	Yes	L1e, L2e	L1i, L2i	
1.A.4 Other Sectors - Liquid Fuels	N_2O	Yes	L2e	L2i	
1.A.4 Other Sectors - Solid Fuels	CO_2	Yes	L1e	L1i	
1.B.1 Fugitive emissions from Solid Fuels	CH_4	Yes	L2e	L2i	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	Yes	L1e, L2e	L1i, L2i	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	Yes	L2e		
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	Yes	L1e, L2e	L1i, L2i	
2. Industrial processes and product use					
2.A.1 Cement Production	CO_2	Yes	L1e, L2e	L1i, L2i	
2.B.1 Ammonia Production	CO_2	Yes	L1e	L1i	
2.B.2 Nitric Acid Production	N_2O	Yes	L1e, L2e	L1i	
2.B.8 Petrochemical and Carbon Black Production	CO_2	Yes	L1e	L1i	
2.C.3 Aluminium Production	PFCs	Yes	L1e, L2e	L1i, L2i	
2.D Non-energy Products from Fuels and Solvent Use	CO_2	Yes	L1e	L1i	
3. Agriculture					
3.A Enteric Fermentation	CH_4	Yes	L1e, L2e	L1i, L2i	
3.B Manure Management	CH_4	Yes	L1e	L1i	
3.B Manure Management	N_2O	Yes	L1e	L1i	
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	Yes	L1e, L2e	L1i, L2i	
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	Yes	L1e, L2e	L1i, L2i	
4. Land use, land use change and forestry					
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	Yes		L2i	
4.A.1 Forest Land Remaining Forest Land	CO_2	Yes		L1i, L2i	
4.B.1 Cropland Remaining Cropland	CO_2	Yes		L1i, L2i	
4.B.2 Land Converted to Cropland	CO_2	Yes		L2i	
4.C.2 Land Converted to Grassland	CO_2	Yes		L2i	
4.E.2 Land Converted to Settlements	CO_2	Yes		L1i, L2i	
4.G Harvested Wood Products	CO_2	Yes		L1i, L2i	
5. Waste					
5.A Solid Waste Disposal	CH_4	Yes	L1e, L2e	L1i, L2i	
5.D Wastewater Treatment and Discharge	CH_4	Yes	L1e, L2e	L1i, L2i	

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

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

Table A1.3-14: Source Analysis Summary (Croatian Inventory NIR 2023, year t=2021)

Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year = 2021)							
A	B	C	D				E
IPCC Source Categories	GHG	Key	If Column C is Yes, Criteria for Identification				Com.
1. Energy							
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	Yes	L1e	T1e T2e	L1i	T1i T2i	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	Yes	L1e L2e	T1e T2e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	Yes	L1e	T1e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	Yes	L1e	T1e T2e	L1i	T1i T2i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2	Yes	L1e	T1e	L1i	T1i	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	Yes	L1e	T1e T2e	L1i	T1i T2i	
1.A.3.b Road Transportation	CO_2	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i	
1.A.3.b Road Transportation	N_2O	Yes	L2e	T2e			
1.A.4 Other Sectors - Biomass	CH_4	Yes	L1e L2e	T2e	L1i L2i		
1.A.4 Other Sectors - Biomass	N_2O	Yes	L2e	T2e			
1.A.4 Other Sectors - Gaseous Fuels	CO_2	Yes	L1e L2e	T1e T2e	L1i	T1i T2i	
1.A.4 Other Sectors - Liquid Fuels	CO_2	Yes	L1e L2e	T1e T2e	L1i	T1i T2i	
1.A.4 Other Sectors - Liquid Fuels	N_2O	Yes	L2e				
1.A.4 Other Sectors - Solid Fuels	CO_2	Yes		T1e		T1i	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	Yes		T2e		T1i T2i	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	Yes		T1e T2e		T1i T2i	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	Yes	L2e				
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	Yes	L1e L2e	T2e	L1i L2i	T1i T2i	
2. Industrial processes and product use							
2.A.1 Cement Production	CO_2	Yes	L1e	T1e	L1i	T1i	
2.B.1 Ammonia Production	CO_2	Yes	L1e	T1e	L1i		
2.B.2 Nitric Acid Production	N_2O	Yes		T1e		T1i	
2.B.8 Petrochemical and Carbon Black Production	CO_2	Yes		T1e		T1i	
2.C.2 Ferroalloys Production	CO_2	Yes		T1e		T1i	
2.C.3 Aluminium Production	CO_2	Yes				T1i	
2.C.3 Aluminium Production	PFCs	Yes		T1e		T1i	
2.F.1 Refrigeration and Air conditioning	F-gases	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i	
3. Agriculture							
3.A Enteric Fermentation	CH_4	Yes	L1e L2e	T1e T2e	L1i , L2i	T1i T2i	
3.B Manure Management	CH_4	Yes	L1e, L2e		L1i		
3.B Manure Management	N_2O	Yes	L1e	T1e T2e		T1i	
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	Yes	L1e L2e	T2e	L1i L2i	T2i	
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	Yes	L1e L2e		L1i L2i	T2i	
4. Land use land use change and forestry							
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	Yes				T2i	
4(V) Biomass Burning	CO_2	Yes			L1i L2i	T1i T2i	
4.A.1 Forest Land Remaining Forest Land	CO_2	Yes			L1i L2i		
4.A.2 Land Converted to Forest Land	CO_2	Yes			L1i L2i	T1i T2i	
4.B.1 Cropland Remaining Cropland	CO_2	Yes			L1i L2i	T1i T2i	
4.B.2 Land Converted to Cropland	CO_2	Yes			L2i	T1i T2i	
4.C.2 Land Converted to Grassland	CO_2	Yes			L1i L2i	T1i T2i	
4.D.2 Land Converted to Wetlands	CO_2	Yes				T2i	
4.E.2 Land Converted to Settlements	CO_2	Yes			L1i L2i	T1i T2i	
4.G Harvested Wood Products	CO_2	Yes			L1i L2i	T1i T2i	
5. Waste							
5.A Solid Waste Disposal	CH_4	Yes	L1e L2e	T1e T2e	L1i L2i	T1i T2i	
5.D Wastewater Treatment and Discharge	CH_4	Yes	L1e L2e		L2i		
5.D Wastewater Treatment and Discharge	N_2O	Yes	L2e	T2e			

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

Annex 2: Assessment of uncertainty

Annex 2: Assessment of uncertainty

2.1. Description of methodology used for identifying uncertainties

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

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

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

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

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

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

2.2.1. Overview of the method

- The Monte Carlo analysis is suitable for detailed category-by-category assessment of uncertainty, particularly where uncertainties are large, distribution is non-normal, distribution functions are complex and/or there are correlations between some of the activity sets, emissions factors, or both.
- The principle of Monte Carlo analysis is to select random values of emission factor, activity data and other estimation parameters from within their individual probability density functions, and to calculate the corresponding emission values.
- This procedure is repeated many times, using a computer, and the results of each calculation run build up the overall emission probability density function.
- Monte Carlo analysis can be performed at the category level, for aggregations of categories or for the inventory as a whole.
- Detailed procedure:
- A probability distribution function (PDF) was allocated to each emission factor and activity data. The PDFs were mostly normal, log-normal or triangle. The parameters of the PDFs were set by analysing the available data on emission factors and activity data or by expert judgement.
- If there was a lack of data for some emission source, associated uncertainties were extracted from the IPCC guidelines which imply that default uncertainty parameters were set.
- Using the software tool @RISK 5.7, each PDF was sampled 10,000 times and the emission calculations performed to produce a converged output distribution.

- The uncertainty in the trend between 1990 and the latest reported year, according to gas, was also estimated.

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

Distributions

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

Correlations

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

Activity data and emission factor uncertainty

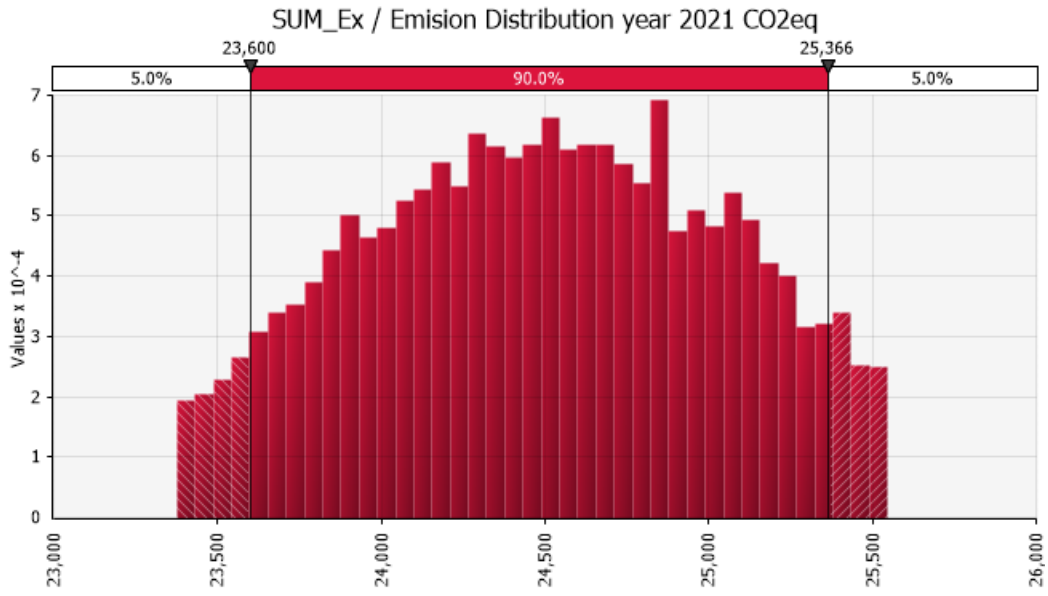
If for activity data or emission factor uncertainty default value from IPCC guidance was used, average value from range of given uncertainty was set.

2.2.3. Uncertainty excluding LULUCF sector

2.2.3.1. Uncertainty in the emissions excluding LULUCF

The estimations of CO_2-eq emissions were 24,446.418 kt CO_2-eq for the year 2021 and 31,416.28 kt CO_2-eq for the year 1990 without removals from LULUCF.

Figure A2.2-1: Distribution of the total CO_2 emissions for year 2021 excluding LULUCF



Monte Carlo analysis shows that with a certainty of 95% total emissions of all categories for the year 2021 (24,439.88 kt CO_2eq) according to simulation varies between 23,600.0 kt CO_2-eq (2.5 percentile) and 25,366.0 kt CO_2eq (97.5 percentile). Figure A2.2-1 shows the distribution of total CO_2 emission for year 2021.

Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories excluding LULUCF for the year 1990 (31,416.28 kt CO_2-eq) varies between 32,925.0 kt CO_2eq (2.5 percentile) and 24,327.0 kt CO_2eq (97.5 percentile).

Figure A2.2-2: Distribution of total CO_2 emission for year 1990 excluding LULUCF

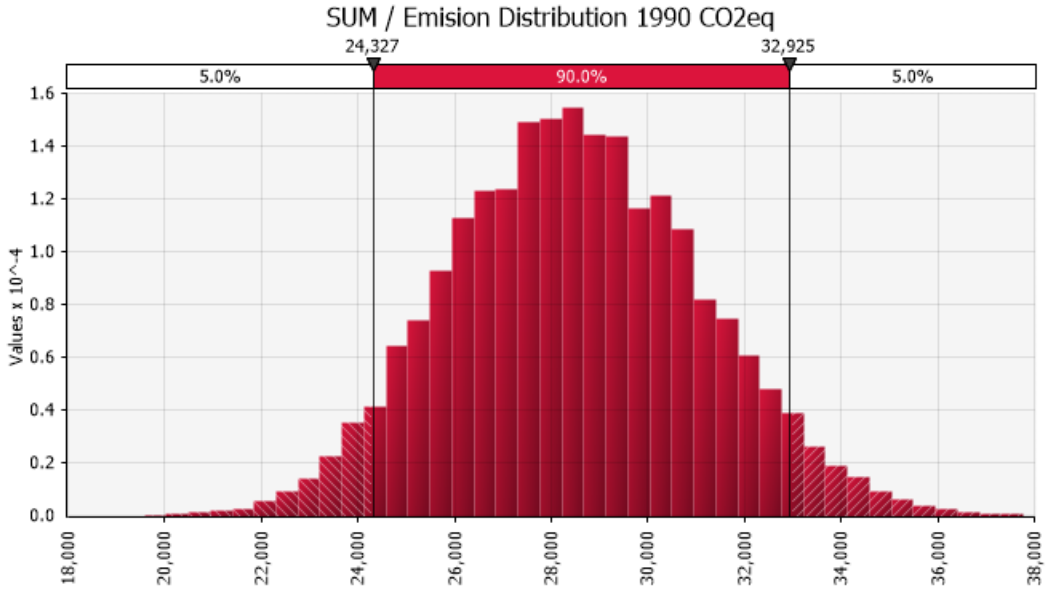


Figure A2.2-2 shows the distribution of total CO_2 emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

2.2.3.2. Uncertainty in the trend excluding LULUCF

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

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

The Inventory trend excluding LULUCF is -24.52%, simulated trend is -28.45 % and the 95% probability range of the trend is -28.83% (2.5 percentile) to -18.33% (97.5 percentile).

Figure A2.2-3: Distribution of trend for year 2021 with the respect to year 1990

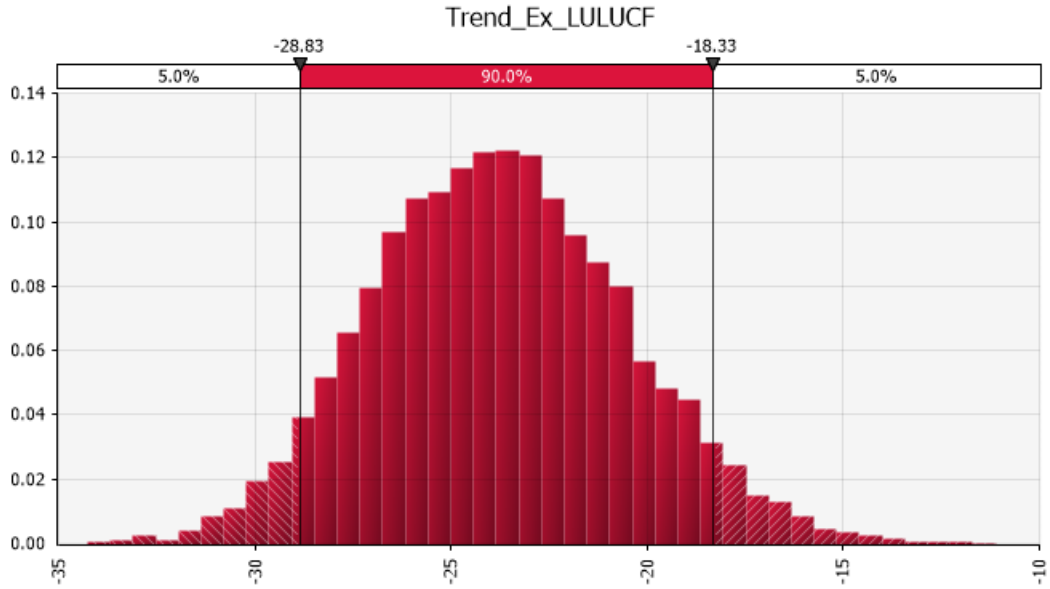


Figure A2.2-3: shows the distribution of trend for year 2021 respect to year 1990.

2.2.4. Uncertainty including LULUCF sector

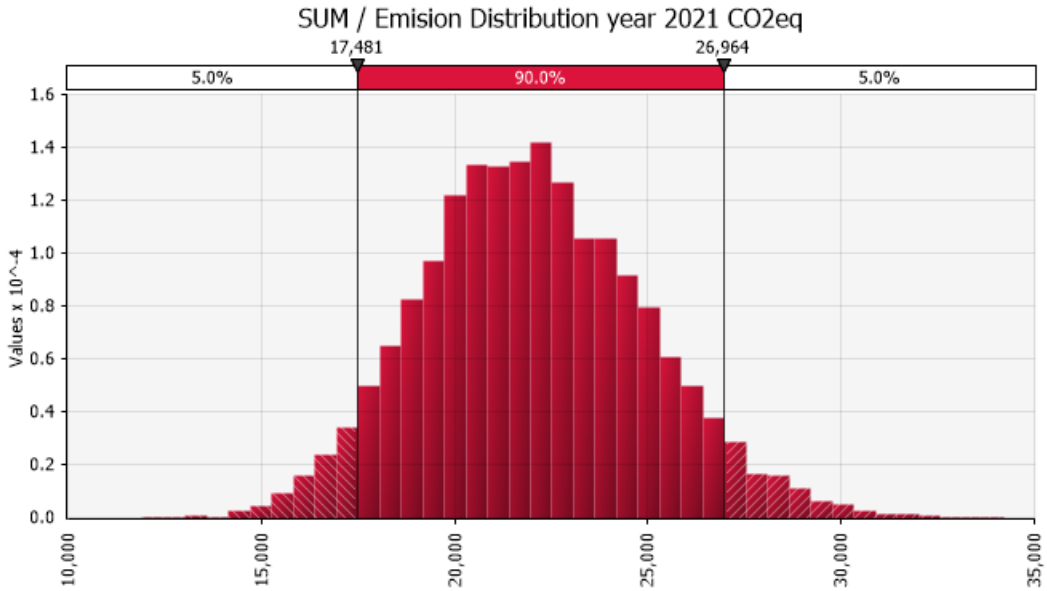
2.2.4.1. Uncertainty in the emissions including LULUCF

The Inventory trend excluding LULUCF is -24.52%, simulated trend is -28.45 % and the 95% probability range of the trend is -28.83% (2.5 percentile) to -18.33% (97.5 percentile).

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2021 (21,858.72 kt CO_2eq) according to simulation varies between 16,466.54 kt CO_2eq (2.5 percentile) and 27,797.59 kt CO_2eq (97.5 percentile).

Figure A2.2-4 shows the distribution of total CO_2 emission including LULUCF for year 2020 with a corresponding probability density function (red line) that best matches the simulation results.

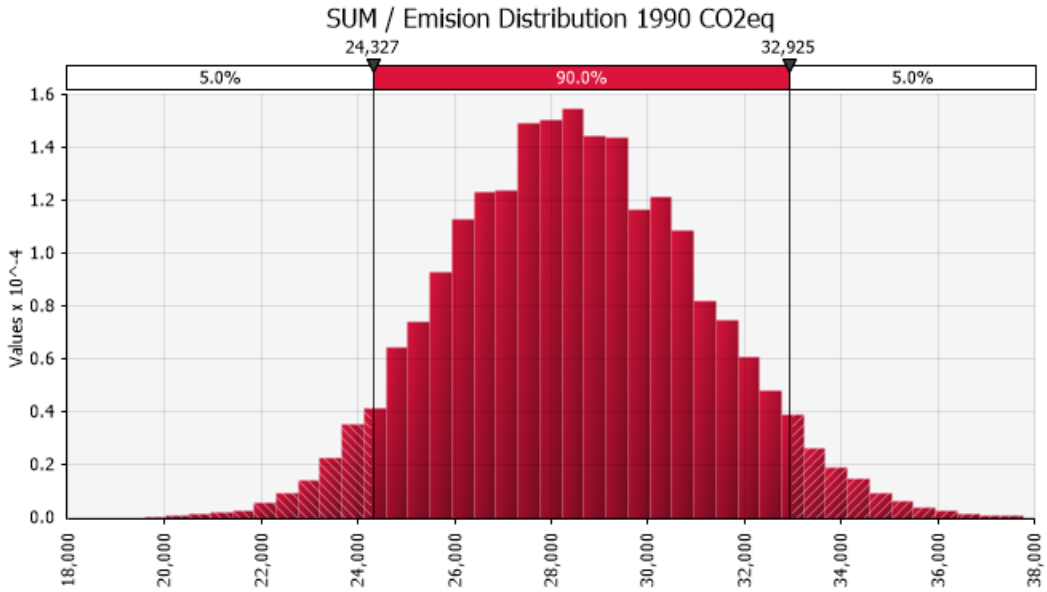
Figure A2.2-4: Distribution of total CO_2 emission for year 2021 including LULUCF



Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (25,141.95 kt CO_2eq) varies between 24,327.0 kt CO_2-eq (2.5 percentile) and 32,925.0 kt CO_2eq (97.5 percentile).

Figure A2.2-5 shows the distribution of total CO_2 emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

Figure A2.2-5: Distribution of total CO_2 emission for year 1990 including LULUCF



2.2.4.2. Uncertainty in the trend including LULUCF

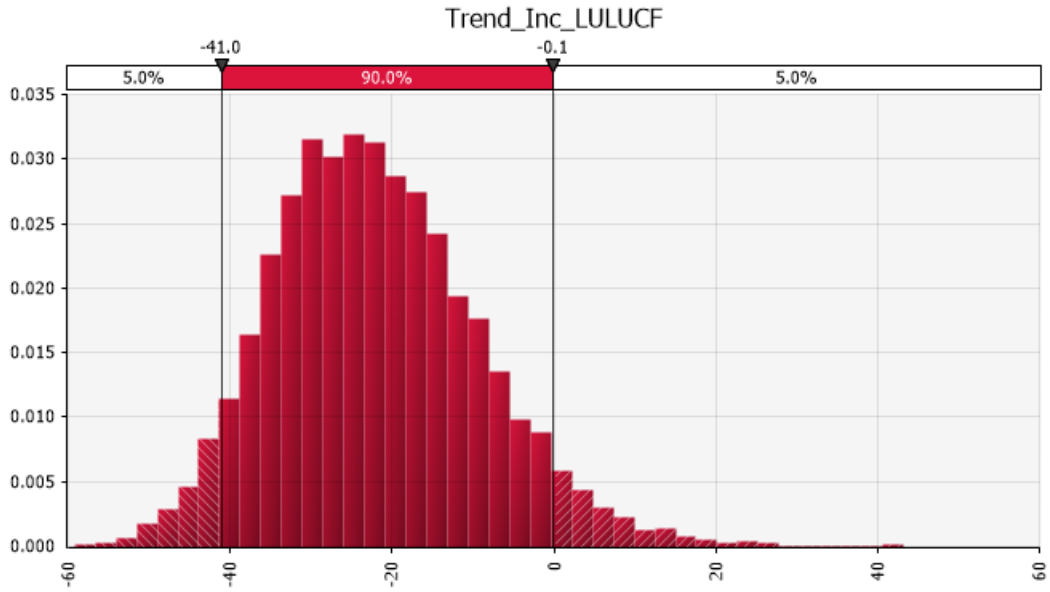
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following forumula:

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

The Inventory trend including LULUCF is -27.71%, simulated trend is -16.21% and the 95% probability range of the trend is -41.0% (2.5 percentile) to -0.1% (97.5 percentile), so the uncertainty introduced in trend varies from -16.21% to 32.06% with respect to the base year emissions.

Figure A2.2-6: shows the distribution of trend for year 2021 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results, including LULUCF.

Figure A2.2-6: Distribution of trend for year 2021 with the respect to year 1990 including LULUCF



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

Table A2:3-1: Uncertainty estimates from the Monte Carlo simulation for the year t=2021 (IPCC 2006 Table 3.3)

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	4,590.624	396.917	-5	5	-5	5	-7.01	7.20	0.000025	-91.35	-0.82	0.91	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	4.139	0.225	-5	5	-50	50	-50.06	50.25	0.000000	-94.58	-2.96	6.74	
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	7.839	0.554	-5	5	-200	200	-91.57	207.49	0.000000	-92.93	-6.64	109.37	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	595.119	1,194.621	-5	5	-5	5	-7.06	7.02	0.000222	100.74	-19.70	21.27	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.179	0.359	-5	5	-50	50	-50.39	50.28	0.000000	101.18	-110.20	237.85	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	2.535	5.100	-5	5	-200	200	-91.77	207.43	0.000002	101.18	-188.83	3055.77	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	1,880.045	2,126.808	-5	5	-5	5	-6.94	7.20	0.000710	13.13	-10.82	11.88	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	1.762	2.937	-5	5	-50	50	-50.14	51.14	0.000000	66.66	-90.78	204.08	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	5.102	7.644	-5	5	-200	200	-91.73	209.23	0.000005	49.83	-140.14	2393.80	
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4		9.530	-5	5	-50	50	-50.11	50.52	0.000001				2
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O		11.990	-5	5	-200	200	-91.67	206.12	0.000011				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	2,096.390	788.120	-5	5	-5	5	-6.87	7.18	0.000095	-62.41	-3.58	4.01	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	2.273	0.796	-5	5	-50	50	-49.32	52.33	0.000000	-64.99	-19.00	43.23	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	4.282	1.493	-5	5	-200	200	-91.55	212.92	0.000000	-65.14	-32.63	491.64	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	1,536.292	436.020	-5	5	-5	5	-6.84	7.15	0.000029	-71.62	-2.71	2.99	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	4.263	1.257	-5	5	-50	50	-50.10	50.67	0.000000	-70.50	-16.37	36.08	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	6.052	1.785	-5	5	-200	200	-91.68	207.47	0.000000	-70.51	-27.48	429.80	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	1,575.900	925.790	-5	5	-5	5	-7.08	7.17	0.000133	-41.25	-5.61	6.21	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.787	0.462	-5	5	-50	50	-50.09	50.37	0.000000	-41.30	-32.29	72.74	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	0.745	0.437	-5	5	-200	200	-91.69	209.27	0.000000	-41.30	-55.11	860.65	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO_2		268.125	-5	5	-5	5	-6.82	7.27	0.000011				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CH_4		1.575	-5	5	-50	50	-49.71	50.24	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	N_2O		1.988	-5	5	-200	200	-91.74	207.29	0.000000				2
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	3.024	1.109	-5	5	-50	50	-49.98	50.17	0.000000	-63.34	-20.18	45.01	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	3.816	1.399	-5	5	-200	200	-91.52	209.32	0.000000	-63.34	-34.39	560.83	
1.A.3.a Domestic Aviation	CO_2	6.601	22.305	-5	5	-5	5	-6.90	6.97	0.000000	237.91	-31.98	35.05	

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
1.A.3.a Domestic Aviation	CH_4	0.001	0.004	-5	5	-50	50	-50.13	50.81	0.000000	237.91	-185.40	413.72	
1.A.3.a Domestic Aviation	N_2O	0.049	0.166	-5	5	-200	200	-91.77	207.64	0.000000	237.91	-314.92	4982.45	
1.A.3.b Road Transportation	CO_2	3,505.880	5,978.834	-5	5	-5	5	-7.09	7.16	0.005708	70.54	-16.23	17.67	
1.A.3.b Road Transportation	CH_4	46.375	9.284	-5	5	-50	50	-49.91	51.30	0.000001	-79.98	-10.97	25.14	
1.A.3.b Road Transportation	N_2O	46.850	51.317	-5	5	-200	200	-91.65	208.02	0.000206	9.54	-102.59	1621.45	
1.A.3.c Railways	CO_2	140.079	45.257	-5	5	-5	5	-7.05	7.35	0.000000	-67.69	-3.14	3.44	
1.A.3.c Railways	CH_4	0.195	0.057	-5	5	-50	50	-50.30	50.74	0.000000	-70.92	-16.04	36.23	
1.A.3.c Railways	N_2O	11.781	4.629	-5	5	-200	200	-91.76	206.43	0.000002	-60.71	-36.78	598.62	
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	134.498	148.588	-5	5	-5	5	-7.03	7.15	0.000003	10.48	-10.56	11.69	
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.355	0.393	-5	5	-50	50	-49.93	50.17	0.000000	10.69	-60.64	138.35	
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.961	1.063	-5	5	-200	200	-91.73	206.95	0.000000	10.70	-103.50	1591.02	
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,450.506	1,001.447	-5	5	-5	5	-6.93	7.12	0.000158	-59.13	-3.89	4.35	
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.091	2.192	-5	5	-50	50	-50.13	50.41	0.000000	-69.10	-17.15	38.03	
1.A.4 Other Sectors - Liquid Fuels	N_2O	78.389	62.716	-5	5	-200	200	-91.64	208.39	0.000308	-19.99	-74.82	1228.40	
1.A.4 Other Sectors - Solid Fuels	CO_2	524.388	7.526	-5	5	-5	5	-6.95	7.17	0.000000	-98.56	-0.13	0.15	
1.A.4 Other Sectors - Solid Fuels	CH_4	37.398	0.638	-5	5	-50	50	-50.47	50.23	0.000000	-98.30	-0.93	2.11	
1.A.4 Other Sectors - Solid Fuels	N_2O	2.114	0.030	-5	5	-200	200	-91.66	209.43	0.000000	-98.57	-1.34	20.47	
1.A.4 Other Sectors - Gaseous Fuels	CO_2	744.057	1,849.617	-5	5	-5	5	-7.03	7.27	0.000535	148.59	-23.55	26.27	
1.A.4 Other Sectors - Gaseous Fuels	CH_4	1.870	4.616	-5	5	-50	50	-50.18	49.89	0.000000	146.79	-137.56	309.47	
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.497	0.874	-5	5	-200	200	-91.67	207.75	0.000000	75.71	-164.43	2526.25	
1.A.4 Other Sectors - Biomass	CH_4	354.228	394.921	-5	5	-50	50	-49.78	50.61	0.001228	11.49	-60.66	135.30	
1.A.4 Other Sectors - Biomass	N_2O	44.700	49.836	-5	5	-200	200	-91.72	207.87	0.000194	11.49	-104.56	1706.64	
1.B.1 Fugitive emissions from Solid Fuels	CH_4	66.802												2
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	157.786	35.379											
1. Exploration	CO_2	28.536	6.398	-5	5	-50	50	-50.29	50.37	0.000000	-77.58	-12.31	26.77	
2. Production(7)	CO_2	129.245	28.977	-5	5	-50	50	-49.61	50.54	0.000007	-77.58	-12.21	27.79	
3. Transport	CO_2	0.005	0.004	-5	5	-50	50	-50.47	50.24	0.000000	-20.45	-44.17	98.84	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	246.878	56.440											
1. Exploration	CH_4	17.030	3.818	-5	5	-100	100	-84.31	102.08	0.000000	-77.58	-19.21	122.22	
2. Production(7)	CH_4	223.474	50.104	-5	5	-100	100	-84.32	101.19	0.000069	-77.58	-19.19	134.57	

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
3. Transport	CH_4	1.504	1.197	-5	5	-100	100	-84.38	100.81	0.000000	-20.45	-68.35	460.89	
4. Refining/storage	CH_4	4.870	1.321	-5	5	-100	100	-84.40	101.07	0.000000	-72.87	-23.16	164.35	
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.056	0.013	-5	5	-10	1000	-81.26	1123.80	0.000000	-77.58	-21.54	515.18	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	424.729	248.544											
2. Production(7)	CO_2	418.423	246.122	-5	5	-100	100	-84.09	101.29	0.001671	-41.18	-50.31	339.16	
3. Processing	CO_2	6.276	2.362	-5	5	-100	100	-84.32	101.27	0.000000	-62.37	-32.34	212.47	
4. Transmission and storage	CO_2	0.011	0.012	-5	5	-100	100	-84.05	101.80	0.000000	8.16	-91.92	627.03	
5. Distribution	CO_2	0.019	0.048	-5	5	-20	500	-88.79	542.79	0.000000	148.35	-236.46	5686.52	
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	155.067	108.435											
2. Production(7)	CH_4	74.418	28.002	-5	5	-100	100	-84.34	101.21	0.000022	-62.37	-32.12	220.42	
3. Processing	CH_4	32.859	12.364	-5	5	-100	100	-84.31	100.61	0.000004	-62.37	-32.30	210.25	
4. Transmission and storage	CH_4	36.108	39.055	-5	5	-100	100	-84.15	100.04	0.000042	8.16	-92.36	607.08	
5. Distribution	CH_4	11.682	29.014	-5	5	-20	500	-88.78	545.47	0.000301	148.35	-237.28	5136.78	
1.B.2.c. Venting and flaring	CO_2	0.002	0.000											
1. Venting - Oil	CO_2	0.002	0.000	-5	5	-100	100	-84.22	100.33	0.000000	-96.94	-2.63	18.56	
1.B.2.c. Venting and flaring	CH_4	0.660	0.020											
1. Venting - Oil	CH_4	0.660	0.020	-5	5	-100	100	-84.21	100.99	0.000000	-96.94	-2.60	17.25	
1.B.2.c. Venting and flaring	N_2O	0.560	0.123											
2. Flaring - Oil	N_2O	0.532	0.119	-5	5	-100	100	-84.39	100.93	0.000000	-77.58	-19.01	132.17	
2. Flaring - Gas	N_2O	0.028	0.004	-5	5	-100	100	-84.28	101.35	0.000000	-85.37	-12.62	84.99	
2.A.1 Cement Production	CO_2	1,086.203	1,204.847	-2	2	-2	2	-2.82	2.86	0.000036	10.92	-25.70	46.89	
2.A.2 Lime Production	CO_2	156.820	122.989	-2	2	-2	2	-2.86	2.82	0.000000	-21.57	-3.09	3.18	
2.A.3 Glass Production	CO_2	43.216	28.853	-2	2	-2	2	-2.86	2.84	0.000000	-33.23	-2.59	2.74	
2.A.4 Other Process Uses of Carbonates	CO_2	11.322	15.568											
2.A.4.a Ceramics	CO_2	9.146	2.712	-2	2	-3	3	-3.57	3.64	0.000000	-70.34	-1.49	1.52	
2.A.4.d Other	CO_2	2.176	12.856	-2	2	-3	3	-3.64	3.66	0.000000	490.73	-30.69	31.81	
2.B.1 Ammonia Production	CO_2	558.672	365.493	-2	2	-2	2	-2.77	2.80	0.000003	-34.58	-2.52	2.66	5
2.B.2 Nitric Acid Production	N_2O	670.739	36.275	-2	2	-2	2	-2.85	2.87	0.000000	-94.59	-0.91	1.36	
2.B.8 Petrochemical and Carbon Black Production	CO_2	192.426	-											
2.B.8.b Ethylene	CO_2	125.652												

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer	CO_2	0.414												2
2.B.8.f Carbon Black	CO_2	66.360												2
2.B.8 Petrochemical and Carbon Black Production	CH_4	6.101												
2.B.8.b Ethylene	CH_4	6.101												
2.C.1 Iron and Steel Production	CO_2	43.808	14.259											
2.C.1.a Steel	CO_2	19.505	14.259	-5	5	-5	5	-6.87	6.96	0.000000	-26.90	-10.44	12.63	
2.C.2 Ferroalloys Production	CO_2	173.798												
2.C.2 Ferroalloys Production	CH_4	4.366												
2.C.2 Ferroalloys Production	CO_2	173.798												2
2.C.2 Ferroalloys Production	CH_4	4.366												2
2.C.3 Aluminium Production	CO_2	118.797												
2.C.3.a CO2 Emissions	CO_2	118.797												2
2.C.3 Aluminium Production	PFCs	1,117.284												
2.C.3.b By-Product Emission\CF4	PFCs	787.623												2
2.C.3.b By-Product Emission\C2F6	PFCs	329.661												2
2.D Non-energy Products from Fuels and Solvent Use	CO_2	176.171	81.870											
2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use	CO_2	31.217	17.223	-5	5	-50	50	-50.24	50.60	0.000002	-44.83	-30.31	68.98	
2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use	CO_2	10.374	2.702	-5	5	-50	50	-50.09	50.62	0.000000	-73.95	-14.25	31.95	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use	CO_2	134.555	55.160	NA	NA	-50	50	-40.78	58.44	0.000024	-59.01	-20.43	40.23	4
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt	CO_2	0.015	0.067	-10	10	-50	50	-50.34	52.04	0.000000	356.12	-252.42	555.94	
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC	CO_2		6.709	-5	5	-5	5	-7.03	7.30	0.000000				
2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing	CO_2	0.009	0.008	-10	10	-50	50	-50.39	51.81	0.000000	-10.46	-49.72	109.12	
2.F.1 Refrigeration and Air conditioning	Aggregate F-gases		1,658.701											
2.F.1.a Commercial Refrigeration\HFC-143a	HFC-143a	-	155.058	-50	50	-50	50	-53.89	123.25	0.000598				2
2.F.1.a Commercial Refrigeration\HFC-125	HFC-125	-	86.648	-50	50	-50	50	-53.57	122.89	0.000184				2
2.F.1.a Commercial Refrigeration\HFC-134a	HFC-134a	-	73.398	-50	50	-50	50	-36.54	201.36	0.000242				2
2.F.1.a Commercial Refrigeration\HFC-32	HFC-32	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.1.b Domestic Refrigeration\HFC-134a	HFC-134a	-	10.727	-30	30	-25	25	91.28	329.28	0.000005				2
2.F.1.c Industrial Refrigeration\HFC-134a	HFC-134a	-	2.647	-50	50	-50	50	-70.04	41.95	0.000000				2
2.F.1.c Industrial Refrigeration\HFC-125	HFC-125	-	30.854	-50	50	-50	50	-71.37	36.91	0.000009				2

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
2.F.1.c Industrial Refrigeration\HFC-143a	HFC-143a	-	48.322	-50	50	-50	50	-71.32	37.87	0.000022				2
2.F.1.c Industrial Refrigeration\HFC-32	HFC-32	-	0.418	-50	50	-50	50	-77.52	10.18	0.000000				2
2.F.1.d Transport Refrigeration\HFC-134a	HFC-134a	-												2
2.F.1.d Transport Refrigeration\HFC-125	HFC-125	-	18.283	-25	25	-25	25	-33.01	38.62	0.000001				2
2.F.1.d Transport Refrigeration\HFC-143a	HFC-143a	-	32.717	-25	25	-25	25	-33.65	37.92	0.000004				2
2.F.1.e Mobile Air-Conditioning\HFC-134a	HFC-134a	-	365.267	-25	25	-25	25	-51.28	0.87	0.000280				2
2.F.1.f Stationary Air-Conditioning\HFC-32	HFC-32	-	181.906	-50	50	-50	50	-62.01	82.49	0.000542				2
2.F.1.f Stationary Air-Conditioning\HFC-125	HFC-125	-	600.280	-50	50	-50	50	-62.68	75.97	0.005573				2
2.F.1.f Stationary Air-Conditioning\HFC-134a	HFC-134a	-	52.114	-50	50	-50	50	-70.40	38.77	0.000026				2
2.F.1.f Stationary Air-Conditioning\HFC-143a	HFC-143a	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.1.f Stationary Air-Conditioning\HFC-152a	HFC-152a	-	-	0	0	0	0	#VALUE!	#VALUE!	0.000000				2
2.F.3 Fire Protection	Aggregate F-gases		5.675											
2.F.3 Fire Protection\HFC-125	HFC-125	-	0.915	-25	25	-10	10	-26.46	27.45	0.000000				2
2.F.3 Fire Protection\HFC-227ea	HFC-227ea	-	2.494	-25	25	-10	10	-26.36	27.62	0.000000				2
2.F.3 Fire Protection\HFC-236fa	HFC-236fa	-	2.266	-25	25	-10	10	15.88	100.10	0.000000				2
2.F.4 Aerosols	Aggregate F-gases	-	9.638											
2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a	HFC-134a	-	9.320	-10	10	0	0	-10.00	10.00	0.000000				2
2.G Other Product Manufacture and Use	N_2O	32.648	16.866											
2.G.3 N2O from Product Uses\2.G.3.a Medical Applications	N_2O	32.118	16.845	-20	20	-10	10	-21.62	22.73	0.000000	-47.55	-14.44	20.20	
2.G.3 N2O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products	N_2O	0.530	0.021	-50	50	-10	10	39404.84	120521.49	0.000002	-96.00	1415.27	7124.14	2
2.G Other Product Manufacture and Use	Aggregate F-gases	11.055	9.629											
2.G.1 Electrical Equipment\SF6	SF_6	11.055	9.629	-25	25	-30	30	-86.95	-70.74	0.000000	-12.91	41.65	308.12	
3.A Enteric Fermentation	CH_4	2,336.027	1,079.307											
Mature dairy cattle	CH_4	1,427.140	371.032	-30	30	-20	20	-33.99	38.07	0.000567	-74.00	-10.70	18.71	
Other mature cattle	CH_4	87.596	106.870	-10	10	-20	20	-21.86	22.77	0.000018	22.00	-33.36	46.86	
Growing cattle	CH_4	537.468	385.842	-10	10	-20	20	-21.99	23.01	0.000235	-28.21	-19.78	28.03	
Sheep	CH_4	168.224	146.572	-10	10	-20	20	-21.82	23.04	0.000034	-12.87	-23.60	33.18	
Market swine	CH_4	56.322	36.307	-10	10	-20	20	-90.35	-84.77	0.000000	-35.54	-58.68	-53.48	
Breeding swine	CH_4	9.744	4.488	-10	10	-20	20	532.76	895.33	0.000002	-53.94	225.05	465.81	
Goats	CH_4	24.080	12.010	-10	10	-20	20	-22.17	23.55	0.000000	-50.13	-13.52	19.19	

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Horses	CH_4	19.656	14.601	-30	30	-20	20	-34.23	38.85	0.000001	-25.72	-30.00	52.60	
Mules and Asses	CH_4	4.760	1.486	-30	30	-20	20	-34.59	38.66	0.000000	-68.79	-12.87	21.49	
Rabbits	CH_4	1.037	0.100	-30	30	-20	20	-33.85	38.04	0.000000	-90.33	-3.89	6.63	
3.B Manure Management	CH_4	491.908	421.699											
Mature dairy cattle	CH_4	179.558	113.934	-30	30	-20	20	-34.27	39.11	0.000054	-36.55	-26.01	43.17	
Other mature cattle	CH_4	8.540	20.553	-10	10	-20	20	-21.78	23.30	0.000001	140.67	-66.60	93.39	
Growing cattle	CH_4	62.321	91.429	-10	10	-20	20	-21.73	22.84	0.000013	46.71	-40.55	55.50	
Sheep	CH_4	4.494	4.029	-10	10	-20	20	-21.87	22.75	0.000000	-10.35	-24.32	33.88	
Market swine	CH_4	31.854	25.933	-10	10	-20	20	-21.54	22.85	0.000001	-18.59	-22.48	30.85	
Breeding swine	CH_4	168.948	151.117	-10	10	-20	20	-21.85	22.83	0.000036	-10.55	-24.78	34.75	
Goats	CH_4	0.655	0.336	-10	10	-20	20	-21.97	22.76	0.000000	-48.75	-14.14	19.29	
Horses	CH_4	2.218	1.637	-30	30	-20	20	-34.29	38.16	0.000000	-26.19	-30.56	51.30	
Mules and Asses	CH_4	0.397	0.124	-30	30	-20	20	-34.49	39.02	0.000000	-68.79	-12.79	21.42	
Poultry	CH_4	31.885	12.506	-10	10	-20	20	-21.59	22.87	0.000000	-60.78	-10.77	14.81	
Rabbits	CH_4	1.037	0.100	-30	30	-20	20	-34.24	38.57	0.000000	-90.33	-3.92	6.55	
3.B Manure Management	N_2O	284.426	115.048											
Mature dairy cattle	N_2O	65.915	6.775	-30	30	-50	100	-84.83	111.80	0.000001	-89.72	-8.88	63.11	
Other mature cattle	N_2O	4.323	3.780	-10	10	-50	100	-84.17	101.98	0.000000	-12.56	-75.12	496.35	
Growing cattle	N_2O	9.522	5.612	-10	10	-50	100	-84.28	102.56	0.000001	-41.06	-50.38	344.00	
Sheep	N_2O	3.529	3.690	-10	10	-50	100	-84.23	102.49	0.000000	4.55	-90.01	637.85	
Market swine	N_2O	8.375	1.040	-10	10	-50	100	-84.16	101.61	0.000000	-87.58	-10.62	74.96	
Breeding swine	N_2O	16.216	1.585	-10	10	-50	100	-84.00	102.03	0.000000	-90.22	-8.38	58.32	
Goats	N_2O	0.193	0.161	-10	10	-50	100	-84.28	102.74	0.000000	-16.88	-71.37	477.43	
Horses	N_2O	0.872	0.647	-30	30	-50	100	-84.78	112.86	0.000000	-25.72	-63.99	459.17	
Mules and Asses	N_2O	0.044	0.014	-30	30	-50	100	-84.66	111.38	0.000000	-68.79	-26.65	191.88	
Poultry	N_2O	20.325	11.962	-10	10	-50	100	-84.29	101.95	0.000004	-41.15	-50.34	366.35	
Rabbits	N_2O	7.810	7.810	-30	30	-50	100	-84.60	112.06	0.000002	0.00	-85.89	594.23	
Indirect N2O emission	N_2O	147.302	71.972											
Total N volatilised as NH3 and NOx	N_2O	147.302	71.972	-10	10	-30	30	-32.65	30.01	0.000016	-51.14	-18.26	28.68	
3.D.1 Direct N2O Emissions From Managed Soils	N_2O	952.297	751.581											

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
Inorganic N fertilizers	N_2O	447.300	425.548	-20	20	-70	200	-91.62	216.53	0.014705	-4.86	-88.95	1444.59	
Organic N fertilizers	N_2O	209.915	96.725	-10	10	-30	30	-31.00	31.64	0.000029	-53.92	-32.27	497.64	
Urine and dung deposited by grazing animals	N_2O	119.511	49.663	-10	10	-50	150	-90.52	154.65	0.000126	-58.44	-38.18	508.63	
Crop residues	N_2O	166.476	162.180	-20	20	-70	200	-91.87	214.86	0.002144	-2.58	-91.60	1492.72	
Mineralization/immobilization associated with loss/gain of soil organic matter	N_2O	0.149	8.518	-20	20	-30	30	-33.89	37.88	0.000000	5634.37	-4062.69	63849.73	
Cultivation of organic soils	N_2O	8.947	8.947	-10	10	-500	500	-88.85	545.80	0.000029	0.00	-95.48	1965.77	
3.D.2 Indirect N2O Emissions From Managed Soils	N_2O	309.660	237.508											
Atmospheric deposition	N_2O	104.399	71.165	-20	20	-250	250	-91.95	273.17	0.000583	-31.83	-64.32	1133.76	
Nitrogen leaching and run-off	N_2O	205.261	166.342	-20	20	-400	400	-90.45	439.91	0.006901	-18.96	-76.98	1605.29	
3.G Liming	CO_2		5.099	-50	50	-50	50	-82.51	-15.81	0.000000				
3.H Urea Application	CO_2	50.020	84.154	-20	20	-50	0	-20.00	19.99	0.000009	68.24	-42.52	57.03	
4.A.1 Forest Land Remaining Forest Land	CO_2	-6,444.758	-5,623.552					-54.53	134.64	0.900493	-12.74			1, 3
4.A.2 Land Converted to Forest Land	CO_2	-28.890	-266.151					-29.53	137.50	0.000645	821.26			1, 3
4.B.1 Cropland Remaining Cropland	CO_2	89.059	138.401					-244.05	549.68	0.009046	55.40			1, 3
4.B.2 Land Converted to Cropland	CO_2	25.846	123.489					-364.25	249.67	0.004223	377.79			1, 3
4.C.1 Grassland Remaining Grassland	CO_2	2.069	2.069					-208.10	-191.91	0.000000	0.00			1, 3
4.C.2 Land Converted to Grassland	CO_2	-9.952	-305.621					-183.84	104.66	0.006174	2970.98			1, 3
4.D.2 Land Converted to Wetlands	CO_2	77.232	11.933					-63.53	216.19	0.000009	-84.55			1, 3
4.E.2 Land Converted to Settlements	CO_2	235.440	629.437					-9.69	189.90	0.010352	167.35			1, 3
4.G Harvested Wood Products	CO_2	-317.852	-685.275					-33.76	90.75	0.001191	115.60			1, 3
4(III).Direct N2O emissions from N mineralization/immobilization	N_2O	42.486	109.885					-86.85	-3.44	0.000066	158.64			1, 3
4(V) Biomass Burning	CO_2	14.979	56.681					123.94	350.52	0.000134	278.41			1, 3
4(V) Biomass Burning	CH_4	1.378	6.529					-76.72	65.40	0.000001	373.80			1, 3
4(V) Biomass Burning	N_2O	0.763	4.025					-78.59	198.32	0.000001	427.48			1, 3
5.A Solid Waste Disposal	CH_4	370.890	1,265.609											
5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic	CH_4	18.361	1,186.219	-50	50	-50	50	-62.61	81.42	0.022579	6360.58	-4356.46	13892.75	
5.A.2 Unmanaged Waste Disposal Sites	CH_4	352.529	79.390	-50	50	-50	50	-62.57	79.01	0.000101	-77.48	-15.28	49.86	
5.B Biological Treatment of Soild Waste	CH_4		19.512											
5.B Biological Treatment of Soild Waste\5.B.1 Composting	CH_4		12.637	-5	5	-100	100	-84.21	100.98	0.000004				2
5.B Biological Treatment of Soild Waste	N_2O		7.176											

TABLE 3.3 GENERAL REPORTING TABLE FOR UNCERTAINTY														
A	B	C	D	E		F		G		H	I	J		K
IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to base year		Approach and Comments
		Gg CO_2 equivalent	Gg CO_2 equivalent	(-) %	(+) %	(-) %	(+) %	(-) %	(+) %	(fraction)	(% of base year)	(-) %	(+) %	
5.B Biological Treatment of Soild Waste\5.B.1 Composting	N_2O		7.176	-5	5	-110	110	-86.70	111.26	0.000002				2
5.C Incineration and Open Burning of Waste	CO_2	23.929												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Clinical Waste	CO_2	23.516												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial Solid Wastes	CO_2	0.413												2
5.C Incineration and Open Burning of Waste	N_2O	0.007												
5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial Solid Wastes	N_2O	0.007												2
5.D Wastewater Treatment and Discharge	CH_4	659.542	523.238											
5.D.1 Domestic wastewater	CH_4	551.417	372,782	-30	30	-30	30	-39.36	46.04	0.000091	16.75	-54.70	100.39	
5.D.2 Industrial wastewater	CH_4	108.126	112,709	-30	30	-30	30	-39.36	46.04	0.000091	16.75	-54.70	100.39	
5.D Wastewater Treatment and Discharge	N_2O	59.478												
5.D.1 Domestic wastewater	N_2O	59.478												
TOTAL	CO2eq	25,141.982	18,644.052					-8.23	53.48	0.999882	-27.71	-16.21	32.06	

Approach and Comments:

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

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

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

4 - Different units of AD

5 - Recovery included in estimation of GHG emissions

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

3.1. Energy sector

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

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fuel consumption	**UNIT**															
Hard coal	1000 t	253.70	569.80	887.50	915.60	957.10	855.50	932.60	919.00	872.90	973.90	526.90	492.10	579.80	434.60	528.20
Fuel oil	1000 t	570.40	283.40	284.00	15.10	58.50	60.10	18.90	1.60	10.60	0.00	0.00	0.00	0.00	0.00	0.00
Light heating oil	1000 t	0.30	0.20	3.00	0.90	0.90	1.20	0.90	1.00	2.10	1.10	1.20	0.90	0.80	1.10	0.40
Natural gas	1000000 m3	201.70	155.80	36.30	24.00	27.00	14.00	2.70	0.60	52.50	66.10	5.30	0.50	0.50	5.60	4.30
Coke oven gas	1000000 m3	24.50														
Biogas	PJ			0.11	0.02	0.00	0.01	0.17	0.39	0.25	0.26	0.31	0.31	0.35	0.37	0.36
Other biomass	PJ				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net calorific values																
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	24.35	24.96	24.64	25.00	24.95	24.85	25.00	24.28	24.572	24.29
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64	34.77	35.00
NCV for coke oven gas	MJ/kg	17.91														
NCV for biogas	TJ/PJ	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass																

EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EF CO2 t/TJ	t/TJ															
EF CO2 -Hard coal	t/TJ	93.31	93.31	93.31	93.31	93.31	93.31	93.74	93.96	92.69	93.39	92.76	92.70	92.75	92.39	93.10
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.28	55.28	55.28	55.28	55.28	55.28	55.00	55.10	55.56	55.43	55.32	55.41	55.49	55.34	55.46
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogass	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CH4 kg/TJ	kg/TJ															
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N2O kg/TJ	kg/TJ															
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

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

ACTIVITY DATA		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fuel consumption	**UNIT**															
Hard coal	1000 t															
Fuel oil	1000 t	118.00	108.60	162.00	108.30	90.90	49.60	27.40	26.80	35.80	0.00	34.10	0.00	0.00	0.00	0.00
Light heating oil	1000 t	0.00	0.90	1.50	0.10	0.00	0.60	0.00	0.00	0.00	0.00	0.50	0.00	0.20	0.00	0.00
Natural gas	1000000 m3	315.50	363.40	479.00	649.90	652.10	673.90	580.40	352.10	343.70	407.90	745.60	583.00	636.10	783.50	736.40
Coke oven gas	1000000 m3															
Biogas	PJ				0.14	0.17	0.34	0.41	0.48	1.07	1.50	2.22	2.64	2.94	2.97	3.64
Other biomass	TJ				1.90	803.20	1003.50	1146.10	1190.30	2189.00	3730.20	4244.80	7004.10	8984.20	9524.20	11187.50
Net calorific values																
NCV for hard coal	MJ/kg	25.14	25.58	25.10	24.13	24.25	24.35	24.96	24.64	25.00	24.95	24.85	25.00	24.28	24.57	24.29
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64	34.77	35.00
NCV for coke oven gas	MJ/kg	17.91														
NCV for biogas	TJ/PT	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EMISSION FACTORS		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EF CO2 t/TJ	t/TJ															
EF CO2 -Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	55.26	55.26	55.26	55.26	55.26	55.26	55.26	55.16	55.25	55.32	55.33	55.43	55.34	55.41	55.35
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - Biogass	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CH4 kg/TJ	kg/TJ															
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	3.67	2.73	2.87	3.67	3.58	3.51	3.24	2.25	2.42	2.81	3.55	2.61	3.56	3.70	3.58
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF N2O kg/TJ	kg/TJ															
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

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

ACTIVITY DATA		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fuel consumption	**UNIT**																
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	2.90	3.70	3.70	2.60	2.50	1.90	1.20	0.50
Light heating oil	1000 t	0.00	6.00	4.40	6.70	4.90	5.30	3.10	3.70	3.10	3.90	3.70	4.20	2.90	2.30	1.90	3.50
Natural gas	1000000 m3	0.00	36.20	53.00	71.30	86.50	76.00	76.60	85.90	71.60	72.40	71.00	54.80	53.80	51.80	53.00	53.60
Coke oven gas	1000000 m3																
Biogas	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.0000	0.0000
Other biomass	PJ					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0028	0.0214	0.0230
Gas works gas	1000000 m3				1.46												
Liqufied 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							24.57	24.29
NCV for fuel oil	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
NCV for light heating oil	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
NCV for natural gas	MJ/m3	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64	34.77	35.00
NCV for coke oven gas	MJ/kg	17.91															
NCV for biogas	TJ/PJ					1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for other biomass	TJ/PJ					1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00	1000.00
NCV for gas works gas	MJ/m3				21.47												
NCV for LPG	MJ/kg	46.89	46.89														
EMISSION FACTORS		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EF CO2 t/TJ	t/TJ																
EF CO2 -Hard coal	t/TJ	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - Fuel oil	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - Light heating oil	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - Natural gas	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - Gas coke	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 -Biogas	t/TJ	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
EF CO2 - Other biomass	t/TJ	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
EF CO2 - Gas works gas	t/TJ	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - LPG	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CH4 kg/TJ	kg/TJ																
EF CH4 -Hard coal	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Fuel oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Light heating oil	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Gas coke	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Biogass	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - Other biomass	kg/TJ	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
EF CH4 - Gas works gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - LPG	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O kg/TJ	kg/TJ																
EF N2O -Hard coal	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - Fuel oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Light heating oil	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - Natural gas	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF N2O - Gas coke	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Biogass	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - Other biomass	kg/TJ	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - Gas works gas	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - LPG	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

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

Refining - transformation		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption													
Fuel oil (1000 t)	1000 t	355.04	300.70	239.40	254.00	244.30	134.10	131.60	114.10	102.00	70.30	23.00	25.50
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG I Gas/diesel oil (1000 t)	1000 t	0.79	35.00	2.20	9.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NCV for gas/diesel oil (MJ/kg	MJ/kg	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Petroleum coke (1000 t)	1000 t	53.69	42.60	63.00	70.70	55.90	31.30	35.60	37.90	24.00	19.70	21.70	22.50
NCV for petroleum coke (MJ	MJ/kg	29.31	29.31	29.31	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
Refinery gas (1000 t)	1000 t	405.94	224.20	262.40	241.10	161.50	208.10	155.30	184.70	187.00	129.20	114.20	98.50
NCV for refinery gas (MJ/kg)	MJ/kg	48.57	48.57	48.57	48.57	48.57	42.60	42.60	42.60	42.60	42.60	42.60	42.60
Natural gas (1000000 m3)	1000 t	7.31	7.10	0.20	1.20	27.10	183.30	199.80	214.10	237.50	200.50	211.10	178.10
NCV for natural gas (MJ/m3	MJ/kg	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64	34.77	35.00
Total fuel cunsumption (TJ)	TJ	**35844.4**	**26105.7**	**24322.7**	**24596.4**	**20316.8**	**21567.0**	**19961.4**	**21058.1**	**21036.6**	**15885.3**	**13801.9**	**12151.9**
Emission factors													
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	t/TJ	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - petroleum coke (t/T	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - refinery gas (t/TJ)	t/TJ	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60	57.60
EF CO2 - natural gas (t/TJ)	t/TJ	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	Gg	**2,424.74**	**1,813.32**	**1,683.27**	**1,729.54**	**1,448.87**	**1,387.39**	**1,298.59**	**1,350.64**	**1,317.29**	**990.69**	**835.52**	**745.35**
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - LPG (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	1.00	1.00	1.00
EF CH4 - refinery gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - natural gas (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	Mg	**64.38**	**50.28**	**43.57**	**45.01**	**39.95**	**32.35**	**30.54**	**30.23**	**29.24**	**21.54**	**15.65**	**14.20**
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	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	1.50	1.50	1.50	1.50
EF N2O - refinery gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	kg/TJ	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	Mg	**12.92**	**10.40**	**9.83**	**10.63**	**9.37**	**6.21**	**6.19**	**6.04**	**5.19**	**3.86**	**2.78**	**2.70**

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
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**	**0.00**	**0.00**	**0.00**	**0.00**
Emissions												
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	**85.40**	**0.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	**1.92**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	**0.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**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	2015	2016	2017	2018	2019	2020	2021
Fuel consumption												
LPG (1000 t)	11.87	0.00	1.00									
NCV for LPG (MJ/kg)	46.89		46.89									
Gas Coke (1000000 m3)												
NCV for gas coke (MJ/m3)												
Light heating oil (1000 t)	0.75	0.70	7.10	5.50								
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71								
Natural gas (1000000 m3)	413.80	229.70	164.50	175.50	241.70	121.30	102.90	112.20	105.60	125.90	103.60	120.70
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64	34.77	35.00
Other Kerosene prod (petrolej) (1000 t)												
NCV for petroleum (MJ/m3)												
Total fuel cunsumption (TJ)	**14,657.46**	**7,839.70**	**5,943.13**	**6,201.91**	**8,217.80**	**4,196.98**	**3,580.92**	**3,893.34**	**3,657.98**	**4,361.18**	**3,602.17**	**4,224.50**
Emissions												
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 Emission (Gg)	**826.75**	**440.35**	**339.20**	**352.16**	**461.02**	**235.45**	**200.89**	**218.42**	**205.21**	**244.66**	**202.08**	**236.99**
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	**14.72**	**7.90**	**6.55**	**6.67**	**8.22**	**4.20**	**3.58**	**3.89**	**3.66**	**4.36**	**3.60**	**4.22**
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	**1.48**	**0.80**	**0.75**	**0.74**	**0.82**	**0.42**	**0.36**	**0.39**	**0.37**	**0.44**	**0.36**	**0.42**

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

Manufacture of solid fuels and other energy industries	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption												
LPG (1000 t)												
NCV for LPG (MJ/kg)												
Gas Coke (1000000 m3)												
NCV for gas coke (MJ/m3)												
Light heating oil (1000 t)		0.40	0.40									
NCV for light heating oil (MJ/kg)		42.71	42.71									
Natural gas (1000000 m3)		1.10	0.50									
NCV for natural gas (MJ/m3)		34.00	34.00									
Other Kerosene prod (petrolej) (1000 t)												
NCV for petroleum (MJ/m3)												
Biogas						26.54	26.93	27.50	19.40	20.71	19.79082	40.58
NCV for biogas (TJ/TJ)						1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total fuel cunsumption (TJ)	**0.00**	**54.48**	**34.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Emissions												
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas coke (t/TJ)	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - light heating oil (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - other kp (t/TJ)	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15	71.15
EF CO2 - biogas (t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO2 Emission (Gg)	**0.00**	**3.36**	**2.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
EF CH4 - LPG (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - gas coke (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - light heating oil (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - natural gas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - other kp (kg/TJ)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - biogas (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CH4 Emission (Mg)	**0.00**	**0.09**	**0.07**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas coke (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - light heating oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - biogas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table A3-8: 1A2a-g – fuel consumption

1A2a Iron and Steal													
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	7.474	0	0	0	0.6	0.9	0.1	0	3.1	1.6	0.9	3.7
Coking coal (kameni ugljen)	10^3 t	0	0	0	1	0	1.8	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	18.248	0.9	0	0	0	0	0	0	0	0	0	0
Lignite	10^3 t	9.349	1.5	0	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	119.957	53.1	25.2	22.9	35	17.5	13	13.8	18.1	16.3	13.5	19.6
Wood	10^3 m^3	0	0	0		0.8	0.5	0.4	0.3	0.4	0.2	0.2	0.2
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	3.2	3.1	2.2	1.8	3.5
Briketi ugljena	10^3 t	0	0	0								0	
Coke oven coke	10^3 t	179.937	16.4	11.8	4.3	3.7	0.6	0.3	0.3	1	0.3	0.3	0.2
Liquified petroleum gas	10^3 t	3.554	1.5	2.1	4.2	1.4	0.8	0.8	1.1	0.9	0.7	0.7	0.7
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0.1	0
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	0	0	0	0	0	0	0	0.2	0.3
Gas/Diesel oil	10^3 t	12.907	4	4	2.7	0.9	0.6	0.5	0.7	0.7	0.6	0.6	0.7
Residual fuel oil	10^3 t	42.516	6.1	1.5	2.7	1.2	1.1	1	0.9	0.4	0	0	0
Petroleum coke	10^3 t	8.602	0	0	0	0.7	0.3	0.1	0.3	0.3	0	0	0.8
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	418.079	0	0								0	
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^3 m^3	0	1.62	0	0.031	0	0	0	0	0	0	0	0

1A2b Non-Ferrous metals													
Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0.1	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	0.2	0	0	0	0	0	0	0	0	0	0	0
Lignite	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	0	0	5	1	0.4	2.6	2.6	9.4	12	12.5	11.7	13.9
Wood	10^3 m^3	0	0	0		0.6	0.2	0.4	0.4	0.3	0.3	0.3	0
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0	0	0	0
Briketi ugljena	10^3 t	0	0	0								0	
Coke oven coke	10^3 t	0	0	0	0	0	0	0.2	0	0	0	0	0
Liquified petroleum gas	10^3 t	1.534	0.5	1.1	2.1	3.1	0.8	0.5	0.6	0.8	0.7	0.7	0.8
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Petroleum	10^3 t						0.2	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	0	0	0	0	0	0	0	0.2	0.2
Gas/Diesel oil	10^3 t	2.818	2.2	1	0.2	0.1	0.9	1.1	0.2	0.1	0.2	0.2	0.2
Residual fuel oil	10^3 t	1.077	0.7	0.3	4	1.2	0	0	0	0	0	0	0
Petroleum coke	10^3 t	0	0	0	0	0	0	0	0	0.3	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	0	0	0	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2c Chemicals

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0.2	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	1.2	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	43.77	21.9	1.2	0	0	0	0	0	0	0	0	0
Lignite	10^3 t	27.507	25.3	0.6	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	181.214	152.2	186.5	183.1	227.6	146.9	145.8	166.2	138.5	147	169.1	115.6
Wood	10^3 m^3	0	0	0		0.1	0	0	0	0	0	0	0
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2
Briketi ugljena	10^3 t	0	0	0								0	
Coke oven coke	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	0.724	8.8	6.9	0	0.1	0	0	0	0	0	0	0
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Petroleum	10^3 t						2.4	3.5	2.6	2.9	1.6	1.5	1.8
Diesel	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10^3 t	3.868	2.3	2	0.5	0.4	0.5	0.2	0.2	0.4	0.4	0.4	0.4
Residual fuel oil	10^3 t	89.079	89.3	102.8	73	3.6	0	0	0	0	0	0.1	0.1
Petroleum coke	10^3 t	0	0	0	0.7	0	0	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	0	0	0	0	0	0	0	0	0	0	0

1A2d Pulp, paper and print

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	42.51	0	0	0	0	0	0	0	0	0	0	0
Lignite	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	92.536	74.4	75	69.2	68.8	27.6	45.6	46.6	46.4	55.5	57.9	60.4
Wood	10^3 m^3	0	0	0		13.2	0.1	0	3.1	0	0	0	0.7
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	81.9	0	1.4	169.4	151.8	20	1.2	22.4	97.5	79.3	192.2	87.1
Briketi ugljena	10^3 t	0	0	0								0	
Coke oven coke	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	0	0	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Gas/Diesel oil	10^3 t	0.405	1.2	0.9	1.6	0.1	0	0	0	0	0	0	0
Residual fuel oil	10^3 t	18.364	12.2	2.4	11.9	9.5	5.2	5.2	1.8	0.7	0.7	0.7	0.8
Petroleum coke	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	0	0	0.031	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2e Food Processing, Beverages and Tobacco

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0	0.7	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0.426	0	0	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	89.92	65.4	23.9	47.7	39.9	34	39.8	37.8	28.1	22.8	11.9	0
Lignite	10^3 t	35.745	29	11.2	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	92.34	100.7	101.6	173	166.6	114.7	120.9	114.3	113.2	121.4	112.1	97.5
Wood	10^3 m^3	0	0	0		0.5	13.5	10.9	2.7	2.4	2.1	1.5	1.6
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	149.4	219.4	253.7	290.6	362.1
Briketi ugljena	10^3 t	0.16	0	0								0	
Coke oven coke	10^3 t	6.841	4.4	2.3	9.6	6.4	4	4.5	4.7	3.5	2.4	3.6	1.9
Liquified petroleum gas	10^3 t	1.09	0.8	0.8	1.6	1.3	1.4	1.2	1.2	1.1	0.9	1	1.2
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	0	0	0	0	0	0	0	0.3	0.2
Gas/Diesel oil	10^3 t	36.196	18.3	15.2	13.3	10	8.7	7.1	6.5	6.3	6.4	5.3	6
Residual fuel oil	10^3 t	72.165	53.1	40.3	32.4	22.9	9.1	11.4	8.3	9.2	8.9	7.7	7.1
Petroleum coke	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	6.1	0	0	0.1099	0	0	0	0	0	0	0	0

1A2f Non-Metalic Minerals

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0.1	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Lignite	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	121.384	66.7	52.6	73.4	56.4	41.8	47.8	53.4	51.3	50.5	45.7	51.9
Wood	10^3 m^3	0	0	0		0	0	0	0	0	0	0	0
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	0	0	0	0	0	0.7	0.9	0.6	0.3	1.6
Briketi ugljena	10^3 t	0	0	0								0	
Coke oven coke	10^3 t	6.804	6.8	7.2	7.7	0.1	0	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	6.567	3.1	3	2.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	0.1	0	0	0	0	0	0	0.1	0.1
Gas/Diesel oil	10^3 t	1.627	0.4	0.4	2.7	0	0	0	0	0	0	0	0
Residual fuel oil	10^3 t	6.093	5.3	2.3	3.8	2.2	0	0	0	0	0	0	0
Petroleum coke	10^3 t	0	0	0	0	0	0	5.4	0	0	0	0	1.8
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	1.01	3.3	0.923	0	0	0	0	0	0	0	0

Table A3-8: 1A2a-g – fuel consumption

1A2g v Construction

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	99.727	5	0	0	0	0	0	0	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	40.732	40.9	53.2	168.3	193.4	74.7	46.3	57.2	53.4	76.9	119.8	132.8
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	18.129	5.7	3	5	1.1	2.7	2.7	1.9	1	1.1	0	0.1
Lignite	10^3 t	0.065	0.1	2.5	0	0	0	0	0.1	0.1	0	0	0
Natural gas	10^6 m^3	137.217	111.6	178.9	124.4	76.4	40.7	38.4	52	56.8	58	53.4	62.4
Wood	10^3 m^3	0	0	0		0.3	0.9	2.3	1.9	9.7	4.6	6.6	6.9
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	0	0	57.8	0	370.6	289	31.9	70.5	67.8	72.5	138.5	67
Briketi ugljena	10^3 t	2.829	0	0								0	
Coke oven coke	10^3 t	3.64	2.6	16.1	0	17.3	20.6	24.2	26.6	26.2	28.7	26.3	27.4
Liquified petroleum gas	10^3 t	0	0.1	3.3	4.6	3.2	1.6	1.4	1.4	1.3	1.2	0.5	1.2
Motor Gasoline	10^3 t	0	0	0		0	0	0	0	0	0.1	0.1	0.2
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	15	14.3	11.1	10.4	11.5	12.3	13.1	6.9	6.7
Gas/Diesel oil	10^3 t	17.142	12	34	7	4.3	2.7	2.8	3.4	3	2.7	4	4.6
Residual fuel oil	10^3 t	127.115	73.3	135	53.1	7.3	3.9	3	3.1	2.8	3	2.1	1.7
Petroleum coke	10^3 t	0	0	0	171.6	115.3	167.2	169.8	202	195.3	142.5	100.7	88
Refinery gas	10^3 t	0	0	0	0	0	0	0	0			0	
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	0	0	0	0	0	0	0	0	0	0	0
Industrial waste-non ren.	TJ					319.1	390	413.4	482.7	817.7	1128.9	1630.3	1875

1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo)

Fuel consumption	Unit	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	10^3 t	0	0	0	0	0	0	0	0.3	0	0	0	0
Coking coal (kameni ugljen)	10^3 t	0.794	1	0	0	0	0	0	0	0.3	0	0	0
Sub-Bituminous Coal (Mrki ugljen)	10^3 t	48.369	1.9	0.1	4.2	0	0	0	0	0	0	0	0
Lignite	10^3 t	0.431	0.4	0.1	0.2	0	0	0	0	0	0	0	0
Natural gas	10^6 m^3	79.309	74.2	55	65.3	54.4	44.2	42.5	47.4	48.6	47.7	45.5	50.2
Wood	10^3 m^3	0	0	0		39.4	27.4	31.7	33.8	35.5	32.8	21.9	21
Biogas	TJ	0	0	0		0	0	0	0	0	0	0	0
Wood waste	TJ	3518.1	2450	2224.4	2087.5	1456.677	579	371.5	715.3	590.7	579	584.9	524.8
Briketi ugljena	10^3 t	0.311	0	0								0	
Coke oven coke	10^3 t	2.549	1.2	0.3	1	0.1	0	0	0	0	0	0	0
Liquified petroleum gas	10^3 t	3.317	2.2	3.2	8	6.8	5.7	5.5	6.4	6.4	6	5.3	6.7
Motor Gasoline	10^3 t	0	0	0	6.9	5.1	4	4.1	3.8	3.2	3.6	0.1	3.5
Petroleum	10^3 t						0	0	0	0	0	0	0
Diesel	10^3 t	0	0	0	110.6	102.2	79.2	76.9	76.2	83.9	89.1	92.7	106.2
Gas/Diesel oil	10^3 t	17.87	7.1	7.6	23	12.2	8.7	8.3	9.8	9.4	10	4.4	9.6
Residual fuel oil	10^3 t	59.519	29.7	19.4	17.7	8.4	3.8	3.5	2.4	3	3.1	1.8	2.1
Petroleum coke	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Refinery gas	10^3 t	0	0	0	0	0	0	0	0	0	0	0	0
Other oil derivates	10^3 t	0	0	0		0	0	0	0	0	0	0	0
Visokopećni plin	10^6 m^3	0	0	0									
Koksni plin	10^3 m^3	0	0	0									
Gas works gas	10^6 m^3	0	7.21	3.5	2.456	0	0	0	0	0	0	0	0

1A2g vii Off-road vehicles and other machinery

Fuel consumption	Jedinica	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Motor gasoline	10^3 t	0.2	8.5	7.6	6.9	5.1	4	4.1	3.8	3.2	3.7	0.3	3.7
Diesel	10^3 t	137.1	43.6	66.1	125.7	116.5	90.3	87.3	87.7	96.2	102.2	100.4	113.7

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

Net Calorific Value		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Anthracite	MJ/kg	29.29	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31	29.31
Coking coal (kameni ugljen)	MJ/kg	25.14	28.12	26.15	25.1	24.77332	26.7	27.39	27.28	26	29	27	26.48
Sub-Bituminous Coal (Mrki ugljen)	MJ/kg	16.74	17.8	17.8	18.5	17.6	17	17	19.6	19	19	18.43	18.5
Lignite	MJ/kg	10.9	12	12	12.1		0	0	11.8	11.85	0	11.2	0
Natural gas	MJ/m3	34	34	34	34.0	34.0	34.6	34.8	34.7	34.64	34.64	34.77	35
Wood	MJ/m3	9	9	9	9.0	9.0	9	9	9	9	9	9	9
Biogas	TJ/TJ	1	1	1	1.0	1.0	1	1	1	1	1	1	1
Wood waste	TJ/TJ	1	1	1	1.0	1.0	1	1	1	1	1	1	1
Briketi ugljena	MJ/kg	16.74											
Coke oven coke	MJ/kg	29.31	29.31	29.31	29.3	29.3	29.31	29.31	29.31	29.31	29.31	29.31	29.31
Liquified petroleum gas	MJ/kg	46.89	46.89	46.89	46.9	46.9	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Motor Gasoline	MJ/kg	44.59	44.59	44.59	44.6	44.6	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Petroleum	MJ/kg	43.94	43.96	43.96			43.96	43.96	43.96	43.96	43.96	43.96	43.96
Diesel	MJ/kg	42.71	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Gas/Diesel oil	MJ/kg	42.71	42.71	42.71	42.7	42.7	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Residual fuel oil	MJ/kg	40.19	40.19	40.19	40.2	40.2	40.19	40.19	40.19	40.19	40.19	40.19	40.19
Petroleum coke	MJ/kg	29.31	29.31	31	31.0	31.0	31	31	31	31	31	31	31
Refinery gas	MJ/kg						0	0	0	0	0	42.6	0
Other oil derivates	MJ/kg						0	0	0	0	0	40.19	0
Visokopećni plin	MJ/m3												
Koksni plin	MJ/m3	17.91											
Gas works gas	MJ/m3	15.82	15.8	15.8	21.47		0	0	0	0	0		0
Industrial waste-non ren.	TJ/TJ	1.0	1.0	1.0	1.0	1.0	1	1	1	1	1	1	1

Table A3-9: 1A2a-g –emission factors

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

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

Domestic aviation		1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption												
Aviation gasoline	1000 t	0.00	0.00	0.00	1.00	0.30	0.40	0.40	0.40	0.40	0.40	0.50
NCV for gasoline	MJ/kg	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Jet kerosene	1000 t	2.00	7.00	8.00	9.00	9.50	9.50	9.60	9.70	9.80	4.90	6.60
NCV for jet kerosene	MJ/kg	44.00	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96	43.96
Motor gasoline	1000 t	0.10	0.30	0.10								
NCV motor gasoline	MJ/kg	44.59	44.59	44.59								
Total fuel cunsumption	TJ	**92.46**	**321.10**	**356.14**	**440.23**	**431.00**	**435.46**	**439.85**	**444.25**	**448.64**	**233.24**	**312.43**
Emissions												
EF CO2 - aviation gasoline	t/TJ	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
EF CO2 - jet kerosene	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO2 - motor gasoline	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
CO2 Emission	Gg	**6.60**	**22.93**	**25.45**	**31.41**	**30.80**	**31.11**	**31.42**	**31.74**	**32.05**	**16.65**	**22.31**
EF CH4 - gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH4 - jet kerosene	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
EF CH4 - motor gasoline	kg/TJ	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CH4 Emission	Mg	**0.05**	**0.16**	**0.18**	**0.22**	**0.22**	**0.22**	**0.22**	**0.22**	**0.22**	**0.12**	**0.16**
EF N2O - gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - jet kerosene	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - motor gasoline	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N2O Emission	Mg	**0.18**	**0.64**	**0.71**	**0.88**	**0.86**	**0.87**	**0.88**	**0.89**	**0.90**	**0.47**	**0.62**

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

1A3bi	CARS		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
	FUEL CONSUMPTION													
	Gasoline	TJ	31889.08	23733.85	32292.86	29259.62	26732.34	21817.61	21912.91	21042.77	20405.68	19339.61	16082.50	18016.03
	Diesel oil	TJ	1638.19	6048.80	8880.71	19728.46	25322.92	32003.51	34626.09	35647.53	34605.96	35811.50	33384.62	36234.77
	LPG	TJ	#DIV/0!	642.39	459.52	1036.27	2752.44	3141.63	3315.12	3315.12	3301.06	3094.74	2475.79	2593.02
	CNG	TJ					2.34	3.62	8.47	9.46	10.60	14.67	12.84	12.228
	Biodiesel	TJ					59.130177	598.4200945	739.4358402	12.99218188	701.000401	1627.32236	1702.05292	2367.61217
	NCV													
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg												
	EF CO2													
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

1A3bii	LIGHT DUTY TRUCKS		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
	FUEL CONSUMPTION													
	Gasoline	TJ	1394.4738	761.32596	1040.8302	666.77447	421.99073	228.3064714	228.6538839	232.4753599	268.316384	331.408244	221.492924	234.429233
	Diesel oil	TJ	3357.0545	3364.9755	5345.5403	9130.0068	7984.733	5372.147924	5295.983611	7152.701045	6726.23294	7182.19546	6774.61926	8264.92243
	LPG	TJ	0	0	0	0	0	0	0	0	0	0	0	0
	CNG	TJ												
	Biodiesel	TJ					23.550799	131.6868794	148.7907168	3.436199293	138.562794	321.66363	336.435199	467.99254
	NCV													
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg												
	EF CO2													
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

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

1A3biii	HEAVY DUTY TRUCKS+BUSSES		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
	FUEL CONSUMPTION													
	Gasoline	TJ	149.5810	59.3951	54.2238	53.9165	26.2786	30.4085	24.8395	20.0935	10.8392	17.4228	9.8617	4.9062
	Diesel oil	TJ	10645.1605	8114.4038	9597.3914	11955.2053	13673.2825	14636.2389	14729.3275	18902.3708	17812.0771	19511.6797	16234.2970	15613.6958
	LPG	TJ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	CNG	TJ					86.0566	134.7824	143.7671	167.5088	166.0631	151.6003	115.8095	155.7717
	Biodiesel	TJ					31.7089	290.0421	311.7669	6.8146	281.7630	654.0926	684.1301	951.6477
	NCV													
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	0	1	1	1	1	1	1	1	1	1
	EF CO2													
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

1A3biv	MOTORCYCLES		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
	FUEL CONSUMPTION													
	Gasoline	TJ	432.971	322.187	687.760	942.854	1205.384	1110.474	1105.119	1088.841	1070.622	1054.824	902.343	1029.812
	Diesel oil	TJ	0.000	0.000	0.000	0.000	0.063	0.344	0.317	0.538	0.542	0.709	0.745	0.941
	LPG	TJ												
	CNG	TJ												
	Biodiesel	TJ					0.0001431	0.006221066	0.006529847	0.000189743	9.03383809	20.9714098	21.9344675	30.5115732
	NCV													
	Gasoline	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	Diesel oil	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	LPG	MJ/kg	1	1	1	1	1	1	1	1	1	1	1	1
	CNG	MJ/106m3	1	1	1	1	1	1	1	1	1	1	1	1
	Biodiesel	MJ/kg	0	0	0	1	1	1	1	1	1	1	1	1
	EF CO2													
	EF CO2 - gasoline (t/TJ)	t/TJ	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
	EF CO2 - diesel (t/TJ)	t/TJ	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
	EF CO2 -LPG (t/TJ)	t/TJ	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1	63.1
	EF CO2 - CNG(t/TJ)	t/TJ	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1
	EF CO2 - Biodiesel (t/TJ	t/TJ	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8	70.8

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

Rail transport																
		1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fuel consumption																
Gasoline (1000 t)	1000 t	0.10	0.10													
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59													
Diesel (1000 t)	1000 t	36.10	27.20	30.50	28.50	26.40	24.80	23.40	21.20	17.50	18.30	17.60	14.70	14.30	13.30	14.30
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	0.20														
NCV for fuel oil (MJ/kg)	MJ/kg	40.19														
Light heating oil (1000 t)	1000 t	1.10														
NCV for light heating oil (MJ/	MJ/kg	42.71														
Brown coal (1000 t)	1000 t	10.00														
NCV for brown coal (MJ/kg)	MJ/kg	16.74														
Lignite (1000 t)	1000 t	4.30														
NCV for lignite (MJ/kg)	MJ/kg	10.90														
Jet Kerosene (1000 t)	1000 t	0.10														
NCV for jet kerosene (MJ/m3)	MJ/kg	43.94														
Total fuel cunsumption (TJ)	TJ	**1,819.97**	**1,166.17**	**1,302.66**	**1,217.24**	**1,127.54**	**1,059.21**	**999.41**	**905.45**	**747.43**	**781.59**	**751.70**	**627.84**	**610.75**	**568.04**	**610.75**
Emissions																
EF CO2 - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - diesel (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - light heating oil (t/T	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - brown coal (t/TJ)	t/TJ	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	t/TJ	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
EF CO2 - jet kerosene (t/TJ)	t/TJ	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50	71.50
EF CO2 - petroleum (t/TJ)	t/TJ															
CO2 Emission (Gg)	Gg	**140.08**	**86.39**	**96.53**	**90.20**	**83.55**	**78.49**	**74.06**	**67.09**	**55.38**	**57.92**	**55.70**	**46.52**	**45.26**	**42.09**	**45.26**
EF CH4 - gasoline (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - diesel (kg/TJ)	kg/TJ	4.15	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32
EF CH4 - fuel oil (kg/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - light heating oil (kg/	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - brown coal (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF CH4 - lignite (kg/TJ)	kg/TJ	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
EF CH4 - jet kerosene (t/TJ)	kg/TJ	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
EF CH4 - petroleum (t/TJ)	kg/TJ															
CH4 Emission (Mg)	Mg	**6.97**	**3.87**	**4.32**	**4.04**	**3.74**	**3.52**	**3.32**	**3.01**	**2.48**	**2.59**	**2.50**	**2.08**	**2.03**	**1.89**	**2.03**
EF N2O - gasoline (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	kg/TJ	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60
EF N2O - fuel oil (kg/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - light heating oil (kg/	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - brown coal (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	kg/TJ	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - jet kerosene (t/TJ)	kg/TJ	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - petroleum (t/TJ)	kg/TJ															
N2O Emission (Mg)	Mg	**44.46**	**33.23**	**37.26**	**34.81**	**32.25**	**30.29**	**28.58**	**25.90**	**21.38**	**22.35**	**21.50**	**17.96**	**17.47**	**16.25**	**17.47**

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

National navigation		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption													
Gasoline (1000 t)	1000 t	0.10	0.60	0.30									
NCV for gasoline (MJ/kg)	MJ/kg	44.59	44.59	44.59									
Diesel (1000 t)	1000 t	38.70	23.20	25.70	31.80	34.80	41.20	41.80	44.30	47.20	49.10	40.20	46.90
NCV for diesel (MJ/kg)	MJ/kg	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	1000 t	2.10	6.20	1.40		2.00							
NCV for fuel oil (MJ/kg)	MJ/kg	40.19	40.19	40.19		40.19							
Light heating oil (1000 t)	1000 t	1.60	1.50										
NCV for light heating oil (MJ/kg	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**	**1,759.65**	**1,785.28**	**1,892.05**	**2,015.91**	**2,097.06**	**1,716.94**	**2,003.10**
Emissions													
EF CO2 - gasoline (t/TJ)	t/TJ	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - diesel (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	t/TJ	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - light heating oil (t/TJ)	t/TJ	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO2 Emission (Gg)	**Gg**	**134.38**	**99.31**	**86.62**	**100.64**	**116.36**	**130.39**	**132.29**	**140.20**	**149.38**	**155.39**	**127.23**	**148.43**
EF CH4 - gasoline (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - diesel (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - fuel oil (kg/TJ)	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
EF CH4 - light heating oil (kg/TJ	kg/TJ	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
CH4 Emission (Mg)	**Mg**	**12.67**	**9.32**	**8.17**	**9.51**	**10.97**	**12.32**	**12.50**	**13.24**	**14.11**	**14.68**	**12.02**	**14.02**
EF N2O - gasoline (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - diesel (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - fuel oil (kg/TJ)	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
EF N2O - light heating oil (kg/TJ	kg/TJ	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
N2O Emission (Mg)	**Mg**	**3.48**	**2.53**	**2.33**	**2.72**	**3.13**	**3.52**	**3.57**	**3.78**	**4.03**	**4.19**	**3.43**	**4.01**

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

Commercial/Institutional	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption												
Petroleum (1000 t)	3.80	0.20										
NCV for jet kerosene (MJ/kg)	43.94											
Light heating oil (1000 t)	90.30	106.30	120.50	131.60	73.80	44.60	44.30	43.50	37.20	26.80	25.60	22.70
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	67.60	2.50	3.90	6.60	8.00	2.70	1.50	0.80	0.00	0.20	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.30	13.80	13.90	20.10	12.90	12.30	12.60	12.10	11.70	12.20	10.00	11.70
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Anthracite (1000 t)												
NCV for anthracite (MJ/kg)												
Brown coal (1000 t) (MU)	24.50	12.70	9.50	0.20	2.20		0.10	0.10	0.00	0.00	0.00	0.00
NCV for brown coal (MJ/kg)	16.74	17.30	17.80	18.50	17.60	16.89	17.00	19.60	19.00	19.00	18.43	18.50
Lignite (1000 t)	40.00	1.60	1.20	0.60	0.30	0.10	0.00	0.20	0.10	0.00	0.00	0.00
NCV for lignite (MJ/kg)	10.90	10.10	12.00	12.10	11.60	10.50	10.50	11.80	11.85	11.85	11.20	11.50
Briquettes (1000 t)	2.90											
NCV for briquettes (MJ/kg)	16.74											
Gas work gas (1000000 m3)	4.90	1.43	1.50	3.43	2.84	0.39						
NCV for gas work gas (MJ/m3)	15.82	15.91	19.49	21.47	18.72	17.10						
Natural gas (1000000 m3)	124.30	132.60	98.20	151.20	192.70	204.80	217.90	231.30	244.30	252.40	235.90	278.70
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64	34.77	35.00
Gasoline (1000 t)		0.33										
NCV for gasoline (MJ/kg)		44.60										
Petroleum coke (1000 t)	1.50											
NCV for petroleum coke (MJ/kg)	33.57											
Anthracite (1000 t)												
NCV for anthracite(MJ/kg)												
Solid Biomass-Wood (TJ) + characoal	0.00	0.00	0.00	0.00	129.80	213.50	176.90	346.60	422.80	517.70	558.30	559.20
Bio gass (TJ)					102.26	116.59	119.11	118.13	114.74	137.07	120.39	107.74
Total fuel cunsumption (TJ)	**12,190.9**	**10,069.4**	**9,506.6**	**12,053.9**	**10,957.7**	**10,014.1**	**10,423.8**	**10,952.6**	**11,138.7**	**11,122.6**	**10,443.2**	**11,939.6**
Commercial/Institutional												
Emissions												
EF CO2 - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - anthracite (t/TJ)												
EF CO2 - brown coal (t/TJ)	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO2 - briquettes (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 - gas works gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - gasoline (t/TJ)												
EF CO2 - sub bit coal (t/TJ)												
EF CO2 - petroleum coke (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 -anthracite (t/TJ)	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30
EF CO2 - solid biomass wood (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
EF CO2 - landfill gas(t/TJ)	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60	54.60
CO2 Emission (Gg)	**854.65**	**661.70**	**640.93**	**789.25**	**690.73**	**614.15**	**634.03**	**671.92**	**680.84**	**677.49**	**639.86**	**722.20**

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

EF CH4 - petroleum (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - anthracite (kg/TJ)												
EF CH4 - brown coal (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - lignite (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - briquettes (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - gasoline (kg/TJ)												
EF CH4 - sub bit coal(kg/TJ)												
EF CH4 - petroleum coke (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - anthracite (t/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 -solid biomass wood (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - landfill gas (t/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH4 Emission (Mg)	**99.38**	**74.66**	**74.97**	**89.75**	**110.66**	**123.12**	**114.07**	**166.48**	**188.37**	**214.10**	**222.38**	**229.51**
EF N2O - petroleum (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - anthracite (kg/TJ)												
EF N2O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gasoline (kg/TJ)												
EF N2O - sub bit coal(kg/TJ)												
EF N2O - petroleum coke (t/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - anthracite (t/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - solid biomass wood (kg/TJ)	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - landfill gas (t/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O Emission (Mg)	**5.87**	**3.66**	**3.86**	**4.16**	**3.40**	**2.84**	**2.71**	**3.40**	**3.56**	**3.71**	**3.77**	**3.86**

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

Residential	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fuel consumption														
Fuel consumption - mobile														
Gasoline (1000 t)	4.00	12.10	8.20	8.20	7.70	7.40	7.50	7.50	7.40	7.40	7.60	7.70	7.60	7.80
NCV for gasoline (MJ/kg)	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59	44.59
Fuel consumption - stationary														
Petroleum (1000 t)		1.60	0.90	1.00	0.90	0.80	0.20							
NCV for petroleum (MJ/kg)		43.96	43.96	43.96	43.96	43.96	43.96	43.96						
Light heating oil (1000 t)	215.90	231.50	138.80	122.00	94.50	83.50	68.30	84.50	84.00	83.40	70.60	50.80	58.20	42.30
NCV for light heating oil (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel oil (1000 t)	48.70	8.10	10.40	11.90	12.30	7.10	5.10	4.30	2.40	1.30	0.00	0.00	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	97.90	51.90	72.20	74.40	56.90	54.20	47.40	47.60	48.80	46.50	42.40	43.50	40.90	41.00
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Brown coal (1000 t)	123.10	12.00	6.10	2.30	4.10	2.60	2.00	1.20	3.20	1.90	1.30	1.70	1.70	1.50
NCV for brown coal (MJ/kg)	16.74	17.80	17.60	17.10	17.80	18.00	16.89	17.00	17.00	19.60	19.00	19.00	18.43	18.50
Lignite (1000 t)	207.30	15.00	9.40	9.00	4.80	11.50	7.40	7.00	4.10	7.00	5.00	5.10	4.30	4.00
NCV for lignite (MJ/kg)	10.90	12.00	11.60	11.60	10.70	10.50	10.50	10.50	10.50	11.80	11.85	11.85	11.20	11.50
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	9.90	7.20	4.98	3.75		1.06	0.19						
NCV for gas work gas (MJ/m3)	15.82	19.49	17.20	17.20	17.10		17.10	17.10						
Natural gas (1000000 m3)	230.00	496.60	732.90	670.20	630.20	601.30	524.10	540.00	560.50	578.10	564.70	554.90	584.80	627.00
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.00	34.00	34.60	34.60	34.80	34.70	34.64	34.64	34.77	35.00
Solid Biomass-Wood (TJ)	42,170.0	39,690.0	49,539.0	48,344.0	48,329.0	48,003.0	42,254.0	48,622.7	47,220.8	45,674.2	43,542.9	42,198.7	42,763.0	46,453.4
Charcoal (TJ)	0.00	0.00	154.00	139.26	83.74	139.00	139.89							
Total fuel cunsumption (TJ)	**70,745.6**	**70,417.3**	**85,088.7**	**81,086.5**	**77,614.7**	**75,512.0**	**66,345.2**	**73,752.1**	**73,125.9**	**71,978.7**	**68,530.4**	**66,065.9**	**67,918.4**	**72,549.1**
Residential														
Emissions i+ii														
EF CO2 - gasoline (t/TJ)	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**	**69.30**
EF CO2 - petroleum (t/TJ)	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30	73.30
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - brown coal (t/TJ)-mrki	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10	96.10
EF CO2 - lignite (t/TJ)	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00	101.00
EF CO2 -hard coal (t/TJ)-kameni	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60	94.60
EF CO2 - anthracite (t/TJ)	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30	98.30
EF CO2 - briquettes (t/TJ)	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50	97.50
EF CO2 - gas work gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
EF CO2 - solid biomass wood (t/TJ	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
EF CO2 - Charcoal (t/TJ)	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00
CO2 Emission (Gg)	**6,751.88**	**6,393.72**	**7,703.87**	**7,398.41**	**7,172.20**	**7,027.67**	**6,173.41**	**6,948.26**	**6,833.12**	**6,681.24**	**6,354.92**	**6,127.07**	**6,266.73**	**6,720.49**

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

EF CH4 - gasoline (kg/TJ)	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**
EF CH4 - petroleum (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - diesel (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - brown coal (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - lignite (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - hard coal (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - anthracite (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - briquettes (kg/TJ)	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 - gas work gas (t/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 -solid biomass wood (kg/T	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00	300.00
EF CH4 -Charcoal (kg/TJ)	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
CH4 Emission (Mg)	**14,155.3**	**12,230.9**	**15,167.1**	**14,767.0**	**14,724.3**	**14,636.1**	**12,874.1**	**14,760.7**	**14,344.6**	**13,888.9**	**13,229.3**	**12,818.9**	**12,992.2**	**14,099.0**
EF N2O - gasoline (kg/TJ)	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**
EF N2O - petroleum (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - diesel (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - brown coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - lignite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - hard coal (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - anthracite (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - briquettes (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - gas work gas (kg/TJ)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	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	4.00	4.00	4.00	4.00	4.00	4.00
EF N2O - Charcoal (kg/TJ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
N2O Emission (Mg)	**183.95**	**168.07**	**205.70**	**200.15**	**199.05**	**197.23**	**173.47**	**199.20**	**193.62**	**187.47**	**178.46**	**172.57**	**175.09**	**189.60**

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

Agriculture/forestry/fishing	1990	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
Fuel consumption											
Other kerosene (1000 t)	0.10										
NCV for other kerosene (MJ/kg)	43.94										
Diesel + light heating oil (1000 t)	232.60	237.60	197.40	200.10	182.60	180.90	180.90	185.90	185.30	193.40	192.00
NCV for diesel (MJ/kg)	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Fuel consumption - mobile (TJ)	9,938.7	10,147.9	8,431.0	8,546.3	7,798.8	7,726.2	7,726.2	7,939.8	7,914.2	8,260.1	8,200.3
Fuel oil (1000 t)	12.30	13.40	4.70	4.40	2.10	1.20	0.80	0.00	0.00	0.00	0.00
NCV for fuel oil (MJ/kg)	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19	40.19
LPG (1000 t)	4.40	2.60	2.70	2.70	2.50	2.50	2.50	2.60	2.60	2.70	2.70
NCV for LPG (MJ/kg)	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89	46.89
Gas work gas (1000000 m3)											
NCV for gas work gas (MJ/m3)											
Natural gas (1000000 m3)	25.00	14.50	23.20	22.20	21.40	27.80	24.00	23.50	26.70	30.30	36.30
NCV for natural gas (MJ/m3)	34.00	34.00	34.00	34.00	34.60	34.80	34.70	34.64	34.64	34.77	35.00
Fuel consumption - stationary (TJ)	1,550.7	1,153.5	1,104.3	1,058.2	942.1	1,132.9	982.2	936.0	1,046.8	1,180.1	1,397.1
Total fuel cunsumption (TJ)	**11,489.4**	**11,301.4**	**9,535.3**	**9,604.5**	**8,740.9**	**8,859.1**	**8,708.4**	**8,875.7**	**8,961.0**	**9,440.2**	**9,597.4**
Agriculture/forestry/fishing											
Emissions											
EF CO2 - gasoline (t/TJ)	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30	69.30
EF CO2 - other kerosene (t/TJ)	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90	71.90
EF CO2 - diesel (t/TJ)	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10	74.10
CO2 emission (Gg) - mobile	**736.45**	**751.96**	**624.73**	**633.28**	**577.89**	**572.51**	**572.51**	**588.34**	**586.44**	**612.07**	**607.64**
EF CO2 - fuel oil (t/TJ)	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40	77.40
EF CO2 - LPG (t/TJ)	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10	63.10
EF CO2 - gas work gas (t/TJ)	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40	44.40
EF CO2 - natural gas (t/TJ)	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10	56.10
CO2 emission (Gg) - stationary	**98.97**	**77.03**	**66.86**	**64.02**	**55.47**	**65.40**	**56.61**	**53.36**	**59.58**	**67.09**	**79.26**
Total CO2 emission (Gg)	**835.42**	**828.99**	**691.59**	**697.30**	**633.36**	**637.92**	**629.12**	**641.70**	**646.02**	**679.17**	**686.91**
EF CH4 - gasoline (kg/TJ)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
EF CH4 - other kerosene (kg/TJ)	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
EF CH4 - diesel (kg/TJ)	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
CH4 emission (Mg) - mobile	**41.84**	**42.11**	**34.99**	**35.47**	**32.37**	**32.06**	**32.06**	**32.95**	**32.84**	**34.28**	**34.03**
EF CH4 - fuel oil (kg/TJ)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
EF CH4 - LPG (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - gas work gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
EF CH4 - natural gas (kg/TJ)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
CH4 emission (Mg) - stationary	**10.22**	**8.46**	**6.47**	**6.18**	**5.13**	**5.91**	**5.07**	**4.68**	**5.23**	**5.90**	**6.99**
Total CH4 emission (Mg)	**52.07**	**50.57**	**41.45**	**41.64**	**37.50**	**37.97**	**37.14**	**37.63**	**38.08**	**40.18**	**41.02**
EF N2O - gasoline (kg/TJ)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
EF N2O - other kerosene (kg/TJ)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
EF N2O - diesel (kg/TJ)	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60	28.60
N2O emission (Mg) - mobile	**284.12**	**290.23**	**241.13**	**244.42**	**223.05**	**220.97**	**220.97**	**227.08**	**226.35**	**236.24**	**234.53**
EF N2O - fuel oil (kg/TJ)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
EF N2O - LPG (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - gas work gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EF N2O - natural gas (kg/TJ)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
N2O emission (Mg) - stationary	**0.40**	**0.38**	**0.20**	**0.19**	**0.14**	**0.14**	**0.11**	**0.09**	**0.10**	**0.12**	**0.14**
Total N2O emission (Mg)	**284.53**	**290.61**	**241.33**	**244.62**	**223.18**	**221.11**	**221.08**	**227.17**	**226.45**	**236.36**	**234.67**

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

		STEP 1				
		A	B	C	D	E
		Amount of Coal Produced	Emission Factor	Methane Emissions	Conversion Factors	Methane Emissions
		(millions t)	(m^3 CH_4 / t)	(millions m^3)	(0.67 Gg 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												
CH4, Gg	Mining	2.094822	1.86685182	1.45050444	1.388106	1.2446523	0.991332	0.799578	0.58491	0.612648	0.184518	NO
	Post-Mining	0.2909475	0.25928498	0.20145895	0.1927925	0.17286838	0.137685	0.111053	0.081238	0.08509	0.025628	NO
	TOTAL	2.3857695	2.1261368	1.65196339	1.5808985	1.41752068	1.129017	0.910631	0.666148	0.697738	0.210146	NO

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

1. B. 2. a. Oil				1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
1. Exploration	**Unit**	**Emission source**	**IPCC Code**												
ACTIVITY DATA															
Well Drilling	10^3 m^3 total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
Well Testing	10^3 m^3 total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
Well Servicing	10^3 m^3 total oil production		1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
EMISSION FACTOR															
CO2															
Well Drilling	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	1.00E-04	0.000	1.00E-04	1.00E-04	1.00E-04
Well Testing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	0.009	9.00E-03	9.00E-03	9.00E-03
Well Servicing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	1.90E-06	0.000	1.90E-06	1.90E-06	1.90E-06
CH4															
Well Drilling	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	3.30E-05	0.000	3.30E-05	3.30E-05	3.30E-05
Well Testing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	0.000	5.10E-05	5.10E-05	5.10E-05
Well Servicing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	0.000	1.10E-04	1.10E-04	1.10E-04
N2O															
Well Drilling	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Well Testing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	6.80E-08	0.000	6.80E-08	6.80E-08	6.80E-08
Well Servicing	Gg/10^3 m^3 total oil production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2. Production	**Unit**	**Emission source**	**IPCC Code**												
ACTIVITY DATA															
Conventional oil	10^3 m^3 total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
Conventional oil	10^3 m^3 total oil production	Venting	1.B.2.a.i	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
Conventional oil	10^3 m^3 total oil production	Flaring	1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.279	820.58	734.65	702.91
EMISSION FACTOR															
CO2															
Conventional oil	Gg/10^3 m^3 total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	0.000	1.30E-04	1.30E-04	1.30E-04
Conventional oil	Gg/10^3 m^3 total oil production	Venting	1.B.2.a.i	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	9.50E-05	0.000	9.50E-05	9.50E-05	9.50E-05
Conventional oil	Gg/10^3 m^3 total oil production	Flaring	1.B.2.a.ii	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	0.041	4.10E-02	4.10E-02	4.10E-02
CH4															
Conventional oil	Gg/10^3 m^3 total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	1.80E-03	0.002	1.80E-03	1.80E-03	1.80E-03
Conventional oil	Gg/10^3 m^3 total oil production	Venting	1.B.2.a.i	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	7.20E-04	0.001	7.20E-04	7.20E-04	7.20E-04
Conventional oil	Gg/10^3 m^3 total oil production	Flaring	1.B.2.a.ii	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	0.000	2.50E-05	2.50E-05	2.50E-05
N2O															
Conventional oil	Gg/10^3 m^3 total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10^3 m^3 total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10^3 m^3 total oil production	Flaring	1.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	0.000	6.40E-07	6.40E-07	6.40E-07
3. Transport	**Unit**	**Emission source**	**IPCC Code**												
ACTIVITY DATA															
Pipelines	10^3 m^3 total oil transported by pipelines	All	1.B.2.a.iii.3	9948.84	3593.02	5552.33	8244.19	7454.65	7217.44	8019.77	9008.14	9943.023	6945.35	7941.86	7913.95
Tanker Trucks and Rail	10^3 m^3 total oil transported by tanker…	Venting	1.B.2.a.i	943.49	255.18	275.30	273.51	124.13	50.01066	95.35354	57.04444	68.201	63.944648	54.994852	28.874954
Natural gas liquids transport-LPG	10^3 m^3 LPG	All	1.B.2.a.iii.3												
EMISSION FACTOR															
CO2															
Pipelines	Gg/10^3 m^3 total oil transported	All	1.B.2.a.iii.3	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	4.90E-07	0.000	4.90E-07	4.90E-07	4.90E-07
Tanker Trucks and Rail	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	0.000	2.30E-06	2.30E-06	2.30E-06
CH4															
Pipelines	Gg/10^3 m^3 total oil transported	All	1.B.2.a.iii.3	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	5.40E-06	0.000	5.40E-06	5.40E-06	5.40E-06
Tanker Trucks and Rail	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	0.000	2.50E-05	2.50E-05	2.50E-05
N2O															
Pipelines	Gg/10^3 m^3 total oil transported	All	1.B.2.a.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tanker Trucks and Rail	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Refining/Storage	**Unit**	**Emission source**	**IPCC Code**												
ACTIVITY DATA															
Oil Refining	10^3 m^3 oil refined	All	1.B.2.a.iii.4	7977.5581	6321.5116	6120.6977	5803.6047	3769.186	3328.372	3748.953	4050.349	4174.535	3016.977	2311.5116	2164.535
EMISSION FACTOR															
CO2															
Oil Refining	Gg/10^3 m^3 total oil refined	All	1.B.2.a.iii.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CH4															
Oil Refining	Gg/10^3 m^3 total oil refined	All	1.B.2.a.iii.4	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	0.000	2.18E-05	2.18E-05	2.18E-05
N2O															
Oil Refining	Gg/10^3 m^3 total oil refined	All	1.B.2.a.iii.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5. Distribution of Oil Prod	**Unit**	**Emission source**	**IPCC Code**												
ACTIVITY DATA															
Gasoline	10^3 m^3 product transported	All	1.B.2.a.iii.5												
Diesel	10^3 m^3 product transported	All	1.B.2.a.iii.5												
Aviation Fuel	10^3 m^3 product transported	All	1.B.2.a.iii.5												
Jet Kerosene	10^3 m^3 product transported	All	1.B.2.a.iii.5												
EMISSION FACTOR															
CO2															
Gasoline	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aviation Fuel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jet Kerosene	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CH4															
Gasoline	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aviation Fuel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jet Kerosene	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N2O															
Gasoline	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aviation Fuel	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jet Kerosene	Gg/10^3 m^3 product transported	All	1.B.2.a.iii.5	NA	NA	NA	NA	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	2015	2016	2017	2018	2019	2020	2021
1. Exploration	Unit	Emission source	IPCC Code												
ACTIVITY DATA															
Well Drilling	10^6 m^3 total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
Well Testing	10^6 m^3 total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
Well Servicing	10^6 m^3 total natural gas production		1.B.2.a.ii	1982.30	1966.40	1638.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
EMISSION FACTOR															
CO2															
Well Drilling	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Well Testing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
CH4															
Well Drilling	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Well Testing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
N2O															
Well Drilling	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Well Testing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
Well Servicing	Gg/10^6 m^3 total natural gas production	Flaring and Venting	1.B.2.a.ii	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2. Production	Unit	Emission source	IPCC Code												
ACTIVITY DATA															
Gas production	10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.2	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
Gas production	10^6 m^3 gas produced	Flaring	1.B.2.b.ii	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
EMISSION FACTOR															
CO2															
Gas production	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.2	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05	4.80E-05
Gas production	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03
CH4															
Gas production	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.2	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03
Gas production	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07	7.60E-07
N2O															
Gas production	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gas production	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing	Unit	Emission source	IPCC Code												
ACTIVITY DATA															
Default weighted total	10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.3	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
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	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
Default weighted total	10^6 m^3 gas produced	Raw CO2 venting	1.B.2.b.i	1982.30	1966.40	1658.50	2283.40	2727.20	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
EMISSION FACTOR															
CO2															
Default weighted total	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.3	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04	1.66E-04
Default weighted total	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03
Default weighted total	Gg/10^6 m^3 gas produced	Raw CO2 venting	1.B.2.b.i	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CH4															
Default weighted total	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.3	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04	5.90E-04
Default weighted total	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06	2.00E-06
Default weighted total	Gg/10^6 m^3 gas produced	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N2O															
Default weighted total	Gg/10^6 m^3 gas produced	Fugitives	1.B.2.b.iii.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Default weighted total	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	3.3E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
Default weighted total	Gg/10^6 m^3 gas produced	Raw CO2 venting	1.B.2.b.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Distribution of Natural Gas	Unit	Emission source	IPCC Code												
ACTIVITY DATA															
Gas distribution	10^6 m^3 of utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	529.4	609.3	862.2	944.6	766.2	806.2	833.4	832.5	833.4	851	942
EMISSION FACTOR															
CO2															
Gas distribution	Gg/10^6 m^3 of utility sales	All	1.B.2.a.iii.5	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05	5.10E-05
CH4															
Gas distribution	Gg/10^6 m^3 of utility sales	All	1.B.2.a.iii.5	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03	1.10E-03
N2O															
Gas distribution	Gg/10^6 m^3 of utility sales	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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

1. B. 2. a. Oil				1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021
2. Production	Unit	mission sourc	IPCC Code												
ACTIVITY DATA															
Conventional oil	10^3 m^3 total oil production	Flaring	1.B.2.a.ii	3135.12	1744.53	1411.51	1100.00	837.67	779.30	857.09	865.70	851.28	820.58	734.65	702.91
EMISSION FACTOR															
N2O															
Conventional oil	Gg/10^3 m^3 total oil production	Fugitives (Onshore)	1.B.2.a.iii.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10^3 m^3 total oil production	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional oil	Gg/10^3 m^3 total oil production	Flaring	1.B.2.a.ii	6.4E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07	6.40E-07
3. Transport	Unit	mission sourc	IPCC Code									2018	2019	2020	2021
ACTIVITY DATA															
Pipelines	10^3 m^3 total oil transported by pipelines	All	1.B.2.a.iii.3	9948.84	3593.02	5552.33	8244.19	7454.65	7217.44	8019.77	9008.14	9943.02	6945.35	7941.86	7913.95
Tanker Trucks and Rail Cars	10^3 m^3 total oil transported by tanker…	Venting	1.B.2.a.i	943.49	255.18	275.30	273.51	124.13	50.01	95.35	57.04	68.20	63.94	54.99	28.87
Natural gas liquids transport-LPG	10^3 m^3 LPG	All	1.B.2.a.iii.3												
EMISSION FACTOR															
CO2															
Tanker Trucks and Rail Cars	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06
CH4															
Tanker Trucks and Rail Cars	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05	2.50E-05
N2O															
Tanker Trucks and Rail Cars	Gg/10^3 m^3 total oil transported	Venting	1.B.2.a.i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1. B. 2. c. 2 ii Venting anf Flaring - Gas				1990	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
2. Production	Unit	ssion sou	IPCC Code														
ACTIVITY DATA																	
Gas production	10^6 m^3 gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
EMISSION FACTOR																	
Gas production	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	2.1E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08	2.10E-08
3. Processing	Unit	ssion sou	IPCC Code														
ACTIVITY DATA																	
Default weighted total	10^6 m^3 gas produced	Flaring	1.B.2.b.ii	1982.30	1658.50	2727.20	2471.40	2013.10	1856.10	1747.00	1780.50	1647.20	1483.50	1230.10	1028.90	849.00	745.90
EMISSION FACTOR																	
N2O																	
Default weighted total	Gg/10^6 m^3 gas produced	Flaring	1.B.2.b.ii	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08	3.30E-08
4. Transmission and storage	Unit	ssion sou	IPCC Code														
ACTIVITY DATA																	
Transmission	10^6 m^3 marketable gas	Fugitives	1.B.2.b.iii.4	2686.6	2704.8	3241.5	3165	2971.7	2809.9	2443.6	2519.2	2611.4	3008.3	2770.5	2908	3040.7	2905.9
EMISSION FACTOR																	
N2O																	
Transmission	Gg/10^6 m^3 marketable gas	Fugitives	1.B.2.b.iii.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Distribution of Natural Gas	Unit	ssion sou	IPCC Code														
ACTIVITY DATA																	
Gas distribution	10^6 m^3 of utility sales (consumption of natural gas in 1A4-Other sectors)	All	1.B.2.a.iii.5	379.3	609.3	944.6	865.2	812.9	788.3	705.6	766.2	806.2	833.4	832.5	833.4	851	942
EMISSION FACTOR																	
N2O																	
Gas distribution	Gg/10^6 m^3 of utility sales	All	1.B.2.a.iii.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

3.2. LULUCF sector - List of implemented and planned projects

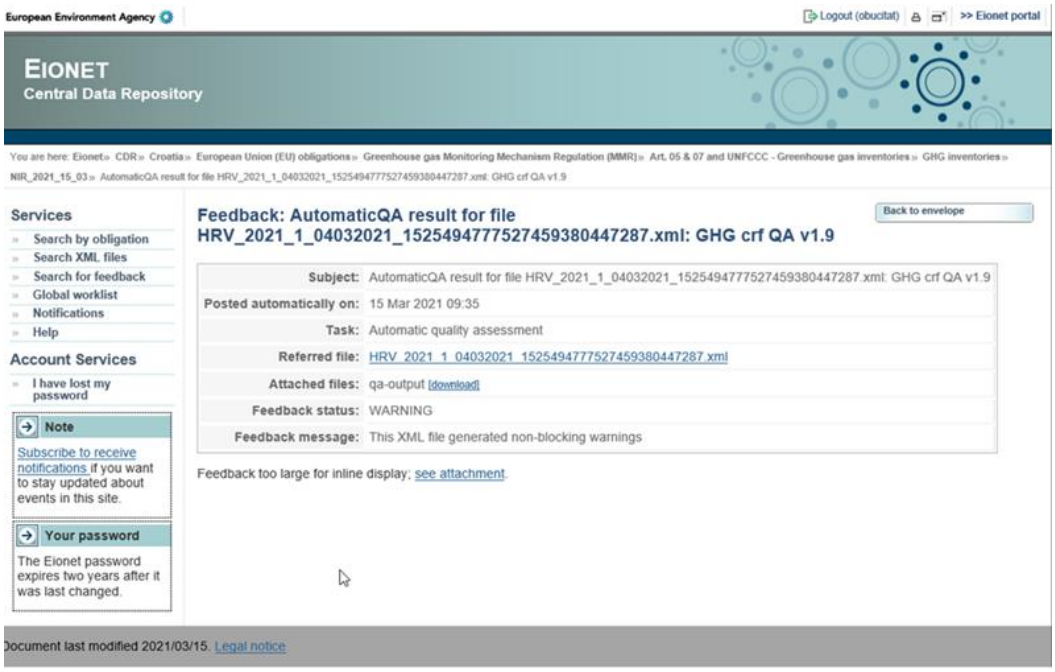
Table A3.2-1: Implemented and planned projects in LUULCF sector

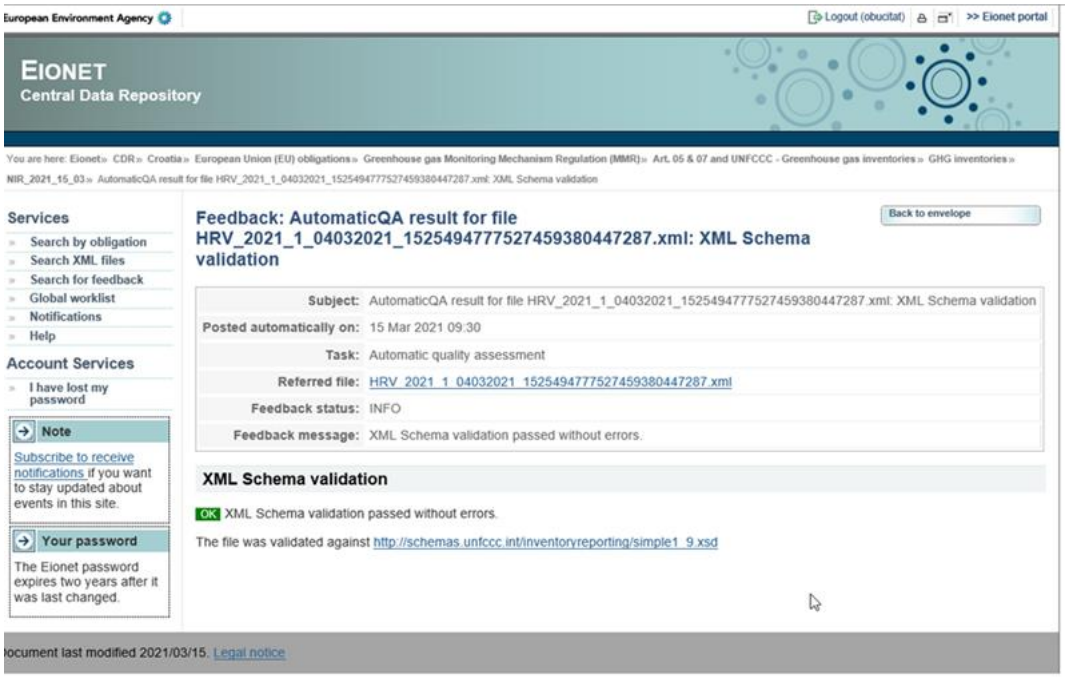
Project	Status	Main objectives
Improving Croatian reporting in Land use, Land Use change and Forestry (LULUCF) sector in the First commitment period of the Kyoto Protocol (abbreviated **LULUCF 1**).	Implemented (2014-2015)	The objective of the project was to comply with requirements set in the Saturday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

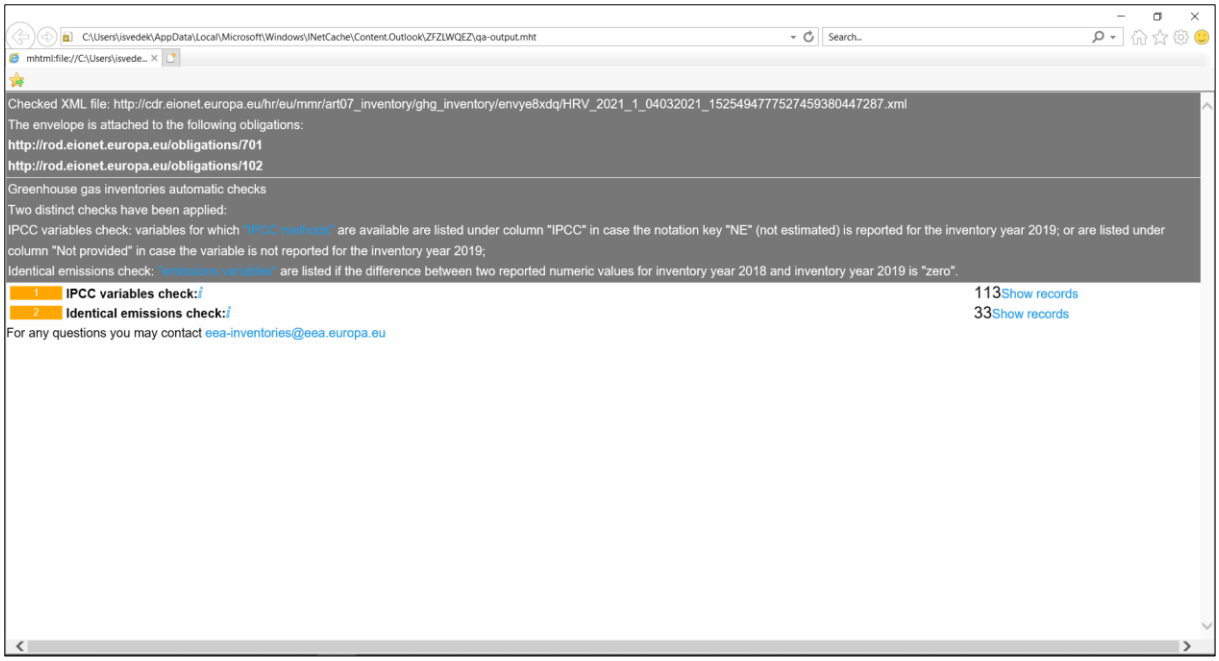
Project	Status	Main objectives
Application of the IPCC Tier 2 method for the estimation of the greenhouse gases emissions from forest fires.	Implemented (2019-2020)	The assessment of the biomass structure on the burnt areas in order to develop national specific values of the M_B and C_f factors for the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

3.3. QA/QC checks conducted by EEA

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






C:\Users\isvedek\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\ZFZLWQEZ\qa-output.mht
Search...
mhtml:file://C:\Users\isvede...
Checked XML file: http://cdr.eionet.europa.eu/hr/eu/mmr/art07_inventory/ghg_inventory/envye8xdq/HRV_2021_1_04032021_152549477752745938044728 7.xml
The envelope is attached to the following obligations:
http://rod.eionet.europa.eu/obligations/701
http://rod.eionet.europa.eu/obligations/102
Greenhouse gas inventories automatic checks
Two distinct checks have been applied:
IPCC variables check: variables for which "IPCC methodos" are available are listed under column "IPCC" in case the notation key "NE" (not estimated) is reported for the inventory year 2019; or are listed under column "Not provided" in case the variable is not reported for the inventory year 2019;
Identical emissions check: "emissions variables" are listed if the difference between two reported numeric values for inventory year 2018 and inventory year 2019 is "zero".
1 IPCC variables check:
113 Show records
2 Identical emissions check:
33 Show records
For any questions you may contact eea-inventories@eea.europa.eu

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

Table A4-1: National Energy balance for 2021, natural units

ENERGY BALANCE 2021 *natural units*	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
	103 t	103 t	103 t	103 t	103 t	106 m3
Production					604.5	745.9
Import	3.7	668.4	1.6	4.0	1761.7	2290.6
Export		2.5			472.5	126.2
Import-processing						
Export-processing						
Stock change		-4.9			6.6	-4.4
Bunkers						
Energy supplied	**3.7**	**661.0**	**1.6**	**4.0**	**1900.3**	**2905.9**
Production						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants						
public cogeneration plants						
public heating plants						
industrial cogeneration plants						
– in rafineries						
– in gas production						
Industrial heating plants						
Petroleum refineries						
NGL-plant						
Coke plant						
Gas works						
Total production						
Transformation sector						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants		528.2				4.3
public cogeneration plants						736.4
public heating plants						53.6
industrial cogeneration plants						275.8
– in rafineries						66.4
– in gas production						52.3
Industrial heating plants						69.9
Petroleum refineries					1861.5	69.7
NGL-plant					38.8	10.6
Coke plant						
Gas works						
Total transformation sector		**528.2**			**1900.3**	**1220.3**
Energy sector own use						
Oil and gas extraction						23.9
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Wind power						
Petroleum refineries						30.3
NGL-plant						44.5
Gas works						
Total energy sector own use						**98.7**
Losses						**67.9**
Final energy demand	**3.7**	**132.8**	**1.6**	**4.0**	**0.0**	**1519.0**
Non energy use						**316.0**
Energy sector						
Petrochemical industry						316.0
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	**3.7**	**132.8**	**1.6**	**4.0**	**0.0**	**1203.0**
Industry	**3.7**	**132.8**	**0.1**			**256.2**
Iron and steel	3.7					19.0
Non-ferrous metals						13.9
Non-metallic minerals						51.6
Chemical						13.8
Construction materials		132.8	0.1			62.4
Pulp and paper						9.8
Food production						42.6
Not elsewhere specified						43.1
Transport						**4.8**
Rail						
Road						
Air						
– international						
– domestic						
Sea and River						
Public transport						4.8
Not elsewhere specified						
Other sectors			**1.5**	**4.0**		**942.0**
Households			1.5	4.0		627.0
Services						278.7
Agriculture						36.3
Construction						

Table A4-1: National Energy balance for 2021, natural units, cont.

ENERGY BALANCE 2021 *natural units*	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
	TJ	103 m3	TJ	TJ	TJ	103 m3	103 t	TJ
Production	63929.3	5472.9	18234.2	2031.4	2092.9	219925.2	0.4	21940.2
Import		108.2					110.6	1445.8
Export		675.2						6520.5
Import-processing								
Export-processing								
Stock change							-7.2	415.9
Bunkers								
Energy supplied	**63929.3**	**4905.9**	**18234.2**	**2031.4**	**2092.9**	**219925.2**	**103.8**	**17281.4**
Production								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in rafineries								
– in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Transformation sector								
hydro power plants	63929.3							
– small HPP	1063.9							
Wind power plants			18234.2					
Solar power plants				1316.8				
Geothermal power plants					1885.1			
thermal power plants						21168.0		
public cogeneration plants						191465.2		11187.5
public heating plants								23.0
industrial cogeneration plants						7292.0		
– in rafineries								
– in gas production								
Industrial heating plants								244.4
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	**63929.3**		**18234.2**	**1316.8**	**1885.1**	**219925.2**		**11454.9**
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Wind power								
Petroleum refineries								
NGL-plant								
Gas works								
Total energy sector own use								
Losses								
Final energy demand		**4905.9**		**714.6**	**207.8**		**103.8**	**5826.5**
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		**4905.9**		**714.6**	**207.8**		**103.8**	**5826.5**
Industry		**30.4**						**2693.4**
Iron and steel		0.2						20.0
Non-ferrous metals								
Non-metallic minerals								1.6
Chemical								0.2
Construction materials		6.9						1942.0
Pulp and paper		0.7						84.0
Food production		1.6						250.7
Not elsewhere specified		21.0						394.9
Transport							**103.8**	
Rail								
Road							103.8	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		**4875.5**		**714.6**	**207.8**			**3133.1**
Households		4861.8		500.2				2697.2
Services		13.7		214.4	138.0			435.9
Agriculture					69.8			
Construction								

Table A4-1: National Energy balance for 2021, natural units, cont.

ENERGY BALANCE 2021 *natural units*	Coke oven coke	Liquefied petroleum	Unleaded motor	Standard motor	Petroleum	Jet fuel	Diesel oil	Light heating oil	Low sulphur fuel	Standard fuel oil
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production		185.3	585.1			79.6	1007.7	113.9	220.3	70.8
Import	30.9	82.4	166.1	0.5	1.8	12.5	1690.3	14.2	2.7	
Export	1.3	144.8	327.9			1.8	898.0	28.7	215.2	32.0
Import-processing										
Export-processing										
Stock change	-0.1	-1.2	20.7			9.9	-17.5	2.1	0.2	-4.6
Bunkers							19.2		4.4	
Energy supplied	**29.5**	**121.7**	**444.0**	**0.5**	**1.8**	**100.2**	**1763.3**	**101.5**	**3.6**	**34.2**
Production										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants										
public cogeneration plants										
public heating plants										
industrial cogeneration plants										
– in rafineries										
– in gas production										
Industrial heating plants										
Petroleum refineries		152.8	585.1			79.6	1007.7	113.9	220.3	70.8
NGL-plant		32.5								
Coke plant										
Gas works										
Total production		**185.3**	**585.1**			**79.6**	**1007.7**	**113.9**	**220.3**	**70.8**
Transformation sector										
hydro power plants										
– small HPP										
Wind power plants										
Solar power plants										
Geothermal power plants										
thermal power plants								0.4		
public cogeneration plants										
public heating plants								3.5	0.5	
industrial cogeneration plants										18.6
– in rafineries										18.6
– in gas production										
Industrial heating plants								0.2		7.3
Petroleum refineries										
NGL-plant										
Coke plant										
Gas works										
Total transformation sector								**4.1**	**0.5**	**25.9**
Energy sector own use										
Oil and gas extraction										
Coal production										
Electric energy supply industry										
hydro power plants										
thermal power plants										
public cogeneration plants										
industrial cogeneration plants										
Wind power										
Petroleum refineries									1.2	5.7
NGL-plant										
Gas works										
Total energy sector own use									**1.2**	**5.7**
Losses										
Final energy demand	**29.5**	**121.7**	**444.0**	**0.5**	**1.8**	**100.2**	**1763.3**	**97.4**	**1.9**	**2.6**
Non energy use										
Energy sector										
Petrochemical industry										
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	**29.5**	**121.7**	**444.0**	**0.5**	**1.8**	**100.2**	**1763.3**	**97.4**	**1.9**	**2.6**
Industry	**29.5**	**8.2**	**0.3**		**1.8**		**9.8**	**16.3**	**1.9**	**2.6**
Iron and steel	0.2	0.7					0.3	0.7		
Non-ferrous metals		0.8					0.2	0.2		
Non-metallic minerals		0.3					0.1			
Chemical					1.8			0.4	0.1	
Construction materials	27.4	1.2	0.2				6.7	4.4	0.7	1.0
Pulp and paper		0.1								
Food production	1.9	1.2					0.2	6.0	1.1	1.6
Not elsewhere specified		3.9	0.1				2.3	4.6		
Transport		**55.3**	**432.5**	**0.5**		**100.2**	**1468.7**			
Rail							14.3			
Road		55.3	432.5				1386.1			
Air				0.5		100.2				
– international						93.6				
– domestic				0.5		6.6				
Sea and River							46.9			
Public transport							21.4			
Not elsewhere specified										
Other sectors		**58.2**	**11.2**				**284.8**	**81.1**		
Households		41.0						42.3		
Services		11.7						22.7		
Agriculture		2.7	7.8				180.9	11.1		
Construction		2.8	3.4				103.9	5.0		

Table A4-1: National Energy balance for 2021, natural units, cont.

ENERGY BALANCE 2021 *natural units*	Naphta	White spirit	Bitumen	Other oils	Lubricants	Petroleum coke	Etan	Other derivates
	103 t	103 t	103 t	103 t	103 t	103 t	103 t	103 t
Production	26.8			9.2		24.0		56.6
Import		4.3	136.2	36.0	5.7	111.9		
Export	27.0	0.9	2.2	9.7	0.2	4.3		75.8
Import-processing								
Export-processing								
Stock change	0.6			-0.1		-18.5		24.5
Bunkers								
Energy supplied	**0.4**	**3.4**	**134.0**	**35.4**	**5.5**	**113.1**		**5.3**
Production								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in rafineries								
– in gas production								
Industrial heating plants								
Petroleum refineries	9.5			9.2		24.0		56.6
NGL-plant	17.3							
Coke plant								
Gas works								
Total production	**26.8**			**9.2**		**24.0**		**56.6**
Transformation sector								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants								
– in rafineries								
– in gas production								
Industrial heating plants								
Petroleum refineries	0.4							
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	**0.4**							
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Wind power								
Petroleum refineries						22.5		
NGL-plant								
Gas works								
Total energy sector own use						**22.5**		
Losses								
Final energy demand	**0.0**	**3.4**	**134.0**	**35.4**	**5.5**	**90.6**		**5.3**
Non energy use		**3.4**	**134.0**	**35.2**	**5.5**			**5.3**
Energy sector				2.0				
Petrochemical industry					0.6			5.3
Other industry		3.4	22.0	9.2	4.9			
Construction			112.0	1.2				
Transport				21.7				
Agriculture				1.1				
Energy consumption	**0.0**			**0.2**		**90.6**		
Industry						**90.6**		
Iron and steel						0.8		
Non-ferrous metals								
Non-metallic minerals						1.8		
Chemical								
Construction materials						88.0		
Pulp and paper								
Food production								
Not elsewhere specified								
Transport				**0.2**				
Rail								
Road				0.1				
Air								
– international								
– domestic								
Sea and River				0.1				
Public transport								
Not elsewhere specified								
Other sectors								
Households								
Services								
Agriculture								
Construction								

Table A4-1: National Energy balance for 2021, natural units, cont.

ENERGY BALANCE 2021 *natural units*	Refinery gas	Refinery semiproducts	Aditives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non
	103 t	103 t	103 t	103 m3	GWh	TJ	TJ
Production	98.5				15210.4	26402.8	1891.5
Import		495.1	43.2		6700.0		
Export					2739.0		
Import-processing							
Export-processing							
Stock change		4.1	2.3				
Bunkers							
Energy supplied	**98.5**	**499.2**	**45.5**		**19171.4**	**26402.8**	**1891.5**
Production							
hydro power plants					7228.7		
– small HPP					120.3		
Wind power plants					2061.8		
Solar power plants					148.9		
Geothermal power plants					89.7		
thermal power plants					1510.9		
public cogeneration plants					3830.4	13766.4	
public heating plants						1786.3	
industrial cogeneration plants					340.0	7708.9	
– in rafineries					68.5	2960.0	
– in gas production					136.2	606.0	
Industrial heating plants						2473.1	
Petroleum refineries	98.5						
NGL-plant							
Coke plant							
Gas works							
Total production	**98.5**				**15210.4**	**25734.7**	
Transformation sector							
hydro power plants							
– small HPP							
Wind power plants							
Solar power plants							
Geothermal power plants							
thermal power plants							
public cogeneration plants							
public heating plants							
industrial cogeneration plants	17.8						
– in rafineries	17.8						
– in gas production							
Industrial heating plants							
Petroleum refineries		499.2	45.5				
NGL-plant							
Coke plant							
Gas works							
Total transformation sector	**17.8**	**499.2**	**45.5**				
Energy sector own use							
Oil and gas extraction					132.1	394.0	
Coal production						445.3	
Electric energy supply industry					15.7		
hydro power plants					188.0		
thermal power plants					139.0		
public cogeneration plants					260.5	2011.6	
industrial cogeneration plants							
Wind power					22.0		
Petroleum refineries	80.7				183.7	3381.5	
NGL-plant					53.4	212.0	
Gas works							
Total energy sector own use	**80.7**				**994.4**	**6444.4**	
Losses					**1690.5**	**1637.4**	
Final energy demand		**0.0**			**16486.5**	**18321.0**	**1891.5**
Non energy use							
Energy sector							
Petrochemical industry							
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption		**0.0**			**16486.5**	**18321.0**	**1891.5**
Industry					**3709.8**	**9378.6**	**1891.5**
Iron and steel					413.1	30.9	16.5
Non-ferrous metals					107.8		
Non-metallic minerals					150.3	9.0	
Chemical					308.0	3287.5	
Construction materials					625.5	6.0	1875.0
Pulp and paper					241.8	1297.5	
Food production					658.5	1941.5	
Not elsewhere specified					1204.8	2806.2	
Transport					**344.3**		
Rail					177.1		
Road					7.1		
Air					30.6		
– international							
– domestic					30.6		
Sea and River					29.2		
Public transport					62.0		
Not elsewhere specified					38.3		
Other sectors					**12432.4**	**8942.4**	
Households					6594.4	5812.1	
Services					5607.1	2859.1	
Agriculture					148.4	271.2	
Construction					82.5		

Table A4-2: National Energy balance for 2021, energy units

PJ	Anthracite	Hard coal	Brown coal	Lignite	Crude oil	Natural gas
Production					25.812	26.391
Import	0.108	16.531	0.030	0.046	75.225	80.171
Export		0.062			20.176	4.417
Import-processing						
Export-processing						
Stock change		-0.121			0.282	-0.154
Bunkers						
Energy supplied	**0.108**	**16.348**	**0.030**	**0.046**	**81.143**	**101.991**
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 rafineries						
– in gas production						
Industrial heating plants						
Petroleum refineries						
NGL-plant						
Coke plant						
Gas works						
Total production						
Gross production	**0.108**	**16.348**	**0.030**	**0.046**	**81.143**	**101.991**
Transformation sector						
hydro power plants						
– small HPP						
Wind power plants						
Solar power plants						
Geothermal power plants						
thermal power plants		12.831				0.151
public cogeneration plants						25.774
public heating plants						1.876
industrial cogeneration plants						9.653
– in rafineries						2.324
– in gas production						1.831
Industrial heating plants						2.447
Petroleum refineries					79.486	2.440
NGL-plant					1.657	0.655
Coke plant						
Gas works						
Total transformation sector		**12.831**			**81.143**	**42.995**
Energy sector own use						
Oil and gas extraction						0.837
Coal production						
Electric energy supply industry						
hydro power plants						
thermal power plants						
public cogeneration plants						
industrial cogeneration plants						
Industrial heating plants						
Petroleum refineries						1.061
NGL-plant						1.558
Gas works						
Total energy sector own use						**3.455**
Losses						**2.377**
Final energy demand	**0.108**	**3.517**	**0.030**	**0.046**		**53.165**
Non energy use						**11.060**
Energy sector						
Petrochemical industry						11.060
Other industry						
Construction						
Transport						
Agriculture						
Energy consumption	**0.108**	**3.517**	**0.030**	**0.046**		**42.105**
Industry	**0.108**	**3.517**	**0.002**			**8.967**
Iron and steel	0.108					0.665
Non-ferrous metals						0.487
Non-metallic minerals						1.806
Chemical						0.483
Construction materials		3.517	0.002			2.184
Pulp and paper						0.343
Food production						1.491
Not elsewhere specified						1.509
Transport						**0.168**
Rail						
Road						
Air						
– international						
– domestic						
Sea and River						
Public transport						0.168
Not elsewhere specified						
Other sectors			**0.028**	**0.046**		**32.970**
Households			0.028	0.046		21.945
Services						9.755
Agriculture						1.271
Construction						

Table A4-2: National Energy balance for 2021, energy units, cont.

PJ	Hydro energy	Fuel wood	Wind energy	Solar energy	Geothermal energy	Landfill gas	Biofuels	Other biomass
Production	63.929	49.256	18.234	2.031	2.093	4.154	0.015	21.940
Import		0.974					4.068	1.446
Export		6.077						6.521
Import-processing								
Export-processing								
Stock change							-0.265	0.416
Bunkers								
Energy supplied	**63.929**	**44.153**	**18.234**	**2.031**	**2.093**	**4.154**	**3.818**	**17.281**
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 rafineries								
– in gas production								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total production								
Gross production	**63.929**	**44.153**	**18.234**	**2.031**	**2.093**	**4.154**	**3.818**	**17.281**
Transformation sector								
hydro power plants	63.929							
– small HPP	1.064							
Wind power plants			18.234					
Solar power plants				1.317				
Geothermal power plants					1.885			
thermal power plants						0.363		
public cogeneration plants						3.642		11.188
public heating plants								0.023
industrial cogeneration plants						0.148		
– in rafineries								
– in gas production								
Industrial heating plants								0.244
Petroleum refineries								
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	**63.929**		**18.234**	**1.317**	**1.885**	**4.154**		**11.455**
						363.496		
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Industrial heating plants								
Petroleum refineries								
NGL-plant								
Gas works								
Total energy sector own use								
Losses								
Final energy demand		**44.153**		**0.715**	**0.208**		**3.818**	**5.827**
Non energy use								
Energy sector								
Petrochemical industry								
Other industry								
Construction								
Transport								
Agriculture								
Energy consumption		**44.153**		**0.715**	**0.208**		**3.818**	**5.827**
Industry		**0.274**						**2.693**
Iron and steel		0.002						0.020
Non-ferrous metals								
Non-metallic minerals								0.002
Chemical								0.000
Construction materials		0.062						1.942
Pulp and paper		0.006						0.084
Food production		0.014						0.251
Not elsewhere specified		0.189						0.395
Transport							**3.818**	
Rail								
Road							3.818	
Air								
– international								
– domestic								
Sea and River								
Public transport								
Not elsewhere specified								
Other sectors		**43.880**		**0.715**	**0.208**			**3.133**
Households		43.756		0.500				2.697
Services		0.123		0.214	0.138			0.436
Agriculture					0.070			
Construction								

Table A4-2: National Energy balance for 2021, energy units, cont.

PJ	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	213.856									
Import	178.598	0.906	3.864	7.406	0.022	0.079	0.550	72.193	0.606	0.109
Export	37.252	0.038	6.790	14.621			0.079	38.354	1.226	8.649
Import-processing										
Export-processing										
Stock change	0.158	-0.003	-0.056	0.923			0.435	-0.747	0.090	0.008
Bunkers								0.820		0.177
Energy supplied	**355.359**	**0.865**	**-2.982**	**-6.292**	**0.022**	**0.079**	**0.906**	**32.272**	**-0.530**	**-8.709**
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 rafineries										
– in gas production										
Industrial heating plants										
Petroleum refineries			7.165	26.090			3.499	43.039	4.865	8.854
NGL-plant			1.524							
Coke plant										
Gas works										
Total production			**8.689**	**26.090**			**3.499**	**43.039**	**4.865**	**8.854**
Gross production	**355.359**	**0.865**	**5.707**	**19.798**	**0.022**	**0.079**	**4.405**	**75.311**	**4.335**	**0.145**
Transformation sector										
hydro power plants	63.929									
– small HPP	1.064									
Wind power plants	18.234									
Solar power plants	1.317									
Geothermal power plants	1.885									
thermal power plants	13.345								0.017	
public cogeneration plants	40.604									
public heating plants	1.899								0.149	0.020
industrial cogeneration plants	9.801									
– in rafineries	2.324									
– in gas production	1.831									
Industrial heating plants	2.691								0.009	
Petroleum refineries	81.926									
NGL-plant	2.312									
Coke plant										
Gas works										
Total transformation sector	**237.943**								**0.175**	**0.020**
Energy sector own use										
Oil and gas extraction	0.837									
Coal production										
Electric energy supply industry										
hydro power plants										
thermal power plants										
public cogeneration plants										
industrial cogeneration plants										
Industrial heating plants										
Petroleum refineries	1.061									0.048
NGL-plant	1.558									
Gas works										
Total energy sector own use	**3.455**									**0.048**
Losses	**2.377**									
Final energy demand	**111.585**	**0.865**	**5.707**	**19.798**	**0.022**	**0.079**	**4.405**	**75.311**	**4.160**	**0.076**
Non energy use	**11.060**									
Energy sector										
Petrochemical industry	11.060									
Other industry										
Construction										
Transport										
Agriculture										
Energy consumption	**100.525**	**0.865**	**5.707**	**19.798**	**0.022**	**0.079**	**4.405**	**75.311**	**4.160**	**0.076**
Industry	**15.561**	**0.865**	**0.384**	**0.013**		**0.079**		**0.419**	**0.696**	**0.076**
Iron and steel	0.795	0.006	0.033					0.013	0.030	
Non-ferrous metals	0.487		0.038					0.009	0.009	
Non-metallic minerals	1.808		0.014					0.004		
Chemical	0.483					0.079			0.017	0.004
Construction materials	7.706	0.803	0.056	0.009				0.286	0.188	0.028
Pulp and paper	0.433		0.005							
Food production	1.756	0.056	0.056					0.009	0.256	0.044
Not elsewhere specified	2.092		0.183	0.004				0.098	0.196	
Transport	**3.986**		**2.593**	**19.285**	**0.022**		**4.405**	**62.728**		
Rail								0.611		
Road	3.818		2.593	19.285				59.200		
Air					0.022		4.405			
– international							4.115			
– domestic					0.022		0.290			
Sea and River								2.003		
Public transport	0.168							0.914		
Not elsewhere specified										
Other sectors	**80.979**		**2.729**	**0.499**				**12.164**	**3.464**	
Households	68.972		1.922						1.807	
Services	10.666		0.549						0.970	
Agriculture	1.340		0.127	0.348				7.726	0.474	
Construction			0.131	0.152				4.438	0.214	

Table A4-2: National Energy balance for 2021, energy units, cont.

PJ	Naphta	White spirit	Bitumen	Lubricants	Paraffin and wax	Petroleum coke	Etan	Other derivates
Production								
Import			0.144	4.563	1.206	0.191	3.469	
Export	1.286	1.204	0.030	0.074	0.325	0.007	0.133	
Import-processing								
Export-processing								
Stock change	-0.185	0.027			-0.003		-0.574	
Bunkers								
Energy supplied	**-1.471**	**-1.177**	**0.114**	**4.489**	**0.878**	**0.184**	**2.762**	
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 rafineries								
– in gas production								
Industrial heating plants								
Petroleum refineries	2.845	0.424			0.308		0.744	
NGL-plant		0.771						
Coke plant								
Gas works								
Total production	**2.845**	**1.195**			**0.308**		**0.744**	
Gross production	**1.374**	**0.018**	**0.114**	**4.489**	**1.186**	**0.184**	**3.506**	
Transformation sector								
hydro power plants								
– small HPP								
Wind power plants								
Solar power plants								
Geothermal power plants								
thermal power plants								
public cogeneration plants								
public heating plants								
industrial cogeneration plants	0.748							
– in rafineries	0.748							
– in gas production								
Industrial heating plants	0.293							
Petroleum refineries		0.018						
NGL-plant								
Coke plant								
Gas works								
Total transformation sector	**1.041**	**0.018**						
Energy sector own use								
Oil and gas extraction								
Coal production								
Electric energy supply industry								
hydro power plants								
thermal power plants								
public cogeneration plants								
industrial cogeneration plants								
Industrial heating plants								
Petroleum refineries	0.229						0.698	
NGL-plant								
Gas works								
Total energy sector own use	**0.229**						**0.698**	
Losses								
Final energy demand	**0.104**	**0.000**	**0.114**	**4.489**	**1.186**	**0.184**	**2.809**	
Non energy use			**0.114**	**4.489**	**1.179**	**0.184**		
Energy sector					0.067			
Petrochemical industry						0.020		
Other industry			0.114	0.737	0.308	0.164		
Construction				3.752	0.040			
Transport					0.727			
Agriculture					0.037			
Energy consumption	**0.104**	**0.000**			**0.007**		**2.809**	
Industry	**0.104**						**2.809**	
Iron and steel							0.025	
Non-ferrous metals								
Non-metallic minerals							0.056	
Chemical								
Construction materials	0.040						2.728	
Pulp and paper								
Food production	0.064							
Not elsewhere specified								
Transport					**0.007**			
Rail								
Road					0.003			
Air								
– international								
– domestic								
Sea and River					0.003			
Public transport								
Not elsewhere specified								
Other sectors								
Households								
Services								
Agriculture								
Construction								

Table A4-2: National Energy balance for 202, energy units, cont.

PJ	Refinery gas	Refinery semiproducts	Aditives	Gas works gas	Electricity	Steam and hot water	Industrial waste, non renewable
Production							0.668
Import			21.141	1.845		24.120	
Export	3.046					9.860	
Import-processing							
Export-processing							
Stock change	0.985		0.175	0.098			
Bunkers							
Energy supplied	**-2.062**		**21.316**	**1.943**		**14.260**	**0.668**
Production							
hydro power plants						26.023	
– small HPP						0.433	
Wind power plants						7.422	
Solar power plants						0.536	
Geothermal power plants						0.323	
thermal power plants						5.439	
public cogeneration plants						13.789	13.766
public heating plants							1.786
industrial cogeneration plants						1.224	7.709
– in rafineries						0.247	2.960
– in gas production						0.490	0.606
Industrial heating plants							2.473
Petroleum refineries	2.275	4.196					
NGL-plant							
Coke plant							
Gas works							
Total production	**2.275**	**4.196**				**54.757**	**25.735**
Gross production	**0.213**	**4.196**	**21.316**	**1.943**		**69.017**	**26.403**
Transformation sector							
hydro power plants							
– small HPP							
Wind power plants							
Solar power plants							
Geothermal power plants							
thermal power plants							
public cogeneration plants							
public heating plants							
industrial cogeneration plants		0.758					
– in rafineries		0.758					
– in gas production							
Industrial heating plants							
Petroleum refineries			21.316	1.943			
NGL-plant							
Coke plant							
Gas works							
Total transformation sector		**0.758**	**21.316**	**1.943**			
Energy sector own use							
Oil and gas extraction						0.476	0.394
Coal production							0.445
Electric energy supply industry						0.057	
hydro power plants						0.677	
thermal power plants						0.500	
public cogeneration plants						0.938	2.012
industrial cogeneration plants							
Industrial heating plants						0.079	
Petroleum refineries		3.438				0.661	3.382
NGL-plant						0.192	0.212
Gas works							
Total energy sector own use		**3.438**				**3.580**	**6.444**
Losses						**6.086**	**1.637**
Final energy demand	**0.213**		**0.000**			**59.351**	**18.321**
Non energy use	**0.213**						
Energy sector							
Petrochemical industry	0.213						
Other industry							
Construction							
Transport							
Agriculture							
Energy consumption			**0.000**			**59.351**	**18.321**
Industry						**13.355**	**9.379**
Iron and steel						1.487	0.031
Non-ferrous metals						0.388	
Non-metallic minerals						0.541	0.009
Chemical						1.109	3.288
Construction materials						2.252	0.006
Pulp and paper						0.870	1.298
Food production						2.371	1.942
Not elsewhere specified						4.337	2.806
Transport						**1.239**	
Rail						0.638	
Road						0.026	
Air						0.110	
– international							
– domestic						0.110	
Sea and River						0.105	
Public transport						0.223	
Not elsewhere specified						0.138	
Other sectors						**44.757**	**8.942**
Households						23.740	5.812
Services						20.186	2.859
Agriculture						0.534	0.271
Construction						0.297	

Table A4-3 Industry analisys balance for 2021, energy units, cont.

1. STANDARD ENERGY BALANCE

		Industrial cogenerations				Industrial heating plants	Own use (production of oil and gas)	Own use (refineries)	Own use (biogas production)	Industry									Commercial sector
ENERGY CONSUMPTION		Rafineries	Production of oil and gas	Other sectors	Total					Total	Iron and Steal	Non-Ferrous metals	Non-Metalic Minerals	Chemicals	Construction	Paper	Food	Other	
Anthracite	10^3 t				0.0					0.9	0.9	0	0	0	0	0	0	0	0.0
Coking coal (kameni ugljen)	10^3 t				0.0					119.8	0.0	0	0	0	119.8	0	0	0	0.0
Sub-Bituminous Coal (Mrki u	10^3 t			11.9	11.9					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lignite	10^3 t				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural gas	10^6 m^3	82.6	49.0	214.5	346.1	79.1	54.6	35.1		230.1	13.0	11.7	45.5	17.0	53.4	9.3	41.5	38.7	235.9
Wood	10^3 m^3				0.0					30.5	0.2	0.3	0.0	0.0	6.6	0.0	1.5	21.9	12.1
Biogas	TJ			140.2	140.2				0.0	0.0									0.0
Wood waste	TJ				0.0					0.0									205.3
Briketi ugljena	TJ				0.0					0.0									120.1
Coke oven coke	TJ			0.0	0.0	264.6				943.9	1.8	0.0	0.3	0.2	138.5	185.0	189.4	428.7	449.4
Liquified petroleum gas	TJ				0.0					1630.3	7.7				1622.6				0.0
Motor Gasoline	10^3 t				0.0					30.2	0.3	0.0	0.0	0.0	26.3	0.0	3.6	0.0	0.0
Petroleum	10^3 t	0			0.0	0.0		0.0		6.1	0.7	0.7	0.2	0.0	0.5	0.1	1.0	2.9	10.0
Diesel	10^3 t				0.0					0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Gas/Diesel oil	10^3 t				0.0					1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Residual fuel oil	10^3 t				0.0					9.6	0.2	0.2	0.1	0.0	6.9	0.0	0.3	1.9	0.0
Petroleum coke	10^3 t				0.0	0.0				14.9	0.6	0.2	0.0	0.4	4.0	0.0	5.3	4.4	25.6
Refinery gas	10^3 t	19.3		0.0	19.3	9.8		0.8		5.5	0.0	0.0	0.0	0.1	1.9	0.0	3.5	0.0	0.0
Other oil derivates	10^3 t	0			0.0			21.7		100.7	0.0	0.0	0.0	0.0	100.7	0.0	0.0	0.0	0.0
Visokopećni plin	10^3 t	20.0			20.0	0.0		94.2		0.0									0.0
Koksni plin	10^3 t				0.0			0.0		0.0									0.0
Gas works gas	10^3 m^3				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	GWh				0.0		181.9	191.1	0.0	3502.6	291.7	99.9	142.0	342.7	608.7	233.0	647.4	1137.2	5043.8
Steam and hot water	TJ				0.0		585.0	3958.2	318.7	10933.3	116.9	0.0	6.5	4413.3	5.5	1223.8	2508.0	2659.3	2490.5

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

		Industrial cogenerations					Own use (production of oil and gas)			Industry									Commercial sector
ENERGY CONSUMPTION		Rafineries	Production of oil and gas	Other sectors	Total	Industrial heating plants		Own use (refineries)	Own use (biogas production)	Total	Iron and Steal	Non-Ferrous metals	Non-Metalic Minerals	Chemicals	Construction	Paper	Food	Other	
Anthracite					0.0					3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coking coal (kameni ugljen)	10^3 t				0.0					132.8	0.0	0.0	0.0	0.0	132.8	0.0	0.0	0.0	0.0
Sub-Bituminous Coal (Mrki u	10^3 t			0.0	0.0					0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Lignite	10^3 t				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural gas	10^6 m^3	9.5	32.3	26.9	68.7		88.4	98.9		444.6	19.6	13.9	51.9	103.5	62.4	48.9	94.2	50.2	278.7
Wood	10^3 m^3				0.0					30.4	0.2	0.0	0.0	0.0	6.9	0.7	1.6	21.0	13.7
Biogas	TJ			88.5	88.5				40.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2
Wood waste	TJ				0.0					0.0									214.4
Briketi ugljena	TJ				0.0					0.0									138.0
Coke oven coke	TJ			0.0	0.0					1046.3	3.5	0.0	1.6	0.2	67.0	87.1	362.1	524.8	435.9
Liquified petroleum gas	TJ				0.0					1891.5	16.5				1875.0				0.0
Motor Gasoline	10^3 t				0.0					29.5	0.2	0.0	0.0	0.0	27.4	0.0	1.9	0.0	0.0
Petroleum	10^3 t	0.0			0.0			0.0		8.2	0.7	0.8	0.3	0.0	1.2	0.1	1.2	3.9	11.7
Diesel	10^3 t				0.0					0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0
Gas/Diesel oil	10^3 t				0.0					1.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Residual fuel oil	10^3 t				0.0					9.8	0.3	0.2	0.1	0.0	6.7	0.0	0.2	2.3	0.0
Petroleum coke	10^3 t				0.0					16.5	0.7	0.2	0.0	0.4	4.6	0.0	6.0	4.6	22.7
Refinery gas	10^3 t	2.7		0.0	2.7			22.8		11.8	0.0	0.0	0.0	0.1	1.7	0.8	7.1	2.1	0.0
Other oil derivates	10^3 t	0.0			0.0			22.5		90.6	0.8	0.0	1.8	0.0	88.0	0.0	0.0	0.0	0.0
Visokopećni plin	10^3 t	2.5			2.5			96.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Koksni plin	10^3 t				0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas works gas	10^3 m^3				0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	GWh				0.0		185.5	183.7	0.0	3709.8	413.1	107.8	150.3	308.0	625.5	241.8	658.5	1204.8	5607.1
Steam and hot water	TJ				0.0			73.4	406.8	3173.1	13.6	0.0	0.0	531.3	0.0	0.0	189.3	2438.9	2835.2

Annex 5: Any additional information

Annex 5-1: Archiving, inventory data record sheet

5.1.1. Inventory data record sheet

Year: 2021

MODULE: ENERGY	
SUBMODULE: CO_2 from Fuel Combustion by Source Categories	
WORKSHEET: 1_1A1A_PUBLIC_ELE_HEAT_1990-2021	**SHEET**: 1A1ai, 1A1aii, 1A1aiii
STEP: 1, 2, 3, 4, 5, 6	**PAGE**: 1 of 1
DIRECT DATA SOURCE: A. ACTIVITY DATA: Institution/organization: Energy Institute ''Hrvoje Požar'' Publications: National Energy Balance for 2021; Annual Energy Report: ''Energy in Croatia 2021'' Contact person: dr.sc. Branko Vuk (phone: +385 1 6326 149, +385 1 6326 206) Data: Fuel consumption data and net calorific values B. METHODOLOGY/EMISSION FACTOR: Publications: IPCC (2006): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Energy Default values for carbon emission factors and fractions of carbon stored were used	
ORIGINAL DATA SOURCE: A. ACTIVITY DATA: Fuel consumption data and net calorific values for 1A1 sector were provided by National energy balance	
METHOD: Tier 1 method based on fuel consumption data and net calorific values Tier 2 method for 1A1ai (natural gas and hard coal) for CO_2 emision calculation – country specific EF from verified reports are used Tier 2 method for 1A1aii (natural gas) for CO_2 emision calculation – country specific EF from verified reports are used	
ADDITIONAL INTERCALCULATION: Not necessary	
DATA ARCHIVATION: Hard copy and electronic copy	
DATA GAPS:	
SUGGESTION FOR THE FUTURE:	
NOTES: Default value for carbon emission factor, fraction of carbon stored and fraction of carbon oxidized were used.	
RESPONSIBILITY: Iva Švedek EKONERG Ltd. address: Koranska 5, 10000 Zagreb tel.: +385 1 6000 111/214 fax.: +385 1 6171 560 e-mail: iva.svedek@ekonerg.hr	

Annex 5-2: GHG emission trend

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

Croatia	CO_2	CH_4		N_2O		HFC,PFC,SF_6	Total	Share
Base year	Gg	Gg	Gg CO_2eq	Gg	Gg CO_2eq	Gg CO_2eq	Gg CO_2eq	%
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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1990
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	16617.86	4822.76	2573.02	NO	1117.28	11.06	NO	NO	25141.98
1. Energy	20362.90	933.35	216.33						21512.57
A. Fuel combustion (sectoral approach)	19780.38	463.94	215.71						20460.03
1. Energy industries	7065.79	6.08	15.48						7087.34
2. Manufacturing industries and construction	5208.58	10.35	14.89						5233.83
3. Transport	3787.06	46.93	59.64						3893.62
4. Other sectors	3718.95	400.59	125.70						4245.24
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	582.52	469.41	0.62						1052.54
1. Solid fuels	NO	66.80	NO,NA						66.80
2. Oil and natural gas	582.52	402.61	0.62						985.74
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2561.23	10.47	703.39	NO	1117.28	11.06	NO	NO	4403.43
A. Mineral industry	1297.56								1297.56
B. Chemical industry	751.10	6.10	670.74	NO	NO	NO	NO	NO	1427.94
C. Metal industry	336.40	4.37	NO	NO	1117.28	NO	NO	NO	1458.05
D. Non-energy products from fuels and solvent use	176.17	NA	NA						176.17
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.06	NO	NO	43.70
H. Other	NA	NA	NA						NA
3. Agriculture	50.02	2827.94	1546.38						4424.34
A. Enteric fermentation		2336.03							2336.03
B. Manure management		491.91	284.43						776.33
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1261.96						1261.96
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.02								50.02
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6356.83	1.38	43.25						-6312.20
A. Forest land	-6458.67	1.26	1.14						-6456.27
B. Cropland	114.91	NO	3.52						118.42
C. Grassland	-7.88	0.12	0.11						-7.66
D. Wetlands	77.23	NO	9.88						87.11
E. Settlements	235.44	NO	28.61						264.05
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-317.85								-317.85
H. Other	NO	NO	NO						NO
5. Waste	0.54	1049.63	63.68						1113.84
A. Solid waste disposal	NA,NO	370.89							370.89
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	19.20	4.20						23.94
D. Waste water treatment and discharge		659.54	59.48						719.02
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	643.85	0.48	4.71						649.03
Aviation	496.62	0.10	3.68						500.39
Navigation	147.23	0.38	1.03						148.64
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5237.84								5237.84
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	217.52								217.52
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									31454.18
Total CO_2 equivalent emissions with land use, land-use change and forestry									25141.98
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1991
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	9455.03	4665.10	2437.57	NO	766.41	10.93	NO	NO	17335.04
1. Energy	15017.89	878.17	184.94						16081.00
A. Fuel combustion (sectoral approach)	14440.98	495.87	184.49						15121.34
1. Energy industries	4742.10	4.45	10.66						4757.22
2. Manufacturing industries and construction	3769.57	7.71	10.85						3788.13
3. Transport	2866.99	35.55	46.88						2949.42
4. Other sectors	3062.32	448.16	116.09						3626.57
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	576.92	382.30	0.45						959.66
1. Solid fuels	NO	59.53	NO,NA						59.53
2. Oil and natural gas	576.92	322.77	0.45						900.13
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1915.88	9.79	622.03	NO	766.41	10.93	NO	NO	3325.05
A. Mineral industry	860.77								860.77
B. Chemical industry	665.95	5.62	589.39	NO	NO	NO	NO	NO	1260.95
C. Metal industry	270.10	4.18	NO	NO	766.41	NO	NO	NO	1040.68
D. Non-energy products from fuels and solvent use	119.06	NA	NA						119.06
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	10.93	NO	NO	43.58
H. Other	NA	NA	NA						NA
3. Agriculture	50.95	2708.70	1526.91						4286.56
A. Enteric fermentation		2207.56							2207.56
B. Manure management		501.14	273.86						775.00
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1253.04						1253.04
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.95								50.95
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7530.22	3.56	43.46						-7483.19
A. Forest land	-8118.98	3.37	2.25						-8113.36
B. Cropland	127.70	NO	3.87						131.58
C. Grassland	3.98	0.20	0.17						4.35
D. Wetlands	67.51	NO	9.45						76.96
E. Settlements	213.33	NO	27.72						241.05
F. Other land	NO	NO	NO						NO
G. Harvested wood products	176.24								176.24
H. Other	NO	NO	NO						NO
5. Waste	0.54	1064.86	60.23						1125.63
A. Solid waste disposal	NA,NO	392.07							392.07
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	18.14	3.97						22.64
D. Waste water treatment and discharge		654.66	56.26						710.92
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	94.29	0.02	0.70						95.01
Aviation	94.29	0.02	0.70						95.01
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6091.91								6091.91
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	226.95								226.95
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24818.23
Total CO_2 equivalent emissions with land use, land-use change and forestry									17335.04
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1992
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2[(1)]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[(1)]	8719.98	4163.80	2455.51	NO	NO	11.02	NO	NO	15350.31
1. Energy	14347.02	917.71	166.16						15430.89
A. Fuel combustion (sectoral approach)	13759.23	422.74	165.75						14347.72
1. Energy industries	5342.75	5.05	13.58						5361.38
2. Manufacturing industries and construction	3079.37	6.08	8.53						3093.98
3. Transport	2776.79	31.53	40.39						2848.71
4. Other sectors	2560.33	380.07	103.26						3043.65
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	587.79	494.97	0.41						1083.17
1. Solid fuels	NO	46.25	NO,NA						46.25
2. Oil and natural gas	587.79	448.72	0.41						1036.91
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1956.15	8.48	802.06	NO	NO	11.02	NO	NO	2777.71
A. Mineral industry	930.52								930.52
B. Chemical industry	832.68	5.74	769.41	NO	NO	NO	NO	NO	1607.83
C. Metal industry	121.11	2.74	NO	NO	NO	NO	NO	NO	123.85
D. Non-energy products from fuels and solvent use	71.85	NA	NA						71.85
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.02	NO	NO	43.67
H. Other	NA	NA	NA						NA
3. Agriculture	65.51	2143.60	1377.63						3586.74
A. Enteric fermentation		1742.71							1742.71
B. Manure management		400.88	214.32						615.21
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1163.31						1163.31
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	65.51								65.51
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[(1)]	-7649.24	16.97	50.02						-7582.26
A. Forest land	-8302.72	15.28	8.48						-8278.96
B. Cropland	129.64	NO	4.23						133.87
C. Grassland	-0.24	1.69	1.46						2.91
D. Wetlands	64.47	NO	9.02						73.49
E. Settlements	206.78	NO	26.83						233.61
F. Other land	NO	NO	NO						NO
G. Harvested wood products	252.83								252.83
H. Other	NO	NO	NO						NO
5. Waste	0.54	1077.04	59.64						1137.22
A. Solid waste disposal	NA,NO	412.15							412.15
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	13.91	3.05						17.49
D. Waste water treatment and discharge		650.98	56.60						707.57
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[(2)]									
International bunkers	72.29	0.01	0.54						72.84
Aviation	72.29	0.01	0.54						72.84
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5308.28								5308.28
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	236.43								236.43
Indirect N_2O			NA,NO						
Indirect CO_2 [(3)]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									22932.57
Total CO_2 equivalent emissions with land use, land-use change and forestry									15350.31
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1993
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	8959.03	4100.71	2111.01	NO	NO	11.14	NO	NO	15181.90
1. Energy	15117.22	804.95	173.66						16095.83
A. Fuel combustion (sectoral approach)	14330.95	441.65	173.26						14945.86
1. Energy industries	5940.22	5.48	15.25						5960.95
2. Manufacturing industries and construction	2917.23	5.75	8.03						2931.01
3. Transport	2925.16	31.46	42.86						2999.49
4. Other sectors	2548.34	398.96	107.12						3054.42
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	786.27	363.30	0.41						1149.97
1. Solid fuels	NO	44.27	NO,NA						44.27
2. Oil and natural gas	786.27	319.03	0.41						1105.71
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1636.57	7.00	612.64	NO	NO	11.14	NO	NO	2267.34
A. Mineral industry	794.62								794.62
B. Chemical industry	715.96	5.77	579.99	NO	NO	NO	NO	NO	1301.72
C. Metal industry	57.46	1.23	NO	NO	NO	NO	NO	NO	58.69
D. Non-energy products from fuels and solvent use	68.52	NA	NA						68.52
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.14	NO	NO	43.79
H. Other	NA	NA	NA						NA
3. Agriculture	52.14	2156.92	1204.62						3413.68
A. Enteric fermentation		1733.21							1733.21
B. Manure management		423.71	212.46						636.17
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	992.16						992.16
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	52.14								52.14
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7847.43	38.52	60.38						-7748.53
A. Forest land	-8303.76	36.75	19.74						-8247.28
B. Cropland	131.57	NO	4.59						136.16
C. Grassland	-3.30	1.77	1.53						0.00
D. Wetlands	61.43	NO	8.58						70.01
E. Settlements	200.23	NO	25.94						226.17
F. Other land	NO	NO	NO						NO
G. Harvested wood products	66.40								66.40
H. Other	NO	NO	NO						NO
5. Waste	0.54	1093.33	59.71						1153.57
A. Solid waste disposal	NA,NO	431.60							431.60
B. Biological treatment of solid waste		NO,IE	NO,IE						NO,IE
C. Incineration and open burning of waste	0.54	13.37	2.93						16.83
D. Waste water treatment and discharge		648.36	56.79						705.14
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	182.30	0.04	1.35						183.69
Aviation	182.30	0.04	1.35						183.69
Navigation	NO	NO	NO						NO
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5583.98								5583.98
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	245.97								245.97
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									22930.42
Total CO_2 equivalent emissions with land use, land-use change and forestry									15181.90
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1994
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	7973.50	3874.19	2137.67	NO	NO	11.96	NO	NO	13997.31
1. Energy	14179.93	732.95	169.03						15081.90
A. Fuel combustion (sectoral approach)	13474.85	404.14	168.66						14047.65
1. Energy industries	4658.42	3.69	10.74						4672.85
2. Manufacturing industries and construction	3077.51	5.33	7.53						3090.37
3. Transport	3102.93	34.24	44.99						3182.16
4. Other sectors	2635.99	360.89	105.40						3102.27
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	705.07	328.81	0.37						1034.25
1. Solid fuels	NO	39.69	NO,NA						39.69
2. Oil and natural gas	705.07	289.12	0.37						994.56
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1821.77	7.31	660.70	NO	NO	11.96	NO	NO	2501.74
A. Mineral industry	953.71								953.71
B. Chemical industry	715.58	5.48	628.05	NO	NO	NO	NO	NO	1349.12
C. Metal industry	81.17	1.83	NO	NO	NO	NO	NO	NO	83.00
D. Non-energy products from fuels and solvent use	71.31	NA	NA						71.31
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				NO	NO	NO	NO	NO	NO
G. Other product manufacture and use	NO	NO	32.65	NO	NO	11.96	NO	NO	44.60
H. Other	NA	NA	NA						NA
3. Agriculture	47.57	2005.42	1200.16						3253.16
A. Enteric fermentation		1576.63							1576.63
B. Manure management		428.79	204.08						632.87
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	996.08						996.08
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	47.57								47.57
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8076.31	12.89	45.71						-8017.71
A. Forest land	-8408.52	11.96	6.77						-8389.79
B. Cropland	133.50	NO	4.94						138.45
C. Grassland	-7.89	0.92	0.80						-6.18
D. Wetlands	58.39	NO	8.15						66.54
E. Settlements	193.71	NO	25.05						218.76
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-45.49								-45.49
H. Other	NO	NO	NO						NO
5. Waste	0.54	1115.62	62.07						1178.23
A. Solid waste disposal	NA,NO	451.90							451.90
B. Biological treatment of solid waste		0.52	0.29						0.81
C. Incineration and open burning of waste	0.54	12.56	2.75						15.85
D. Waste water treatment and discharge		650.64	59.03						709.67
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	403.81	0.41	2.93						407.15
Aviation	264.02	0.05	1.96						266.03
Navigation	139.78	0.36	0.97						141.11
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	4999.29								4999.29
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	255.69								255.69
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									22015.02
Total CO_2 equivalent emissions with land use, land-use change and forestry									13997.31
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1995
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	8260.25	3823.27	2064.10	21.66	NO	12.45	NO	NO	14181.73
1. Energy	15121.53	750.90	160.80						16033.23
A. Fuel combustion (sectoral approach)	14285.75	426.33	160.44						14872.52
1. Energy industries	5261.60	4.54	11.00						5277.14
2. Manufacturing industries and construction	2874.38	5.25	7.43						2887.07
3. Transport	3292.91	35.72	40.64						3369.26
4. Other sectors	2856.86	380.82	101.37						3339.05
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	835.78	324.57	0.36						1160.71
1. Solid fuels	NO	31.61	NO,NA						31.61
2. Oil and natural gas	835.78	292.96	0.36						1129.09
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1647.34	6.55	635.45	21.66	NO	12.45	NO	NO	2323.46
A. Mineral industry	739.76								739.76
B. Chemical industry	756.00	5.67	602.81	NO	NO	NO	NO	NO	1364.48
C. Metal industry	40.32	0.88	NO	NO	NO	NO	NO	NO	41.19
D. Non-energy products from fuels and solvent use	111.27	NA	NA						111.27
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				21.66	NO	NO	NO	NO	21.66
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.45	NO	NO	45.09
H. Other	NA	NA	NA						NA
3. Agriculture	46.29	1927.22	1158.53						3132.04
A. Enteric fermentation		1516.84							1516.84
B. Manure management		410.38	190.45						600.83
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	968.07						968.07
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	46.29								46.29
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8555.46	8.45	42.31						-8504.70
A. Forest land	-8866.34	7.87	4.64						-8853.83
B. Cropland	135.43	NO	5.30						140.74
C. Grassland	-11.98	0.58	0.50						-10.90
D. Wetlands	55.34	NO	7.72						63.06
E. Settlements	187.18	NO	24.16						211.33
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-55.09								-55.09
H. Other	NO	NO	NO						NO
5. Waste	0.54	1130.15	67.01						1197.69
A. Solid waste disposal	NA,NO	474.01							474.01
B. Biological treatment of solid waste		0.55	0.31						0.86
C. Incineration and open burning of waste	0.54	11.99	2.62						15.15
D. Waste water treatment and discharge		643.61	64.07						707.68
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	348.25	0.31	2.54						351.10
Aviation	245.16	0.05	1.82						247.03
Navigation	103.08	0.27	0.72						104.07
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5288.54								5288.54
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	265.62								265.62
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									22686.43
Total CO_2 equivalent emissions with land use, land-use change and forestry									14181.73
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1996
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	9128.12	3795.14	2069.04	24.78	NO	12.90	NO	NO	15029.98
1. Energy	15640.05	787.01	205.71						16632.78
A. Fuel combustion (sectoral approach)	14829.75	474.46	205.37						15509.58
1. Energy industries	5085.53	4.56	11.51						5101.60
2. Manufacturing industries and construction	2866.98	5.16	7.28						2879.41
3. Transport	3620.22	38.64	65.84						3724.70
4. Other sectors	3257.02	426.10	120.74						3803.86
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	810.30	312.55	0.35						1123.20
1. Solid fuels	NO	25.50	NO,NA						25.50
2. Oil and natural gas	810.30	287.05	0.35						1097.70
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1650.65	5.80	594.42	24.78	NO	12.90	NO	NO	2288.55
A. Mineral industry	826.77								826.77
B. Chemical industry	701.63	5.44	561.78	NO	NO	NO	NO	NO	1268.84
C. Metal industry	19.17	0.35	NO	NO	NO	NO	NO	NO	19.53
D. Non-energy products from fuels and solvent use	103.08	NA	NA						103.08
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				24.78	NO	NO	NO	NO	24.78
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.90	NO	NO	45.54
H. Other	NA	NA	NA						NA
3. Agriculture	52.44	1838.98	1157.86						3049.29
A. Enteric fermentation		1428.37							1428.37
B. Manure management		410.61	180.35						590.96
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	977.51						977.51
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	52.44								52.44
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8215.55	18.52	46.97						-8150.07
A. Forest land	-8557.93	16.96	9.41						-8531.56
B. Cropland	137.37	NO	5.66						143.03
C. Grassland	-15.71	1.55	1.34						-12.81
D. Wetlands	52.30	NO	7.29						59.59
E. Settlements	180.69	NO	23.27						203.95
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-12.27								-12.27
H. Other	NO	NO	NO						NO
5. Waste	0.54	1144.83	64.07						1209.44
A. Solid waste disposal	NA,NO	500.17							500.17
B. Biological treatment of solid waste		0.58	0.33						0.90
C. Incineration and open burning of waste	0.54	11.92	2.61						15.06
D. Waste water treatment and discharge		632.17	61.14						693.30
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	339.28	0.34	2.46						342.09
Aviation	223.16	0.04	1.65						224.86
Navigation	116.12	0.30	0.81						117.23
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5877.64								5877.64
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	275.65								275.65
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									23180.05
Total CO_2 equivalent emissions with land use, land-use change and forestry									15029.98
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1997
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	10948.42	3769.75	2241.61	29.00	NO	12.52	NO	NO	17001.31
1. Energy	16674.29	750.32	203.84						17628.44
A. Fuel combustion (sectoral approach)	15911.94	444.29	203.49						16559.72
1. Energy industries	5557.16	5.00	13.43						5575.58
2. Manufacturing industries and construction	3080.25	5.82	8.16						3094.23
3. Transport	3966.11	41.01	76.44						4083.55
4. Other sectors	3308.41	392.47	105.47						3806.35
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.35	306.03	0.35						1068.73
1. Solid fuels	NO	18.65	NO,NA						18.65
2. Oil and natural gas	762.35	287.37	0.35						1050.07
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1812.03	6.17	624.06	29.00	NO	12.52	NO	NO	2483.78
A. Mineral industry	948.72								948.72
B. Chemical industry	743.07	5.34	591.42	NO	NO	NO	NO	NO	1339.83
C. Metal industry	40.82	0.83	NO	NO	NO	NO	NO	NO	41.65
D. Non-energy products from fuels and solvent use	79.41	NA	NA						79.41
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				29.00	NO	NO	NO	NO	29.00
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.52	NO	NO	45.17
H. Other	NA	NA	NA						NA
3. Agriculture	68.39	1817.88	1302.59						3188.85
A. Enteric fermentation		1402.54							1402.54
B. Manure management		415.34	176.66						592.00
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1125.92						1125.92
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	68.39								68.39
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7608.11	19.74	46.62						-7541.74
A. Forest land	-8068.99	18.23	10.07						-8040.69
B. Cropland	139.30	NO	6.01						145.31
C. Grassland	-20.57	1.51	1.31						-17.74
D. Wetlands	49.26	NO	6.86						56.11
E. Settlements	172.93	NO	22.37						195.30
F. Other land	NO	NO	NO						NO
G. Harvested wood products	119.97								119.97
H. Other	NO	NO	NO						NO
5. Waste	1.82	1175.65	64.50						1241.97
A. Solid waste disposal	NA,NO	528.68							528.68
B. Biological treatment of solid waste		0.61	0.34						0.95
C. Incineration and open burning of waste	1.82	11.47	2.53						15.82
D. Waste water treatment and discharge		634.89	61.62						696.51
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	310.14	0.24	2.26						312.64
Aviation	235.74	0.05	1.75						237.53
Navigation	74.41	0.19	0.52						75.12
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5526.07								5526.07
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	285.86								285.86
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24543.05
Total CO_2 equivalent emissions with land use, land-use change and forestry									17001.31
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1998
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2[(1)]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[(1)]	11548.81	3776.96	1945.37	34.81	NO	13.40	NO	NO	17319.36
1. Energy	17247.97	736.86	188.68						18173.50
A. Fuel combustion (sectoral approach)	16570.51	448.41	188.36						17207.28
1. Energy industries	6238.88	5.83	14.98						6259.68
2. Manufacturing industries and construction	3065.07	5.60	7.94						3078.60
3. Transport	4098.78	41.96	54.19						4194.93
4. Other sectors	3167.79	395.02	111.25						3674.06
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	677.45	288.45	0.33						966.23
1. Solid fuels	NO	19.54	NO,NA						19.54
2. Oil and natural gas	677.45	268.91	0.33						946.69
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1715.25	5.48	477.89	34.81	NO	13.40	NO	NO	2246.83
A. Mineral industry	1014.42								1014.42
B. Chemical industry	592.72	5.05	445.24	NO	NO	NO	NO	NO	1043.01
C. Metal industry	29.65	0.42	NO	NO	NO	NO	NO	NO	30.08
D. Non-energy products from fuels and solvent use	78.46	NA	NA						78.46
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				34.81	NO	NO	NO	NO	34.81
G. Other product manufacture and use	NO	NO	32.65	NO	NO	13.40	NO	NO	46.05
H. Other	NA	NA	NA						NA
3. Agriculture	44.25	1787.45	1152.71						2984.41
A. Enteric fermentation		1368.17							1368.17
B. Manure management		419.28	170.83						590.11
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	981.88						981.88
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	44.25								44.25
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[(1)]	-7462.36	50.53	63.28						-7348.55
A. Forest land	-7797.78	44.61	23.89						-7729.28
B. Cropland	141.23	NO	6.37						147.60
C. Grassland	-24.06	5.92	5.12						-13.03
D. Wetlands	46.21	NO	6.42						52.64
E. Settlements	168.37	NO	21.47						189.84
F. Other land	NO	NO	NO						NO
G. Harvested wood products	3.68								3.68
H. Other	NO	NO	NO						NO
5. Waste	3.70	1196.65	62.82						1263.17
A. Solid waste disposal	NA,NO	560.67							560.67
B. Biological treatment of solid waste		0.64	0.36						1.00
C. Incineration and open burning of waste	3.70	11.34	2.53						17.57
D. Waste water treatment and discharge		624.01	59.92						683.93
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[(2)]									
International bunkers	336.44	0.26	2.46						339.16
Aviation	254.59	0.05	1.89						256.53
Navigation	81.85	0.21	0.57						82.63
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5535.75								5535.75
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	296.18								296.18
Indirect N_2O			NA,NO						
Indirect CO_2 [(3)]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24667.91
Total CO_2 equivalent emissions with land use, land-use change and forestry									17319.36
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1999
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	11834.72	3793.75	2128.27	42.05	NO	13.35	NO	NO	17812.14
1. Energy	17896.52	710.52	240.54						18847.58
A. Fuel combustion (sectoral approach)	17234.65	442.49	240.24						17917.38
1. Energy industries	6459.12	6.13	15.48						6480.73
2. Manufacturing industries and construction	2867.36	4.68	6.68						2878.73
3. Transport	4329.18	42.68	97.82						4469.68
4. Other sectors	3578.99	389.01	120.25						4088.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	661.86	268.03	0.30						930.19
1. Solid fuels	NO	5.88	NO,NA						5.88
2. Oil and natural gas	661.86	262.14	0.30						924.31
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2070.99	5.54	557.50	42.05	NO	13.35	NO	NO	2689.43
A. Mineral industry	1268.53								1268.53
B. Chemical industry	701.41	5.06	524.85	NO	NO	NO	NO	NO	1231.33
C. Metal industry	27.67	0.48	NO	NO	NO	NO	NO	NO	28.15
D. Non-energy products from fuels and solvent use	73.38	NA	NA						73.38
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				42.05	NO	NO	NO	NO	42.05
G. Other product manufacture and use	NO	NO	32.65	NO	NO	13.35	NO	NO	46.00
H. Other	NA	NA	NA						NA
3. Agriculture	50.49	1836.31	1225.03						3111.83
A. Enteric fermentation		1375.91							1375.91
B. Manure management		460.40	178.69						639.09
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1046.34						1046.34
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	50.49								50.49
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8187.65	6.62	37.96						-8143.07
A. Forest land	-8450.14	4.77	3.06						-8442.32
B. Cropland	143.17	NO	6.73						149.89
C. Grassland	-27.56	1.85	1.60						-24.11
D. Wetlands	43.17	NO	5.99						49.16
E. Settlements	161.98	NO	20.58						182.56
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-58.26								-58.26
H. Other	NO	NO	NO						NO
5. Waste	4.38	1234.76	67.24						1306.37
A. Solid waste disposal	NA,NO	593.83							593.83
B. Biological treatment of solid waste		0.67	0.38						1.05
C. Incineration and open burning of waste	4.38	10.44	2.35						17.17
D. Waste water treatment and discharge		629.82	64.51						694.33
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	311.54	0.22	2.28						314.04
Aviation	245.16	0.05	1.82						247.03
Navigation	66.37	0.17	0.47						67.01
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5328.01								5328.01
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	306.85								306.85
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									25955.21
Total CO_2 equivalent emissions with land use, land-use change and forestry									17812.14
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2000
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	12762.59	3843.46	2288.69	50.76	NO	12.72	NO	NO	18958.22
1. Energy	17356.75	654.51	245.88						18257.15
A. Fuel combustion (sectoral approach)	16645.33	396.59	245.59						17287.52
1. Energy industries	5810.87	4.42	16.53						5831.82
2. Manufacturing industries and construction	3061.67	5.01	7.21						3073.89
3. Transport	4354.38	41.18	99.28						4494.84
4. Other sectors	3418.41	345.98	122.57						3886.96
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	711.42	257.92	0.29						969.63
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	711.42	257.92	0.29						969.63
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2236.24	3.81	649.74	50.76	NO	12.72	NO	NO	2953.27
A. Mineral industry	1426.45								1426.45
B. Chemical industry	704.40	3.27	617.10	NO	NO	NO	NO	NO	1324.76
C. Metal industry	29.68	0.54	NO	NO	NO	NO	NO	NO	30.22
D. Non-energy products from fuels and solvent use	75.71	NA	NA						75.71
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				50.76	NO	NO	NO	NO	50.76
G. Other product manufacture and use	NO	NO	32.65	NO	NO	12.72	NO	NO	45.36
H. Other	NA	NA	NA						NA
3. Agriculture	60.87	1798.12	1234.21						3093.20
A. Enteric fermentation		1349.71							1349.71
B. Manure management		448.41	169.57						617.97
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1064.64						1064.64
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	60.87								60.87
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6897.42	108.54	93.45						-6695.43
A. Forest land	-7138.64	97.56	51.65						-6989.43
B. Cropland	145.10	NO	7.09						152.18
C. Grassland	-32.63	10.98	9.48						-12.17
D. Wetlands	40.13	NO	5.56						45.69
E. Settlements	158.28	NO	19.67						177.96
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-69.66								-69.66
H. Other	NO	NO	NO						NO
5. Waste	6.15	1278.48	65.40						1350.03
A. Solid waste disposal	NA,NO	631.87							631.87
B. Biological treatment of solid waste		0.76	0.43						1.19
C. Incineration and open burning of waste	6.15	9.44	2.16						17.75
D. Waste water treatment and discharge		636.41	62.81						699.22
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	258.78	0.19	1.89						260.86
Aviation	201.16	0.04	1.49						202.69
Navigation	57.62	0.15	0.40						58.17
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	4771.83								4771.83
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	318.38								318.38
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									25653.65
Total CO_2 equivalent emissions with land use, land-use change and forestry									18958.22
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2001
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	12769.53	3842.35	2212.83	62.00	NO	12.81	NO	NO	18899.52
1. Energy	18358.84	698.20	238.26						19295.29
A. Fuel combustion (sectoral approach)	17596.69	424.47	237.99						18259.15
1. Energy industries	6343.85	5.00	18.64						6367.49
2. Manufacturing industries and construction	3196.99	4.92	7.17						3209.07
3. Transport	4420.07	35.16	89.81						4545.04
4. Other sectors	3635.78	379.40	122.38						4137.55
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	762.15	273.72	0.27						1036.15
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	762.15	273.72	0.27						1036.15
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2324.68	3.94	549.69	62.00	NO	12.81	NO	NO	2953.11
A. Mineral industry	1644.58								1644.58
B. Chemical industry	595.81	3.92	517.91	NO	NO	NO	NO	NO	1117.64
C. Metal industry	7.15	0.02	NO	NO	NO	NO	NO	NO	7.18
D. Non-energy products from fuels and solvent use	77.15	NA	NA						77.15
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				62.00	NO	NO	NO	NO	62.00
G. Other product manufacture and use	NO	NO	31.77	NO	NO	12.81	NO	NO	44.58
H. Other	NA	NA	NA						NA
3. Agriculture	92.09	1828.72	1305.92						3226.74
A. Enteric fermentation		1363.14							1363.14
B. Manure management		465.58	169.36						634.94
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1136.56						1136.56
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	92.09								92.09
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8012.77	21.28	50.32						-7941.17
A. Forest land	-8161.55	17.94	9.97						-8133.63
B. Cropland	147.03	NO	7.44						154.47
C. Grassland	-26.55	3.33	2.88						-20.34
D. Wetlands	36.36	NO	5.10						41.45
E. Settlements	298.06	NO	24.93						322.99
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-306.12								-306.12
H. Other	NO	NO	NO						NO
5. Waste	6.68	1290.21	68.65						1365.55
A. Solid waste disposal	NA,NO	669.68							669.68
B. Biological treatment of solid waste		0.61	0.35						0.96
C. Incineration and open burning of waste	6.68	9.21	2.12						18.01
D. Waste water treatment and discharge		610.71	66.19						676.90
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	291.47	0.27	2.12						293.86
Aviation	201.16	0.04	1.49						202.69
Navigation	90.31	0.23	0.63						91.17
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5187.98								5187.98
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	330.39								330.39
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									26840.69
Total CO_2 equivalent emissions with land use, land-use change and forestry									18899.52
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2002
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	13610.19	3841.11	2137.19	82.58	NO	13.15	NO	NO	19684.21
1. Energy	19511.40	687.64	202.94						20401.98
A. Fuel combustion (sectoral approach)	18735.04	408.64	202.67						19346.35
1. Energy industries	7225.52	5.48	22.16						7253.16
2. Manufacturing industries and construction	3057.13	4.84	7.05						3069.02
3. Transport	4729.32	34.18	58.32						4821.81
4. Other sectors	3723.08	364.14	115.14						4202.36
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	776.36	279.00	0.27						1055.63
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	776.36	279.00	0.27						1055.63
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2291.36	3.67	534.85	82.58	NO	13.15	NO	NO	2925.60
A. Mineral industry	1645.41								1645.41
B. Chemical industry	550.89	3.66	503.95	NO	NO	NO	NO	NO	1058.50
C. Metal industry	4.72	0.01	NO	NO	NO	NO	NO	NO	4.73
D. Non-energy products from fuels and solvent use	90.34	NA	NA						90.34
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				82.58	NO	NO	NO	NO	82.58
G. Other product manufacture and use	NO	NO	30.90	NO	NO	13.15	NO	NO	44.05
H. Other	NA	NA	NA						NA
3. Agriculture	80.76	1811.77	1279.90						3172.42
A. Enteric fermentation		1332.32							1332.32
B. Manure management		479.44	167.79						647.23
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1112.11						1112.11
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	80.76								80.76
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8277.11	7.16	47.27						-8222.68
A. Forest land	-8460.49	6.29	3.88						-8450.32
B. Cropland	148.96	NO	7.80						156.76
C. Grassland	-37.52	0.87	0.75						-35.89
D. Wetlands	33.09	NO	4.63						37.72
E. Settlements	341.18	NO	30.20						371.38
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-302.33								-302.33
H. Other	NO	NO	NO						NO
5. Waste	3.78	1330.87	72.23						1406.89
A. Solid waste disposal	NA,NO	713.17							713.17
B. Biological treatment of solid waste		0.82	0.46						1.28
C. Incineration and open burning of waste	3.78	9.02	2.03						14.83
D. Waste water treatment and discharge		607.86	69.74						677.60
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	262.60	0.23	1.92						264.74
Aviation	188.59	0.04	1.40						190.02
Navigation	74.01	0.19	0.52						74.72
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	4975.57								4975.57
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	342.82								342.82
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									27906.89
Total CO_2 equivalent emissions with land use, land-use change and forestry									19684.21
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2003
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2[(1)]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[(1)]	15696.47	4070.80	2080.44	108.85	NO	13.50	NO	NO	21970.06
1. Energy	20816.14	744.26	215.95						21776.35
A. Fuel combustion (sectoral approach)	20087.34	464.10	215.69						20767.13
1. Energy industries	7871.16	6.53	23.03						7900.71
2. Manufacturing industries and construction	3136.78	5.53	7.94						3150.25
3. Transport	5126.76	33.12	60.45						5220.33
4. Other sectors	3952.65	418.92	124.27						4495.84
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	728.80	280.16	0.26						1009.22
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	728.80	280.16	0.26						1009.22
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2324.39	3.49	506.57	108.85	NO	13.50	NO	NO	2956.80
A. Mineral industry	1652.12								1652.12
B. Chemical industry	574.42	3.47	476.55	NO	NO	NO	NO	NO	1054.44
C. Metal industry	6.62	0.02	NO	NO	NO	NO	NO	NO	6.64
D. Non-energy products from fuels and solvent use	91.23	NA	NA						91.23
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				108.85	NO	NO	NO	NO	108.85
G. Other product manufacture and use	NO	NO	30.02	NO	NO	13.50	NO	NO	43.52
H. Other	NA	NA	NA						NA
3. Agriculture	71.79	1905.72	1213.41						3190.91
A. Enteric fermentation		1390.19							1390.19
B. Manure management		515.53	171.77						687.30
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1041.63						1041.63
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	71.79								71.79
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[(1)]	-7516.66	44.30	72.98						-7399.38
A. Forest land	-7838.32	40.26	21.68						-7776.37
B. Cropland	150.90	NO	8.16						159.05
C. Grassland	-49.14	4.04	3.49						-41.62
D. Wetlands	29.82	NO	4.17						33.98
E. Settlements	380.90	NO	35.49						416.39
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-190.82								-190.82
H. Other	NO	NO	NO						NO
5. Waste	0.80	1373.04	71.54						1445.38
A. Solid waste disposal	NA,NO	761.98							761.98
B. Biological treatment of solid waste		0.58	0.33						0.92
C. Incineration and open burning of waste	0.80	8.78	1.93						11.51
D. Waste water treatment and discharge		601.69	69.28						670.97
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[(2)]									
International bunkers	251.70	0.21	1.83						253.74
Aviation	182.30	0.04	1.35						183.69
Navigation	69.39	0.18	0.48						70.05
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5755.73								5755.73
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	355.64								355.64
Indirect N_2O			NA,NO						
Indirect CO_2 [(3)]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									29369.44
Total CO_2 equivalent emissions with land use, land-use change and forestry									21970.06
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2004
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	15097.55	4144.70	2271.76	130.15	NO	13.95	NO	NO	21658.12
1. Energy	20272.16	729.49	247.61						21249.26
A. Fuel combustion (sectoral approach)	19494.24	451.34	247.36						20192.94
1. Energy industries	6784.01	5.45	20.90						6810.36
2. Manufacturing industries and construction	3583.00	6.71	9.55						3599.25
3. Transport	5262.21	31.06	99.02						5392.29
4. Other sectors	3865.02	408.13	117.89						4391.04
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	777.92	278.15	0.25						1056.32
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	777.92	278.15	0.25						1056.32
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2536.41	4.19	608.48	130.15	NO	13.95	NO	NO	3293.18
A. Mineral industry	1748.15								1748.15
B. Chemical industry	665.57	4.19	579.33	NO	NO	NO	NO	NO	1249.08
C. Metal industry	13.72	NA,NO	NO	NO	NO	NO	NO	NO	13.72
D. Non-energy products from fuels and solvent use	108.97	NA	NA						108.97
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				130.15	NO	NO	NO	NO	130.15
G. Other product manufacture and use	NO	NO	29.15	NO	NO	13.95	NO	NO	43.10
H. Other	NA	NA	NA						NA
3. Agriculture	75.94	1980.02	1288.72						3344.68
A. Enteric fermentation		1431.35							1431.35
B. Manure management		548.67	173.65						722.32
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1115.07						1115.07
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	NO								NO
H. Urea application	75.94								75.94
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7787.31	3.27	55.72						-7728.33
A. Forest land	-8154.54	2.19	1.82						-8150.54
B. Cropland	154.68	NO	8.51						163.19
C. Grassland	-59.71	1.08	0.93						-57.69
D. Wetlands	26.55	NO	3.70						30.25
E. Settlements	426.02	NO	40.75						466.76
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-180.30								-180.30
H. Other	NO	NO	NO						NO
5. Waste	0.35	1427.73	71.24						1499.32
A. Solid waste disposal	NA,NO	809.55							809.55
B. Biological treatment of solid waste		0.69	0.39						1.08
C. Incineration and open burning of waste	0.35	8.81	1.93						11.08
D. Waste water treatment and discharge		608.69	68.92						677.61
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	284.43	0.23	2.07						286.73
Aviation	210.59	0.04	1.56						212.19
Navigation	73.83	0.19	0.51						74.54
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5660.22								5660.22
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	368.82								368.82
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									29386.45
Total CO_2 equivalent emissions with land use, land-use change and forestry									21658.12
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2005
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	15307.27	4158.79	2237.94	189.06	NO	14.70	NO	NO	21907.76
1. Energy	20656.65	750.90	212.00						21619.55
A. Fuel combustion (sectoral approach)	19899.91	472.30	211.76						20583.97
1. Energy industries	6810.03	5.16	20.33						6835.53
2. Manufacturing industries and construction	3724.02	6.06	8.81						3738.89
3. Transport	5467.69	28.51	61.93						5558.12
4. Other sectors	3898.16	432.57	120.69						4451.43
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	756.74	278.60	0.24						1035.58
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	756.74	278.60	0.24						1035.58
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2597.76	4.22	594.51	189.06	NO	14.70	NO	NO	3400.25
A. Mineral industry	1809.90								1809.90
B. Chemical industry	663.60	4.22	566.23	NO	NO	NO	NO	NO	1234.06
C. Metal industry	12.71	NA,NO	NO	NO	NO	NO	NO	NO	12.71
D. Non-energy products from fuels and solvent use	111.55	NA	NA						111.55
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				189.06	NO	NO	NO	NO	189.06
G. Other product manufacture and use	NO	NO	28.28	NO	NO	14.70	NO	NO	42.98
H. Other	NA	NA	NA						NA
3. Agriculture	85.46	1980.23	1296.14						3361.83
A. Enteric fermentation		1458.81							1458.81
B. Manure management		521.42	160.19						681.61
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1135.95						1135.95
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.49								14.49
H. Urea application	70.97								70.97
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-8032.76	3.06	61.02						-7968.68
A. Forest land	-8264.49	2.42	2.35						-8259.72
B. Cropland	156.01	NO	8.87						164.88
C. Grassland	-60.56	0.64	0.55						-59.36
D. Wetlands	23.28	NO	3.24						26.51
E. Settlements	461.72	NO	46.01						507.73
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-348.72								-348.72
H. Other	NO	NO	NO						NO
5. Waste	0.16	1420.37	74.28						1494.82
A. Solid waste disposal	NA,NO	804.98							804.98
B. Biological treatment of solid waste		1.25	0.71						1.96
C. Incineration and open burning of waste	0.16	8.76	1.91						10.83
D. Waste water treatment and discharge		605.39	71.66						677.05
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	337.55	0.26	2.47						340.27
Aviation	257.74	0.05	1.91						259.70
Navigation	79.82	0.21	0.56						80.58
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5908.79								5908.79
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	382.32								382.32
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									29876.44
Total CO_2 equivalent emissions with land use, land-use change and forestry									21907.76
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2006
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	15685.83	4295.28	2257.85	244.72	NO	14.57	NO	NO	22498.24
1. Energy	20732.16	732.83	213.79						21678.77
A. Fuel combustion (sectoral approach)	19966.19	435.66	213.55						20615.39
1. Energy industries	6631.42	5.40	20.06						6656.87
2. Manufacturing industries and construction	3855.12	6.44	9.37						3870.92
3. Transport	5820.94	27.23	66.18						5914.34
4. Other sectors	3658.71	396.60	117.95						4173.25
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	765.97	297.17	0.24						1063.38
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	765.97	297.17	0.24						1063.38
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2733.20	4.10	587.03	244.72	NO	14.57	NO	NO	3583.62
A. Mineral industry	1938.74								1938.74
B. Chemical industry	657.88	4.10	559.63	NO	NO	NO	NO	NO	1221.62
C. Metal industry	13.31	NA,NO	NO	NO	NO	NO	NO	NO	13.31
D. Non-energy products from fuels and solvent use	123.26	NA	NA						123.26
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				244.72	NO	NO	NO	NO	244.72
G. Other product manufacture and use	NO	NO	27.40	NO	NO	14.57	NO	NO	41.97
H. Other	NA	NA	NA						NA
3. Agriculture	80.67	2042.96	1312.15						3435.77
A. Enteric fermentation		1456.68							1456.68
B. Manure management		586.27	165.86						752.14
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1146.28						1146.28
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	17.48								17.48
H. Urea application	63.19								63.19
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7860.94	6.79	68.51						-7785.64
A. Forest land	-8130.59	6.12	4.67						-8119.80
B. Cropland	157.78	NO	9.23						167.00
C. Grassland	-83.61	0.67	0.58						-82.37
D. Wetlands	20.01	NO	2.77						22.78
E. Settlements	498.44	NO	51.27						549.71
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-322.96								-322.96
H. Other	NO	NO	NO						NO
5. Waste	0.74	1508.61	76.36						1585.71
A. Solid waste disposal	NA,NO	888.39							888.39
B. Biological treatment of solid waste		0.97	0.55						1.52
C. Incineration and open burning of waste	0.74	8.99	1.97						11.70
D. Waste water treatment and discharge		610.26	73.84						684.10
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	325.65	0.21	2.39						328.25
Aviation	264.02	0.05	1.96						266.03
Navigation	61.63	0.16	0.43						62.21
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5497.41								5497.41
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	396.21								396.21
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									30283.88
Total CO_2 equivalent emissions with land use, land-use change and forestry									22498.24
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2007
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	18096.16	4327.35	2325.16	321.42	NO	14.59	NO	NO	25084.67
1. Energy	21965.25	729.17	219.88						22914.30
A. Fuel combustion (sectoral approach)	21237.66	420.61	219.65						21877.91
1. Energy industries	7815.15	6.24	24.11						7845.50
2. Manufacturing industries and construction	3853.05	6.50	9.34						3868.89
3. Transport	6242.17	26.27	70.14						6338.58
4. Other sectors	3327.29	381.60	116.06						3824.94
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	727.60	308.56	0.23						1036.39
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	727.60	308.56	0.23						1036.39
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2804.49	3.82	644.01	321.42	NO	14.59	NO	NO	3788.33
A. Mineral industry	1966.71								1966.71
B. Chemical industry	696.32	3.82	617.48	NO	NO	NO	NO	NO	1317.62
C. Metal industry	13.69	NA,NO	NO	NO	NO	NO	NO	NO	13.69
D. Non-energy products from fuels and solvent use	127.77	NA	NA						127.77
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				321.42	NO	NO	NO	NO	321.42
G. Other product manufacture and use	NO	NO	26.53	NO	NO	14.59	NO	NO	41.11
H. Other	NA	NA	NA						NA
3. Agriculture	89.32	1967.76	1291.60						3348.68
A. Enteric fermentation		1400.89							1400.89
B. Manure management		566.87	155.48						722.35
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1136.12						1136.12
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	16.60								16.60
H. Urea application	72.72								72.72
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6763.56	35.58	91.78						-6636.20
A. Forest land	-7294.20	33.14	19.35						-7241.70
B. Cropland	368.82	NO	11.46						380.28
C. Grassland	-101.08	2.43	2.10						-96.54
D. Wetlands	17.54	NO	2.35						19.89
E. Settlements	554.70	NO	56.52						611.22
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-309.35								-309.35
H. Other	NO	NO	NO						NO
5. Waste	0.65	1591.03	77.88						1669.56
A. Solid waste disposal	NA,NO	963.67							963.67
B. Biological treatment of solid waste		1.85	1.05						2.90
C. Incineration and open burning of waste	0.65	9.32	2.04						12.01
D. Waste water treatment and discharge		616.20	74.79						690.99
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	353.05	0.25	2.58						355.87
Aviation	276.60	0.05	2.05						278.70
Navigation	76.45	0.20	0.53						77.17
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5322.60								5322.60
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	410.89								410.89
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									31720.87
Total CO_2 equivalent emissions with land use, land-use change and forestry									25084.67
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2008
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	16658.40	4276.07	2587.83	392.18	NO	13.39	NO	NO	23927.86
1. Energy	20802.16	714.91	216.84						21733.91
A. Fuel combustion (sectoral approach)	20165.34	418.78	216.62						20800.74
1. Energy industries	6771.62	5.37	21.53						6798.52
2. Manufacturing industries and construction	3872.78	6.26	9.05						3888.09
3. Transport	6079.11	24.16	66.08						6169.35
4. Other sectors	3441.83	382.99	119.96						3944.78
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	636.82	296.13	0.22						933.17
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	636.82	296.13	0.22						933.17
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2694.97	3.62	656.84	392.18	NO	13.39	NO	NO	3760.99
A. Mineral industry	1868.34								1868.34
B. Chemical industry	676.64	3.62	631.19	NO	NO	NO	NO	NO	1311.45
C. Metal industry	23.41	NA,NO	NO	NO	NO	NO	NO	NO	23.41
D. Non-energy products from fuels and solvent use	126.57	NA	NA						126.57
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				392.18	NO	NO	NO	NO	392.18
G. Other product manufacture and use	NO	NO	25.65	NO	NO	13.39	NO	NO	39.04
H. Other	NA	NA	NA						NA
3. Agriculture	96.60	1870.77	1548.59						3515.96
A. Enteric fermentation		1347.72							1347.72
B. Manure management		523.05	143.47						666.52
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1405.12						1405.12
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	20.78								20.78
H. Urea application	75.83								75.83
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6936.00	10.73	85.59						-6839.68
A. Forest land	-7476.69	9.68	7.32						-7459.70
B. Cropland	389.41	NO	13.69						403.10
C. Grassland	-131.78	1.05	0.91						-129.81
D. Wetlands	14.53	NO	1.92						16.45
E. Settlements	593.88	NO	61.75						655.63
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-325.34								-325.34
H. Other	NO	NO	NO						NO
5. Waste	0.67	1676.05	79.96						1756.68
A. Solid waste disposal	NA,NO	1054.08							1054.08
B. Biological treatment of solid waste		3.70	2.10						5.81
C. Incineration and open burning of waste	0.67	9.54	2.09						12.30
D. Waste water treatment and discharge		608.73	75.77						684.50
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	384.96	0.23	2.82						388.01
Aviation	317.46	0.06	2.35						319.87
Navigation	67.50	0.17	0.46						68.14
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5298.65								5298.65
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	426.02								426.02
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									30767.54
Total CO_2 equivalent emissions with land use, land-use change and forestry									23927.86
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2009
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	14767.75	4356.03	2029.06	473.67	NO	9.63	NO	NO	21636.14
1. Energy	19642.09	720.06	211.37						20573.52
A. Fuel combustion (sectoral approach)	19068.23	432.82	211.16						19712.21
1. Energy industries	6365.42	5.34	18.68						6389.44
2. Manufacturing industries and construction	3157.36	5.91	8.30						3171.58
3. Transport	6091.06	22.84	65.30						6179.20
4. Other sectors	3454.39	398.72	118.88						3971.99
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	573.86	287.25	0.21						861.32
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	573.86	287.25	0.21						861.32
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2086.10	3.26	551.63	473.67	NO	9.63	NO	NO	3124.27
A. Mineral industry	1455.41								1455.41
B. Chemical industry	529.27	3.26	527.51	NO	NO	NO	NO	NO	1060.04
C. Metal industry	4.84	NA,NO	NO	NO	NO	NO	NO	NO	4.84
D. Non-energy products from fuels and solvent use	96.57	NA	NA						96.57
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				473.67	NO	NO	NO	NO	473.67
G. Other product manufacture and use	NO	NO	24.11	NO	NO	9.63	NO	NO	33.74
H. Other	NA	NA	NA						NA
3. Agriculture	76.96	1896.76	1093.67						3067.39
A. Enteric fermentation		1333.59							1333.59
B. Manure management		563.17	146.82						709.99
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	946.85						946.85
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	11.92								11.92
H. Urea application	65.04								65.04
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-7037.56	5.71	90.35						-6941.50
A. Forest land	-7853.48	5.46	5.72						-7842.30
B. Cropland	429.56	NO	15.92						445.48
C. Grassland	-129.26	0.25	0.21						-128.80
D. Wetlands	11.51	NO	1.49						13.00
E. Settlements	683.09	NO	67.00						750.09
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-178.97								-178.97
H. Other	NO	NO	NO						NO
5. Waste	0.16	1730.25	82.04						1812.45
A. Solid waste disposal	NA,NO	1144.79							1144.79
B. Biological treatment of solid waste		5.10	2.86						7.96
C. Incineration and open burning of waste	0.16	9.51	2.08						11.75
D. Waste water treatment and discharge		570.84	77.11						647.95
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	292.16	0.11	2.15						294.42
Aviation	270.31	0.05	2.00						272.37
Navigation	21.85	0.06	0.15						22.06
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5576.02								5576.02
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	441.50								441.50
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									28577.64
Total CO_2 equivalent emissions with land use, land-use change and forestry									21636.14
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2010
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	14032.47	4421.98	2251.12	567.73	NO	10.13	NO	NO	21283.43
1. Energy	18806.64	748.20	209.87						19764.71
A. Fuel combustion (sectoral approach)	18265.12	460.18	209.67						18934.97
1. Energy industries	5877.34	4.86	19.32						5901.52
2. Manufacturing industries and construction	3015.80	5.84	8.09						3029.72
3. Transport	5865.78	20.53	62.03						5948.34
4. Other sectors	3506.21	428.94	120.24						4055.39
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	541.52	288.02	0.20						829.74
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	541.52	288.02	0.20						829.74
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2123.44	3.05	704.20	567.73	NO	10.13	NO	NO	3408.55
A. Mineral industry	1403.71								1403.71
B. Chemical industry	615.36	3.05	680.28	NO	NO	NO	NO	NO	1298.69
C. Metal industry	14.68	NA,NO	NO	NO	NO	NO	NO	NO	14.68
D. Non-energy products from fuels and solvent use	89.69	NA	NA						89.69
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				567.73	NO	NO	NO	NO	567.73
G. Other product manufacture and use	NO	NO	23.91	NO	NO	10.13	NO	NO	34.05
H. Other	NA	NA	NA						NA
3. Agriculture	88.04	1884.16	1162.85						3135.04
A. Enteric fermentation		1303.76							1303.76
B. Manure management		580.40	141.44						721.84
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1021.41						1021.41
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	21.46								21.46
H. Urea application	66.58								66.58
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6985.70	1.97	96.10						-6887.63
A. Forest land	-7711.87	1.84	4.52						-7705.51
B. Cropland	439.81	NO	18.15						457.97
C. Grassland	-149.40	0.13	0.11						-149.15
D. Wetlands	8.49	NO	1.06						9.56
E. Settlements	676.41	NO	72.25						748.66
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-249.16								-249.16
H. Other	NO	NO	NO						NO
5. Waste	0.05	1784.61	78.11						1862.76
A. Solid waste disposal	NA,NO	1172.26							1172.26
B. Biological treatment of solid waste		4.17	2.26						6.43
C. Incineration and open burning of waste	0.05	9.65	2.11						11.80
D. Waste water treatment and discharge		598.53	73.74						672.27
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:[2]									
International bunkers	315.09	0.11	2.33						317.52
Aviation	295.46	0.06	2.19						297.70
Navigation	19.64	0.05	0.14						19.82
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5940.55								5940.55
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	453.92								453.92
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									28171.06
Total CO_2 equivalent emissions with land use, land-use change and forestry									21283.43
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2011
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	14895.06	4393.83	2321.33	629.73	NO	10.57	NO	NO	22250.53
1. Energy	18595.12	712.95	198.38						19506.45
A. Fuel combustion (sectoral approach)	18036.24	447.37	198.20						18681.81
1. Energy industries	6247.86	5.62	20.45						6273.94
2. Manufacturing industries and construction	2779.55	5.12	7.11						2791.79
3. Transport	5726.93	18.82	51.85						5797.60
4. Other sectors	3281.90	417.81	118.78						3818.48
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	558.89	265.57	0.18						824.64
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	558.89	265.57	0.18						824.64
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1949.82	1.96	693.97	629.73	NO	10.57	NO	NO	3286.06
A. Mineral industry	1255.57								1255.57
B. Chemical industry	593.19	1.96	670.44	NO	NO	NO	NO	NO	1265.59
C. Metal industry	16.64	NA,NO	NO	NO	NO	NO	NO	NO	16.64
D. Non-energy products from fuels and solvent use	84.43	NA	NA						84.43
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				629.73	NO	NO	NO	NO	629.73
G. Other product manufacture and use	NO	NO	23.53	NO	NO	10.57	NO	NO	34.10
H. Other	NA	NA	NA						NA
3. Agriculture	105.18	1837.98	1233.81						3176.97
A. Enteric fermentation		1277.73							1277.73
B. Manure management		560.25	132.32						692.57
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	1101.49						1101.49
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	21.32								21.32
H. Urea application	83.86								83.86
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5755.12	20.86	116.11						-5618.14
A. Forest land	-6518.13	17.02	13.31						-6487.81
B. Cropland	464.84	NO	20.03						484.86
C. Grassland	-160.97	3.84	3.32						-153.80
D. Wetlands	8.52	NO	1.07						9.58
E. Settlements	719.39	NO	78.40						797.79
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-268.76								-268.76
H. Other	NO	NO	NO						NO
5. Waste	0.05	1820.08	79.06						1899.20
A. Solid waste disposal	NA,NO	1210.33							1210.33
B. Biological treatment of solid waste		4.88	2.62						7.50
C. Incineration and open burning of waste	0.05	9.19	2.01						11.25
D. Waste water treatment and discharge		595.68	74.43						670.11
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	387.14	0.25	2.83						390.22
Aviation	311.17	0.06	2.31						313.54
Navigation	75.97	0.19	0.52						76.69
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5834.09								5834.09
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	468.26								468.26
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									27868.67
Total CO_2 equivalent emissions with land use, land-use change and forestry									22250.53
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2012
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	13720.34	4360.53	2137.00	703.06	NO	11.30	NO	NO	20932.23
1. Energy	17224.34	672.52	188.97						18085.82
A. Fuel combustion (sectoral approach)	16751.09	442.06	188.81						17381.97
1. Energy industries	5849.20	5.47	19.37						5874.04
2. Manufacturing industries and construction	2409.07	5.25	7.22						2421.54
3. Transport	5551.16	15.20	48.37						5614.73
4. Other sectors	2941.67	416.14	113.85						3471.65
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	473.24	230.45	0.16						703.85
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	473.24	230.45	0.16						703.85
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1755.60	NO,NE,IE,NA	601.62	703.06	NO	11.30	NO	NO	3071.57
A. Mineral industry	1173.23								1173.23
B. Chemical industry	502.01	NO,NE,IE	580.13	NO	NO	NO	NO	NO	1082.13
C. Metal industry	1.43	NA,NO	NO	NO	NO	NO	NO	NO	1.43
D. Non-energy products from fuels and solvent use	78.92	NA	NA						78.92
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				703.06	NO	NO	NO	NO	703.06
G. Other product manufacture and use	NO	NO	21.50	NO	NO	11.30	NO	NO	32.79
H. Other	NA	NA	NA						NA
3. Agriculture	101.23	1830.57	1129.60						3061.41
A. Enteric fermentation		1283.43							1283.43
B. Manure management		547.14	129.65						676.79
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	999.96						999.96
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.38								14.38
H. Urea application	86.85								86.85
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5360.91	43.55	136.50						-5180.87
A. Forest land	-6098.84	40.42	26.29						-6032.13
B. Cropland	482.88	NO	21.90						504.79
C. Grassland	-190.72	3.13	2.70						-184.89
D. Wetlands	8.55	NO	1.07						9.61
E. Settlements	757.05	NO	84.53						841.58
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-319.83								-319.83
H. Other	NO	NO	NO						NO
5. Waste	0.08	1813.89	80.31						1894.29
A. Solid waste disposal	NA,NO	1243.45							1243.45
B. Biological treatment of solid waste		4.96	2.52						7.48
C. Incineration and open burning of waste	0.08	8.89	1.94						10.91
D. Waste water treatment and discharge		556.59	75.85						632.45
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	342.53	0.10	2.53						345.16
Aviation	330.03	0.06	2.45						332.54
Navigation	12.50	0.03	0.09						12.62
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6011.36								6011.36
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	485.43								485.43
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									26113.10
Total CO_2 equivalent emissions with land use, land-use change and forestry									20932.23
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2013
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	12167.33	4205.27	1593.66	768.70	NO	7.40	NO	NO	18742.36
1. Energy	16492.03	657.46	186.52						17336.01
A. Fuel combustion (sectoral approach)	16039.24	438.25	186.36						16663.85
1. Energy industries	5238.07	4.66	18.60						5261.34
2. Manufacturing industries and construction	2384.92	5.04	7.00						2396.96
3. Transport	5636.55	15.01	48.81						5700.37
4. Other sectors	2779.70	413.54	111.94						3305.18
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	452.80	219.21	0.16						672.16
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	452.80	219.21	0.16						672.16
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1865.50	NO,NE,IE,NA	233.40	768.70	NO	7.40	NO	NO	2875.00
A. Mineral industry	1271.22								1271.22
B. Chemical industry	509.33	NO,NE,IE	213.66	NO	NO	NO	NO	NO	722.99
C. Metal industry	13.93	NA,NO	NO	NO	NO	NO	NO	NO	13.93
D. Non-energy products from fuels and solvent use	71.02	NA	NA						71.02
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				768.70	NO	NO	NO	NO	768.70
G. Other product manufacture and use	NO	NO	19.73	NO	NO	7.40	NO	NO	27.13
H. Other	NA	NA	NA						NA
3. Agriculture	74.61	1748.53	977.74						2800.88
A. Enteric fermentation		1230.76							1230.76
B. Manure management		517.77	121.34						639.11
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	856.40						856.40
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	14.23								14.23
H. Urea application	60.39								60.39
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-6264.87	2.16	114.97						-6147.74
A. Forest land	-6580.82	1.63	7.00						-6572.18
B. Cropland	294.91	NO	21.42						316.32
C. Grassland	-219.29	0.53	0.46						-218.30
D. Wetlands	9.41	NO	1.11						10.52
E. Settlements	657.11	NO	84.98						742.09
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-426.18								-426.18
H. Other	NO	NO	NO						NO
5. Waste	0.04	1797.13	81.04						1878.21
A. Solid waste disposal	NA,NO	1237.95							1237.95
B. Biological treatment of solid waste		5.75	2.80						8.55
C. Incineration and open burning of waste	0.04	8.47	1.85						10.36
D. Waste water treatment and discharge		544.96	76.39						621.35
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	379.01	0.10	2.77						381.88
Aviation	366.52	0.07	2.68						369.27
Navigation	12.50	0.03	0.09						12.62
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5975.40								5975.40
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	503.06								503.06
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24890.09
Total CO_2 equivalent emissions with land use, land-use change and forestry									18742.36
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2014
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2[(1)]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[(1)]	11560.04	4167.59	1561.37	854.20	NO	7.91	NO	NO	18151.10
1. Energy	15620.71	590.98	175.82						16387.51
A. Fuel combustion (sectoral approach)	15179.55	386.31	175.67						15741.52
1. Energy industries	4743.91	3.62	15.96						4763.49
2. Manufacturing industries and construction	2324.33	4.30	6.04						2334.67
3. Transport	5580.73	14.02	48.06						5642.81
4. Other sectors	2530.59	364.36	105.61						3000.56
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	441.16	204.67	0.15						645.99
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	441.16	204.67	0.15						645.99
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1991.34	NO,NE,IE,NA	254.43	854.20	NO	7.91	NO	NO	3107.88
A. Mineral industry	1354.11								1354.11
B. Chemical industry	559.83	NO,NE,IE	236.72	NO	NO	NO	NO	NO	796.55
C. Metal industry	10.11	NA,NO	NO	NO	NO	NO	NO	NO	10.11
D. Non-energy products from fuels and solvent use	67.29	NA	NA						67.29
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				854.20	NO	NO	NO	NO	854.20
G. Other product manufacture and use	NO	NO	17.71	NO	NO	7.91	NO	NO	25.62
H. Other	NA	NA	NA						NA
3. Agriculture	69.47	1731.88	934.83						2736.18
A. Enteric fermentation		1213.29							1213.29
B. Manure management		518.59	123.46						642.05
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	811.37						811.37
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	19.99								19.99
H. Urea application	49.47								49.47
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[(1)]	-6121.53	0.36	115.09						-6006.08
A. Forest land	-6300.42	0.24	7.49						-6292.69
B. Cropland	287.18	0.09	20.97						308.24
C. Grassland	-233.84	0.03	0.02						-233.79
D. Wetlands	9.69	NO	1.15						10.84
E. Settlements	654.47	NO	85.45						739.92
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-538.61								-538.61
H. Other	NO	NO	NO						NO
5. Waste	0.04	1844.37	81.20						1925.61
A. Solid waste disposal	NA,NO	1285.91							1285.91
B. Biological treatment of solid waste		6.05	2.87						8.92
C. Incineration and open burning of waste	0.04	8.50	1.86						10.40
D. Waste water treatment and discharge		543.91	76.47						620.38
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[(2)]									
International bunkers	383.77	0.11	2.80						386.68
Aviation	368.10	0.07	2.69						370.87
Navigation	15.66	0.04	0.11						15.81
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5245.05								5245.05
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	519.02								519.02
Indirect N_2O			NA,NO						
Indirect CO_2 [(3)]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24157.18
Total CO_2 equivalent emissions with land use, land-use change and forestry									18151.10
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2015
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	11985.98	4281.52	1691.29	948.12	NO	5.75	NO	NO	18912.65
1. Energy	15798.65	656.43	185.63						16640.71
A. Fuel combustion (sectoral approach)	15549.11	439.68	185.46						16174.25
1. Energy industries	4718.82	4.63	17.44						4740.89
2. Manufacturing industries and construction	2222.70	3.73	5.32						2231.76
3. Transport	5887.78	13.52	50.01						5951.31
4. Other sectors	2719.81	417.80	112.68						3250.30
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	249.53	216.75	0.17						466.46
1. Solid fuels	NO	NO	NA,NO						NO,NA
2. Oil and natural gas	249.53	216.75	0.17						466.46
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1956.67	NO,NE,IE,NA	294.77	948.12	NO	5.75	NO	NO	3205.31
A. Mineral industry	1306.35								1306.35
B. Chemical industry	572.27	NO,NE,IE	276.87	NO	NO	NO	NO	NO	849.14
C. Metal industry	9.30	NA,NO	NO	NO	NO	NO	NO	NO	9.30
D. Non-energy products from fuels and solvent use	68.74	NA	NA						68.74
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				948.12	NO	NO	NO	NO	948.12
G. Other product manufacture and use	NO	NO	17.90	NO	NO	5.75	NO	NO	23.65
H. Other	NA	NA	NA						NA
3. Agriculture	69.34	1714.43	1003.43						2787.20
A. Enteric fermentation		1193.79							1193.79
B. Manure management		520.64	121.10						641.74
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	882.33						882.33
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	12.09								12.09
H. Urea application	57.25								57.25
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5838.73	15.64	124.69						-5698.40
A. Forest land	-5822.18	11.00	14.12						-5797.06
B. Cropland	337.20	2.89	21.96						362.04
C. Grassland	-269.86	1.75	1.52						-266.59
D. Wetlands	9.98	NO	1.19						11.17
E. Settlements	670.28	NO	85.90						756.18
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-764.15								-764.15
H. Other	NO	NO	NO						NO
5. Waste	0.05	1895.01	82.78						1977.83
A. Solid waste disposal	NA,NO	1337.26							1337.26
B. Biological treatment of solid waste		5.88	2.43						8.31
C. Incineration and open burning of waste	0.05	8.25	1.80						10.10
D. Waste water treatment and discharge		543.62	78.55						622.17
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	365.05	0.10	2.67						367.81
Aviation	354.08	0.07	2.59						356.74
Navigation	10.97	0.03	0.08						11.07
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6006.75								6006.75
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	537.95								537.95
Indirect N_2O			NA,NO						
Indirect CO_2 [3]	NA,NO								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24611.05
Total CO_2 equivalent emissions with land use, land-use change and forestry									18912.65
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2016
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	12268.69	4294.30	1472.07	1083.59	NO	6.80	NO	NO	19125.45
1. Energy	16208.64	647.10	190.80						17046.54
A. Fuel combustion (sectoral approach)	15971.92	428.71	190.61						16591.24
1. Energy industries	4846.79	6.10	20.48						4873.38
2. Manufacturing industries and construction	2228.67	3.24	4.67						2236.57
3. Transport	6106.38	13.47	54.84						6174.69
4. Other sectors	2790.08	405.91	110.62						3306.60
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	236.72	218.39	0.18						455.29
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	236.72	218.39	0.18						455.29
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1824.16	NO,NE,IE,NA	114.55	1083.59	NO	6.80	NO	NO	3029.10
A. Mineral industry	1201.30								1201.30
B. Chemical industry	547.86	NO,NE,IE	97.25	NO	NO	NO	NO	NO	645.11
C. Metal industry	1.05	NO,NA	NO	NO	NO	NO	NO	NO	1.05
D. Non-energy products from fuels and solvent use	73.94	NA	NA						73.94
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1083.59	NO	NO	NO	NO	1083.59
G. Other product manufacture and use	NO	NO	17.30	NO	NO	6.80	NO	NO	24.10
H. Other	NA	NA	NA						NA
3. Agriculture	76.17	1708.60	960.27						2745.03
A. Enteric fermentation		1196.83							1196.83
B. Manure management		511.77	123.32						635.09
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	836.95						836.95
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	11.20								11.20
H. Urea application	64.96								64.96
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5840.33	9.99	121.85						-5708.49
A. Forest land	-5702.78	8.31	12.87						-5681.60
B. Cropland	282.51	0.06	19.99						302.55
C. Grassland	-308.22	1.62	1.40						-305.21
D. Wetlands	10.27	NO	1.23						11.50
E. Settlements	657.97	NO	86.36						744.34
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-780.07								-780.07
H. Other	NO	NO	NO						NO
5. Waste	0.05	1928.62	84.61						2013.28
A. Solid waste disposal	NO,NA	1365.28							1365.28
B. Biological treatment of solid waste		8.51	3.16						11.67
C. Incineration and open burning of waste	0.05	7.63	1.67						9.34
D. Waste water treatment and discharge		547.21	79.79						626.99
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	388.96	0.11	2.84						391.91
Aviation	375.75	0.07	2.75						378.57
Navigation	13.21	0.03	0.09						13.34
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5970.35								5970.35
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	553.99								553.99
Indirect N_2O			NO,NA						
Indirect CO_2 [3]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24833.94
Total CO_2 equivalent emissions with land use, land-use change and forestry									19125.45
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2017
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	13610.63	4350.38	1616.31	1229.02	NO	7.23	NO	NO	20813.57
1. Energy	16597.78	636.02	192.85						17426.65
A. Fuel combustion (sectoral approach)	16286.19	419.35	192.67						16898.21
1. Energy industries	4464.77	7.74	19.16						4491.67
2. Manufacturing industries and construction	2429.58	3.95	5.60						2439.12
3. Transport	6570.29	13.07	58.75						6642.11
4. Other sectors	2821.56	394.59	109.17						3325.31
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	311.59	216.67	0.18						528.44
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	311.59	216.67	0.18						528.44
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2065.09	NO,NE,IE,NA	105.24	1229.02	NO	7.23	NO	NO	3406.58
A. Mineral industry	1425.61								1425.61
B. Chemical industry	566.79	NO,NE,IE	87.68	NO	NO	NO	NO	NO	654.47
C. Metal industry	1.87	NO,NA	NO	NO	NO	NO	NO	NO	1.87
D. Non-energy products from fuels and solvent use	70.82	NA	NA						70.82
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1229.02	NO	NO	NO	NO	1229.02
G. Other product manufacture and use	NO	NO	17.56	NO	NO	7.23	NO	NO	24.80
H. Other	NA	NA	NA						NA
3. Agriculture	81.13	1688.58	1074.29						2843.99
A. Enteric fermentation		1193.63							1193.63
B. Manure management		494.94	122.04						616.99
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	952.24						952.24
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	10.92								10.92
H. Urea application	70.21								70.21
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5133.36	77.54	160.09						-4895.73
A. Forest land	-4762.73	68.56	44.92						-4649.25
B. Cropland	281.71	0.54	19.76						302.01
C. Grassland	-295.00	8.45	7.30						-279.25
D. Wetlands	10.56	NO	1.27						11.83
E. Settlements	661.45	NO	86.83						748.28
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-1029.35								-1029.35
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1948.24	83.83						2032.08
A. Solid waste disposal	NO,NA	1414.22							1414.22
B. Biological treatment of solid waste		8.56	2.74						11.30
C. Incineration and open burning of waste	NO	6.87	1.50						8.37
D. Waste water treatment and discharge		518.60	79.60						598.19
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	469.17	0.14	3.42						472.73
Aviation	449.06	0.09	3.28						452.43
Navigation	20.11	0.05	0.14						20.31
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	5906.57								5906.57
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	568.30								568.30
Indirect N_2O			NO,NA						
Indirect CO_2 [3]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									25709.31
Total CO_2 equivalent emissions with land use, land-use change and forestry									20813.57
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2018
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	12101.10	4105.07	1528.49	1356.03	NO	6.46	NO	NO	19097.16
1. Energy	15691.36	600.29	188.56						16480.21
A. Fuel combustion (sectoral approach)	15406.72	401.44	188.39						15996.56
1. Energy industries	3907.81	8.78	19.76						3936.35
2. Manufacturing industries and construction	2411.05	4.19	5.89						2421.13
3. Transport	6340.78	11.73	54.30						6406.80
4. Other sectors	2747.08	376.75	108.44						3232.27
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	284.63	198.85	0.17						483.65
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	284.63	198.85	0.17						483.65
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1960.55	NO,NE,IE,NA	60.88	1356.03	NO	6.46	NO	NO	3383.93
A. Mineral industry	1358.42								1358.42
B. Chemical industry	513.06	NO,NE,IE	44.56	NO	NO	NO	NO	NO	557.62
C. Metal industry	8.99	NO,NA	NO	NO	NO	NO	NO	NO	8.99
D. Non-energy products from fuels and solvent use	80.09	NA	NA						80.09
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1356.03	NO	NO	NO	NO	1356.03
G. Other product manufacture and use	NO	NO	16.32	NO	NO	6.46	NO	NO	22.78
H. Other	NA	NA	NA						NA
3. Agriculture	72.24	1580.87	1077.62						2730.74
A. Enteric fermentation		1119.66							1119.66
B. Manure management		461.20	113.68						574.88
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	963.95						963.95
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	4.62								4.62
H. Urea application	67.62								67.62
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5623.05	1.46	117.77						-5503.83
A. Forest land	-5493.24	0.94	9.72						-5482.58
B. Cropland	271.85	0.01	18.99						290.85
C. Grassland	-315.53	0.50	0.44						-314.59
D. Wetlands	10.84	NO	1.31						12.16
E. Settlements	664.69	NO	87.31						751.99
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-761.66								-761.66
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1922.45	83.67						2006.12
A. Solid waste disposal	NO,NA	1405.39							1405.39
B. Biological treatment of solid waste		10.17	3.30						13.46
C. Incineration and open burning of waste	NO	7.15	1.56						8.71
D. Waste water treatment and discharge		499.75	78.81						578.56
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	624.92	0.28	4.55						629.75
Aviation	559.65	0.11	4.09						563.85
Navigation	65.27	0.17	0.46						65.90
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6057.52								6057.52
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	582.37								582.37
Indirect N_2O			NO,NA						
Indirect CO_2 [3]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24600.99
Total CO_2 equivalent emissions with land use, land-use change and forestry									19097.16
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2019
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	11999.83	4052.61	1532.79	1470.23	NO	8.09	NO	NO	19063.55
1. Energy	15764.28	578.86	192.82						16535.95
A. Fuel combustion (sectoral approach)	15477.34	392.54	192.66						16062.54
1. Energy industries	3880.44	11.02	22.70						3914.17
2. Manufacturing industries and construction	2421.11	4.49	6.23						2431.83
3. Transport	6516.87	11.03	57.01						6584.91
4. Other sectors	2658.92	365.99	106.72						3131.63
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	286.94	186.32	0.16						473.42
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	286.94	186.32	0.16						473.42
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	2017.51	NO,NE,IE,NA	60.74	1470.23	NO	8.09	NO	NO	3556.57
A. Mineral industry	1324.94								1324.94
B. Chemical industry	594.60	NO,NE,IE	44.55	NO	NO	NO	NO	NO	639.15
C. Metal industry	4.91	NO,NA	NO	NO	NO	NO	NO	NO	4.91
D. Non-energy products from fuels and solvent use	93.05	NA	NA						93.05
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1470.23	NO	NO	NO	NO	1470.23
G. Other product manufacture and use	NO	NO	16.19	NO	NO	8.09	NO	NO	24.28
H. Other	NA	NA	NA						NA
3. Agriculture	75.66	1570.39	1075.18						2721.24
A. Enteric fermentation		1120.39							1120.39
B. Manure management		450.00	114.80						564.80
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	960.38						960.38
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	2.07								2.07
H. Urea application	73.59								73.59
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5857.61	3.11	118.67						-5735.84
A. Forest land	-5736.87	2.58	10.61						-5723.69
B. Cropland	268.96	0.04	18.52						287.52
C. Grassland	-317.32	0.49	0.42						-316.41
D. Wetlands	11.13	NO	1.35						12.49
E. Settlements	668.65	NO	87.77						756.42
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-752.16								-752.16
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1900.25	85.38						1985.63
A. Solid waste disposal	NO,NA	1377.79							1377.79
B. Biological treatment of solid waste		12.59	4.12						16.71
C. Incineration and open burning of waste	NO	6.57	1.44						8.01
D. Waste water treatment and discharge		503.30	79.82						583.12
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	683.77	0.32	4.98						689.08
Aviation	605.86	0.12	4.43						610.41
Navigation	77.91	0.20	0.55						78.67
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6228.14								6228.14
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	599.60								599.60
Indirect N_2O			NO,NA						
Indirect CO_2 [3]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24799.39
Total CO_2 equivalent emissions with land use, land-use change and forestry									19063.55
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2020
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[1]	11029.97	4038.36	1587.71	1574.63	NO	9.35	NO	NO	18240.03
1. Energy	14788.60	570.42	195.93						15554.96
A. Fuel combustion (sectoral approach)	14500.42	398.39	195.79						15094.60
1. Energy industries	3659.32	11.84	23.07						3694.23
2. Manufacturing industries and construction	2381.74	5.07	6.88						2393.69
3. Transport	5732.11	10.34	55.80						5798.26
4. Other sectors	2727.25	371.13	110.03						3208.41
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	288.18	172.03	0.14						460.36
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	288.18	172.03	0.14						460.36
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1986.75	NO,NE,IE,NA	75.60	1574.63	NO	9.35	NO	NO	3646.34
A. Mineral industry	1359.34								1359.34
B. Chemical industry	535.32	NO,NE,IE	57.87	NO	NO	NO	NO	NO	593.19
C. Metal industry	4.93	NO,NA	NO	NO	NO	NO	NO	NO	4.93
D. Non-energy products from fuels and solvent use	87.16	NA	NA						87.16
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1574.63	NO	NO	NO	NO	1574.63
G. Other product manufacture and use	NO	NO	17.73	NO	NO	9.35	NO	NO	27.08
H. Other	NA	NA	NA						NA
3. Agriculture	95.18	1514.65	1090.89						2700.72
A. Enteric fermentation		1091.14							1091.14
B. Manure management		423.50	111.26						534.76
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	979.63						979.63
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	6.89								6.89
H. Urea application	88.29								88.29
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[1]	-5840.56	36.43	137.33						-5666.79
A. Forest land	-5841.47	32.49	26.28						-5782.70
B. Cropland	265.32	0.01	18.02						283.35
C. Grassland	-317.91	3.93	3.40						-310.58
D. Wetlands	11.42	NO	1.40						12.81
E. Settlements	671.62	NO	88.24						759.86
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-629.54								-629.54
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1916.86	87.94						2004.81
A. Solid waste disposal	NO,NA	1393.07							1393.07
B. Biological treatment of solid waste		16.64	6.24						22.88
C. Incineration and open burning of waste	NO	6.58	1.44						8.01
D. Waste water treatment and discharge		500.58	80.27						580.85
E. Other	NO	NO	NO						NO
6. Other ***(as specified in summary 1.A)***	NO	NO	NO	NO	NO	NO	NO	NO	NO

Memo items:[2]									
International bunkers	227.53	0.20	1.65						229.38
Aviation	163.82	0.03	1.20						165.05
Navigation	63.71	0.17	0.45						64.33
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	6383.96								6383.96
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	616.36								616.36
Indirect N_2O			NO,NA						
Indirect CO_2 [3]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									23906.82
Total CO_2 equivalent emissions with land use, land-use change and forestry									18240.03
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

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

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2021
Submission 2023 v1
CROATIA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2[(1)]	CH_4	N_2O	HFCs	PFCs	SF_6	Unspecified mix of HFCs and PFCs	NF_3	Total
	CO_2 equivalent (kt)								
Total (net emissions)[(1)]	11486.87	3893.69	1554.59	1699.28	NO	9.63	NO	NO	18644.05
1. Energy	15473.90	595.25	203.16						16272.30
A. Fuel combustion (sectoral approach)	15189.98	430.35	203.02						15823.35
1. Energy industries	3718.35	13.05	25.29						3756.69
2. Manufacturing industries and construction	2418.06	5.20	7.10						2430.36
3. Transport	6194.98	9.74	57.18						6261.90
4. Other sectors	2858.59	402.37	113.46						3374.41
5. Other	NO,IE	NO,IE	NO,IE						NO,IE
B. Fugitive emissions from fuels	283.92	164.90	0.14						448.95
1. Solid fuels	NO	NO	NO,NA						NO,NA
2. Oil and natural gas	283.92	164.90	0.14						448.95
C. CO_2 transport and storage	NO								NO
2. Industrial processes and product use	1833.88	NO,NE,IE,NA	53.14	1699.28	NO	9.63	NO	NO	3595.93
A. Mineral industry	1372.26								1372.26
B. Chemical industry	365.49	NO,NE,IE	36.27	NO	NO	NO	NO	NO	401.77
C. Metal industry	14.26	NO,NA	NO	NO	NO	NO	NO	NO	14.26
D. Non-energy products from fuels and solvent use	81.87	NA	NA						81.87
E. Electronic Industry				NO	NO	NO	NO	NO	NO
F. Product uses as ODS substitutes				1699.28	NO	NO	NO	NO	1699.28
G. Other product manufacture and use	NO	NO	16.87	NO	NO	9.63	NO	NO	26.49
H. Other	NA	NA	NA						NA
3. Agriculture	102.85	1501.01	1097.08						2700.94
A. Enteric fermentation		1079.31							1079.31
B. Manure management		421.70	107.99						529.69
C. Rice cultivation		NO							NO
D. Agricultural soils		NE	989.09						989.09
E. Prescribed burning of savannas		NO	NO						NO
F. Field burning of agricultural residues		NO	NO						NO
G. Liming	18.70								18.70
H. Urea application	84.15								84.15
I. Other carbon-containing fertilizers	NA								NA
J. Other	NO	NO	NO						NO
4. Land use, land-use change and forestry[(1)]	-5923.76	6.53	114.87						-5802.37
A. Forest land	-5833.12	4.75	11.78						-5816.60
B. Cropland	261.95	0.00	17.53						279.48
C. Grassland	-308.68	1.78	1.54						-305.36
D. Wetlands	11.93	NO	1.47						13.40
E. Settlements	629.44	NO	82.55						711.99
F. Other land	NO	NO	NO						NO
G. Harvested wood products	-685.27								-685.27
H. Other	NO	NO	NO						NO
5. Waste	NO,NA	1790.90	86.34						1877.24
A. Solid waste disposal	NO,NA	1265.61							1265.61
B. Biological treatment of solid waste		19.51	7.18						26.69
C. Incineration and open burning of waste	NO	6.77	1.48						8.24
D. Waste water treatment and discharge		499.02	77.69						576.70
E. Other	NO	NO	NO						NO
6. Other *(as specified in summary 1.A)*	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:[(2)]									
International bunkers	372.76	0.25	2.71						375.73
Aviation	298.31	0.06	2.18						300.55
Navigation	74.45	0.20	0.53						75.18
Multilateral operations	C	C	C						C
CO_2 emissions from biomass	7049.25								7049.25
CO_2 captured	NO								NO
Long-term storage of C in waste disposal sites	637.95								637.95
Indirect N_2O			NO,NA						
Indirect CO_2 [(3)]	NO,NA								
Total CO_2 equivalent emissions without land use, land-use change and forestry									24446.42
Total CO_2 equivalent emissions with land use, land-use change and forestry									18644.05
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry									NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry									NA

Annex 5-3: CO_2 emission factors, oxidation factors and national net calorific values

Table 5.3-1: National net calorific values, CO_2 emission factors and oxidation factors for 2021 (needed for monitoring and reporting on CO_2 emission)

Gorivo		DOV		CO_2 Emisijski faktor (t CO_2/TJ)	Oksidacijski faktor (OF)
		Jedinica	2021		
Motorni benzin	Motor Gasoline	GJ/t	44.5900	69.30	1
Aviobenzin	Aviation Gasoline	GJ/t	44.5900	70.00	1
Kerozin (Mlazno gorivo)	Jet Kerosene	GJ/t	43.9600	71.50	1
Dizel i ekstra lako loživo ulje (plinsko ulje)	Gas/Diesel Oil	GJ/t	42.7100	74.10	1
Loživo ulje i srednje loživo ulje	Residual Fuel Oil	GJ/t	40.1900	77.40	1
Ukapljeni naftni plin	Liquefied Petroleum Gases	GJ/t	46.8900	63.10	1
Maziva	Lubricants	GJ/t	33.5000	73.30	1
Naftni koks	Petroleum Coke	GJ/t	31.0000	97.50	1
Petrolej	Petroleum	GJ/t	43.9600	73.30	1
Antracit	Anthracite	GJ/t	29.3100	98.30	1
Kameni ugljen-Industrija	Other bituminous coal *Industry*	GJ/t	26.4800	94.60	1
Kameni ugljen-*Termoelektrane*	Other bituminous coal *Thermal power plant*	GJ/t	24.7610	93.104	1
Ugljen za proizvodnju koksa (koksni ugljen)	Coking coal	GJ/t	28.2000	94.60	1
Mrki ugljen (smeđi ugljen) *Industrija*	Sub bituminous coal *Industry*	GJ/t	18.5000	96.10	1
Lignit	Lignite	GJ/t	11.5000	101.00	1
Briketi kamenog ugljena	Brown coal briquettes	GJ/t	20.7000	97.50	1
Koks	Coke oven coke	GJ/t	29.3100	107.00	1
Prirodni plin	Natural Gas	GJ/10^3m^3	35.0000	56.10	1
Gradski plin	Gas Works Gas	GJ/t	38.7000	44.40	1
Koksni plin	Coke Oven Gas	GJ/t	38.7000	44.40	1
Rafinerijski plin	Refinery Gas	GJ/t	42.6000	57.60	1

Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2021.

Informative Inventory Report for 2021 was not submitted so emissions for 2021 were specified as NE.

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

2021

	Total emissions (CO_{2-eq})			
	Greenhouse gas inventory emissions [kt CO_{2eq}] (3)	Verified emissions under Directive 2003/87/EC [kt CO2eq] (3)	Ratio in % (Verified emissions/inventory emissions (3)	Comment (2)
Greenhouse gas emissions (for GHG inventory: total GHG emissions, including indirect CO_2 emissions if reported, without LULUCF, and excluding emissions from domestic aviation; for Directive 2003/87/EC: GHG emissions from stationary installations under Article 2(1) of Directive 2003/87/EC)	24,417.57	6,996.69	**28.65%**	
CO_2 emissions (for GHG inventory: total CO_2 emissions, including indirect CO_2 emissions if reported, without LULUCF, and excluding CO_2 emissions from domestic aviation; for Directive 2003/87/EC: CO_2 emissions from stationary installations under Article 2(1) of Directive 2003/87/EC)	17,793.64	6,960.42	**39.12%**	

	CO_2 emissions			
	Greenhouse gas inventory emissions [kt] (3)	Verified emissions under Directive 2003/87/EC [kt] (3)	Ratio in % (Verified emissions/inventory emissions (3)	Comment (2)
1.A Fuel combustion activities, total	6,888.70	NA	**NA**	
1.A Fuel combustion activities, stationary combustion	6,105.00	5,207.63	**85.30%**	
1.A.1 Energy industries	3,696.47	3,552.94	**96.12%**	In inventory dana from ETS are not used for emission calculation
1.A.1.a Public electricity and heat production	2,720.16	2,692.88	99.00%	
1.A.1.b Petroleum refining	741.75	733.82	98.93%	
1.A.1.c Manufacture of solid fuels and other energy industries	234.56	126.25	53.82%	
Iron and steel (for GHG inventory combined CRT categories 1.A.2.a + 2.C.1 + 1.A.1.c and other relvant CRT categories that include emissions from iron and steel (e.g. 1A1a, 1B1) (4)	2,408.53	1,654.69	68.70%	
1.A.2 Manufacturing industries and construction	56.08	7.63	**13.61%**	
1.A.2.a Iron and steel	30.01	16.87	56.22%	
1.A.2.b Non-ferrous metals	231.94	0.00	0.00%	
1.A.2.c Chemicals	120.16	114.61	95.38%	
1.A.2.d Pulp, paper and print	240.06	64.90	27.03%	
1.A.2.e Food processing, beverages and tobacco	1,359.02	1,433.82	105.50%	In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f
1.A.2.f Non-metallic minerals	371.27	16.85	4.54%	In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f
1.A.2.g Other	6,194.98	NO	NO	
1.A.3 Transport	NO	NO	NO	
1.A.3.e Other transportation (pipeline transport)	2,839.57	NO	NO	
1.A.4 Other sectors	648.06	NO	NO	
1.A.4.a Commercial/institutional	1,505.26	NO	NO	
1.A.4.b Agriculture/Forestry/Fisheries	783.70	NO	NO	
1.B Fugitive emissions from Fuels	NO	NO	NO	
1.C CO_2 Transport and storage	NO	NO	NO	
1.C.1 Transport of CO_2	NO	NO	NO	
1.C.2 Injection and storage	NO	NO	NO	
1.C.3 Other	1,372.26	1,372.22	100.00%	
2.A Mineral products	1,204.85	1,204.85	**100.00%**	
2.A.1 Cement production	122.99	122.99	100.00%	
2.A.2 Lime production	28.85	28.85	100.00%	
2.A.3 Glass production	15.57	15.53	99.75%	
2.A.4 Other process uses of carbonates	365.49	362.69	99.23%	
2.B Chemical industry	365.49	362.69	**99.23%**	
2.B.1 Ammonia production	NO	NO	NO	
2.B.3 Adipic acid production (CO_2)	NO	NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	NO	NO	NO	
2.B.5 Carbide production	NO	NO	NO	
2.B.6 Titanium dioxide production	NO	NO	NO	
2.B.7 Soda ash production	NO	NO	NO	
2.B.8 Petrochemical and carbon black production	14.26	17.88	125.40%	
2.C Metal production	14.26	17.88	**125.40%**	
2.C.1 Iron and steel production	NO	NO	NO	
2.C.2 Ferroalloys production	NO	NO	NO	
2.C.3 Aluminium production	NO	NO	NO	
2.C.4 Magnesium production	NO	NO	NO	
2.C.5 Lead production	NO	NO	NO	
2.C.6 Zinc production	NO	NO	NO	
2.C.7 Other metal production	NO	NO	NO	

	N_2O emissions			
	Greenhouse gas inventory emissions [kt CO_{2eq}] (3)	Verified emissions under Directive 2003/87/EC [kt CO_{2eq}] (3)	Ratio in % (Verified emissions/inventory emissions (3)	Comment (2)
2.B.2 Nitric acid production	36.275	36.27	100.00%	
2.B.3 Adipic acid production	NO	NO	NO	
2.B.4 Caprolactam, glyoxal and glyoxylic acid production	NO	NO	NO	

	PFC emissions			
	Greenhouse gas inventory emissions [kt CO_{2eq}] (3)	Verified emissions under Directive 2003/87/EC [kt CO_{2eq}] (3)	Ratio in % (Verified emissions/inventory emissions (3)	Comment (2)
2.C.3 Aluminium production	NO	NO	NO	

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

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

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

In Croatia, there is a long tradition of forest management and a comprehensive national system for monitoring, data collection and reporting on the condition and activities in the forestry sector. In that respect, the main effort was directed in the harmonization of current system with the KP-LULUCF requirements. In the beginning of 2010, MESD commissioned a preparation of Action plan for implementation of Article 3, paragraphs 3 and 4 of the Kyoto Protocol which should facilitate the process of data collection and preparation of information related to accounting of LULUCF activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol. Terms of reference for this Action plan included harmonization of definitions and their appliance to national circumstances, identification of lands subject to activities under Article 3.3 and elected activity under Article 3.4, data collection for estimation of carbon stock change and non-CO_2 greenhouse gas emissions and uncertainty assessment and verification.

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

Information from national registry

Changes to the national registry of HR in 2021 are presented in Table1.1-2.

Table 1.1-2: Information on Kyoto Protocol units

Reporting Item	Description
15/CMP.1 annex I.E paragraph 11: Standard electronic format (SEF)	The Standard Electronic Format report for 2021 has been submitted to the UNFCCC Secretariat electronically.
15/CMP.1 annex I.E paragraph 12: List of discrepant transactions	No discrepant transactions occurred in 2021.
15/CMP.1 annex I.E paragraph 13 & 14: List of CDM notifications	No CDM notifications occurred in 2021.
15/CMP.1 annex I.E paragraph 15: List of non-replacements	No non-replacements occurred in 2021.
15/CMP.1 annex I.E paragraph 16: List of invalid units	No invalid units exist as at 31 December 2021.
15/CMP.1 annex I.E paragraph 17 Actions and changes to address discrepancies	No actions were taken or changes made to address discrepancies for the period under review.

Reporting Item	Description
15/CMP.1 annex I.E Publicly accessible information	The public website of Croatian National registry can be found at https://unionregistry.ec.europa.eu/euregistry/HR/index.xhtml in English and Croatian language and at http://www.haop.hr/hr/tematska-podrucja/zrak-klima-tlo/klimatske-promjene in Croatian language.
15/CMP.1 annex I.E paragraph 18 CPR Calculation	The commitment period reserve equals the lower of either 90% of a Party's assigned amount pursuant to Article 3(7bis), (8) and (8bis) or 100% of its most recently reviewed inventory, multiplied by 8 (Table 1.1-1).

There has not been any issuance, acquisition, holding, transfer, cancellation, retirement and/or carry-over of CP2 AAUs, RMUs, ERUs, CERs, tCERs and lCERs in 2021.

Croatia has performed issuance and cancellation of CP1 ERUs in 2015 to account for the LULUCF activities in the first commitment period of the Kyoto protocol. Pursuant to Commission Delegated Regulation (EU) 2015/1844, CP1 AAUs have been exchanged in return for the CER and ERU units exchanged by the operators pursuant to Article 60 of the Regulation (EU) No 389/2013. Retirement transactions have been performed in 2015 to account for the CP1 emissions.

SEF report which is submitted together with this report contains the information on the transactions in the reporting period, the year 2021. Croatia did not have any holdings or performed any transactions involving CP2 Kyoto units in the reporting period.

Croatia did not conclude any transfers of its annual emission allocation to other Member States pursuant to Decision 406/2009/EC.

Changes in national registry

Changes in national registry are given in the table 1.1-3.

Table 1.1-3: Changes in national registry

Reporting Item	**Description**
15/CMP.1 annex II.E paragraph 32.(a) Change of name or contact	No change of name or contact occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(b) Change regarding cooperation arrangement	There was a change in the cooperation arrangement during the reported period as the United Kingdom of Great Britain and Northern Ireland no longer operate their registry in a consolidated manner within the Consolidated System of EU registries, CS EUR.
15/CMP.1 annex II.E paragraph 32.(c) Change to database structure or the capacity of national registry	There has been 6 new EUCR releases (versions 12.4, 13.0.2, 13.2.1, 13.3.3, 13.5.1 and 13.5.2) after version 11.5 (the production version at the time of the last Chapter 14 submission). No changes were applied to the database, whose model is provided in Annex A. No change was required to the application backup plan or to the disaster recovery plan. No change to the capacity of the national registry occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(d) Change regarding conformance to technical standards	The changes that have been introduced with versions 12.4, 13.0.2, 13.2.1, 13.3.3, 13.5.1 and 13.5.2 compared with version 11.5 of the national registry are presented in Annex B. It is to be noted that each release of the registry is subject to both regression testing and tests related to new functionality. These tests also include thorough testing against the DES and are carried out prior to the relevant major release of the version to Production (see Annex B). No other change in the registry's conformance to the technical standards occurred for the reported period.

Reporting Item	Description
15/CMP.1 annex II.E paragraph 32.(e) Change to discrepancies procedures	No change of discrepancies procedures occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(f) Change regarding security	No changes regarding security were introduced.
15/CMP.1 annex II.E paragraph 32.(g) Change to list of publicly available information	No change to the list of publicly available information occurred during the reporting period.
15/CMP.1 annex II.E paragraph 32.(h) Change of Internet address	No change to the registry internet address during the reported period.
15/CMP.1 annex II.E paragraph 32.(i) Change regarding data integrity measures	No change of data integrity measures occurred during the reporting period.
15/CMP.1 annex II.E paragraph 32.(j) Change regarding test results	No change during the reported period.
1/CMP.8 paragraph 23 PPSR account	Previous period surplus reserve (PPSR) account will be established in the Consolidated System of European Registries (CSEUR).

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

Changes in the national system

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

There have been no changes since the last submission.

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

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

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

There have been no changes since the last submission.

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

There have been no changes since the last submission.

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

There have been no changes since the last submission.

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

There have been no changes since the last submission.

REPUBLIC OF CROATIA

MINISTRY OF ECONOMY AND SUSTAINABLE DEVELOPMENT

Radnička cesta 80/7, 10000 Zagreb
Tel + 385 1 1234 567
info@mzoe.hr
www.mzoe.hr