# ANNEXES TO THE NATIONAL INVENTORY REPORT

Mrach, 2020

# 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- | Level Assessment | Cumulative Total (%) |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 0.145 | 14% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 0.110 | 25% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 0.077 | 33% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CO_2$ | 2,158.014 | 0.068 | 40% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 0.067 | 47% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 0.058 | 52% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CO_2$ | 1,702.511 | 0.053 | 58% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CO_2$ | 1,641.149 | 0.051 | 63% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.039 | 67% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 0.034 | 70% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 0.034 | 74% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 0.024 | 76% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 0.023 | 78% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 0.019 | 80% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 0.018 | 82% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 0.017 | 84% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 0.016 | 85% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 0.014 | 87% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | 442.772 | 0.014 | 88% |
| 3.B Manure Management | $CH_4$ | 426.179 | 0.013 | 89% |
| 3.B Manure Management | $N_2O$ | 375.219 | 0.012 | 91% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 0.011 | 92% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 0.010 | 93% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 0.007 | 93% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 0.007 | 94% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.006 | 95% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.005 | 95% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 0.005 | 96% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 0.005 | 96% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CH_4$ | 148.067 | 0.005 | 97% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 0.004 | 97% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 0.004 | 98% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.004 | 98% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 0.003 | 98% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 0.002 | 98% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.002 | 99% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 0.002 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 0.002 | 99% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 0.001 | 99% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.001 | 100% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 0.001 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F- | 10.450 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $N_2O$ | 7.502 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 0.000 | 100% |

| Tier 1 Analysis - Level Assessment | | | | |
|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq- | Level Assessment | Cumulative Total (%) |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $N_2O$ | 4.973 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $N_2O$ | 4.291 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CH_4$ | 4.196 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CH_4$ | 2.700 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CH_4$ | 2.096 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $N_2O$ | 0.876 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CH_4$ | 0.735 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 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 | $CO_2$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $CH_4$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $N_2O$ | 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 | F- | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F- | 0.000 | 0.000 | 100% |
| 2.F.4 Aerosols | F- | 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 | | 31,875.849 | | |

Table A1.3-2: Key categories analysis – Level Assessment - Tier 1 (Excluding LULUCF) – 2018

| Tier 1 Analysis - Level Assessment | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq- | Last Year (2018) Estimate (Gg eq-CO2) | Level Assessment | Cumulative Total (%) |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.257 | 26% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 1,891.695 | 0.080 | 34% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.074 | 41% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.068 | 48% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.051 | 53% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 1,140.558 | 0.048 | 58% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.047 | 62% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 2,158.014 | 1,061.264 | 0.045 | 67% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.041 | 71% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,641.149 | 942.308 | 0.040 | 75% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 875.556 | 0.037 | 79% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.036 | 82% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.022 | 84% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.020 | 86% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.017 | 88% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.014 | 90% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,702.511 | 290.546 | 0.012 | 91% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.011 | 92% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CO_2$ | 442.772 | 223.726 | 0.009 | 93% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.007 | 94% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.006 | 94% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.006 | 95% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CH_4$ | 148.067 | 121.543 | 0.005 | 95% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 0.000 | 116.931 | 0.005 | 96% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.004 | 96% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.004 | 97% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 82.914 | 0.003 | 97% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.003 | 97% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.003 | 97% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.003 | 98% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 61.925 | 0.003 | 98% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.002 | 98% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.002 | 98% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.002 | 99% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.002 | 99% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 42.847 | 0.002 | 99% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.001 | 99% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.001 | 99% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.001 | 100% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 100% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 6.933 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 5.500 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 100% |

| Tier 1 Analysis - Level Assessment | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq- | Last Year (2018) Estimate (Gg eq-CO2) | Level Assessment | Cumulative Total (%) |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.973 | 2.152 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 1.660 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.291 | 1.617 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 1.350 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 7.502 | 1.315 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.700 | 1.015 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.000 | 0.975 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.096 | 0.909 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 4.196 | 0.735 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.000 | 0.613 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.545 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.876 | 0.501 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.735 | 0.420 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.308 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 0.017 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 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 | $CH_4$ | 5.447 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 100% |
| TOTAL | | 31,875.849 | 23,792.796 | | |

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 | $CO_2$ | 6,704.183 | 0.170 | 17% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 0.117 | 29% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 0.089 | 37% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 0.062 | 44% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $CO_2$ | 2,158.014 | 0.055 | 49% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 0.054 | 55% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 0.046 | 59% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CO_2$ | 1,702.511 | 0.043 | 63% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $CO_2$ | 1,641.149 | 0.042 | 68% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.031 | 71% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 0.028 | 74% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 0.028 | 76% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 0.019 | 78% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 0.019 | 80% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 0.015 | 82% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 0.014 | 83% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 0.014 | 84% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 0.013 | 86% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 0.011 | 87% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | 442.772 | 0.011 | 88% |
| 3.B Manure Management | $CH_4$ | 426.179 | 0.011 | 89% |
| 3.B Manure Management | $N_2O$ | 375.219 | 0.009 | 90% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 0.009 | 91% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 0.008 | 92% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 0.008 | 92% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 0.006 | 93% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 0.006 | 94% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 0.006 | 94% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 0.005 | 95% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.005 | 95% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.004 | 96% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 0.004 | 96% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 0.004 | 96% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CH_4$ | 148.067 | 0.004 | 97% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 0.004 | 97% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 0.003 | 97% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.003 | 98% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 0.002 | 98% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 0.002 | 98% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 0.002 | 98% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.002 | 99% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 0.001 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 0.001 | 99% |
| 4(III).Direct N2O emissions from N mineralization/immobilization | $N_2O$ | 47.233 | 0.001 | 99% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 0.001 | 99% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.001 | 99% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 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 | $CO_2$ | 23.135 | 0.001 | 100% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 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 (%) |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 0.000 | 100% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $N_2O$ | 7.502 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $N_2O$ | 4.973 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $N_2O$ | 4.291 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CH_4$ | 4.196 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - | $CH_4$ | 2.700 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $CH_4$ | 2.096 | 0.000 | 100% |
| 4.C.1 Grassland Remaining Grassland | $CO_2$ | 2.069 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 0.000 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $N_2O$ | 0.876 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $CH_4$ | 0.735 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 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 | $CO_2$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $CH_4$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $N_2O$ | 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 | F-gases | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 0.000 | 100% |
| 2.F.4 Aerosols | F-gases | 0.000 | 0.000 | 100% |
| 3.G Liming | $CO_2$ | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 0.000 | 100% |
| TOTAL | | 39,543.940 | | |

Table A1.3-4: Key categories analysis – Level Assessment - Tier 1 (Including LULUCF) – 2018

| Tier 1 Analysis - Level Assessment Including LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) | Last Year (2018) | Level Assessment | Cumulative |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.194 | 19% |
| 4.A.1 Forest Land Remaining Forest Land | $CO_2$ | 6,704.183 | 5,133.751 | 0.163 | 36% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 1,891.695 | 0.060 | 42% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.056 | 47% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.051 | 53% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.039 | 56% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 1,140.558 | 0.036 | 60% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.036 | 64% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 2,158.014 | 1,061.264 | 0.034 | 67% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.031 | 70% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,641.149 | 942.308 | 0.030 | 73% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 875.556 | 0.028 | 76% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.027 | 79% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 746.003 | 0.024 | 81% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 675.294 | 0.021 | 83% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.016 | 85% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.015 | 86% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.013 | 88% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 378.907 | 0.012 | 89% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.010 | 90% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,702.511 | 290.546 | 0.009 | 91% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.009 | 92% |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | 28.890 | 262.107 | 0.008 | 92% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 225.448 | 0.007 | 93% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CO_2$ | 442.772 | 223.726 | 0.007 | 94% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.005 | 94% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.005 | 95% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.004 | 95% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CH_4$ | 148.067 | 121.543 | 0.004 | 96% |
| 4(III).Direct N2O emissions from N | $N_2O$ | 47.233 | 121.002 | 0.004 | 96% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 0.000 | 116.931 | 0.004 | 96% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.003 | 97% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.003 | 97% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 82.914 | 0.003 | 97% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.002 | 98% |
| 4.B.2 Land Converted to Cropland | $CO_2$ | 23.135 | 69.925 | 0.002 | 98% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.002 | 98% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.002 | 98% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 61.925 | 0.002 | 98% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.002 | 99% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.002 | 99% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.002 | 99% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.001 | 99% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 42.847 | 0.001 | 99% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.001 | 99% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.001 | 99% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.001 | 100% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 12.141 | 0.000 | 100% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 11.391 | 0.000 | 100% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 100% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 6.933 | 0.000 | 100% |

| Tier 1 Analysis - Level Assessment Including LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) | Last Year (2018) | Level Assessment | Cumulative |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 5.500 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.973 | 2.152 | 0.000 | 100% |
| 4.C.1 Grassland Remaining Grassland | $CO_2$ | 2.069 | 2.069 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 1.660 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.291 | 1.617 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 1.350 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 7.502 | 1.315 | 0.000 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 1.301 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 1.052 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.700 | 1.015 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.000 | 0.975 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.096 | 0.909 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 4.196 | 0.735 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.000 | 0.613 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.545 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.876 | 0.501 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.735 | 0.420 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.308 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 0.017 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 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 | $CH_4$ | 5.447 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 100% |
| TOTAL | | 39,543.940 | 31,433.187 | | |

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

| Tier 1 Analysis - Trend Assessment | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source/Sink Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-$CO_2$) | Last Year (2018) Estimate (Gg eq-$CO_2$) | Trend Assessment | % Contribution to trend | Cumulative Total (%) |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.197 | 0.199 | 20% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CO_2$ | 4,615.029 | 875.556 | 0.145 | 0.146 | 35% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.077 | 0.078 | 42% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.060 | 0.061 | 48% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,702.511 | 290.546 | 0.055 | 0.056 | 54% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.052 | 0.053 | 59% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.040 | 0.040 | 63% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CO_2$ | 595.119 | 1,140.558 | 0.039 | 0.040 | 67% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.034 | 0.034 | 71% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 2,158.014 | 1,061.264 | 0.031 | 0.031 | 74% |
| 1.A.1 Fuel combustion - Energy Industries - | $CO_2$ | 1,838.442 | 1,891.695 | 0.029 | 0.030 | 77% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.029 | 0.029 | 80% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.027 | 0.027 | 82% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.022 | 0.022 | 85% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.022 | 0.022 | 87% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,641.149 | 942.308 | 0.016 | 0.016 | 89% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.009 | 0.009 | 89% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.008 | 0.008 | 90% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.000 | 0.008 | 0.008 | 91% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.007 | 0.007 | 92% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 0.000 | 116.931 | 0.007 | 0.007 | 92% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CO_2$ | 442.772 | 223.726 | 0.006 | 0.006 | 93% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CH_4$ | 220.427 | 61.925 | 0.006 | 0.006 | 94% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.005 | 0.005 | 94% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.005 | 0.005 | 95% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.005 | 0.005 | 95% |
| 2.D Non-energy Products from Fuels and Solvent | $CO_2$ | 227.926 | 82.914 | 0.005 | 0.005 | 96% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.005 | 0.005 | 96% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CO_2$ | 157.786 | 42.847 | 0.004 | 0.004 | 97% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.003 | 0.003 | 97% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.003 | 0.003 | 97% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.003 | 0.003 | 98% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.003 | 0.003 | 98% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.002 | 0.002 | 98% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.002 | 0.002 | 98% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.002 | 0.002 | 98% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.002 | 0.002 | 99% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.002 | 0.002 | 99% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.001 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.001 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.001 | 0.001 | 99% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.001 | 0.001 | 99% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.001 | 0.001 | 99% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CH_4$ | 148.067 | 121.543 | 0.001 | 0.001 | 99% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.001 | 0.001 | 99% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.000 | 0.000 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 0.000 | 8.441 | 0.000 | 0.000 | 100% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 0.000 | 5.329 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $N_2O$ | 8.920 | 1.350 | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 7.502 | 1.315 | 0.000 | 0.000 | 100% |

| Tier 1 Analysis - Trend Assessment | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source/Sink Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-$CO_2$) | Last Year (2018) Estimate (Gg eq-$CO_2$) | Trend Assessment | % Contribution to trend | Cumulative Total (%) |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $N_2O$ | 2.851 | 5.500 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 5.715 | 6.933 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 4.196 | 0.735 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CH_4$ | 3.702 | 0.545 | 0.000 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.291 | 1.617 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.973 | 2.152 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.700 | 1.015 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 0.000 | 0.975 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.096 | 0.909 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.000 | 0.613 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 1.555 | 1.660 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CH_4$ | 0.159 | 0.308 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 0.876 | 0.501 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.735 | 0.420 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $N_2O$ | 0.064 | 0.017 | 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 | 0.006 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| TOTAL | | 31,875.84 | 23,792.79 | | | |

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 (2018) Estimate (Gg eq-CO2) | Trend Assessment | % Contribution to trend | Cumulative Total (%) |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.133 | 0.166 | 17% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CO_2$ | 4,615.029 | 875.556 | 0.112 | 0.139 | 30% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.054 | 0.067 | 37% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,702.511 | 290.546 | 0.043 | 0.053 | 42% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.041 | 0.051 | 48% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.039 | 0.049 | 53% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.033 | 0.041 | 57% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.028 | 0.035 | 60% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CO_2$ | 595.119 | 1,140.558 | 0.027 | 0.033 | 63% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 2,158.014 | 1,061.264 | 0.026 | 0.033 | 67% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.022 | 0.027 | 69% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 746.003 | 0.020 | 0.025 | 72% |
| 2.F.1 Refrigeration and Air conditioning | F- | 0.000 | 480.164 | 0.019 | 0.024 | 74% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 675.294 | 0.019 | 0.024 | 77% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $CO_2$ | 1,838.442 | 1,891.695 | 0.017 | 0.021 | 79% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.016 | 0.020 | 81% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,641.149 | 942.308 | 0.014 | 0.018 | 83% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.014 | 0.017 | 84% |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | 28.890 | 262.107 | 0.010 | 0.012 | 86% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 378.907 | 0.009 | 0.011 | 87% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 225.448 | 0.009 | 0.011 | 88% |
| 4.A.1 Forest Land Remaining Forest Land | $CO_2$ | 6,704.183 | 5,133.751 | 0.008 | 0.010 | 89% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.007 | 0.009 | 90% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.006 | 0.008 | 91% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.000 | 0.006 | 0.008 | 91% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.006 | 0.007 | 92% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CO_2$ | 442.772 | 223.726 | 0.005 | 0.006 | 93% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 0.000 | 116.931 | 0.005 | 0.006 | 93% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CH_4$ | 220.427 | 61.925 | 0.005 | 0.006 | 94% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 82.914 | 0.004 | 0.005 | 94% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.004 | 0.005 | 95% |
| 4(III).Direct N2O emissions from N | $N_2O$ | 47.233 | 121.002 | 0.003 | 0.004 | 95% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CO_2$ | 157.786 | 42.847 | 0.003 | 0.004 | 96% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.003 | 0.004 | 96% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.003 | 0.003 | 96% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.003 | 0.003 | 97% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.003 | 0.003 | 97% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 12.141 | 0.002 | 0.003 | 97% |
| 4.B.2 Land Converted to Cropland | $CO_2$ | 23.135 | 69.925 | 0.002 | 0.003 | 97% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.002 | 0.002 | 98% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.002 | 0.002 | 98% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.002 | 0.002 | 98% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.001 | 0.002 | 98% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.001 | 0.002 | 98% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.001 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.001 | 0.001 | 99% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.001 | 0.001 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.001 | 0.001 | 99% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.001 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.001 | 0.001 | 99% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.001 | 0.001 | 99% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.000 | 0.001 | 99% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.000 | 0.001 | 99% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 0.001 | 99% |

| Tier 1 Analysis - Trend Assessment Including LULUCF | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source/Sink Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-$CO_2$) | Last Year (2018) Estimate (Gg eq-$CO_2$) | Trend Assessment | % Contribution to trend | Cumulative Total (%) |
| 2.F.4 Aerosols | F- | 0.000 | 8.689 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.000 | 0.000 | 100% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $N_2O$ | 8.920 | 1.350 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F- | 0.000 | 5.197 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 7.502 | 1.315 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 0.000 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 0.000 | 100% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CH_4$ | 148.067 | 121.543 | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $N_2O$ | 2.851 | 5.500 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F- | 10.450 | 5.527 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 4.196 | 0.735 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CH_4$ | 3.702 | 0.545 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $N_2O$ | 5.715 | 6.933 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.973 | 2.152 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.291 | 1.617 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.700 | 1.015 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 0.000 | 0.975 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.096 | 0.909 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.000 | 0.613 | 0.000 | 0.000 | 100% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 11.391 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 0.000 | 100% |
| 4.C.1 Grassland Remaining Grassland | $CO_2$ | 2.069 | 2.069 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $CH_4$ | 1.555 | 1.660 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 1.052 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 0.000 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 1.301 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 0.876 | 0.501 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CH_4$ | 0.159 | 0.308 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.735 | 0.420 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $N_2O$ | 0.064 | 0.017 | 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 | 0.006 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| TOTAL | | 39,543.94 | 31,433.18 | | | |

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 | 1,240.239 | 0.164 | 16% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 0.134 | 30% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 0.124 | 42% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 0.058 | 48% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | 442.772 | 0.046 | 53% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 0.045 | 57% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 0.036 | 61% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 0.036 | 64% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 0.027 | 67% |
| 3.B Manure Management | $N_2O$ | 375.219 | 0.024 | 70% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 0.022 | 72% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 0.020 | 74% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 0.019 | 76% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 0.018 | 78% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 0.018 | 79% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $CO_2$ | 2,158.014 | 0.017 | 81% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 0.017 | 83% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 0.014 | 84% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.014 | 85% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CO_2$ | 1,702.511 | 0.013 | 87% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $CO_2$ | 1,641.149 | 0.013 | 88% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 0.013 | 89% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 0.012 | 91% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 0.009 | 91% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 0.009 | 92% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CH_4$ | 148.067 | 0.008 | 93% |
| 3.B Manure Management | $CH_4$ | 426.179 | 0.007 | 94% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 0.007 | 95% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 0.006 | 95% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 0.006 | 96% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.005 | 96% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 0.005 | 97% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 0.004 | 97% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 0.004 | 98% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 0.002 | 98% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 0.002 | 98% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.002 | 99% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 0.002 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $N_2O$ | 7.502 | 0.002 | 99% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $N_2O$ | 4.973 | 0.001 | 99% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 0.001 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $N_2O$ | 4.291 | 0.001 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 0.001 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.001 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid | $CH_4$ | 4.196 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $N_2O$ | 0.876 | 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.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $CH_4$ | 2.700 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid | $CH_4$ | 2.096 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 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 | $CH_4$ | 0.735 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 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 | $CO_2$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $CH_4$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other | $N_2O$ | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 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 | F-gases | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 0.000 | 100% |
| 2.F.4 Aerosols | F-gases | 0.000 | 0.000 | 100% |
| 3.G Liming | $CO_2$ | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 0.000 | 100% |
| TOTAL | | 31,875.849 | | |

Table A1.3-8: Key categories analysis – Level Assessment - Tier 2 (Excluding LULUCF) – 2018

| Tier 2 Analysis - Level Assessment - Excluding LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-CO2) | Last Year (2018) Estimate (Gg eq-CO2) | Level Assessment Tier 2 | Cumulative Total (%) |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.212 | 21% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.179 | 39% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.143 | 53% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.071 | 60% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.033 | 64% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CO_2$ | 442.772 | 223.726 | 0.032 | 67% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.027 | 70% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.027 | 72% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.023 | 75% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 1,891.695 | 0.022 | 77% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.019 | 79% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.018 | 80% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.017 | 82% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 1,140.558 | 0.013 | 84% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.013 | 85% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 2,158.014 | 1,061.264 | 0.012 | 86% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.011 | 87% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CH_4$ | 148.067 | 121.543 | 0.011 | 88% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,641.149 | 942.308 | 0.011 | 89% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 875.556 | 0.010 | 90% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.010 | 91% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.010 | 92% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.009 | 93% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 61.925 | 0.009 | 94% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.007 | 95% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.006 | 96% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.006 | 96% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 82.914 | 0.005 | 97% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,702.511 | 290.546 | 0.003 | 97% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 42.847 | 0.003 | 97% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.003 | 98% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 6.933 | 0.002 | 98% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.002 | 98% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 5.500 | 0.002 | 99% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 0.000 | 116.931 | 0.001 | 99% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.001 | 99% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.001 | 99% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.001 | 99% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.001 | 99% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.973 | 2.152 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.291 | 1.617 | 0.001 | 99% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 1.350 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 7.502 | 1.315 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.000 | 100% |

| Tier 2 Analysis - Level Assessment - Excluding LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-CO2) | Last Year (2018) Estimate (Gg eq-CO2) | Level Assessment Tier 2 | Cumulative Total (%) |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.000 | 0.975 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 100% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.876 | 0.501 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 1.660 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.700 | 1.015 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.096 | 0.909 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 4.196 | 0.735 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.000 | 0.613 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.545 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.735 | 0.420 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.308 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 0.017 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 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 | $CH_4$ | 5.447 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 100% |
| TOTAL | | 31,875.849 | 23,792.796 | | |

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 | $CO_2$ | 6,704.183 | 0.420 | 42% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.068 | 49% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 0.056 | 54% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 0.054 | 60% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 0.051 | 65% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 0.027 | 68% |
| 4(III).Direct N2O emissions from N mineralization/immobilization | $N_2O$ | 47.233 | 0.026 | 70% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 0.024 | 73% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 0.021 | 75% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | 442.772 | 0.019 | 77% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 0.019 | 79% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 0.015 | 80% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 0.015 | 82% |
| 4.B.2 Land Converted to Cropland | $CO_2$ | 23.135 | 0.015 | 83% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 0.014 | 84% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 0.011 | 86% |
| 3.B Manure Management | $N_2O$ | 375.219 | 0.010 | 87% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | 220.427 | 0.009 | 87% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 0.008 | 88% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 0.008 | 89% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 0.007 | 90% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 0.007 | 91% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CO_2$ | 2,158.014 | 0.007 | 91% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 0.007 | 92% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 0.006 | 93% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.006 | 93% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CO_2$ | 1,702.511 | 0.006 | 94% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $CO_2$ | 1,641.149 | 0.005 | 94% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 0.005 | 95% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 0.005 | 95% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 0.005 | 96% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 0.004 | 96% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 0.004 | 97% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CH_4$ | 148.067 | 0.004 | 97% |
| 3.B Manure Management | $CH_4$ | 426.179 | 0.003 | 97% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CO_2$ | 157.786 | 0.003 | 97% |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | 28.890 | 0.003 | 98% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 0.002 | 98% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 0.002 | 98% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 0.002 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 0.002 | 99% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 0.002 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 0.001 | 99% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.001 | 99% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $N_2O$ | 7.502 | 0.001 | 99% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.001 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 0.001 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $N_2O$ | 4.973 | 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 (%) |
| 2.G Other Product Manufacture and Use | F- | 10.450 | 0.000 | 100% |
| 3.H Urea Application | $CO_2$ | 50.020 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $N_2O$ | 4.291 | 0.000 | 100% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.000 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CH_4$ | 4.196 | 0.000 | 100% |
| 4.C.1 Grassland Remaining Grassland | $CO_2$ | 2.069 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $N_2O$ | 0.876 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $CH_4$ | 2.700 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CH_4$ | 2.096 | 0.000 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous | $CH_4$ | 0.735 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $N_2O$ | 0.064 | 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 | $CO_2$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil | $CH_4$ | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil | $N_2O$ | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 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 | F- | 0.000 | 0.000 | 100% |
| 2.F.3 Fire Protection | F- | 0.000 | 0.000 | 100% |
| 2.F.4 Aerosols | F- | 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 | | 39,543.940 | | |

Table A1.3-10: Key categories analysis – Level Assessment - Tier 2 (Including LULUCF) – 2018

| Tier 2 Analysis - Level Assessment - Including LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-CO2) | Last Year (2018) Estimate (Gg eq- | Level Assessment Tier 2 | Cumulative Total (%) |
| 4.A.1 Forest Land Remaining Forest Land | $CO_2$ | 6,704.183 | 5,133.751 | 0.462 | 46% |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.059 | 52% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 378.907 | 0.055 | 58% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.050 | 63% |
| 4(III).Direct N2O emissions from N | $N_2O$ | 47.233 | 121.002 | 0.048 | 67% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 746.003 | 0.044 | 72% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 675.294 | 0.042 | 76% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.040 | 80% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 225.448 | 0.023 | 82% |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | 28.890 | 262.107 | 0.022 | 85% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.020 | 87% |
| 4.B.2 Land Converted to Cropland | $CO_2$ | 23.135 | 69.925 | 0.016 | 88% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.009 | 89% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CO_2$ | 442.772 | 223.726 | 0.009 | 90% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.008 | 91% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.008 | 92% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.006 | 92% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 1,891.695 | 0.006 | 93% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.005 | 93% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.005 | 94% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.005 | 94% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 1,140.558 | 0.004 | 95% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.004 | 95% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 11.391 | 0.003 | 95% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 2,158.014 | 1,061.264 | 0.003 | 96% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.003 | 96% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - | $CH_4$ | 148.067 | 121.543 | 0.003 | 96% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,641.149 | 942.308 | 0.003 | 97% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 875.556 | 0.003 | 97% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.003 | 97% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.003 | 98% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.003 | 98% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - | $CH_4$ | 220.427 | 61.925 | 0.002 | 98% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 12.141 | 0.002 | 98% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.002 | 98% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.002 | 99% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.002 | 99% |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | 227.926 | 82.914 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 1,702.511 | 290.546 | 0.001 | 99% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - | $CO_2$ | 157.786 | 42.847 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.001 | 99% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 6.933 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.001 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 5.500 | 0.001 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 1.301 | 0.000 | 100% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CO_2$ | 0.000 | 116.931 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 1.052 | 0.000 | 100% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.000 | 100% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 100% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.000 | 100% |

| Tier 2 Analysis - Level Assessment - Including LULUCF | | | | | |
|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-CO2) | Last Year (2018) Estimate (Gg eq- | Level Assessment Tier 2 | Cumulative Total (%) |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.973 | 2.152 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 4.291 | 1.617 | 0.000 | 100% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 1.350 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 7.502 | 1.315 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.000 | 0.975 | 0.000 | 100% |
| 4.C.1 Grassland Remaining Grassland | $CO_2$ | 2.069 | 2.069 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 100% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $N_2O$ | 0.876 | 0.501 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 1.660 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.700 | 1.015 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 2.096 | 0.909 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 4.196 | 0.735 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.000 | 0.613 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.545 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries and | $CH_4$ | 0.735 | 0.420 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.308 | 0.000 | 100% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - | $N_2O$ | 0.064 | 0.017 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 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 | $CH_4$ | 5.447 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 100% |
| TOTAL | | 39,543.940 | 31,433.187 | | |

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- | Last Year (2018) Estimate (Gg eq- | Trend Assessment Tier 2 | % Contribution to Trend | Cumulative Total (%) |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.057 | 0.339 | 34% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.014 | 0.084 | 42% |
| 2.F.1 Refrigeration and Air conditioning | F-gases | 0.000 | 480.164 | 0.011 | 0.068 | 49% |
| 1.A.1 Fuel combustion - Energy Industries - | $CO_2$ | 4,615.029 | 875.556 | 0.010 | 0.062 | 55% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.006 | 0.035 | 59% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CO_2$ | 442.772 | 223.726 | 0.005 | 0.032 | 62% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CH_4$ | 220.427 | 61.925 | 0.005 | 0.030 | 65% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.004 | 0.025 | 68% |
| 1.A.2 Fuel combustion - Manufacturing | $CO_2$ | 1,702.511 | 290.546 | 0.004 | 0.024 | 70% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.003 | 0.019 | 72% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.003 | 0.018 | 74% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.003 | 0.017 | 75% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.003 | 0.017 | 77% |
| 1.A.1 Fuel combustion - Energy Industries - | $CO_2$ | 595.119 | 1,140.558 | 0.003 | 0.017 | 79% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.003 | 0.016 | 80% |
| 3.D.1 Direct N2O Emissions From Managed | $N_2O$ | 1,094.218 | 850.383 | 0.002 | 0.015 | 82% |
| 1.A.2 Fuel combustion - Manufacturing | $CO_2$ | 2,158.014 | 1,061.264 | 0.002 | 0.013 | 83% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.002 | 0.013 | 84% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.002 | 0.013 | 86% |
| 1.A.1 Fuel combustion - Energy Industries - | $CO_2$ | 1,838.442 | 1,891.695 | 0.002 | 0.012 | 87% |
| 2.D Non-energy Products from Fuels and | $CO_2$ | 227.926 | 82.914 | 0.002 | 0.011 | 88% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CO_2$ | 157.786 | 42.847 | 0.002 | 0.011 | 89% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.002 | 0.010 | 90% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.002 | 0.010 | 91% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.002 | 0.009 | 92% |
| 3.D.2 Indirect N2O Emissions From Managed | $N_2O$ | 357.590 | 273.106 | 0.001 | 0.007 | 93% |
| 1.A.2 Fuel combustion - Manufacturing | $CO_2$ | 1,641.149 | 942.308 | 0.001 | 0.007 | 93% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 0.000 | 8.441 | 0.001 | 0.006 | 94% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.001 | 0.005 | 94% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.001 | 0.004 | 95% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.001 | 0.004 | 95% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.001 | 0.004 | 96% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 8.920 | 1.350 | 0.001 | 0.004 | 96% |
| 1.A.2 Fuel combustion - Manufacturing | $N_2O$ | 7.502 | 1.315 | 0.001 | 0.003 | 96% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 0.003 | 97% |
| 1.A.2 Fuel combustion - Manufacturing | $CO_2$ | 0.000 | 116.931 | 0.000 | 0.003 | 97% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 2.851 | 5.500 | 0.000 | 0.002 | 97% |
| 2.F.4 Aerosols | F-gases | 0.000 | 8.689 | 0.000 | 0.002 | 97% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CH_4$ | 148.067 | 121.543 | 0.000 | 0.002 | 98% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 0.002 | 98% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.000 | 0.002 | 98% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.000 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - | $N_2O$ | 5.715 | 6.933 | 0.000 | 0.002 | 98% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 0.002 | 99% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 0.002 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing | $N_2O$ | 4.291 | 1.617 | 0.000 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing | $N_2O$ | 4.973 | 2.152 | 0.000 | 0.001 | 99% |
| 2.F.3 Fire Protection | F-gases | 0.000 | 5.197 | 0.000 | 0.001 | 99% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.000 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 0.000 | 5.329 | 0.000 | 0.001 | 99% |
| 2.G Other Product Manufacture and Use | F-gases | 10.450 | 5.527 | 0.000 | 0.001 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.000 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing | $N_2O$ | 0.000 | 0.975 | 0.000 | 0.001 | 100% |

| Tier 2 Analysis - Trend Assessment Excluding LULUCF | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq- | Last Year (2018) Estimate (Gg eq- | Trend Assessment Tier 2 | % Contribution to Trend | Cumulative Total (%) |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.000 | 0.001 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 0.001 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $CH_4$ | 4.196 | 0.735 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 3.702 | 0.545 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 0.000 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $CH_4$ | 2.700 | 1.015 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $CH_4$ | 2.096 | 0.909 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $N_2O$ | 0.876 | 0.501 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $CH_4$ | 0.000 | 0.613 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 1.555 | 1.660 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - | $CH_4$ | 0.159 | 0.308 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing | $CH_4$ | 0.735 | 0.420 | 0.000 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $N_2O$ | 0.064 | 0.017 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black | $CO_2$ | 192.426 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black | $CH_4$ | 5.447 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 0.000 | 100% |
| TOTAL | | 31,875.849 | 23,792.796 | | | |

Table A1.3-12: Key categories analysis – Trend Assessment - Tier 2 (Including LULUCF) – 2018

| Tier 2 Analysis - Trend Assessment Including LULUCF | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-$CO_2$) | Last Year (2018) Estimate (Gg eq-$CO_2$) | Trend Assessment Tier 2 | % Contribution to Trend | Cumulative Total (%) |
| 5.A Solid Waste Disposal | $CH_4$ | 539.010 | 1,771.443 | 0.040 | 0.130 | 13% |
| 4(III).Direct N2O emissions from N | $N_2O$ | 47.233 | 121.002 | 0.029 | 0.096 | 23% |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | 199.640 | 378.907 | 0.028 | 0.092 | 32% |
| 4.G Harvested Wood Products | $CO_2$ | 301.544 | 746.003 | 0.027 | 0.087 | 41% |
| 4.E.2 Land Converted to Settlements | $CO_2$ | 250.713 | 675.294 | 0.026 | 0.086 | 49% |
| 4.C.2 Land Converted to Grassland | $CO_2$ | 10.152 | 225.448 | 0.020 | 0.065 | 56% |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | 28.890 | 262.107 | 0.018 | 0.058 | 61% |
| 4.A.1 Forest Land Remaining Forest Land | $CO_2$ | 6,704.183 | 5,133.751 | 0.016 | 0.051 | 67% |
| 4.B.2 Land Converted to Cropland | $CO_2$ | 23.135 | 69.925 | 0.011 | 0.035 | 70% |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | 0.010 | 0.031 | 73% |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | 83.466 | 12.141 | 0.009 | 0.031 | 76% |
| 2.F.1 Refrigeration and Air conditioning | F- | 0.000 | 480.164 | 0.008 | 0.027 | 79% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CO_2$ | 4,615.029 | 875.556 | 0.008 | 0.026 | 82% |
| 3.A Enteric Fermentation | $CH_4$ | 2,120.224 | 983.257 | 0.005 | 0.016 | 83% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CO_2$ | 442.772 | 223.726 | 0.005 | 0.015 | 85% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CH_4$ | 220.427 | 61.925 | 0.004 | 0.013 | 86% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,702.511 | 290.546 | 0.003 | 0.010 | 87% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | 0.003 | 0.010 | 88% |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | 0.003 | 0.008 | 89% |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | 445.000 | 169.948 | 0.003 | 0.008 | 90% |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | 0.002 | 0.008 | 90% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CO_2$ | 595.119 | 1,140.558 | 0.002 | 0.006 | 91% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 2,158.014 | 1,061.264 | 0.002 | 0.006 | 92% |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | 0.002 | 0.006 | 92% |
| 3.B Manure Management | $N_2O$ | 375.219 | 136.316 | 0.002 | 0.006 | 93% |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | 0.002 | 0.005 | 93% |
| 2.G Other Product Manufacture and Use | $N_2O$ | 33.376 | 71.443 | 0.002 | 0.005 | 94% |
| 2.D Non-energy Products from Fuels and Solvent | $CO_2$ | 227.926 | 82.914 | 0.001 | 0.005 | 94% |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | 357.590 | 273.106 | 0.001 | 0.005 | 95% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $CO_2$ | 157.786 | 42.847 | 0.001 | 0.005 | 95% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $CO_2$ | 1,838.442 | 1,891.695 | 0.001 | 0.004 | 96% |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | 0.001 | 0.004 | 96% |
| 5.D Wastewater Treatment and Discharge | $N_2O$ | 66.884 | 89.000 | 0.001 | 0.004 | 96% |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 50.267 | 52.411 | 0.001 | 0.003 | 97% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 1,641.149 | 942.308 | 0.001 | 0.003 | 97% |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | 1,094.218 | 850.383 | 0.001 | 0.003 | 97% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | 0.000 | 8.441 | 0.001 | 0.002 | 98% |
| 2.B.2 Nitric Acid Production | $N_2O$ | 754.265 | 50.109 | 0.001 | 0.002 | 98% |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | 0.001 | 0.002 | 98% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $N_2O$ | 8.920 | 1.350 | 0.000 | 0.002 | 98% |
| 2.A.1 Cement Production | $CO_2$ | 1,093.483 | 1,210.718 | 0.000 | 0.001 | 98% |
| 3.B Manure Management | $CH_4$ | 426.179 | 401.273 | 0.000 | 0.001 | 98% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 7.502 | 1.315 | 0.000 | 0.001 | 99% |
| 3.G Liming | $CO_2$ | 0.000 | 10.917 | 0.000 | 0.001 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CO_2$ | 0.000 | 116.931 | 0.000 | 0.001 | 99% |
| 2.F.4 Aerosols | F- | 0.000 | 8.689 | 0.000 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $N_2O$ | 2.851 | 5.500 | 0.000 | 0.001 | 99% |
| 5.B Biological Treatment of Soild Waste | $CH_4$ | 0.000 | 4.759 | 0.000 | 0.001 | 99% |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | 0.000 | 0.001 | 99% |
| 3.H Urea Application | $CO_2$ | 50.020 | 65.048 | 0.000 | 0.001 | 99% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $N_2O$ | 5.715 | 6.933 | 0.000 | 0.001 | 99% |
| 5.B Biological Treatment of Soild Waste | $N_2O$ | 0.000 | 3.404 | 0.000 | 0.001 | 99% |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | 0.000 | 0.001 | 99% |

| Tier 2 Analysis - Trend Assessment Including LULUCF | | | | | | |
|---|---|---|---|---|---|---|
| IPCC Source Categories | Direct GHG | Base Year (1990) Estimate (Gg eq-CO2) | Last Year (2018) Estimate (Gg eq-CO2) | Trend Assessment Tier 2 | % Contribution to Trend | Cumulative Total (%) |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.973 | 2.152 | 0.000 | 0.000 | 99% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 4.291 | 1.617 | 0.000 | 0.000 | 99% |
| 4(V) Biomass Burning | $CO_2$ | 14.979 | 11.391 | 0.000 | 0.000 | 99% |
| 2.F.3 Fire Protection | F- | 0.000 | 5.197 | 0.000 | 0.000 | 99% |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | 0.000 | 0.000 | 100% |
| 4(V) Biomass Burning | $N_2O$ | 0.858 | 1.052 | 0.000 | 0.000 | 100% |
| 4(V) Biomass Burning | $CH_4$ | 1.230 | 1.301 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | 0.000 | 5.329 | 0.000 | 0.000 | 100% |
| 2.G Other Product Manufacture and Use | F- | 10.450 | 5.527 | 0.000 | 0.000 | 100% |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and | $CH_4$ | 148.067 | 121.543 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $N_2O$ | 0.000 | 0.975 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CO_2$ | 558.672 | 513.057 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | 0.000 | 0.000 | 100% |
| 2.C.1 Iron and Steel Production | $CO_2$ | 43.808 | 8.994 | 0.000 | 0.000 | 100% |
| 2.A.4 Other Process Uses of Carbonates | $CO_2$ | 13.073 | 34.642 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 4.196 | 0.735 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Liquid | $CH_4$ | 3.702 | 0.545 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | 0.000 | 0.000 | 100% |
| 2.A.2 Lime Production | $CO_2$ | 156.820 | 88.946 | 0.000 | 0.000 | 100% |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.700 | 1.015 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CH_4$ | 0.590 | 0.043 | 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 | $N_2O$ | 0.876 | 0.501 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 2.096 | 0.909 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $N_2O$ | 0.630 | 0.170 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.000 | 0.613 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous | $CH_4$ | 1.555 | 1.660 | 0.000 | 0.000 | 100% |
| 2.A.3 Glass Production | $CO_2$ | 43.216 | 30.498 | 0.000 | 0.000 | 100% |
| 1.A.1 Fuel combustion - Energy Industries - Solid | $CH_4$ | 0.159 | 0.308 | 0.000 | 0.000 | 100% |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | 0.000 | 0.000 | 100% |
| 1.A.2 Fuel combustion - Manufacturing Industries | $CH_4$ | 0.735 | 0.420 | 0.000 | 0.000 | 100% |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and | $N_2O$ | 0.064 | 0.017 | 0.000 | 0.000 | 100% |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | 0.000 | 0.000 | 100% |
| 1.B.2.c. Venting and flaring | $CO_2$ | 0.002 | 0.000 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | 0.000 | 0.000 | 100% |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | 0.000 | 0.000 | 100% |
| 1.B.1 Fugitive emissions from Solid Fuels | $CH_4$ | 59.644 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $CH_4$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.1 Ammonia Production | $N_2O$ | 0.000 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CO_2$ | 192.426 | 0.000 | 0.000 | 0.000 | 100% |
| 2.B.8 Petrochemical and Carbon Black Production | $CH_4$ | 5.447 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | $CO_2$ | 118.797 | 0.000 | 0.000 | 0.000 | 100% |
| 2.C.3 Aluminium Production | PFCs | 1,240.239 | 0.000 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $CO_2$ | 0.536 | 0.000 | 0.000 | 0.000 | 100% |
| 5.C Incineration and Open Burning of Waste | $N_2O$ | 0.007 | 0.000 | 0.000 | 0.000 | 100% |
| TOTAL | | 39,543.94 | 31,433.18 | | | |

Table A1.3-13: Source Analysis Summary (Croatian Inventory NIR 2020, 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 | | Com. |
| 1. Energy | | | | | |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | Yes | L1e L2e | L1i | |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | Yes | L1e L2e | L1i L2i | |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | Yes | L1e | L1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels | $CO_2$ | Yes | L1e L2e | L1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CO_2$ | Yes | L1e L2e | L1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CO_2$ | Yes | L1e L2e | L1i | |
| 1.A.3.b Road Transportation | $CO_2$ | Yes | L1e L2e | L1i L2i | |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | Yes | L1e L2e | L1i | |
| 1.A.4 Other Sectors - Biomass | $N_2O$ | 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 | | |
| 1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil | $CH_4$ | Yes | L1e L2e | L1i L2i | |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | Yes | L1e L2e | L1i L2i | |
| 2. Industrial processes and product use | | | | | |
| 2.A.1 Cement Production | $CO_2$ | Yes | L1e L2e | L1i L2i | |
| 2.B.1 Ammonia Production | $CO_2$ | Yes | L1e | L1i | |
| 2.B.2 Nitric Acid Production | $N_2O$ | 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 L2e | L1i L2i | |
| 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 | | 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 2020, year t=2018)

| Tier 1 and Tier 2 Analysis - Source Analysis Summary (Croatian Inventory, year = 2018) | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | B | C | D | | | | E |
| IPCC Source Categories | GHG | Key | If Column C is Yes, Criteria for Identification | | | | Com. |
| **1. Energy** | | | | | | | |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | Yes | L1e L2e | T1e T2e | L1i | T1i | |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | Yes | L1e | T1e | L1i | T1i T2i | |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | Yes | L1e L2e | T1e T2e | L1i | T1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels | $CO_2$ | Yes | L1e L2e | T1e T2e | L1i | T1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CO_2$ | Yes | L1e L2e | T1e T2e | L1i | T1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels | $CO_2$ | Yes | | T1e | | T1i | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CO_2$ | Yes | L1e | T1e | 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.3.c Railways | $CO_2$ | Yes | | | | T2i | |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | Yes | L1e | | L1i | | |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | Yes | L1e L2e | T1e T2e | L1i | | |
| 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 | |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | Yes | L2e | T2e | | | |
| 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 | $CH_4$ | Yes | | T1e | | T1i T2i | |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CH_4$ | Yes | L2e | T2e | | | |
| 1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas | $CO_2$ | Yes | L1e L2e | T1e 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 | FCs | Yes | | T1e | | T1i | |
| 2.D Non-energy Products from Fuels and Solvent Use | $CO_2$ | Yes | | | | T1i | |
| 2.F.1 Refrigeration and Air conditioning | F-gasses | Yes | L1e L2e | T1e T2e | L1i L2i | T1i T2i | |
| **3. Agriculture** | | | | | | | |
| 3.A Enteric Fermentation | $CH_4$ | Yes | L1e L2e | T1e T2e | L1i | T1i T2i | |
| 3.B Manure Management | $CH_4$ | Yes | L1e | | L1i | | |
| 3.B Manure Management | $N_2O$ | Yes | L1e | T1e | | T1i | |
| 3.D.1 Direct N2O Emissions From Managed Soils | $N_2O$ | Yes | L1e L2e | T2e | L1i L2i | | |
| 3.D.2 Indirect N2O Emissions From Managed Soils | $N_2O$ | Yes | L1e L2e | T2e | L1i L2i | | |
| **4. Land use, land use change and forestry** | | | | | | | |
| 4(III).Direct N2O emissions from N mineralization/immobilization | $N_2O$ | Yes | | | L2i | T2i | |
| 4.A.1 Forest Land Remaining Forest Land | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| 4.A.2 Land Converted to Forest Land | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| 4.B.1 Cropland Remaining Cropland | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| 4.B.2 Land Converted to Cropland | $CO_2$ | Yes | | | L2i | T2i | |
| 4.C.2 Land Converted to Grassland | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| 4.D.2 Land Converted to Wetlands | $CO_2$ | Yes | | | | T2i | |
| 4.E.2 Land Converted to Settlements | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| 4.G Harvested Wood Products | $CO_2$ | Yes | | | L1i L2i | T1i T2i | |
| **5. Waste** | | | | | | | |
| 5.A Solid Waste Disposal | $CH_4$ | Yes | L1e L2e | T1e T2e | L1i L2i | T1i T2i | |
| 5.D Wastewater Treatment and Discharge | $CH_4$ | Yes | L1e | T1e | L1i | T1i T2i | |
| 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

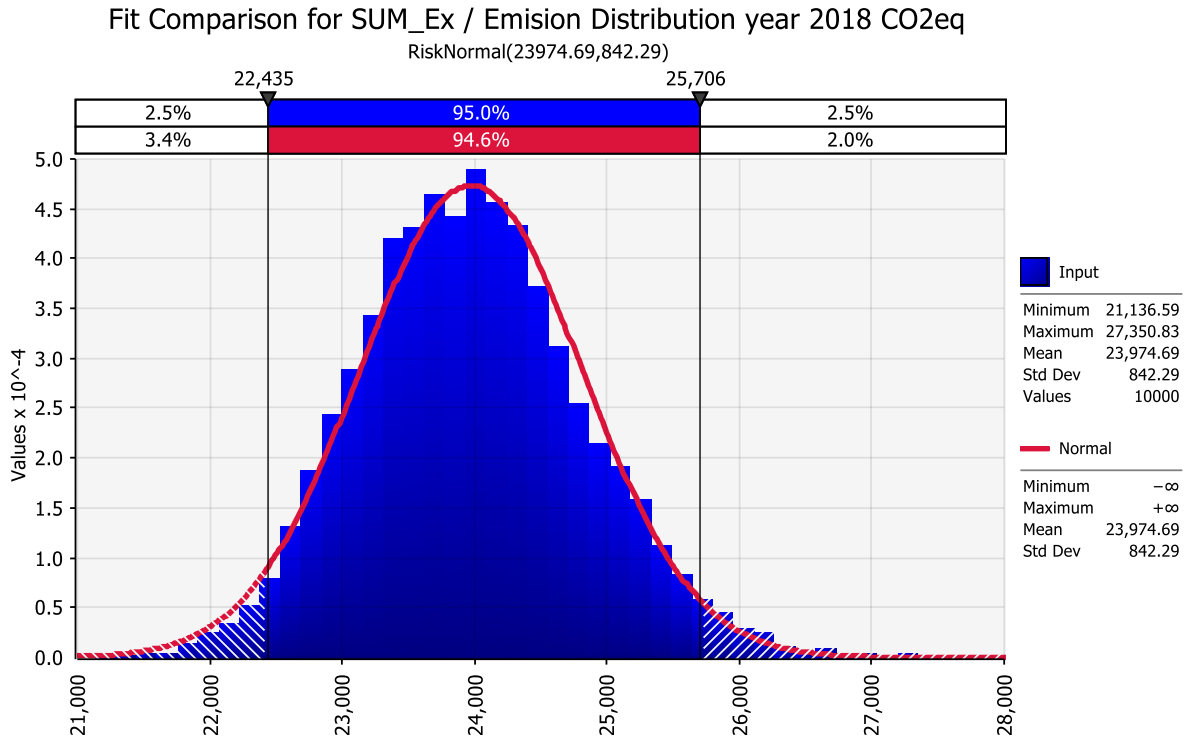
If for activity data or emission factor uncertainty default value from IPCC guidance was used, average value from range of given uncertainty was set.

### 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 23,792.80 kt $CO_2$-eq for the year 2018 and 31,875.85 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 2018 excluding LULUCF



Monte Carlo analysis shows that with a certainty of 95% total emissions of all categories for the year 2018 (23,974.69 kt $CO_2$eq) according to simulation varies between 22,434.84 kt $CO_2$-eq (2.5 percentile) and 25,706.31 kt $CO_2$eq (97.5 percentile). Figure A2.2-1 shows the distribution of total $CO_2$ emission for year 2018 with a corresponding probability density function (red line) that best matches the simulation results.

Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories excluding LULUCF for the year 1990 (32,238.02 kt $CO_2$-eq) varies between 30,382.30 kt $CO_2$eq (2.5 percentile) and 34,308.79 kt $CO_2$eq (97.5 percentile).

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

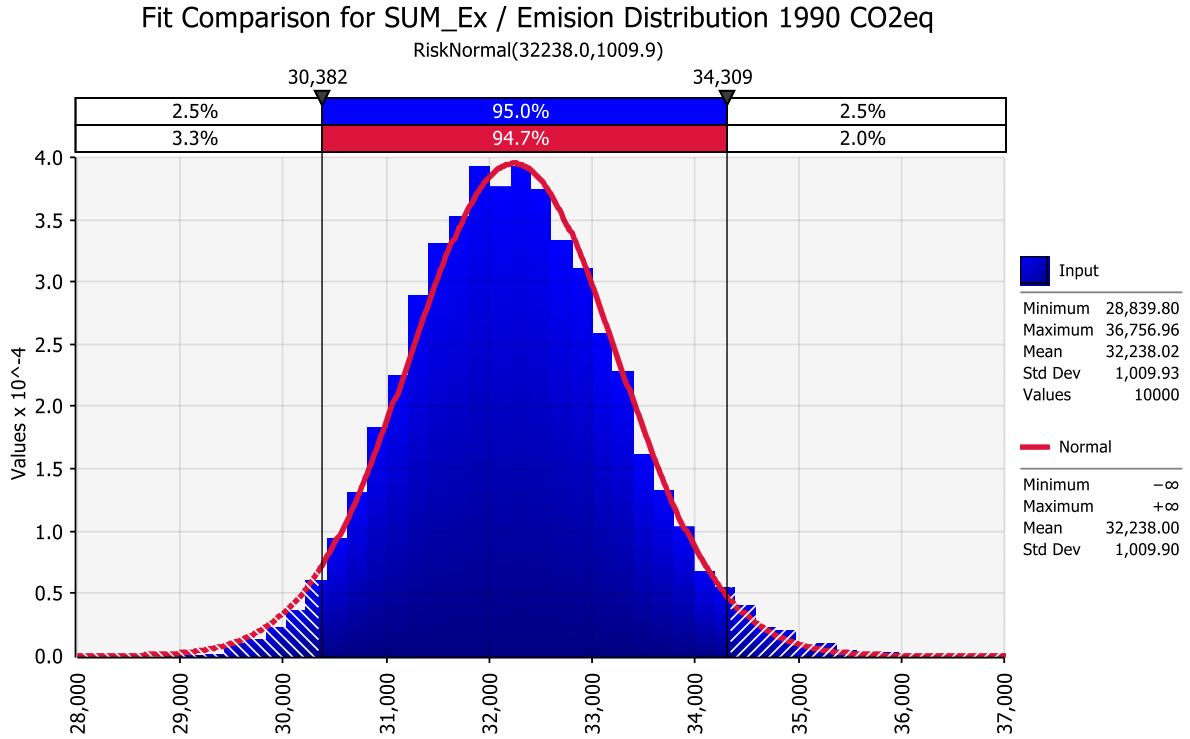



Figure A2.2-2 shows the distribution of total $CO_2$ emission for year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

### 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 -25.36%, simulated trend is -25.56% and the 95% probability range of the trend is -32.23% (2,5 percentile) to -18.52% (97.5 percentile).

Figure A2.2-3: Distribution of trend for year 2018 with the respect to year 1990

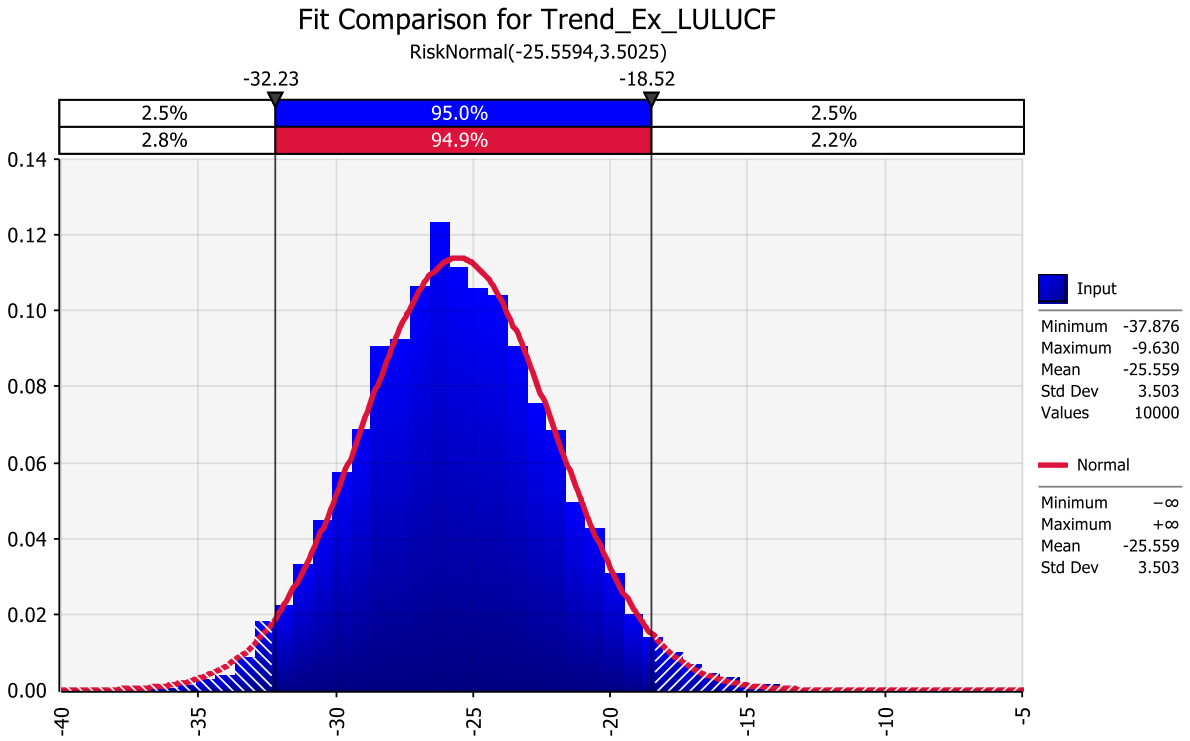



Figure A2.2-3: shows the distribution of trend for year 2018 respect to year 1990 with a corresponding probability density function (red line) that best matches the simulation results.

## 2.2.4. Uncertainty including LULUCF sector

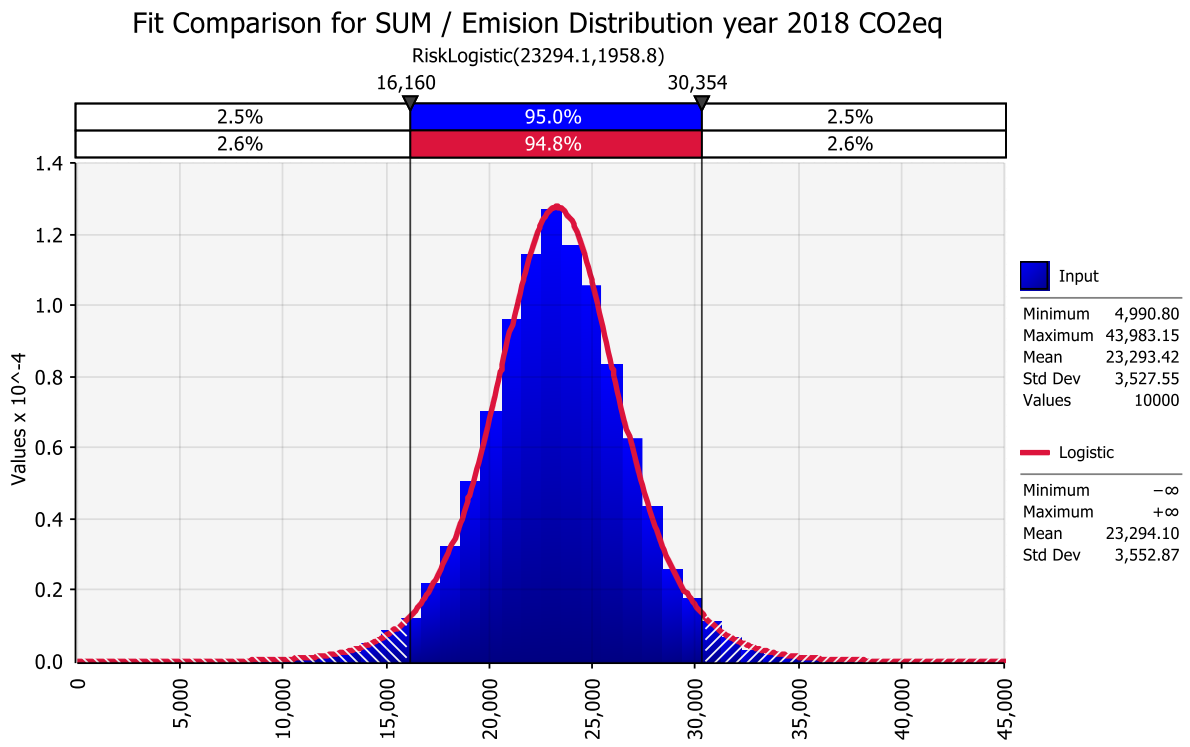
### 2.2.4.1. Uncertainty in the emissions including LULUCF

The estimations of $CO_2$eq emissions were 18,698.57 kt CO2-eq for the year 2018 and 25,454.40 kt $CO_2$eq for the year 1990 with removals from LULUCF included.

Monte Carlo analysis shows that with a certainty of 95% total emissions of categories for the year 2018 (23,293.42 kt $CO_2$eq) according to simulation varies between 16,160.50 kt $CO_2$eq (2.5 percentile) and 30,354.44 kt $CO_2$eq (97.5 percentile).

Figure A2.2-4 shows the distribution of total $CO_2$ emission including LULUCF for year 2018 with a corresponding probability density function (red line) that best matches the simulation results.

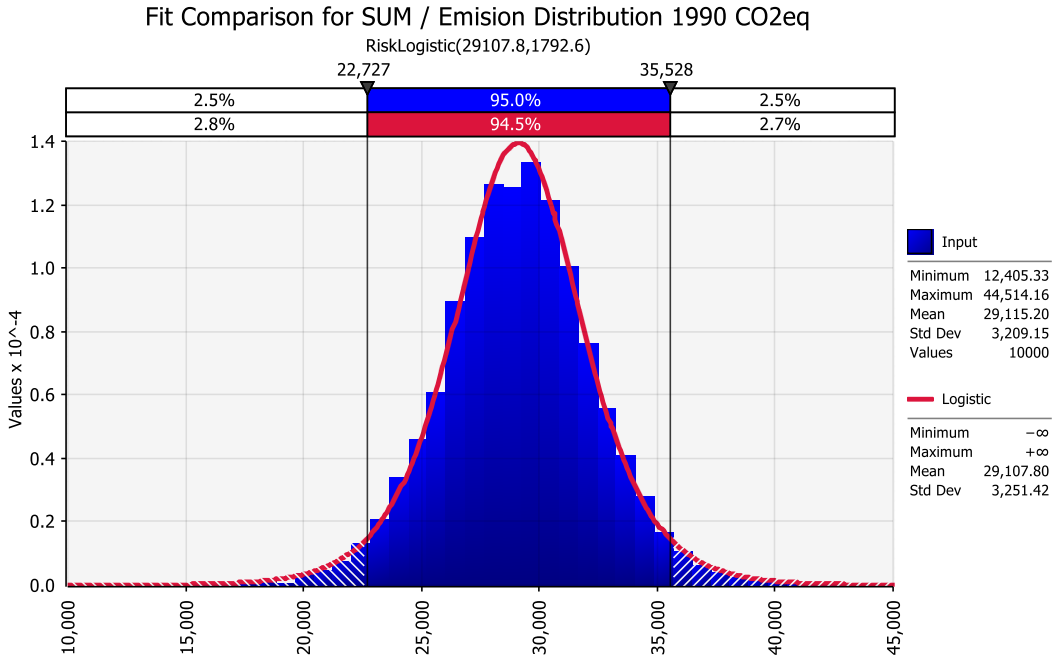
Figure A2.2-4: Distribution of total $CO_2$ emission for year 2018 including LULUCF




Monte Carlo analysis shows that with a certainty of 95% total simulated emissions of all categories including LULUCF for the year 1990 (29,115.20 kt $CO_2$eq) varies between 22,727.00 kt $CO_2$-eq (2.5 percentile) and 35,528.34 kt $CO_2$eq (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

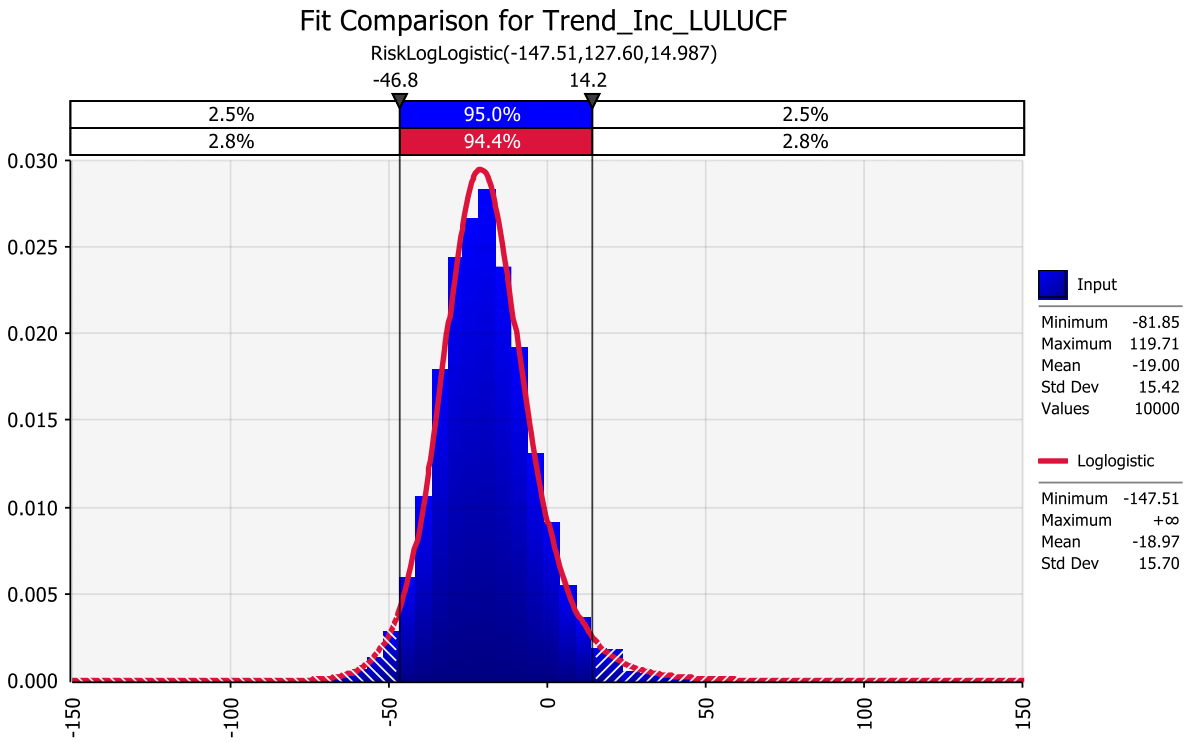
The trend in the inventory is estimated for each category and for the total summary emission (all categories included) with the following forumula:

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

The Inventory trend including LULUCF is -26.54%, simulated trend is -19.00% and the 95% probability range of the trend is -46.26% (2.5 percentile) to 14.50% (97.5 percentile), so the uncertainty introduced in trend varies from -20.29% to 40.72% with respect to the base year emissions.

Figure A2.2-6: shows the distribution of trend for year 2018 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 2018 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=2018 (IPCC 2006 Table 3.3)

| A | B | C | D | E | | F | | G | | H | I | J | | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IPCC category | Gas | Base year emissions /removals | Year t emissions /removals | Activity data uncertainty | | Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used) | | Combined uncertainty | | Contribution to variance in Year t | Inventory trend in national emissions for year t increase with respect to base year | Uncertainty introduced into the trend in total national emissions with respect to base year | | Approach and Comments |
| | | Gg CO2 equivalent | Gg CO2 equivalent | ( - ) % | ( + ) % | ( - ) % | ( + ) % | ( - ) % | ( + ) % | (fraction) | (% of base year) | ( - ) % | ( + ) % | |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CO_2$ | 4,615.029 | 875.556 | -5 | 5 | -5 | 5 | -7.01 | 7.17 | 0.000080 | -81.03 | -1.79 | 2.01 | |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $CH_4$ | 3.702 | 0.545 | -5 | 5 | -50 | 50 | -50.17 | 50.74 | 0.000000 | -85.28 | -8.13 | 18.10 | |
| 1.A.1 Fuel combustion - Energy Industries - Liquid Fuels | $N_2O$ | 8.920 | 1.350 | -5 | 5 | -200 | 200 | -91.77 | 208.72 | 0.000000 | -84.87 | -14.15 | 219.02 | |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CO_2$ | 595.119 | 1,140.558 | -5 | 5 | -5 | 5 | -7.08 | 7.16 | 0.000139 | 91.65 | -18.49 | 20.27 | |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $CH_4$ | 0.159 | 0.308 | -5 | 5 | -50 | 50 | -49.90 | 50.09 | 0.000000 | 92.90 | -106.03 | 239.95 | |
| 1.A.1 Fuel combustion - Energy Industries - Solid Fuels | $N_2O$ | 2.851 | 5.500 | -5 | 5 | -200 | 200 | -91.69 | 210.27 | 0.000002 | 92.90 | -179.58 | 2876.33 | |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CO_2$ | 1,838.442 | 1,891.695 | -5 | 5 | -5 | 5 | -6.95 | 7.25 | 0.000375 | 2.90 | -9.80 | 10.91 | |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $CH_4$ | 1.555 | 1.660 | -5 | 5 | -50 | 50 | -50.10 | 50.59 | 0.000000 | 6.75 | -59.95 | 128.63 | |
| 1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels | $N_2O$ | 5.715 | 6.933 | -5 | 5 | -200 | 200 | -91.67 | 208.18 | 0.000003 | 21.30 | -113.75 | 1700.50 | |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $CH_4$ | | 5.329 | -5 | 5 | -50 | 50 | -50.26 | 50.42 | 0.000000 | | | | 2 |
| 1.A.1 Fuel combustion - Energy Industries - Biomass | $N_2O$ | | 8.441 | -5 | 5 | -200 | 200 | -91.58 | 209.05 | 0.000004 | | | | 2 |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CO_2$ | 2,158.014 | 1,061.264 | -5 | 5 | -5 | 5 | -7.04 | 7.18 | 0.000117 | -50.82 | -4.67 | 5.08 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $CH_4$ | 2.096 | 0.909 | -5 | 5 | -50 | 50 | -50.27 | 50.90 | 0.000000 | -56.64 | -23.76 | 52.49 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels | $N_2O$ | 4.973 | 2.152 | -5 | 5 | -200 | 200 | -91.62 | 207.07 | 0.000000 | -56.73 | -40.49 | 649.45 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CO_2$ | 1,702.511 | 290.546 | -5 | 5 | -5 | 5 | -6.96 | 7.18 | 0.000009 | -82.93 | -1.63 | 1.80 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $CH_4$ | 4.196 | 0.735 | -5 | 5 | -50 | 50 | -50.00 | 50.36 | 0.000000 | -82.48 | -9.52 | 21.44 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels | $N_2O$ | 7.502 | 1.315 | -5 | 5 | -200 | 200 | -91.76 | 208.38 | 0.000000 | -82.48 | -16.49 | 265.36 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels | $CO_2$ | 1,641.149 | 942.308 | -5 | 5 | -5 | 5 | -7.11 | 7.14 | 0.000093 | -42.58 | -5.44 | 6.11 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels | $CH_4$ | 0.735 | 0.420 | -5 | 5 | -50 | 50 | -50.46 | 50.14 | 0.000000 | -42.84 | -31.45 | 69.03 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels | $N_2O$ | 0.876 | 0.501 | -5 | 5 | -200 | 200 | -91.68 | 206.87 | 0.000000 | -42.84 | -53.77 | 904.94 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels | $CO_2$ | | 116.931 | -5 | 5 | -5 | 5 | -6.95 | 7.20 | 0.000001 | | | | 2 |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels | $CH_4$ | | 0.613 | -5 | 5 | -50 | 50 | -50.20 | 50.49 | 0.000000 | | | | 2 |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels | $N_2O$ | | 0.975 | -5 | 5 | -200 | 200 | -91.71 | 208.37 | 0.000000 | | | | 2 |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $CH_4$ | 2.700 | 1.015 | -5 | 5 | -50 | 50 | -49.95 | 50.49 | 0.000000 | -62.41 | -20.52 | 46.87 | |
| 1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass | $N_2O$ | 4.291 | 1.617 | -5 | 5 | -200 | 200 | -91.60 | 206.98 | 0.000000 | -62.32 | -35.26 | 615.84 | |
| 1.A.3.a Domestic Aviation | $CO_2$ | 6.601 | 31.737 | -5 | 5 | -5 | 5 | -6.98 | 7.13 | 0.000000 | 380.79 | -45.88 | 51.44 | |
| 1.A.3.a Domestic Aviation | $CH_4$ | 0.001 | 0.006 | -5 | 5 | -50 | 50 | -50.03 | 50.15 | 0.000000 | 380.48 | -262.54 | 592.28 | |
| 1.A.3.a Domestic Aviation | $N_2O$ | 0.055 | 0.265 | -5 | 5 | -200 | 200 | -91.71 | 207.22 | 0.000000 | 380.48 | -450.24 | 6695.83 | |
| 1.A.3.b Road Transportation | $CO_2$ | 3,505.875 | 6,112.813 | -5 | 5 | -5 | 5 | -6.90 | 7.22 | 0.003917 | 74.36 | -16.45 | 18.47 | |
| 1.A.3.b Road Transportation | $CH_4$ | 40.650 | 26.204 | -5 | 5 | -50 | 50 | -50.19 | 50.22 | 0.000004 | -35.54 | -35.67 | 80.07 | |
| 1.A.3.b Road Transportation | $N_2O$ | 40.351 | 54.363 | -5 | 5 | -200 | 200 | -91.65 | 208.64 | 0.000155 | 34.72 | -125.83 | 1977.43 | |
| 1.A.3.c Railways | $CO_2$ | 140.079 | 46.523 | -5 | 5 | -5 | 5 | -98.79 | -98.61 | 0.000000 | -66.79 | | | |
| 1.A.3.c Railways | $CH_4$ | 0.174 | 0.052 | -5 | 5 | -50 | 50 | -99.84 | -99.51 | 0.000000 | -70.10 | | | |
| 1.A.3.c Railways | $N_2O$ | 13.248 | 5.351 | -5 | 5 | -200 | 200 | -100.00 | -99.94 | 0.000000 | -59.61 | | | |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CO_2$ | 134.383 | 149.379 | -5 | 5 | -5 | 5 | -7.09 | 7.22 | 0.000002 | 11.16 | 528.84 | 673.71 | |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $CH_4$ | 0.317 | 0.353 | -5 | 5 | -50 | 50 | -49.99 | 50.15 | 0.000000 | 11.37 | 1544.84 | 8079.42 | |
| 1.A.3.d Domestic Navigation - Liquid Fuels | $N_2O$ | 1.079 | 1.201 | -5 | 5 | -200 | 200 | -91.70 | 208.92 | 0.000000 | 11.37 | -30.68 | 20143.16 | |
| 1.A.4 Other Sectors - Liquid Fuels | $CO_2$ | 2,450.466 | 1,120.751 | -5 | 5 | -5 | 5 | -7.05 | 7.15 | 0.000131 | -54.26 | -4.35 | 4.86 | |
| 1.A.4 Other Sectors - Liquid Fuels | $CH_4$ | 6.331 | 2.392 | -5 | 5 | -50 | 50 | -50.11 | 50.16 | 0.000000 | -62.22 | -20.65 | 45.45 | |
| 1.A.4 Other Sectors - Liquid Fuels | $N_2O$ | 88.151 | 68.632 | -5 | 5 | -200 | 200 | -91.68 | 209.44 | 0.000247 | -22.14 | -72.99 | 1180.60 | |
| 1.A.4 Other Sectors - Solid Fuels | $CO_2$ | 524.388 | 8.478 | -5 | 5 | -5 | 5 | -6.89 | 7.08 | 0.000000 | -98.38 | -0.15 | 0.17 | |
| 1.A.4 Other Sectors - Solid Fuels | $CH_4$ | 33.392 | 0.630 | -5 | 5 | -50 | 50 | -50.10 | 50.70 | 0.000000 | -98.11 | -1.04 | 2.33 | |
| 1.A.4 Other Sectors - Solid Fuels | $N_2O$ | 2.377 | 0.038 | -5 | 5 | -200 | 200 | -91.76 | 208.70 | 0.000000 | -98.40 | -1.50 | 22.95 | |
| 1.A.4 Other Sectors - Gaseous Fuels | $CO_2$ | 744.057 | 1,617.801 | -5 | 5 | -5 | 5 | -7.02 | 7.12 | 0.000271 | 117.43 | -20.97 | 23.17 | |
| 1.A.4 Other Sectors - Gaseous Fuels | $CH_4$ | 1.670 | 3.605 | -5 | 5 | -50 | 50 | -49.94 | 50.77 | 0.000000 | 115.86 | -119.93 | 260.11 | |
| 1.A.4 Other Sectors - Gaseous Fuels | $N_2O$ | 0.559 | 0.859 | -5 | 5 | -200 | 200 | -91.67 | 207.65 | 0.000000 | 53.69 | -143.72 | 2366.57 | |
| 1.A.4 Other Sectors - Biomass | $CH_4$ | 316.275 | 329.757 | -5 | 5 | -50 | 50 | -50.24 | 50.31 | 0.000575 | 4.26 | -57.79 | 128.39 | |

| A | B | C | D | E | | F | | G | | H | I | J | | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IPCC category | Gas | Base year emissions /removals | Year t emissions /removals | Activity data uncertainty | | Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used) | | Combined uncertainty | | Contribution to variance in Year t | Inventory trend in national emissions for year t increase with respect to base year | Uncertainty introduced into the trend in total national emissions with respect to base year | | Approach and Comments |
| | | Gg CO2 equivalent | Gg CO2 equivalent | ( - ) % | ( + ) % | ( - ) % | ( + ) % | ( - ) % | ( + ) % | (fraction) | (% of base year) | ( - ) % | ( + ) % | |
| **1.A.4 Other Sectors - Biomass** | **$N_2O$** | **50.267** | **52.411** | -5 | 5 | -200 | 200 | -91.68 | 207.52 | 0.000144 | 4.27 | -97.68 | 1568.66 | |
| **1.B.1 Fugitive emissions from Solid Fuels** | **$CH_4$** | **59.644** | | | | | | | | | | | | 2 |
| **1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil** | **$CO_2$** | **157.786** | **42.847** | | | | | | | | | | | |
| 1. Exploration | $CO_2$ | 28.536 | 7.748 | -5 | 5 | -50 | 50 | -50.03 | 50.60 | 0.000000 | -72.85 | -14.92 | 33.37 | |
| 2. Production(7) | $CO_2$ | 129.245 | 35.094 | -5 | 5 | -50 | 50 | -49.82 | 50.29 | 0.000007 | -72.85 | -14.93 | 32.51 | |
| 3. Transport | $CO_2$ | 0.005 | 0.005 | -5 | 5 | -50 | 50 | -50.00 | 50.31 | 0.000000 | -0.06 | -54.55 | 117.59 | |
| **1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil** | **$CH_4$** | **220.427** | **61.925** | | | | | | | | | | | |
| 1. Exploration | $CH_4$ | 15.205 | 4.129 | -5 | 5 | -100 | 100 | -84.14 | 101.34 | 0.000000 | -72.85 | -23.34 | 164.12 | |
| 2. Production(7) | $CH_4$ | 199.531 | 54.179 | -5 | 5 | -100 | 100 | -84.19 | 100.78 | 0.000054 | -72.85 | -23.30 | 159.22 | |
| 3. Transport | $CH_4$ | 1.343 | 1.342 | -5 | 5 | -100 | 100 | -84.28 | 99.78 | 0.000000 | -0.06 | -85.49 | 621.92 | |
| 4. Refining/storage | $CH_4$ | 4.348 | 2.275 | -5 | 5 | -100 | 100 | -84.20 | 101.69 | 0.000000 | -47.67 | -44.75 | 311.20 | |
| **1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil** | **$N_2O$** | **0.064** | **0.017** | -5 | 5 | -10 | 1000 | -100.00 | -100.00 | 0.000000 | -72.85 | | | |
| **1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas** | **$CO_2$** | **442.772** | **223.726** | | | | | | | | | | | |
| 1. Exploration | $CO_2$ | 18.043 | 11.196 | -5 | 5 | -50 | 50 | -100.00 | -100.00 | 0.000000 | -37.95 | -62.05 | -62.05 | |
| 2. Production(7) | $CO_2$ | 418.423 | 208.581 | -5 | 5 | -100 | 100 | -84.35 | 100.59 | 0.000805 | -50.15 | -42.55 | 301.52 | |
| 3. Processing | $CO_2$ | 6.276 | 3.894 | -5 | 5 | -100 | 100 | -84.25 | 100.62 | 0.000000 | -37.95 | -52.72 | 355.99 | |
| 4. Transmission and storage | $CO_2$ | 0.011 | 0.011 | -5 | 5 | -100 | 100 | -84.20 | 100.47 | 0.000000 | 3.12 | -87.79 | 599.06 | |
| 5. Distribution | $CO_2$ | 0.019 | 0.042 | -5 | 5 | -20 | 500 | -100.00 | -100.00 | 0.000000 | 119.48 | | | |
| **1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas** | **$CH_4$** | **148.067** | **121.543** | | | | | | | | | | | |
| 1. Exploration | $CH_4$ | 9.614 | 5.966 | -5 | 5 | -100 | 100 | -84.26 | 100.72 | 0.000001 | -37.95 | -53.40 | 370.42 | |
| 2. Production(7) | $CH_4$ | 66.445 | 41.232 | -5 | 5 | -100 | 100 | -84.26 | 101.65 | 0.000031 | -37.95 | -53.50 | 376.92 | |
| 3. Processing | $CH_4$ | 29.338 | 18.205 | -5 | 5 | -100 | 100 | -84.17 | 100.69 | 0.000006 | -37.95 | -52.96 | 385.34 | |
| 4. Transmission and storage | $CH_4$ | 32.239 | 33.246 | -5 | 5 | -100 | 100 | -84.44 | 100.46 | 0.000020 | 3.12 | -88.67 | 613.49 | |
| 5. Distribution | $CH_4$ | 10.431 | 22.894 | -5 | 5 | -20 | 500 | -100.00 | -100.00 | 0.000000 | 119.48 | | | |
| **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 | -84.13 | 100.72 | 0.000000 | -92.77 | -6.15 | 42.28 | |
| **1.B.2.c. Venting and flaring** | **$CH_4$** | **0.590** | **0.043** | | | | | | | | | | | |
| 1. Venting - Oil | $CH_4$ | 0.590 | 0.043 | -5 | 5 | -100 | 100 | -84.09 | 100.43 | 0.000000 | -92.77 | -6.19 | 40.45 | |
| **1.B.2.c. Venting and flaring** | **$N_2O$** | **0.630** | **0.170** | | | | | | | | | | | |
| 2. Flaring - Oil | $N_2O$ | 0.598 | 0.162 | -5 | 5 | -100 | 100 | -84.24 | 101.56 | 0.000000 | -72.85 | -23.21 | 157.07 | |
| 2. Flaring - Gas | $N_2O$ | 0.032 | 0.008 | -5 | 5 | -100 | 100 | -84.21 | 100.89 | 0.000000 | -75.87 | -20.66 | 139.88 | |
| **2.A.1 Cement Production** | **$CO_2$** | **1,093.483** | **1,210.718** | -2 | 2 | -2 | 2 | -2.85 | 2.85 | 0.000025 | 10.72 | -25.88 | 47.66 | |
| **2.A.2 Lime Production** | **$CO_2$** | **156.820** | **88.946** | -2 | 2 | -2 | 2 | -2.83 | 2.87 | 0.000000 | -43.28 | -2.25 | 2.27 | |
| **2.A.3 Glass Production** | **$CO_2$** | **43.216** | **30.498** | -2 | 2 | -2 | 2 | -2.85 | 2.84 | 0.000000 | -29.43 | -2.77 | 2.92 | |
| **2.A.4 Other Process Uses of Carbonates** | **$CO_2$** | **13.073** | **34.642** | | | | | | | | | | | |
| 2.A.4.a Ceramics | $CO_2$ | 9.146 | 11.463 | -7.5 | 7.5 | -5 | 5 | -8.90 | 9.19 | 0.000000 | 25.34 | -12.70 | 13.42 | |
| 2.A.4.b Other uses of Soda Ash | $CO_2$ | 3.927 | 6.389 | -7.5 | 7.5 | -5 | 5 | -8.97 | 8.98 | 0.000000 | 62.70 | -16.74 | 17.84 | |
| 2.A.4.d Other | $CO_2$ | | 16.790 | -7.5 | 7.5 | -5 | 5 | -8.80 | 9.20 | 0.000000 | | | | |
| **2.B.1 Ammonia Production** | **$CO_2$** | **558.672** | **513.057** | -2 | 2 | -2 | 2 | -2.79 | 2.79 | 0.000004 | -8.17 | -3.61 | 3.78 | 5 |
| **2.B.2 Nitric Acid Production** | **$N_2O$** | **754.265** | **50.109** | -2 | 2 | -2 | 2 | -2.83 | 2.81 | 0.000000 | -93.36 | -1.13 | 1.69 | |
| **2.B.8 Petrochemical and Carbon Black Production** | **$CO_2$** | **192.426** | - | | | | | | | | | | | |
| 2.B.8.b Ethylene | $CO_2$ | 125.652 | | | | | | | | | | | | |
| 2.B.8.c Ethylene Dichloride and Vinyl Chloride Monomer | $CO_2$ | 0.414 | | | | | | | | | | | | 2 |
| 2.B.8.f Carbon Black | $CO_2$ | 66.360 | | | | | | | | | | | | 2 |
| **2.B.8 Petrochemical and Carbon Black Production** | **$CH_4$** | **5.447** | | | | | | | | | | | | |
| 2.B.8.b Ethylene | $CH_4$ | 5.447 | | | | | | | | | | | | |
| **2.C.1 Iron and Steel Production** | **$CO_2$** | **43.808** | **8.994** | | | | | | | | | | | |
| 2.C.1.a Steel | $CO_2$ | 19.505 | 8.517 | -5 | 5 | -5 | 5 | -6.99 | 7.21 | 0.000000 | -56.33 | -6.18 | 7.69 | |
| 2.C.2 Ferroalloys Production | $CO_2$ | 173.798 | | | | | | | | | | | | |
| 2.C.2 Ferroalloys Production | $CH_4$ | 3.899 | | | | | | | | | | | | |
| **2.C.2 Ferroalloys Production** | **$CO_2$** | **173.798** | | | | | | | | | | | | 2 |
| **2.C.2 Ferroalloys Production** | **$CH_4$** | **3.899** | | | | | | | | | | | | 2 |
| **2.C.3 Aluminium Production** | **$CO_2$** | **118.797** | | | | | | | | | | | | |

| A | B | C | D | E | | F | | G | | H | I | J | | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IPCC category | Gas | Base year emissions /removals | Year t emissions /removals | Activity data uncertainty | | Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used) | | Combined uncertainty | | Contribution to variance in Year t | Inventory trend in national emissions for year t increase with respect to base year | Uncertainty introduced into the trend in total national emissions with respect to base year | | Approach and Comments |
| | | Gg CO2 equivalent | Gg CO2 equivalent | ( - ) % | ( + ) % | ( - ) % | ( + ) % | ( - ) % | ( + ) % | (fraction) | (% of base year) | ( - ) % | ( + ) % | |
| 2.C.3.a CO2 Emissions | $CO_2$ | 118.797 | | | | | | | | | | | | 2 |
| **2.C.3 Aluminium Production** | **PFCs** | **1,240.239** | | | | | | | | | | | | |
| 2.C.3.b By-Product Emission\CF4 | PFCs | 877.908 | | | | | | | | | | | | 2 |
| 2.C.3.b By-Product Emission\C2F6 | PFCs | 362.330 | | | | | | | | | | | | 2 |
| **2.D Non-energy Products from Fuels and Solvent Use** | **$CO_2$** | **227.926** | **82.914** | | | | | | | | | | | |
| 2.D Non-energy Products from Fuels and Solvent Use\2.D.1 Lubricant Use | $CO_2$ | 72.603 | 16.853 | -5 | 5 | -50 | 50 | -50.14 | 50.67 | 0.000002 | -76.79 | -12.85 | 28.18 | |
| 2.D Non-energy Products from Fuels and Solvent Use\2. Paraffin wax use | $CO_2$ | 22.816 | 3.145 | -5 | 5 | -50 | 50 | -49.92 | 50.49 | 0.000000 | -86.22 | -7.72 | 16.94 | |
| 2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Solvent use | $CO_2$ | 132.492 | 56.287 | NA | NA | -50 | 50 | -40.78 | 58.47 | 0.000017 | -57.52 | -21.48 | 42.54 | 4 |
| 2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\Road paving with asphalt | $CO_2$ | 0.005 | 0.023 | -10 | 10 | -50 | 50 | -50.27 | 51.86 | 0.000000 | 326.94 | -238.55 | 533.36 | |
| 2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Other\Urea based CC | $CO_2$ | | 6.601 | -5 | 5 | -5 | 5 | -6.86 | 7.19 | 0.000000 | | | | |
| 2.D Non-energy Products from Fuels and Solvent Use\2.D.3 Other\ Asphalt roofing | $CO_2$ | 0.009 | 0.006 | -10 | 10 | -50 | 50 | -50.71 | 51.96 | 0.000000 | -35.19 | -36.12 | 80.97 | |
| **2.F.1 Refrigeration and Air conditioning** | **F-gasses** | | **480.164** | | | | | | | | | | | |
| 2.F.1.a Commercial Refrigeration\HFC-143a | HFC-143a | | 66.142 | -50 | 50 | -50 | 50 | -62.33 | 78.18 | 0.000048 | | | | 2 |
| 2.F.1.a Commercial Refrigeration\HFC-125 | HFC-125 | | 44.225 | -50 | 50 | -50 | 50 | -62.65 | 79.55 | 0.000021 | | | | 2 |
| 2.F.1.a Commercial Refrigeration\HFC-134a | HFC-134a | | 5.584 | -50 | 50 | -50 | 50 | -62.80 | 80.29 | 0.000000 | | | | 2 |
| 2.F.1.a Commercial Refrigeration\HFC-32 | HFC-32 | - | 0.068 | -50 | 50 | -50 | 50 | -61.84 | 80.66 | 0.000000 | | | | 2 |
| 2.F.1.b Domestic Refrigeration\HFC-134a | HFC-134a | | 0.215 | -50 | 50 | -50 | 50 | -62.00 | 78.14 | 0.000000 | | | | 2 |
| 2.F.1.c Industrial Refrigeration\HFC-134a | HFC-134a | | 2.631 | -50 | 50 | -50 | 50 | -62.82 | 80.76 | 0.000000 | | | | 2 |
| 2.F.1.c Industrial Refrigeration\HFC-125 | HFC-125 | | 18.989 | -50 | 50 | -50 | 50 | -62.54 | 81.04 | 0.000004 | | | | 2 |
| 2.F.1.c Industrial Refrigeration\HFC-143a | HFC-143a | | 21.627 | -50 | 50 | -50 | 50 | -62.57 | 80.77 | 0.000005 | | | | 2 |
| 2.F.1.c Industrial Refrigeration\HFC-32 | HFC-32 | | 0.824 | -50 | 50 | -50 | 50 | -61.99 | 83.36 | 0.000000 | | | | 2 |
| 2.F.1.d Transport Refrigeration\HFC-134a | HFC-134a | | 10.773 | -50 | 50 | -50 | 50 | -62.92 | 79.54 | 0.000001 | | | | 2 |
| 2.F.1.d Transport Refrigeration\HFC-125 | HFC-125 | - | 37.563 | -50 | 50 | -50 | 50 | -62.74 | 80.58 | 0.000015 | | | | 2 |
| 2.F.1.d Transport Refrigeration\HFC-143a | HFC-143a | - | 56.696 | -50 | 50 | -50 | 50 | -62.65 | 79.71 | 0.000035 | | | | 2 |
| 2.F.1.e Mobile Air-Conditioning\HFC-134a | HFC-134a | | 119.728 | -50 | 50 | -50 | 50 | -62.60 | 80.06 | 0.000157 | | | | 2 |
| 2.F.1.f Stationary Air-Conditioning\HFC-32 | HFC-32 | | 14.112 | -50 | 50 | -50 | 50 | -100.00 | -100.00 | 0.000000 | | | | 2 |
| 2.F.1.f Stationary Air-Conditioning\HFC-125 | HFC-125 | | 74.226 | -50 | 50 | -50 | 50 | -100.00 | -100.00 | 0.000000 | | | | 2 |
| 2.F.1.f Stationary Air-Conditioning\HFC-134a | HFC-134a | | 6.169 | -50 | 50 | -50 | 50 | -100.00 | -100.00 | 0.000000 | | | | 2 |
| 2.F.1.f Stationary Air-Conditioning\HFC-143a | HFC-143a | - | 0.594 | -50 | 50 | -50 | 50 | -100.00 | -100.00 | 0.000000 | | | | 2 |
| 2.F.1.f Stationary Air-Conditioning\HFC-152a | HFC-152a | - | 0.000 | -50 | 50 | -50 | 50 | -100.00 | -100.00 | 0.000000 | | | | 2 |
| **2.F.3 Fire Protection** | **F-gasses** | | **5.197** | | | | | | | | | | | |
| 2.F.3 Fire Protection\HFC-125 | HFC-125 | | 0.504 | -50 | 50 | -50 | 50 | -62.21 | 80.77 | 0.000000 | | | | 2 |
| 2.F.3 Fire Protection\HFC-227ea | HFC-227ea | | 3.861 | -50 | 50 | -50 | 50 | -62.74 | 79.32 | 0.000000 | | | | 2 |
| 2.F.3 Fire Protection\HFC-236fa | HFC-236fa | | 0.832 | -50 | 50 | -50 | 50 | -61.80 | 79.69 | 0.000000 | | | | 2 |
| **2.F.4 Aerosols** | **F-gasses** | | **8.689** | | | | | | | | | | | |
| 2.F.4 Aerosols\2.F.4.a Metered Dose Inhalers\HFC-134a | HFC-134a | | 8.689 | -50 | 50 | -50 | 50 | -61.52 | 81.17 | 0.000001 | | | | 2 |
| **2.G Other Product Manufacture and Use** | **$N_2O$** | **33.376** | **71.443** | | | | | | | | | | | |
| 2.G.3 N2O from Product Uses\2.G.3.a Medical Applications | $N_2O$ | 32.780 | 71.401 | -50 | 50 | -50 | 50 | -62.81 | 81.05 | 0.000055 | 117.82 | | | |
| 2.G.3 N2O from Product Uses\2.G.3.b Other\Propellant for pressure and aerosol products | $N_2O$ | 0.596 | 0.042 | -50 | 50 | -50 | 50 | -61.99 | 81.24 | 0.000000 | -93.00 | -4.73 | 14.62 | 2 |
| **2.G Other Product Manufacture and Use** | **F-gasses** | **10.450** | **5.527** | | | | | | | | | | | |
| 2.G.1 Electrical Equipment\SF6 | $SF_6$ | 10.450 | 5.527 | -50 | 50 | -50 | 50 | -96.28 | -82.00 | 0.000000 | -47.11 | -35.80 | 107.42 | |
| **3.A Enteric Fermentation** | **$CH_4$** | **2,120.224** | **983.257** | | | | | | | | | | | |
| Mature dairy cattle | $CH_4$ | 1,353.450 | 397.364 | -30 | 30 | -20 | 20 | -34.15 | 38.62 | 0.000435 | -70.64 | -12.10 | 20.07 | |
| Other mature cattle | $CH_4$ | 64.266 | 40.330 | -10 | 10 | -20 | 20 | -21.95 | 22.85 | 0.000002 | -37.24 | -17.37 | 23.74 | |
| Growing cattle | $CH_4$ | 450.021 | 356.210 | -10 | 10 | -20 | 20 | -21.59 | 23.33 | 0.000133 | -20.85 | -21.67 | 29.77 | |
| Sheep | $CH_4$ | 150.200 | 127.259 | -10 | 10 | -20 | 20 | -21.85 | 23.02 | 0.000017 | -15.27 | -23.25 | 31.23 | |
| Market swine | $CH_4$ | 8.700 | 5.831 | -10 | 10 | -20 | 20 | -22.01 | 23.13 | 0.000000 | -32.97 | -18.30 | 25.59 | |
| Breeding swine | $CH_4$ | 50.288 | 34.686 | -10 | 10 | -20 | 20 | -21.93 | 23.04 | 0.000001 | -31.02 | -19.04 | 25.84 | |
| Goats | $CH_4$ | 21.500 | 10.008 | -10 | 10 | -20 | 20 | -22.25 | 22.70 | 0.000000 | -53.45 | -12.72 | 17.99 | |
| Horses | $CH_4$ | 17.550 | 10.642 | -30 | 30 | -20 | 20 | -33.27 | 38.27 | 0.000000 | -39.36 | -24.84 | 42.11 | |
| Mules and Asses | $CH_4$ | 4.250 | 0.926 | -30 | 30 | -20 | 20 | -33.63 | 38.56 | 0.000000 | -78.21 | -8.94 | 15.41 | |
| **3.B Manure Management** | **$CH_4$** | **426.179** | **401.273** | | | | | | | | | | | |
| Mature dairy cattle | $CH_4$ | 160.320 | 131.498 | -30 | 30 | -20 | 20 | -33.98 | 38.13 | 0.000048 | -17.98 | -32.87 | 55.93 | |

| A | B | C | D | E | | F | | G | | H | I | J | | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IPCC category | Gas | Base year emissions /removals | Year t emissions /removals | Activity data uncertainty | | Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used) | | Combined uncertainty | | Contribution to variance in Year t | Inventory trend in national emissions for year t increase with respect to base year | Uncertainty introduced into the trend in total national emissions with respect to base year | | Approach and Comments |
| | | Gg CO2 equivalent | Gg CO2 equivalent | ( - ) % | ( + ) % | ( - ) % | ( + ) % | ( - ) % | ( + ) % | (fraction) | (% of base year) | ( - ) % | ( + ) % | |
| Other mature cattle | $CH_4$ | 7.652 | 7.600 | -10 | 10 | -20 | 20 | -21.86 | 23.14 | 0.000000 | -0.68 | -27.56 | 37.71 | |
| Growing cattle | $CH_4$ | 55.644 | 69.706 | -10 | 10 | -20 | 20 | -21.89 | 22.78 | 0.000005 | 25.27 | -34.94 | 46.12 | |
| Sheep | $CH_4$ | 4.013 | 3.489 | -10 | 10 | -20 | 20 | -21.76 | 22.74 | 0.000000 | -13.06 | -23.92 | 32.94 | |
| Market swine | $CH_4$ | 29.919 | 33.166 | -10 | 10 | -20 | 20 | -21.67 | 22.46 | 0.000001 | 10.85 | -30.28 | 41.57 | |
| Breeding swine | $CH_4$ | 137.244 | 143.229 | -10 | 10 | -20 | 20 | -21.83 | 22.76 | 0.000022 | 4.36 | -28.71 | 38.88 | |
| Goats | $CH_4$ | 0.585 | 0.278 | -10 | 10 | -20 | 20 | -21.82 | 22.88 | 0.000000 | -52.55 | -13.19 | 17.99 | |
| Horses | $CH_4$ | 1.981 | 1.201 | -30 | 30 | -20 | 20 | -33.95 | 38.84 | 0.000000 | -39.36 | -25.00 | 42.78 | |
| Mules and Asses | $CH_4$ | 0.355 | 0.077 | -30 | 30 | -20 | 20 | -33.69 | 37.81 | 0.000000 | -78.21 | -8.84 | 15.45 | |
| Poultry | $CH_4$ | 28.468 | 11.030 | -10 | 10 | -20 | 20 | -21.77 | 22.60 | 0.000000 | -61.26 | -10.53 | 14.83 | |
| **3.B Manure Management** | **$N_2O$** | **375.219** | **136.316** | | | | | | | | | | | |
| Mature dairy cattle | $N_2O$ | 74.123 | 11.041 | -30 | 30 | -50 | 100 | -84.61 | 109.85 | 0.000003 | -85.11 | | | |
| Other mature cattle | $N_2O$ | 5.047 | 2.103 | -10 | 10 | -50 | 100 | -84.32 | 101.62 | 0.000000 | -58.33 | | | |
| Growing cattle | $N_2O$ | 20.149 | 10.590 | -10 | 10 | -50 | 100 | -84.57 | 102.60 | 0.000002 | -47.44 | | | |
| Sheep | $N_2O$ | 3.969 | 4.035 | -10 | 10 | -50 | 100 | -84.22 | 103.07 | 0.000000 | 1.67 | | | |
| Market swine | $N_2O$ | 9.563 | 1.844 | -10 | 10 | -50 | 100 | -84.30 | 102.59 | 0.000000 | -80.71 | | | |
| Breeding swine | $N_2O$ | 14.028 | 1.651 | -10 | 10 | -50 | 100 | -84.44 | 102.18 | 0.000000 | -88.23 | | | |
| Goats | $N_2O$ | 0.217 | 0.169 | -10 | 10 | -50 | 100 | -84.53 | 102.04 | 0.000000 | -22.42 | | | |
| Horses | $N_2O$ | 0.980 | 0.594 | -30 | 30 | -50 | 100 | -85.16 | 112.50 | 0.000000 | -39.36 | | | |
| Mules and Asses | $N_2O$ | 0.049 | 0.011 | -30 | 30 | -50 | 100 | -84.58 | 111.30 | 0.000000 | -78.21 | | | |
| Poultry | $N_2O$ | 22.856 | 12.907 | -10 | 10 | -50 | 100 | -84.44 | 101.50 | 0.000003 | -43.53 | | | |
| *Indirect N2O emission* | *$N_2O$* | *224.238* | *91.371* | | | | | | | | | | | |
| Total N volatilised as NH3 and NOx | $N_2O$ | 224.238 | 91.371 | -10 | 10 | -30 | 30 | -30.97 | 31.86 | 0.000017 | -59.25 | -15.10 | 23.70 | |
| **3.D.1 Direct N2O Emissions From Managed Soils** | **$N_2O$** | **1,094.218** | **850.383** | | | | | | | | | | | |
| Inorganic N fertilizers | $N_2O$ | 503.002 | 465.570 | -20 | 20 | -70 | 200 | -91.68 | 215.50 | 0.011785 | -7.44 | -87.21 | 1401.83 | |
| Organic N fertilizers | $N_2O$ | 256.811 | 141.800 | -10 | 10 | -30 | 30 | -31.19 | 32.59 | 0.000043 | -44.78 | -20.29 | 32.99 | |
| Urine and dung deposited by grazing animals | $N_2O$ | 136.971 | 54.983 | -10 | 10 | -50 | 150 | -90.51 | 156.76 | 0.000104 | -59.86 | -36.85 | 437.91 | |
| Crop residues | $N_2O$ | 187.207 | 168.225 | -20 | 20 | -70 | 200 | -91.52 | 215.17 | 0.001537 | -10.14 | -84.02 | 1327.63 | |
| Mineralization/immobilization associated with loss/gain of soil organic matter | $N_2O$ | 0.167 | 9.745 | -20 | 20 | -30 | 30 | -34.39 | 38.25 | 0.000000 | 5733.72 | -2364.04 | 3978.12 | |
| Cultivation of organic soils | $N_2O$ | 10.061 | 10.061 | -10 | 10 | -500 | 500 | -88.88 | 547.21 | 0.000024 | 0.00 | -95.49 | 2088.92 | |
| **3.D.2 Indirect N2O Emissions From Managed Soils** | **$N_2O$** | **357.590** | **273.106** | | | | | | | | | | | |
| Atmospheric deposition | $N_2O$ | 121.809 | 85.029 | -20 | 20 | -250 | 250 | -91.96 | 275.35 | 0.000560 | -30.19 | -65.98 | 1138.06 | |
| Nitrogen leaching and run-off | $N_2O$ | 235.781 | 188.077 | -20 | 20 | -400 | 400 | -90.21 | 437.08 | 0.005890 | -20.23 | -75.90 | 1692.99 | |
| **3.G Liming** | **$CO_2$** | | **10.917** | -50 | 50 | -50 | 50 | -61.99 | 79.34 | 0.000001 | | | | |
| **3.H Urea Application** | **$CO_2$** | **50.020** | **65.048** | -20 | 20 | -50 | 0 | -20.01 | 19.99 | 0.000004 | 30.04 | -32.67 | 42.61 | |
| **4.A.1 Forest Land Remaining Forest Land** | **$CO_2$** | **- 6,704.183** | **- 5,133.751** | | | | | -60.93 | 199.37 | 0.879852 | -23.42 | -701.43 | 630.56 | 1, 3 |
| **4.A.2 Land Converted to Forest Land** | **$CO_2$** | **- 28.890** | **- 262.107** | | | | | -186.66 | 172.39 | 0.004375 | 807.26 | -2269.00 | 3103.60 | 1, 3 |
| **4.B.1 Cropland Remaining Cropland** | **$CO_2$** | **199.640** | **378.907** | | | | | -319.80 | 243.78 | 0.022526 | 89.79 | -1548.36 | 1163.70 | 1, 3 |
| **4.B.2 Land Converted to Cropland** | **$CO_2$** | **23.135** | **69.925** | | | | | -516.99 | 369.51 | 0.001895 | 202.25 | -1531.55 | 1119.91 | 1, 3 |
| **4.C.1 Grassland Remaining Grassland** | **$CO_2$** | **2.069** | **2.069** | | | | | -95.86 | 95.62 | 0.000000 | 0.00 | -145.42 | 430.66 | 1, 3 |
| **4.C.2 Land Converted to Grassland** | **$CO_2$** | **- 10.152** | **- 225.448** | | | | | -120.68 | 227.89 | 0.003045 | 2120.65 | -3679.52 | -780.65 | 1, 3 |
| **4.D.2 Land Converted to Wetlands** | **$CO_2$** | **83.466** | **12.141** | | | | | -194.82 | 436.27 | 0.000029 | -85.45 | -146.38 | 243.19 | 1, 3 |
| **4.E.2 Land Converted to Settlements** | **$CO_2$** | **250.713** | **675.294** | | | | | -93.30 | 138.76 | 0.012109 | 169.35 | -258.08 | 1077.81 | 1, 3 |
| **4.G Harvested Wood Products** | **$CO_2$** | **- 301.544** | **- 746.003** | | | | | -87.50 | 131.05 | 0.000523 | 147.39 | -465.56 | -172.64 | 1, 3 |
| **4(III).Direct N2O emissions from N mineralization/immobilization** | **$N_2O$** | **47.233** | **121.002** | | | | | -883.17 | 704.72 | 0.018241 | 156.18 | -2518.75 | 2384.19 | 1, 3 |
| **4(V) Biomass Burning** | **$CO_2$** | **14.979** | **11.391** | | | | | 336.38 | 675.35 | 0.000007 | -23.95 | 432.54 | 1136.12 | 1, 3 |
| **4(V) Biomass Burning** | **$CH_4$** | **1.230** | **1.301** | | | | | -400.21 | 831.74 | 0.000000 | 5.76 | 260.86 | 2719.85 | 1, 3 |
| **4(V) Biomass Burning** | **$N_2O$** | **0.858** | **1.052** | | | | | -321.05 | 747.21 | 0.000000 | 22.64 | 303.05 | 1685.33 | 1, 3 |
| **5.A Solid Waste Disposal** | **$CH_4$** | **539.010** | **1,771.443** | | | | | | | | | | | |
| 5.A.1 Managed Waste Disposal Sites\5.A.1.a Anaerobic | $CH_4$ | 26.684 | 1,638.568 | -50 | 50 | -50 | 50 | -62.50 | 81.23 | 0.028843 | 6040.71 | -4203.58 | 12586.52 | |
| 5.A.2 Unmanaged Waste Disposal Sites | $CH_4$ | 512.327 | 132.876 | -50 | 50 | -50 | 50 | -61.29 | 77.49 | 0.000187 | -74.06 | -17.35 | 51.11 | |
| **5.B Biological Treatment of Soild Waste** | **$CH_4$** | | **4.759** | | | | | | | | | | | |
| 5.B Biological Treatment of Soild Waste\5.B.1 Composting | $CH_4$ | | 4.759 | -50 | 50 | -100 | 100 | -86.34 | 132.43 | 0.000001 | | | | 2 |
| **5.B Biological Treatment of Soild Waste** | **$N_2O$** | | **3.404** | | | | | | | | | | | |

| A | B | C | D | E | | F | | G | | H | I | J | | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IPCC category | Gas | Base year emissions /removals | Year t emissions /removals | Activity data uncertainty | | Emission factor/estimation parameter uncertainty (combined if more than one estimation parameter is used) | | Combined uncertainty | | Contribution to variance in Year t | Inventory trend in national emissions for year t increase with respect to base year | Uncertainty introduced into the trend in total national emissions with respect to base year | | Approach and Comments |
| | | Gg CO2 equivalent | Gg CO2 equivalent | ( - ) % | ( + ) % | ( - ) % | ( + ) % | ( - ) % | ( + ) % | (fraction) | (% of base year) | ( - ) % | ( + ) % | |
| 5.B Biological Treatment of Soild Waste\5.B.1 Composting | $N_2O$ | | 3.404 | -50 | 50 | -110 | 110 | -88.44 | 140.16 | 0.000000 | | | | 2 |
| **5.C Incineration and Open Burning of Waste** | **$CO_2$** | **0.536** | | | | | | | | | | | | |
| 5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Clinical Waste | $CO_2$ | 0.123 | | | | | | | | | | | | |
| 5.C.1 Waste Incineration\5.C.1.2 Non-biogenic\5.C.1.2.b Other\Industrial Solid Wastes | $CO_2$ | 0.413 | | | | | | | | | | | | 2 |
| **5.C Incineration and Open Burning of Waste** | **$N_2O$** | **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** | **$CH_4$** | **445.000** | **169.948** | | | | | | | | | | | |
| 5.D.1 Domestic wastewater | $CH_4$ | 348.357 | 60.608 | -30 | 30 | -30 | 30 | -38.87 | 46.65 | 0.000014 | -82.60 | -8.05 | 15.37 | |
| 5.D.2 Industrial wastewater | $CH_4$ | 96.643 | 109.340 | -30 | 30 | -30 | 30 | -38.70 | 46.72 | 0.000046 | 13.14 | -51.84 | 96.90 | |
| **5.D Wastewater Treatment and Discharge** | **$N_2O$** | **66.884** | **89.000** | | | | | | | | | | | |
| 5.D.1 Domestic wastewater | $N_2O$ | 66.884 | 89.000 | -50 | 50 | -50 | 50 | -61.45 | 79.46 | 0.000085 | 33.07 | -88.75 | 270.80 | |
| **TOTAL** | **CO2eq** | **25,454.403** | **18,698.569** | | | | | **-12.41** | **63.24** | **1.000000** | **-26.54** | **-19.72** | **41.04** | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 |
| 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 |
| 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 |
| 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 |
| 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 |
| Other biomass | PJ | | | | 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 |
| NCV for fuel oil | MJ/kg | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 |
| NCV for light heating oil | MJ/kg | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 |
| NCV for natural gas | MJ/m3 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.60 | 34.60 | 34.80 | 34.70 | 34.64 |
| NCV for coke oven gas | MJ/kg | 17.91 | | | | | | | | | | | |
| NCV for biogas | TJ/PJ | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 |
| NCV for other biomass | | | | | | | | | | | | | |

| EMISSION FACTORS | | 1990 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| EF CO2 - Fuel oil | t/TJ | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 |
| EF CO2 - Light heating oil | t/TJ | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| EF CO2 - Natural gas | t/TJ | 55.28 | 55.28 | 55.28 | 55.28 | 55.28 | 55.28 | 55.00 | 55.10 | 55.56 | 55.43 | 55.32 | 55.41 |
| 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 - 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 |
| EF CO2 - Other biomass | t/TJ | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| EF CH4 kg/TJ | kg/TJ | | | | | | | | | | | | |
| EF CH4 -Hard coal | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Fuel oil | kg/TJ | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - Light heating oil | kg/TJ | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - Natural gas | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Gas coke | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Biogas | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Other biomass | kg/TJ | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| EF N2O kg/TJ | kg/TJ | | | | | | | | | | | | |
| EF N2O -Hard coal | kg/TJ | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| EF N2O - Fuel oil | kg/TJ | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - Light heating oil | kg/TJ | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - Natural gas | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF N2O - Gas coke | kg/TJ | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - 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 |
| 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 |

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

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

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

| ACTIVITY DATA | | 1990 | 1995 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | **UNIT** | | | | | | | | | | | | | |
| Hard coal | 1000 t | | | | | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| Fuel oil | 1000 t | 0.00 | 35.60 | #REF! | 39.00 | 23.20 | 23.50 | 13.70 | 4.50 | 2.90 | 3.70 | 3.70 | 2.60 | 2.50 |
| 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 |
| 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 |
| 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 |
| Other biomass | PJ | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 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 | | | | | |
| NCV for fuel oil | MJ/kg | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 |
| NCV for light heating oil | MJ/kg | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 |
| NCV for natural gas | MJ/m3 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.60 | 34.60 | 34.80 | 34.70 | 34.64 |
| NCV for coke oven gas | MJ/kg | 17.91 | | | | | | | | | | | | |
| NCV for biogas | TJ/PJ | | | | | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 | 1000.00 |
| NCV for other biomass | TJ/PJ | | | | | 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 |
| EF CO2 t/TJ | t/TJ | | | | | | | | | | | | | |
| EF CO2 -Hard coal | t/TJ | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 | 94.60 |
| EF CO2 - Fuel oil | t/TJ | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 |
| EF CO2 - Light heating oil | t/TJ | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| EF CO2 - Natural gas | t/TJ | 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 |
| EF CO2 -Biogas | t/TJ | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 | 54.60 |
| EF CO2 - Other biomass | t/TJ | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| EF 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 |
| 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 |
| EF CH4 kg/TJ | kg/TJ | | | | | | | | | | | | | |
| EF CH4 -Hard coal | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Fuel oil | kg/TJ | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - Light heating oil | kg/TJ | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - Natural gas | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - Gas coke | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - 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 |
| EF CH4 - Other biomass | kg/TJ | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| EF 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 |
| 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 |
| EF N2O kg/TJ | kg/TJ | | | | | | | | | | | | | |
| EF N2O -Hard coal | kg/TJ | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| EF N2O - Fuel oil | kg/TJ | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - Light heating oil | kg/TJ | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - Natural gas | kg/TJ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF N2O - Gas coke | kg/TJ | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - Biogass | kg/TJ | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - Other biomass | kg/TJ | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 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 |
| 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 |

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

| Refining - transformation | | 1990 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | | | |
| Fuel oil (1000 t) | 1000 t | 227.20 | 193.40 | 254.00 | 244.30 | 196.30 | 153.30 | 108.40 | 100.80 | 134.10 | 131.60 | 114.10 | 102.00 |
| 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 (1000 t) | 1000 t | 0.00 | 0.00 | 9.50 | 0.00 | 0.00 | 2.70 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NCV for LPG (MJ/kg) | MJ/kg | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 |
| Petroleum coke (1000 t) | 1000 t | 0.00 | 0.00 | 70.70 | 55.90 | 43.90 | 54.50 | 40.80 | 25.30 | 31.30 | 35.60 | 37.90 | 24.00 |
| NCV for petroleum coke (MJ | MJ/kg | 33.57 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 | 31.00 |
| Refinery gas (1000 t) | 1000 t | 58.40 | 40.70 | 241.10 | 161.50 | 267.10 | 293.80 | 175.40 | 276.20 | 208.10 | 155.30 | 184.70 | 187.00 |
| NCV for refinery gas (MJ/kg | MJ/kg | 48.57 | 48.57 | 48.57 | 48.57 | 48.57 | 46.00 | 46.00 | 42.60 | 42.60 | 42.60 | 42.60 | 42.60 |
| Natural gas (1000000 m3) | 1000 t | 7.30 | 0.20 | 1.20 | 27.10 | 158.40 | 212.40 | 237.50 | 227.20 | 183.30 | 199.80 | 214.10 | 237.50 |
| NCV for natural gas (MJ/m3 | MJ/kg | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.60 | 34.60 | 34.80 | 34.70 | 34.64 |
| **Total fuel cunsumption (TJ)** | TJ | **12215.9** | **9756.3** | **24596.4** | **20316.8** | **27608.8** | **28713.6** | **21835.1** | **24462.7** | **21567.0** | **19961.4** | **21058.1** | **21036.6** |
| **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 | **884.06** | **715.86** | **1,729.54** | **1,448.87** | **1,805.63** | **1,849.22** | **1,394.72** | **1,516.22** | **1,387.39** | **1,298.59** | **1,350.64** | **1,317.29** |
| 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 | **30.48** | **25.30** | **45.01** | **39.95** | **43.39** | **41.04** | **30.55** | **32.56** | **32.35** | **30.54** | **30.23** | **29.24** |
| 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 | **5.79** | **4.86** | **10.63** | **9.37** | **8.61** | **8.32** | **6.13** | **5.57** | **6.21** | **6.19** | **6.04** | **5.19** |

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

| Manufacture of solid fuels and other energy industries | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | |
| LPG (1000 t) | | | | | | | | | | | |
| NCV for LPG (MJ/kg) | | | | | | | | | | | |
| Gas Coke (1000000 m3) | 107.40 | | | | | | | | | | |
| NCV for gas coke (MJ/m3) | 17.91 | | | | | | | | | | |
| Light heating oil (1000 t) | | | | | | | | | | | |
| NCV for light heating oil (MJ/kg) | | | | | | | | | | | |
| Natural gas (1000000 m3) | | | | | | | | | | | |
| NCV for natural gas (MJ/m3) | | | | | | | | | | | |
| Other Kerosene prod (petrolej) (1000 t) | | | | | | | | | | | |
| NCV for petroleum (MJ/m3) | | | | | | | | | | | |
| **Total fuel cunsumption (TJ)** | **1,923.53** | **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 |
| EF CO2 - gas coke (t/TJ) | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 |
| EF CO2 - light heating oil (t/TJ) | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| EF CO2 - natural gas (t/TJ) | 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** | **0.00** | **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 |
| EF CH4 - gas coke (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - light heating oil (kg/TJ) | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - natural gas (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **CH4 Emission (Mg)** | **1.92** | **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 |
| EF N2O - gas coke (kg/TJ) | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - light heating oil (kg/TJ) | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - natural gas (kg/TJ) | 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** |

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

| Manufacture of solid fuels and other energy industries | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | |
| LPG (1000 t) | 12.10 | 1.00 | | | | | | | | | |
| NCV for LPG (MJ/kg) | 46.89 | 46.89 | | | | | | | | | |
| Gas Coke (1000000 m3) | | | | | | | | | | | |
| NCV for gas coke (MJ/m3) | | | | | | | | | | | |
| Light heating oil (1000 t) | 0.70 | 7.10 | | | | | | | | | |
| NCV for light heating oil (MJ/kg) | 42.71 | 42.71 | | | | | | | | | |
| Natural gas (1000000 m3) | 391.10 | 140.00 | 241.70 | 156.30 | 114.40 | 120.20 | 91.70 | 121.30 | 102.90 | 112.20 | 105.60 |
| 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 |
| Other Kerosene prod (petrolej) (1000 t) | | | | | | | | | | | |
| NCV for petroleum (MJ/m3) | | | | | | | | | | | |
| **Total fuel cunsumption (TJ)** | **13,894.67** | **5,110.13** | **8,217.80** | **5,314.20** | **3,889.60** | **4,086.80** | **3,172.82** | **4,196.98** | **3,580.92** | **3,893.34** | **3,657.98** |
| **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 |
| 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 |
| EF CO2 - light heating oil (t/TJ) | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| EF CO2 - natural gas (t/TJ) | 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)** | **784.00** | **292.46** | **461.02** | **298.13** | **218.21** | **229.27** | **178.00** | **235.45** | **200.89** | **218.42** | **205.21** |
| 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 |
| EF CH4 - gas coke (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - light heating oil (kg/TJ) | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - natural gas (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **CH4 Emission (Mg)** | **13.95** | **5.72** | **8.22** | **5.31** | **3.89** | **4.09** | **3.17** | **4.20** | **3.58** | **3.89** | **3.66** |
| 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 coke (kg/TJ) | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - light heating oil (kg/TJ) | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - natural gas (kg/TJ) | 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)** | **1.40** | **0.66** | **0.82** | **0.53** | **0.39** | **0.41** | **0.32** | **0.42** | **0.36** | **0.39** | **0.37** |

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

| Manufacture of solid fuels and other energy industries | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | |
| LPG (1000 t) | | | | | | | | | | | |
| NCV for LPG (MJ/kg) | | | | | | | | | | | |
| Gas Coke (1000000 m3) | | | | | | | | | | | |
| NCV for gas coke (MJ/m3) | | | | | | | | | | | |
| Light heating oil (1000 t) | 0.70 | 0.40 | | | | | | | | | |
| NCV for light heating oil (MJ/kg) | 42.71 | 42.71 | | | | | | | | | |
| Natural gas (1000000 m3) | 0.90 | 0.50 | | | | | | | | | |
| NCV for natural gas (MJ/m3) | 34.00 | 34.00 | | | | | | | | | |
| Other Kerosene prod (petrolej) (1000 t) | | | | | | | | | | | |
| NCV for petroleum (MJ/m3) | | | | | | | | | | | |
| Biogas | | | | | | 22.54 | 17.30 | 26.54 | 26.93 | 27.50 | 19.40 |
| NCV for biogas (TJ/TJ) | | | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **Total fuel cunsumption (TJ)** | **60.50** | **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 |
| 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 |
| EF CO2 - light heating oil (t/TJ) | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| EF CO2 - natural gas (t/TJ) | 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 |
| 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 |
| **CO2 Emission (Gg)** | **3.93** | **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 |
| EF CH4 - gas coke (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - light heating oil (kg/TJ) | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - natural gas (kg/TJ) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EF CH4 - 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 |
| 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 |
| **CH4 Emission (Mg)** | **0.12** | **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 |
| EF N2O - gas coke (kg/TJ) | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| EF N2O - light heating oil (kg/TJ) | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - natural gas (kg/TJ) | 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 |
| **N2O Emission (Mg)** | **0.02** | **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 | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Anthracite | $10^3$ t | | 0 | 0.6 | 1.6 | 0.2 | 1.3 | 1.5 | 0.9 | 0.1 | 0 | 3.1 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 1 | 0 | 0 | 0.3 | 0.2 | 0 | 1.8 | 0 | 0 | 0 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 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 |
| Natural gas | $10^6$ $m^3$ | 28.7 | 22.9 | 35 | 31.5 | 15.5 | 15.4 | 15.6 | 17.5 | 13 | 13.8 | 18.1 |
| Wood | $10^3$ $m^3$ | | | 0.8 | 0.7 | 0.5 | 0.3 | 0.3 | 0.5 | 0.4 | 0.3 | 0.4 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 0 | 0 | 0 | 0.6 | 0 | 0 | 0 | 3.2 | 3.1 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 5.2 | 4.3 | 3.7 | 2 | 1.6 | 2.5 | 2.5 | 0.6 | 0.3 | 0.3 | 1 |
| Liquified petroleum gas | $10^3$ t | 1.7 | 4.2 | 1.4 | 2.1 | 2.8 | 3.8 | 2.2 | 0.8 | 0.8 | 1.1 | 0.9 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 4.1 | 2.7 | 0.9 | 1.2 | 0.7 | 0.6 | 0.5 | 0.6 | 0.5 | 0.7 | 0.7 |
| Residual fuel oil | $10^3$ t | 1.3 | 2.7 | 1.2 | 1 | 1.3 | 0.6 | 1.4 | 1.1 | 1 | 0.9 | 0.4 |
| Petroleum coke | $10^3$ t | 0 | 0 | 0.7 | 0 | 0.2 | 0 | 0.3 | 0.3 | 0.1 | 0.3 | 0.3 |
| Refinery gas | $10^3$ t | 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 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^3$ $m^3$ | 0 | 0.031 | 0 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 |

| 1A2b Non-Ferrous metals | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Anthracite | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 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 |
| Natural gas | $10^6$ $m^3$ | 4.6 | 1 | 0.4 | 1.2 | 1.1 | 0.9 | 1.1 | 2.6 | 2.6 | 9.4 | 12 |
| Wood | $10^3$ $m^3$ | | | 0.6 | 0.6 | 0.5 | 0.4 | 0.4 | 0.2 | 0.4 | 0.4 | 0.3 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 0 |
| Liquified petroleum gas | $10^3$ t | 0.5 | 2.1 | 3.1 | 3.8 | 5.1 | 5.3 | 4.2 | 0.8 | 0.5 | 0.6 | 0.8 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0.6 | 0.2 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 1.4 | 0.2 | 0.1 | 0.2 | 0.8 | 0.8 | 0.7 | 0.9 | 1.1 | 0.2 | 0.1 |
| Residual fuel oil | $10^3$ t | 0.5 | 4 | 1.2 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum coke | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 |
| Refinery gas | $10^3$ t | 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 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table A3-8: 1A2a-g – fuel consumption

## 1A2c Chemicals

| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anthracite | $10^3$ t | | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 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 |
| Natural gas | $10^6$ $m^3$ | 139.3 | 183.1 | 227.6 | 210.2 | 143.4 | 147.1 | 140.2 | 146.9 | 145.8 | 166.2 | 138.5 |
| Wood | $10^3$ $m^3$ | | | 0.1 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Liquified petroleum gas | $10^3$ t | 5.7 | 0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0 | 0 | 0 | 0 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 1.4 | 2.4 | 3.5 | 2.6 | 2.9 |
| Diesel | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 9 | 0.5 | 0.4 | 0.4 | 0.6 | 0.6 | 0.5 | 0.5 | 0.2 | 0.2 | 0.4 |
| Residual fuel oil | $10^3$ t | 99.7 | 73 | 3.6 | 4.9 | 1.3 | 2 | 3 | 0 | 0 | 0 | 0 |
| Petroleum coke | $10^3$ t | 0 | 0.7 | 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 |
| Other oil derivates | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 1A2d Pulp, paper and print

| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anthracite | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 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 |
| Natural gas | $10^6$ $m^3$ | 74.3 | 69.2 | 68.8 | 65.8 | 58.8 | 37.6 | 34.7 | 27.6 | 45.6 | 46.6 | 46.4 |
| Wood | $10^3$ $m^3$ | | | 13.2 | 0 | 0 | 0 | 0 | 0.1 | 0 | 3.1 | 0 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 169.4 | 151.8 | 193.2 | 422.6 | 19.4 | 5.5 | 20 | 1.2 | 22.4 | 97.5 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Liquified petroleum gas | $10^3$ t | 0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 0.9 | 1.6 | 0.1 | 0.1 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| Residual fuel oil | $10^3$ t | 9.2 | 11.9 | 9.5 | 7.1 | 4.3 | 2.8 | 1.2 | 5.2 | 5.2 | 1.8 | 0.7 |
| Petroleum coke | $10^3$ t | 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 |
| Other oil derivates | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 0 | 0.031 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table A3-8: 1A2a-g – fuel consumption

## 1A2e Food Processing, Beverages and Tobacco

| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anthracite | $10^3$ t | | 0 | 0.7 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 1.2 | 0.9 | 0 | 0 | 0 | 0 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 39.2 | 47.7 | 39.9 | 41 | 35.7 | 35.7 | 35 | 34 | 39.8 | 37.8 | 28.1 |
| Lignite | $10^3$ t | 18.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural gas | $10^6$ $m^3$ | 139.4 | 173 | 166.6 | 156.1 | 143.6 | 130 | 137.9 | 114.7 | 120.9 | 114.3 | 113.2 |
| Wood | $10^3$ $m^3$ | | | 0.5 | 0.7 | 1.4 | 4.2 | 10.6 | 13.5 | 10.9 | 2.7 | 2.4 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 0 | 0 | 0 | 9.37 | 0 | 0 | 0 | 149.4 | 219.4 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 4.8 | 9.6 | 6.4 | 6.4 | 7 | 3 | 5.2 | 4 | 4.5 | 4.7 | 3.5 |
| Liquified petroleum gas | $10^3$ t | 0.6 | 1.6 | 1.3 | 1.5 | 1.2 | 1.4 | 1.5 | 1.4 | 1.2 | 1.2 | 1.1 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 13.1 | 13.3 | 10 | 9.9 | 9.9 | 9.1 | 8.9 | 8.7 | 7.1 | 6.5 | 6.3 |
| Residual fuel oil | $10^3$ t | 29.1 | 32.4 | 22.9 | 23.6 | 12.2 | 8.4 | 7.7 | 9.1 | 11.4 | 8.3 | 9.2 |
| Petroleum coke | $10^3$ t | 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 |
| Other oil derivates | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 0.1 | 0.1099 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 1A2f Non-Metalic Minerals

| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anthracite | $10^3$ t | | 0.1 | 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 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lignite | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural gas | $10^6$ $m^3$ | 54.5 | 73.4 | 56.4 | 55.4 | 48.4 | 50 | 48.5 | 41.8 | 47.8 | 53.4 | 51.3 |
| Wood | $10^3$ $m^3$ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.7 | 0.9 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 7.6 | 7.7 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Liquified petroleum gas | $10^3$ t | 2.8 | 2.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gas/Diesel oil | $10^3$ t | 0.3 | 2.7 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Residual fuel oil | $10^3$ t | 2.2 | 3.8 | 2.2 | 1.8 | 1.8 | 0.1 | 0 | 0 | 0 | 0 | 0 |
| Petroleum coke | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.4 | 0 | 0 |
| Refinery gas | $10^3$ t | 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 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 2.5 | 0.923 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Table A3-8: 1A2a-g – fuel consumption

| 1A2g v Construction | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Anthracite | $10^3$ t | | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0 | 0 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 68.8 | 168.3 | 193.4 | 162 | 145.9 | 120.7 | 106.6 | 74.7 | 46.3 | 57.2 | 53.4 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 3 | 5 | 1.1 | 18.4 | 0 | 4.5 | 1.5 | 2.7 | 2.7 | 1.9 | 1 |
| Lignite | $10^3$ t | 2 | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0 | 0.1 | 0.1 |
| Natural gas | $10^6$ $m^3$ | 195.9 | 124.4 | 76.4 | 67.6 | 54.1 | 39.3 | 36.3 | 40.7 | 38.4 | 52 | 56.8 |
| Wood | $10^3$ $m^3$ | | | 0.3 | 0.2 | 0.5 | 0.2 | 0.7 | 0.9 | 2.3 | 1.9 | 9.7 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 0 | 0 | 370.6 | 213.6 | 361.4 | 391.6 | 12.1 | 289 | 31.9 | 70.5 | 67.8 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 0 | 0 | 17.3 | 18.7 | 19.5 | 19.4 | 21.3 | 20.6 | 24.2 | 26.6 | 26.2 |
| Liquified petroleum gas | $10^3$ t | 4.1 | 4.6 | 3.2 | 2.8 | 3.1 | 2.7 | 2.4 | 1.6 | 1.4 | 1.4 | 1.3 |
| Motor Gasoline | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | | 15 | 14.3 | 13.5 | 12 | 11.9 | 11.6 | 11.1 | 10.4 | 11.5 | 12.3 |
| Gas/Diesel oil | $10^3$ t | 24.9 | 7 | 4.3 | 3.5 | 3.1 | 2.6 | 2.5 | 2.7 | 2.8 | 3.4 | 3 |
| Residual fuel oil | $10^3$ t | 160.9 | 53.1 | 7.3 | 5.6 | 5.5 | 4.4 | 4.9 | 3.9 | 3 | 3.1 | 2.8 |
| Petroleum coke | $10^3$ t | 16.3 | 171.6 | 115.3 | 93.3 | 93.7 | 146.4 | 154.7 | 167.2 | 169.8 | 202 | 195.3 |
| Refinery gas | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Other oil derivates | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Industrial waste-non ren. | TJ | | | 319.1 | 179.4 | 340.6 | 366.2 | 424.9 | 390 | 413.4 | 482.7 | 817.7 |

| 1A2g viii Other industry (analiza industrije+Opća potrošnja-Građevinarstvo) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel consumption | Unit | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Anthracite | $10^3$ t | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 0 |
| Coking coal (kameni ugljen) | $10^3$ t | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 |
| Sub-Bituminous Coal (Mrki ugljen) | $10^3$ t | 0.1 | 4.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lignite | $10^3$ t | 0.1 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural gas | $10^6$ $m^3$ | 50.8 | 65.3 | 54.4 | 59.9 | 52.7 | 45 | 42.1 | 44.2 | 42.5 | 47.4 | 48.6 |
| Wood | $10^3$ $m^3$ | | | 39.4 | 44.5 | 45.6 | 44.4 | 35.3 | 27.4 | 31.7 | 33.8 | 35.5 |
| Biogas | TJ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wood waste | TJ | 1979.4 | 2087.5 | 1456.677 | 1232.8 | 1306.1 | 1386.63 | 1188 | 579 | 371.5 | 715.3 | 590.7 |
| Briketi ugljena | $10^3$ t | | | | | | | | | | | |
| Coke oven coke | $10^3$ t | 0.7 | 1 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Liquified petroleum gas | $10^3$ t | 4.4 | 8 | 6.8 | 5.5 | 5.8 | 5.5 | 5.7 | 5.7 | 5.5 | 6.4 | 6.4 |
| Motor Gasoline | $10^3$ t | 7.8 | 6.9 | 5.1 | 4.7 | 4.2 | 4.1 | 4.1 | 4 | 4.1 | 3.8 | 3.2 |
| Petroleum | $10^3$ t | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Diesel | $10^3$ t | 68 | 110.6 | 102.2 | 98.3 | 90 | 87.4 | 78.6 | 79.2 | 76.9 | 76.2 | 83.9 |
| Gas/Diesel oil | $10^3$ t | 8.2 | 23 | 12.2 | 11.6 | 10.7 | 9.8 | 8.4 | 8.7 | 8.3 | 9.8 | 9.4 |
| Residual fuel oil | $10^3$ t | 22.6 | 17.7 | 8.4 | 5.8 | 5.7 | 4 | 3.3 | 3.8 | 3.5 | 2.4 | 3 |
| Petroleum coke | $10^3$ t | 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 |
| Other oil derivates | $10^3$ t | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visokopećni plin | $10^6$ $m^3$ | | | | | | | | | | | |
| Koksni plin | $10^3$ $m^3$ | | | | | | | | | | | |
| Gas works gas | $10^6$ $m^3$ | 4.2 | 2.456 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 |

| 1A2g vii Off-road vehicles and other machinery | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel consumption | Jedinica | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Motor gasoline | $10^3$ t | 7.8 | 6.9 | 5.1 | 4.7 | 4.2 | 4.1 | 4.1 | 4 | 4.1 | 3.8 | 3.2 |
| Diesel | $10^3$ t | 68 | 125.7 | 116.5 | 111.8 | 102 | 99.3 | 90.2 | 90.3 | 87.3 | 87.7 | 96.2 |

Table A3-8: 1A2a-g – fuel consumption

| 1A2g viii - Total for the period from 1990 -2000 | | | | |
|---|---|---|---|---|
| Fuel consumption | Jedinica | 1990 | 1995 | 2000 |
| Antracit | $10^3$ t | 107.2 | 5 | |
| Kameni ugljen-Bitumenous Coal | $10^3$ t | 42 | 41.9 | 53.2 |
| Mrki ugljen-Sub-bituminous Coal | $10^3$ t | 261.2 | 95.8 | 28.2 |
| Lignit-Lignite | $10^3$ t | 73.2 | 56.3 | 14.4 |
| Briquetts | $10^3$ t | 3.3 | | |
| Natural gas | $10^6$ $m^3$ | 845.7 | 656.8 | 703.8 |
| Fuel wood | $10^3$ $m^3$ | | | |
| Biogass | TJ | | | |
| Wood waste | TJ | 3600 | 2450 | 2227.6 |
| Coke oven coke | $10^3$ t | 251.2 | 31.4 | 37.7 |
| Liquified petroleum gas | $10^3$ t | 17.5 | 17.6 | 21 |
| Motor gasoline | $10^3$ t | 0.2 | 8.5 | 7.6 |
| Diesel | $10^3$ t | 137.1 | 43.6 | 66.1 |
| Gas/diesel oil | $10^3$ t | 109.4 | 57.9 | 64.7 |
| Residual fuel oil | $10^3$ t | 419.2 | 269.7 | 302.2 |
| Petroleum coke | $10^3$ t | 0 | | |
| Koksni plin-Coke oven gas | 106 m3 | 29.9 | | |
| Petroleum coke | $10^3$ t | 0.1 | | |
| Lubricants | $10^3$ t | 8.6 | | |
| Gas works gas | $10^0$ $m^3$ | 6.1 | 9.84 | 7.9 |

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

| Net Calorific Value | | 2001 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antracit | MJ/kg | | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 | 29.31 |
| Kameni ugljen | MJ/kg | 25.8 | 25.1 | 24.77332 | 25.24 | 26.46616 | 27.0485791 | 26.2 | 26.7 | 27.39 | 27.28 | 26 |
| Mrki ugljen | MJ/kg | 18.2 | 18.5 | 17.6 | 17.1 | 17.8 | | 16.89 | 17 | 17 | 19.6 | 19 |
| Lignit | MJ/kg | 12.2 | 12.1 | | | | | 0 | 0 | | 11.8 | 11.85 |
| Prirodni plin | MJ/m3 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | 34.0 | 34.6 | 34.6 | 34.8 | 34.7 | 34.6 |
| Ogrjevno drvo | MJ/m3 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9 | 9 | 9.0 | 9.0 | 9.0 |
| Bio plin | TJ/TJ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1 | 1 | 1.0 | 1.0 | 1.0 |
| Industrijski otpaci (drvni) | TJ/TJ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1 | 1 | 1.0 | 1.0 | 1.0 |
| Briketi ugljena | MJ/kg | | | | | | | | | | | |
| Koks | MJ/kg | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.3 | 29.31 | 29.31 | 29.3 | 29.3 | 29.3 |
| Ukapljeni plin | MJ/kg | 46.9 | 46.9 | 46.9 | 46.9 | 46.9 | 46.9 | 46.89 | 46.89 | 46.9 | 46.9 | 46.9 |
| Motorni benzin | MJ/kg | 44.6 | 44.6 | 44.6 | 44.6 | 44.6 | 44.6 | 44.59 | 44.59 | 44.6 | 44.6 | 44.6 |
| Petroleum | MJ/kg | | | | | | | 43.96 | 43.96 | 44.0 | 44.0 | 44.0 |
| Dizelsko gorivo | MJ/kg | 42.7 | 42.7 | 42.7 | 42.7 | 42.7 | 42.7 | 42.71 | 42.71 | 42.7 | 42.7 | 42.7 |
| Ekstralako l. ulje | MJ/kg | 42.7 | 42.7 | 42.7 | 42.7 | 42.7 | 42.7 | 42.71 | 42.71 | 42.7 | 42.7 | 42.7 |
| Loživo ulje | MJ/kg | 40.2 | 40.2 | 40.2 | 40.2 | 40.2 | 40.2 | 40.19 | 40.19 | 40.2 | 40.2 | 40.2 |
| Naftni koks | MJ/kg | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31 | 31 | 31.0 | 31.0 | 31.0 |
| Rafinerijski plin | MJ/kg | | | | | | | 0 | 0 | | | |
| Ostali derivati nafte | MJ/kg | | | | | | | 0 | 0 | | | |
| Visokopećni plin | MJ/m3 | | | | | | | | | | | |
| Koksni plin | MJ/m3 | | | | | | | | | | | |

| 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** | **2000** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | | |
| Aviation gasoline | 1000 t | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.30 | 0.40 | 0.40 | 0.40 |
| NCV for gasoline | MJ/kg | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 | 44.59 |
| Jet kerosene | 1000 t | 2.00 | 8.00 | 9.00 | 10.00 | 9.00 | 9.00 | 8.70 | 9.50 | 9.50 | 9.60 | 9.70 |
| 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 | 0.10 | | | | | | | | | |
| NCV motor gasoline | MJ/kg | 44.59 | 44.59 | | | | | | | | | |
| **Total fuel cunsumption** | TJ | **92.46** | **356.14** | **440.23** | **484.19** | **440.23** | **440.23** | **427.04** | **431.00** | **435.46** | **439.85** | **444.25** |
| **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** | **25.45** | **31.41** | **34.55** | **31.41** | **31.41** | **30.47** | **30.80** | **31.11** | **31.42** | **31.74** |
| 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** | **0.18** | **0.22** | **0.24** | **0.22** | **0.22** | **0.21** | **0.22** | **0.22** | **0.22** | **0.22** |
| EF N2O - gasoline | kg/TJ | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 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** | **0.71** | **0.88** | **0.97** | **0.88** | **0.88** | **0.85** | **0.86** | **0.87** | **0.88** | **0.89** |

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

| 1A3bi | CARS | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FUEL CONSUMPTION | | | | | | | | | | | | | |
| | Gasoline | TJ | | 31326.39 | 31854.20 | 26546.03 | 25990.49 | 24350.37 | 23828.58 | 21720.34 | 21717.61 | 21808.27 | 20938.26 | 20283.53 |
| | Diesel oil | TJ | | 1629.64 | 8696.11 | 24285.29 | 24724.19 | 25983.60 | 23569.86 | 26866.30 | 30510.23 | 33676.20 | 34490.13 | 32991.60 |
| | LPG | TJ | | #DIV/0! | 459.52 | 2752.44 | 2020.96 | 2569.57 | 2639.91 | 2832.16 | 3141.63 | 3315.12 | 3315.12 | 3301.06 |
| | CNG | TJ | | | | 2.40 | 0.57 | 0.86 | 4.14 | 3.88 | 3.77 | 8.76 | 9.93 | 11.10 |
| | Biodiesel | TJ | | | | 59.130177 | 73.5912329 | 996.97545 | 667.956991 | 702.115844 | 598.420095 | 739.43584 | 12.99218188 | 701.000401 |
| | | | | | | | | | | | | | | |
| | NCV | | | | | | | | | | | | | |
| | Gasoline | MJ/kg | | 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 |
| | LPG | MJ/kg | | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |

| 1A3bii | LIGHT DUTY TRUCKS | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FUEL CONSUMPTION | | | | | | | | | | | | | |
| | Gasoline | TJ | | 1968.3648 | 1493.7195 | 628.46808 | 580.360249 | 384.663696 | 339.029761 | 354.220818 | 352.640656 | 354.834669 | 361.6492871 | 417.844316 |
| | Diesel oil | TJ | | 3434.7595 | 5750.4421 | 9672.5246 | 9323.74562 | 8521.19768 | 7792.89133 | 6414.61859 | 6714.00653 | 6776.39 | 9122.021855 | 8471.19935 |
| | LPG | TJ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | CNG | TJ | | | | | | | | | | | | |
| | Biodiesel | TJ | | | | 23.550799 | 27.7520041 | 222.013818 | 220.846326 | 167.637718 | 131.686879 | 148.790717 | 3.436199293 | 138.562794 |
| | | | | | | | | | | | | | | |
| | NCV | | | | | | | | | | | | | |
| | Gasoline | MJ/kg | | 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 |
| | LPG | MJ/kg | | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |

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

| 1A3biii | HEAVY DUTY TRUCKS+BUSSES | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FUEL CONSUMPTION | | | | | | | | | | | | | |
| | Gasoline | TJ | | 146.7125 | 53.1843 | 25.7183 | 22.4126 | 10.3799 | 19.1810 | 31.1116 | 29.6229 | 24.2703 | 19.5782 | 10.5285 |
| | Diesel oil | TJ | | 10576.0050 | 9377.0853 | 13023.1221 | 12364.9590 | 11006.9059 | 15716.3429 | 14562.6064 | 14787.6885 | 14198.8307 | 18090.4795 | 17681.5095 |
| | LPG | TJ | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | CNG | TJ | | | | 85.9977 | 26.6255 | 33.1437 | 60.4625 | 128.7210 | 134.6284 | 143.4822 | 167.0354 | 165.5631 |
| | Biodiesel | TJ | | | | 31.7089 | 36.8041 | 280.0606 | 445.3927 | 380.5748 | 290.0421 | 311.7669 | 6.8146 | 281.7630 |
| | NCV | | | | | | | | | | | | | |
| | Gasoline | MJ/kg | | 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 |
| | LPG | MJ/kg | | 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 |
| | Biodiesel | MJ/kg | | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |

| 1A3biv | MOTORCYCLES | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FUEL CONSUMPTION | | | | | | | | | | | | | |
| | Gasoline | TJ | | 424.634 | 674.574 | 1185.775 | 1141.722 | 1036.521 | 993.183 | 1130.179 | 1086.927 | 1084.143 | 1064.689 | 1043.563 |
| | Diesel oil | TJ | | 0.000 | 0.000 | 0.059 | 0.058 | 0.076 | 0.142 | 0.216 | 0.317 | 0.297 | 0.504 | 0.500 |
| | LPG | TJ | | | | | | | | | | | | |
| | CNG | TJ | | | | | | | | | | | | |
| | Biodiesel | TJ | | | | 0.0001431 | 0.00017344 | 14.3123095 | 0.00402589 | 0.00565167 | 0.00622107 | 0.00652985 | 0.000189743 | 9.03383809 |
| | NCV | | | | | | | | | | | | | |
| | Gasoline | MJ/kg | | 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 |
| | LPG | MJ/kg | | 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 |
| | Biodiesel | MJ/kg | | 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 |
| | 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 |
| | 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 |
| | 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 |
| | 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 |

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

| Rail transport | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| **Fuel consumption** | | | | | | | | | | | | |
| Gasoline (1000 t) | 1000 t | 0.10 | 0.10 | | | | | | | | | |
| NCV for gasoline (MJ/kg) | MJ/kg | 44.59 | 44.59 | | | | | | | | | |
| Diesel (1000 t) | 1000 t | 36.10 | 27.20 | 28.50 | 26.40 | 24.80 | 23.40 | 21.20 | 17.50 | 18.30 | 17.60 | 14.70 |
| 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 |
| 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** | **1,217.24** | **1,127.54** | **1,059.21** | **999.41** | **905.45** | **747.43** | **781.59** | **751.70** | **627.84** |
| **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 |
| 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 |
| EF CO2 - fuel oil (t/TJ) | t/TJ | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 |
| EF CO2 - 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 |
| 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 |
| 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 |
| 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 |
| EF CO2 - petroleum (t/TJ) | t/TJ | | | | | | | | | | | |
| **CO2 Emission (Gg)** | Gg | **140.08** | **86.39** | **90.20** | **83.55** | **78.49** | **74.06** | **67.09** | **55.38** | **57.92** | **55.70** | **46.52** |
| 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 |
| 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 |
| EF CH4 - fuel oil (kg/TJ) | kg/TJ | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| EF CH4 - 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 |
| 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 |
| 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 |
| 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 |
| EF CH4 - petroleum (t/TJ) | kg/TJ | | | | | | | | | | | |
| **CH4 Emission (Mg)** | Mg | **6.97** | **3.87** | **4.04** | **3.74** | **3.52** | **3.32** | **3.01** | **2.48** | **2.59** | **2.50** | **2.08** |
| 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 |
| 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 |
| EF N2O - fuel oil (kg/TJ) | kg/TJ | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| EF N2O - 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 |
| 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 |
| 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 |
| 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 |
| EF N2O - petroleum (t/TJ) | kg/TJ | | | | | | | | | | | |
| **N2O Emission (Mg)** | Mg | **44.46** | **33.23** | **34.81** | **32.25** | **30.29** | **28.58** | **25.90** | **21.38** | **22.35** | **21.50** | **17.96** |

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

| National navigation | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | | |
| Gasoline (1000 t) | | 0.10 | 0.30 | | | | | | | | | |
| NCV for gasoline (MJ/kg) | | 44.59 | 44.59 | | | | | | | | | |
| Diesel (1000 t) | | 38.70 | 25.70 | 34.80 | 35.40 | 33.50 | 38.50 | 42.00 | 41.20 | 41.80 | 44.30 | 47.20 |
| 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 oil (1000 t) | | 2.10 | 1.40 | 2.00 | 1.80 | 1.90 | | 0.40 | | | | |
| NCV for fuel oil (MJ/kg) | | 40.19 | 40.19 | 40.19 | 40.19 | 40.19 | | 40.19 | | | | |
| Light heating oil (1000 t) | | 1.60 | | | | | | 1.10 | | | | |
| NCV for light heating oil (MJ/kg) | | 42.71 | | | | | | 42.71 | | | | |
| **Total fuel cunsumption (TJ)** | | **1,810.07** | **1,167.29** | **1,566.69** | **1,584.28** | **1,507.15** | **1,644.34** | **1,856.88** | **1,759.65** | **1,785.28** | **1,892.05** | **2,015.91** |
| **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 - 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 |
| EF CO2 - fuel oil (t/TJ) | | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 | 77.40 |
| EF CO2 - light heating oil (t/TJ) | | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 | 74.10 |
| **CO2 Emission (Gg)** | | **134.38** | **86.62** | **116.36** | **117.63** | **111.93** | **121.85** | **137.65** | **130.39** | **132.29** | **140.20** | **149.38** |
| EF CH4 - gasoline (kg/TJ) | | 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) | | 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) | | 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) | | 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)** | | **12.67** | **8.17** | **10.97** | **11.09** | **10.55** | **11.51** | **13.00** | **12.32** | **12.50** | **13.24** | **14.11** |
| 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 - diesel (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 - fuel oil (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 - light heating oil (kg/TJ) | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| **N2O Emission (Mg)** | | **3.48** | **2.33** | **3.13** | **3.17** | **3.01** | **3.29** | **3.62** | **3.52** | **3.57** | **3.78** | **4.03** |

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

| Commercial/Institutional | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | |
| Petroleum (1000 t) | 3.80 | | | | | | | | | | |
| NCV for jet kerosene (MJ/kg) | 43.94 | | | | | | | | | | |
| Light heating oil (1000 t) | 90.30 | 120.50 | 73.80 | 64.80 | 50.00 | 44.20 | 36.10 | 44.60 | 44.30 | 43.50 | 37.20 |
| 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 |
| Fuel oil (1000 t) | 67.60 | 3.90 | 8.00 | 9.70 | 9.50 | 4.60 | 3.20 | 2.70 | 1.50 | 0.80 | 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) | 4.30 | 13.90 | 12.90 | 13.70 | 12.10 | 12.10 | 12.10 | 12.30 | 12.60 | 12.10 | 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 |
| Anthracite (1000 t) | | | | | | | | | | | |
| NCV for anthracite (MJ/kg) | | | | | | | | | | | |
| Brown coal (1000 t) (MU) | 24.50 | 9.50 | 2.20 | 5.20 | 4.90 | 0.50 | 0.10 | | 0.10 | 0.10 | 0.00 |
| NCV for brown coal (MJ/kg) | 16.74 | 17.80 | 17.60 | 17.10 | 17.80 | 18.00 | 16.89 | 16.89 | 17.00 | 19.60 | 19.00 |
| Lignite (1000 t) | 40.00 | 1.20 | 0.30 | 0.10 | | | 0.10 | 0.10 | 0.00 | 0.20 | 0.10 |
| NCV for lignite (MJ/kg) | 10.90 | 12.00 | 11.60 | 11.60 | 11.60 | | 10.50 | 10.50 | 10.50 | 11.80 | 11.85 |
| Briquettes (1000 t) | 2.90 | | | | | | | | | | |
| NCV for briquettes (MJ/kg) | 16.74 | | | | | | | | | | |
| Gas work gas (1000000 m3) | 4.90 | 1.50 | 2.84 | 2.49 | 1.87 | 1.49 | 1.14 | 0.39 | | | |
| NCV for gas work gas (MJ/m3) | 15.82 | 19.49 | 18.72 | 17.20 | 17.20 | 17.10 | 17.10 | 17.10 | | | |
| Natural gas (1000000 m3) | 124.30 | 98.20 | 192.70 | 173.50 | 162.00 | 166.00 | 159.80 | 204.80 | 217.90 | 231.30 | 244.30 |
| NCV for natural gas (MJ/m3) | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.60 | 34.60 | 34.80 | 34.70 | 34.64 |
| Gasoline (1000 t) | | | | | | | | | | | |
| NCV for gasoline (MJ/kg) | | | | | | | | | | | |
| Petroleum coke (1000 t) | 1.50 | | | | | | | | | | |
| NCV for petroleum coke (MJ/kg) | 33.57 | | | | | | | | | | |
| Anthracite (1000 t) | | | | | | 0.10 | | | | | |
| NCV for anthracite(MJ/kg) | | | | | | 29.31 | | | | | |
| Solid Biomass-Wood (TJ) + charcoal | 0.00 | 0.00 | 129.80 | 157.85 | 140.00 | 143.00 | 177.98 | 213.50 | 176.90 | 346.60 | 422.80 |
| Bio gass (TJ) | | | 102.26 | 110.60 | 86.07 | 75.83 | 103.20 | 116.59 | 119.11 | 118.13 | 114.74 |
| **Total fuel cunsumption (TJ)** | **12,190.9** | **9,506.6** | **10,957.7** | **10,100.1** | **8,938.2** | **8,540.3** | **8,070.2** | **10,014.1** | **10,423.8** | **10,952.6** | **11,138.7** |
| **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 |
| 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 |
| 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 - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **CO2 Emission (Gg)** | **854.65** | **640.93** | **690.73** | **641.00** | **562.78** | **529.07** | **496.89** | **614.15** | **634.03** | **671.92** | **680.84** |

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 |
| 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 |
| 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 - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **CH4 Emission (Mg)** | **99.38** | **74.97** | **110.66** | **113.30** | **99.01** | **95.31** | **101.22** | **123.12** | **114.07** | **166.48** | **188.37** |
| 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 |
| 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 |
| 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 - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **N2O Emission (Mg)** | **5.87** | **3.86** | **3.40** | **3.33** | **2.82** | **2.46** | **2.34** | **2.84** | **2.71** | **3.40** | **3.56** |

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

| Residential | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 |
| 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 |
| **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 |
| 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 |
| 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 |
| 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) | 97.90 | 51.90 | 72.20 | 74.40 | 56.90 | 54.20 | 47.40 | 47.60 | 48.80 | 46.50 | 42.40 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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** |
| **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** |
| 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 |
| 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 |
| 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 - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **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** |

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** |
| 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 |
| 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 |
| 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 - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **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** |
| 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** |
| 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 |
| 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 |
| 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 - 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 |
| 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 |
| EF N2O - hard coal (kg/TJ) | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| EF N2O - 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **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** |

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

| Agriculture/forestry/fishing | 1990 | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fuel consumption** | | | | | | | | | | | | |
| Other kerosene (1000 t) | 0.10 | | | | | | | | | | | |
| NCV for other kerosene (MJ/kg) | 43.94 | | | | | | | | | | | |
| Diesel + light heating oil (1000 t) | 232.60 | 237.60 | 197.40 | 200.10 | 200.20 | 186.30 | 182.20 | 182.20 | 182.60 | 180.90 | 180.90 | 185.90 |
| NCV for diesel (MJ/kg) | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 | 42.71 |
| **Fuel consumption - mobile (TJ)** | 9,938.7 | 10,147.9 | 8,431.0 | 8,546.3 | 8,550.5 | 7,956.9 | 7,781.8 | 7,781.8 | 7,798.8 | 7,726.2 | 7,726.2 | 7,939.8 |
| Fuel oil (1000 t) | 12.30 | 13.40 | 4.70 | 4.40 | 4.40 | 4.10 | 3.50 | 2.50 | 2.10 | 1.20 | 0.80 | 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) | 4.40 | 2.60 | 2.70 | 2.70 | 2.70 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.60 |
| NCV for LPG (MJ/kg) | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 | 46.89 |
| Gas work gas (1000000 m3) | | | | | | | | | | | | |
| NCV for gas work gas (MJ/m3) | | | | | | | | | | | | |
| Natural gas (1000000 m3) | 25.00 | 14.50 | 23.20 | 22.20 | 21.50 | 20.70 | 21.00 | 21.70 | 21.40 | 27.80 | 24.00 | 23.50 |
| NCV for natural gas (MJ/m3) | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.00 | 34.60 | 34.60 | 34.80 | 34.70 | 34.64 |
| **Fuel consumption - stationary (TJ)** | 1,550.7 | 1,153.5 | 1,104.3 | 1,058.2 | 1,034.4 | 985.8 | 971.9 | 968.5 | 942.1 | 1,132.9 | 982.2 | 936.0 |
| **Total fuel cunsumption (TJ)** | **11,489.4** | **11,301.4** | **9,535.3** | **9,604.5** | **9,585.0** | **8,942.7** | **8,753.7** | **8,750.3** | **8,740.9** | **8,859.1** | **8,708.4** | **8,875.7** |
| **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 | 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 | 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 | 74.10 |
| **CO2 emission (Gg) - mobile** | **736.45** | **751.96** | **624.73** | **633.28** | **633.60** | **589.60** | **576.63** | **576.63** | **577.89** | **572.51** | **572.51** | **588.34** |
| 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 - gas work gas (t/TJ) | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 | 44.40 |
| EF CO2 - natural gas (t/TJ) | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 | 56.10 |
| **CO2 emission (Gg) - stationary** | **98.97** | **77.03** | **66.86** | **64.02** | **62.68** | **59.63** | **58.34** | **57.29** | **55.47** | **65.40** | **56.61** | **53.36** |
| **Total CO2 emission (Gg)** | **835.42** | **828.99** | **691.59** | **697.30** | **696.28** | **649.24** | **634.97** | **633.92** | **633.36** | **637.92** | **629.12** | **641.70** |
| 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 | 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 | 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 | 4.15 |
| **CH4 emission (Mg) - mobile** | **41.84** | **42.11** | **34.99** | **35.47** | **35.48** | **33.02** | **32.29** | **32.29** | **32.37** | **32.06** | **32.06** | **32.95** |
| 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 - 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 |
| **CH4 emission (Mg) - stationary** | **10.22** | **8.46** | **6.47** | **6.18** | **6.06** | **5.75** | **5.56** | **5.34** | **5.13** | **5.91** | **5.07** | **4.68** |
| **Total CH4 emission (Mg)** | **52.07** | **50.57** | **41.45** | **41.64** | **41.54** | **38.77** | **37.86** | **37.64** | **37.50** | **37.97** | **37.14** | **37.63** |
| 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 | 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 | 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 | 28.60 |
| **N2O emission (Mg) - mobile** | **284.12** | **290.23** | **241.13** | **244.42** | **244.55** | **227.57** | **222.56** | **222.56** | **223.05** | **220.97** | **220.97** | **227.08** |
| 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 - 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 |
| **N2O emission (Mg) - stationary** | **0.40** | **0.38** | **0.20** | **0.19** | **0.19** | **0.18** | **0.17** | **0.15** | **0.14** | **0.14** | **0.11** | **0.09** |
| **Total N2O emission (Mg)** | **284.53** | **290.61** | **241.33** | **244.62** | **244.74** | **227.75** | **222.73** | **222.71** | **223.18** | **221.11** | **221.08** | **227.17** |

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 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Exploration** | **Unit** | **Emission source** | **IPCC Code** | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Well Drilling | $10^3$ $m^3$ total oil production | | 1.B.2.a.ii | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| Well Testing | $10^3$ $m^3$ total oil production | | 1.B.2.a.ii | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| Well Servicing | $10^3$ $m^3$ total oil production | | 1.B.2.a.ii | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Well Drilling | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 |
| Well Testing | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 |
| Well Servicing | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 |
| CH4 | | | | | | | | | | | | | | |
| Well Drilling | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 |
| Well Testing | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 |
| Well Servicing | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 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 |
| Well Testing | $Gg/10^3$ $m^3$ total oil production | Flaring and Venting | 1.B.2.a.ii | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 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 |
| **2. Production** | **Unit** | **Emission source** | **IPCC Code** | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Conventional oil | $10^3$ $m^3$ total oil production | Fugitives (Onshore) | 1.B.2.a.iii.2 | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| Conventional oil | $10^3$ $m^3$ total oil production | Venting | 1.B.2.a.i | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| Conventional oil | $10^3$ $m^3$ total oil production | Flaring | 1.B.2.a.ii | 3135.12 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Fugitives (Onshore) | 1.B.2.a.iii.2 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 | 1.30E-04 |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Venting | 1.B.2.a.i | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 | 9.50E-05 |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Flaring | 1.B.2.a.ii | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 | 4.10E-02 |
| CH4 | | | | | | | | | | | | | | |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Fugitives (Onshore) | 1.B.2.a.iii.2 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 | 1.80E-03 |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Venting | 1.B.2.a.i | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 | 7.20E-04 |
| Conventional oil | $Gg/10^3$ $m^3$ total oil production | Flaring | 1.B.2.a.ii | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 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 |
| 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 |
| 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 |
| **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 | 5552.33 | 7454.65 | 6184.88 | 5182.56 | 6275.58 | 5780.23 | 7217.44 | 8019.77 | 9008.14 | 9943.02 |
| Tanker Trucks and Rail | $10^3$ $m^3$ total oil transported by tanker… | Venting | 1.B.2.a.i | 943.49 | 275.30 | 124.13 | 85.04 | 42.67 | 41.30 | 49.84969 | 50.01066 | 95.35354 | 57.04444 | 68.20106 |
| Natural gas liquids transport-LPG | $10^3$ $m^3$ LPG | All | 1.B.2.a.iii.3 | | | | | | | | | | | |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Pipelines | $Gg/10^3$ $m^3$ total oil transported | All | 1.B.2.a.iii.3 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 | 4.90E-07 |
| Tanker Trucks and Rail | $Gg/10^3$ $m^3$ total oil transported | Venting | 1.B.2.a.i | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 | 2.30E-06 |
| CH4 | | | | | | | | | | | | | | |
| Pipelines | $Gg/10^3$ $m^3$ total oil transported | All | 1.B.2.a.iii.3 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 | 5.40E-06 |
| Tanker Trucks and Rail | $Gg/10^3$ $m^3$ total oil transported | Venting | 1.B.2.a.i | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 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 |
| 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 |
| **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 | 6120.6977 | 3769.186 | 3904.6512 | 3614.3023 | 3526.5116 | 2838.837 | 3328.372 | 3748.953 | 4050.349 | 4174.5349 |
| 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 |
| CH4 | | | | | | | | | | | | | | |
| Oil Refining | $Gg/10^3$ $m^3$ total oil refined | All | 1.B.2.a.iii.4 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 2.18E-05 | 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 |

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

| 1. B. 2. b. Natural Gas | | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Exploration | Unit | Emission source | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Well Drilling | $10^3$ $m^3$ total natural gas production | | 1.B.2.a.ii | 1982.30 | 1638.50 | 2727.20 | 2471.40 | 2013.10 | 1856.10 | 1747.00 | 1780.50 | 1647.20 | 1483.50 | 1230.10 |
| Well Testing | $10^3$ $m^3$ total natural gas production | | 1.B.2.a.ii | 1982.30 | 1638.50 | 2727.20 | 2471.40 | 2013.10 | 1856.10 | 1747.00 | 1780.50 | 1647.20 | 1483.50 | 1230.10 |
| Well Servicing | $10^3$ $m^3$ total natural gas production | | 1.B.2.a.ii | 1982.30 | 1638.50 | 2727.20 | 2471.40 | 2013.10 | 1856.10 | 1747.00 | 1780.50 | 1647.20 | 1483.50 | 1230.10 |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Well Drilling | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 | 1.00E-04 |
| Well Testing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 | 9.00E-03 |
| Well Servicing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 | 1.90E-06 |
| CH4 | | | | | | | | | | | | | | |
| Well Drilling | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 | 3.30E-05 |
| Well Testing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 | 5.10E-05 |
| Well Servicing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 | 1.10E-04 |
| N2O | | | | | | | | | | | | | | |
| Well Drilling | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Well Testing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 | 6.80E-08 |
| Well Servicing | $Gg/10^3$ $m^3$ total natural gas production | Flaring and Venting | 1.B.2.a.ii | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2. Production | Unit | Emission source | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Gas production | $10^6$ $m^3$ gas produced | Fugitives | 1.B.2.b.iii.2 | 1982.30 | 1658.50 | 2727.20 | 2471.40 | 2013.10 | 1856.10 | 1747.00 | 1780.50 | 1647.20 | 1483.50 | 1230.10 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 3. Processing | Unit | Emission source | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Default weighted | $10^6$ $m^3$ gas produced | Fugitives | 1.B.2.b.iii.3 | 1982.30 | 1658.50 | 2727.20 | 2471.40 | 2013.10 | 1856.10 | 1747.00 | 1780.50 | 1647.20 | 1483.50 | 1230.10 |
| Default weighted | $10^6$ $m^3$ 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 |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Fugitives | 1.B.2.b.iii.3 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 | 1.66E-04 |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Flaring | 1.B.2.b.ii | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 | 3.00E-03 |
| CH4 | | | | | | | | | | | | | | |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Fugitives | 1.B.2.b.iii.3 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 | 5.90E-04 |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Flaring | 1.B.2.b.ii | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 | 2.00E-06 |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Raw CO2 venting | 1.B.2.b.i | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N2O | | | | | | | | | | | | | | |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Fugitives | 1.B.2.b.iii.3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Flaring | 1.B.2.b.ii | 3.3E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 | 3.30E-08 |
| Default weighted | $Gg/10^6$ $m^3$ gas produced | Raw CO2 venting | 1.B.2.b.i | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4. Transmission a | Unit | Emission source | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Transmission | $10^6$ $m^3$ marketable gas | Fugitives | 1.B.2.b.iii.4 | 2686.6 | 2704.8 | 3241.5 | 3165 | 2971.7 | 2809.9 | 2443.6 | 2519.2 | 2611.4 | 3008.3 | 2770.5 |
| Transmission | $10^6$ $m^3$ marketable gas | Venting | 1.B.2.b.i | 2686.6 | 2704.8 | 3241.5 | 3165 | 2971.7 | 2809.9 | 2443.6 | 2519.2 | 2611.4 | 3008.3 | 2770.5 |
| Storage | $10^6$ $m^3$ marketable gas | All | 1.B.2.b.iii.4 | 2686.6 | 2704.8 | 3241.5 | 3165 | 2971.7 | 2809.9 | 2443.6 | 2519.2 | 2611.4 | 3008.3 | 2770.5 |
| EMISSION FACTOR | | | | | | | | | | | | | | |
| CO2 | | | | | | | | | | | | | | |
| Transmission | $Gg/10^6$ $m^3$ marketable gas | Fugitives | 1.B.2.b.iii.4 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 | 8.80E-07 |
| Transmission | $Gg/10^6$ $m^3$ marketable gas | Venting | 1.B.2.b.i | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 | 3.10E-06 |
| Storage | $Gg/10^6$ $m^3$ marketable gas | All | 1.B.2.b.iii.4 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 | 1.10E-07 |
| CH4 | | | | | | | | | | | | | | |
| Transmission | $Gg/10^6$ $m^3$ marketable gas | Fugitives | 1.B.2.b.iii.4 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 | 2.73E-04 |
| Transmission | $Gg/10^6$ $m^3$ marketable gas | Venting | 1.B.2.b.i | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 | 1.82E-04 |
| Storage | $Gg/10^6$ $m^3$ marketable gas | All | 1.B.2.b.iii.4 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 | 2.50E-05 |
| 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 |
| Transmission | $Gg/10^6$ $m^3$ marketable gas | Venting | 1.B.2.b.i | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Storage | $Gg/10^6$ $m^3$ marketable gas | All | 1.B.2.b.iii.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 5. Distribution of I | Unit | Emission source | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Gas distribution | $10^6$ $m^3$ of utility sales (consumption of natural gas in 1A4-Other sectors) | All | 1.B.2.a.iii.5 | 379.3 | 609.3 | 944.6 | 865.2 | 812.9 | 788.3 | 705.6 | 766.2 | 806.2 | 833.4 | 832.5 |
| 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 |
| 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 |
| 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 |

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

| 1. B. 2. a. Oil | | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 1411.51 | 837.67 | 772.56 | 697.56 | 698.49 | 689.77 | 779.30 | 857.09 | 865.70 | 851.28 |
| 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 |
| 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 |
| Conventional oil | Gg/$10^3$ $m^3$ total oil production | Flaring | 1.B.2.a.ii | 0.00000064 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 | 6.40E-07 |
| 3. Transport | Unit | mission sourc | IPCC Code | | | | | | | | | | | |
| ACTIVITY DATA | | | | | | | | | | | | | | |
| Pipelines | $10^3$ $m^3$ total oil transported by pipelines | All | 1.B.2.a.iii.3 | 9948.84 | 5552.33 | 7454.65 | 6184.88 | 5182.56 | 6275.58 | 5780.23 | 7217.44 | 8019.77 | 9008.14 | 9943.02 |
| Tanker Trucks and Rail Cars | $10^3$ $m^3$ total oil transported by tanker… | Venting | 1.B.2.a.i | 943.49 | 275.30 | 124.13 | 85.04 | 42.67 | 41.30 | 49.85 | 50.01 | 95.35 | 57.04 | 68.20 |
| 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 |
| 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 |
| 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 |

| 1. B. 2. c. 2 ii Venting anf Flaring - Gas | | | | 1990 | 2000 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

## 3.2. LULUCF sector - List of implemented and planned projects

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

| 1.Project | Status | Main objectives |
|---|---|---|
| Improving Croatian reporting in Land use, Land use change and Forestry (LULUCF) sector in the First commitment period of the Kyoto Protocol (abbreviated **LULUCF 1**) | Implemented (2014-2015) | The objective of the project was to comply with requirements set in the Saturday paper in 2012 regarding the traceability and identification of lands that were subject of forest activities (lands under the Article 3.3 and Article 3.4 of the KP). The main tasks of the project were: (i) identification of areas where an increase of forests occurred prior to 1990, which were a result of man's decision to support the natural spread of forests on the categories of land that haven't been forests before; (ii) identification of areas where an increase of forests occurred after 1990, which were a result of man's decision to support the natural spread of forests on the categories of land that haven't been forests before; (iii) identification of areas where an increase of forests occurred after the 1990, which were not the result of a man's decision to support the natural spread of forests to categories of land that haven't been forests before; (iv) identification of land that were subject of deforestation in period 1990-2014;<br>The main outcome was the application of Approach 3 to identify and trace lands that are converted to and from forest lands. Registration system of LUC to/from forest land has been kept after the end of the project. |
| Upgrading the Croatian National System for the reporting of greenhouse gas emissions for the implementation of the Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities | Implemented (2014-2015) | The main objective of the project was to improve national NIR reporting estimates of the emissions/removals from LULUCF sector. Project activities referred to the setting the preconditions for the development of a future land cover and land use information system as well as improvements in reporting system procedures. |

| | | |
|---|---|---|
| (abbreviated: **LULUCF 2**) | | |
| The analysis of the national forest inventory data for fulfilling obligations under the UN Framework Convention on Climate Change and the Kyoto Protocol | Implemented (2016) | The objective of the project was to analyse and discuss the importance and usability of data collected during National Forest Inventories (NFI) in fulfilment of national obligations set under the UN Framework Convention on climate change, Kyoto Protocol and according to the Decision No 529/2013/EU of the European Parliament and of the Council. One of the main outcomes was the international workshop that had been organized to exchange information, experience and knowledge among experts from EU member states on these data issues for the purpose of future planning in forestry sector and reporting from LULUCF sector. |
| Calculation of greenhouse gas emissions due to natural disturbances under the provisions of Decision 2/CMP.7 | Implemented (2016-2017) | The main goal of the project was to determine types of the natural disturbances for the forests in Croatia and to define background level (BL) and margin level (ML) in areas under the forest management activity (FM) and Afforestation activity. |
| Application of the IPCC Tier 2 method for the estimation of the carbon stock change in dead wood pool on the deforested areas in Republic of Croatia | Implemented (2018) | The use of data from the national forest inventory databases (abbreviated: CRONFI) to perform the estimation of carbon stock changes in the deadwood pool using a higher level (Tier 2) of the IPCC methodology for the forest land areas that had been converted to perennial cropland and settlements (areas subject of deforestation) |
| Application of the IPCC Tier 2 method for the estimation of the greenhouse gases emissions from forest fires | Ongoing | The assessment of the biomass structure on the burnt areas in order to develop national specific values of the $M_B$ and $C_f$ factors for the application of a higher level (Tier 2) of the IPCC methodology for calculating GHG emissions as a result of biomass burning in Croatia. |
| Croatian Land Information System | Planned | The aim of the project is a development of harmonized land monitoring data system that enables integration and processing of Land Cover (LC), Land Use (LU) and land management data from different data sources and its use for a variety of purposes. |
| HWP project | Planned | The aim of the project is to defined preconditions for the development of an information system on wood products (monitoring of the entire production cycle, |

| | | |
|---|---|---|
| | | final product production, export) and to define the national factors needed to calculate carbon stock changes in wood products using the Tier 3 level of IPCC methodology for the NIR report purposes in the part related to the calculation for HWPs. |
| LULUCF 3 | Ongoing | The aim of the project is examination and the review of the existing systems for determining the content of carbon stocks in biomass in the category of forest land as well as in the categories of land that have been converted into forest land (Cropland and Grassland). Also, it is envisaged to define preconditions for the development of the appropriate models on national level for the future reporting. |
| Tier 3 application for CSC in dead wood in deforested areas | Planned | The aim of this project is to develop model to apply Tier 3 in estimating CSC in DW pool on deforested areas in Croatia using the CRONFI data. |
| LULUCF projections project | Planned | The aim of the project is to define the basic settings and preconditions on national level for the preparation of projections of emissions / removals in the LULUCF sector (period up to 2030, 2050) and related activities. |

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

Table A4-1: National Energy balance for 2018, natural units

| *ENERGY BALANCE 2016* *natural units* | Anthracite | Hard coal | Brown coal | Lignite | Crude oil | Natural gas |
|---|---|---|---|---|---|---|
| | 103 t | 103 t | 103 t | 103 t | 103 t | 106 m3 |
| Production | | | | | 732.1 | 1230.1 |
| Import | 3.1 | 495.9 | 30.4 | 5.2 | 2965.5 | 1589.2 |
| Export | | | | | | 113.3 |
| Import-processing | | | | | | |
| Export-processing | | | | | | |
| Stock change | | 49.9 | | | -63.5 | 64.5 |
| Bunkers | | | | | | |
| **Energy supplied** | **3.1** | **545.8** | **30.4** | **5.2** | **3634.1** | **2770.5** |
| ***Production*** | | | | | | |
| hydro power plants | | | | | | |
| – small HPP | | | | | | |
| Wind power plants | | | | | | |
| Solar power plants | | | | | | |
| Geothermal power plants | | | | | | |
| thermal power plants | | | | | | |
| public cogeneration plants | | | | | | |
| public heating plants | | | | | | |
| industrial cogeneration plants | | | | | | |
| – in 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 | | 492.1 | | | | 0.5 |
| public cogeneration plants | | | | | | 583.0 |
| public heating plants | | | | | | 53.8 |
| industrial cogeneration plants | | | 28.1 | | | 277.5 |
| – in rafineries | | | | | | 53.1 |
| – in gas production | | | | | | 49.7 |
| Industrial heating plants | | | | | | 75.5 |
| Petroleum refineries | | | | | 3590.1 | 106.6 |
| NGL-plant | | | | | 44.0 | 9.9 |
| Coke plant | | | | | | |
| Gas works | | | | | | |
| **Total transformation sector** | | **492.1** | **28.1** | | **3634.1** | **1106.8** |
| ***Energy sector own use*** | | | | | | |
| Oil and gas extraction | | | | | | 21.2 |
| Coal production | | | | | | |
| Electric energy supply industry | | | | | | |
| hydro power plants | | | | | | |
| thermal power plants | | | | | | |
| public cogeneration plants | | | | | | |
| industrial cogeneration plants | | | | | | |
| Wind power | | | | | | |
| Petroleum refineries | | | | | | 73.1 |
| NGL-plant | | | | | | 34.7 |
| Gas works | | | | | | |
| **Total energy sector own use** | | | | | | **129.0** |
| **Losses** | | | | | | **30.0** |
| **Final energy demand** | **3.1** | **53.7** | **2.3** | **5.2** | | **1504.7** |
| **Non energy use** | | | | | | **427.7** |
| Energy sector | | | | | | |
| Petrochemical industry | | | | | | 427.7 |
| Other industry | | | | | | |
| Construction | | | | | | |
| Transport | | | | | | |
| Agriculture | | | | | | |
| **Energy consumption** | **3.1** | **53.7** | **2.3** | **5.2** | | **1077.0** |
| **Industry** | **3.1** | **53.7** | **1.0** | **0.1** | | **239.4** |
| Iron and steel | 3.1 | | | | | 17.1 |
| Non-ferrous metals | | | | | | 12.0 |
| Non-metallic minerals | | | | | | 51.0 |
| Chemical | | | | | | 10.0 |
| Construction materials | | 53.4 | 1.0 | 0.1 | | 56.8 |
| Pulp and paper | | | | | | 7.1 |
| Food production | | | | | | 45.4 |
| Not elsewhere specified | | 0.3 | | | | 40.0 |
| **Transport** | | | | | | **5.1** |
| Rail | | | | | | |
| Road | | | | | | 0.2 |
| Air | | | | | | |
| – international | | | | | | |
| – domestic | | | | | | |
| Sea and River | | | | | | |
| Public transport | | | | | | 4.9 |
| Not elsewhere specified | | | | | | |
| **Other sectors** | | | **1.3** | **5.1** | | **832.5** |
| Households | | | 1.3 | 5.0 | | 564.7 |
| Services | | | | 0.1 | | 244.3 |
| Agriculture | | | | | | 23.5 |
| Construction | | | | | | |

Table A4-1: National Energy balance for 2018, natural units, cont.

| *ENERGY BALANCE 2016* *natural units* | Hydro energy | Fuel wood | Wind energy | Solar energy | Geothermal energy | Landfill gas | Biofuels | Other biomass |
|---|---|---|---|---|---|---|---|---|
| | TJ | 103 m3 | TJ | TJ | TJ | 103 m3 | 103 t | TJ |
| Production | 66978.5 | 5165.8 | 11489.3 | 1227.9 | 392.2 | 173475.0 | 0.4 | 16565.7 |
| Import | | 67.6 | | | | | 33.3 | 1184.5 |
| Export | | 595.8 | | | | | | 6234.2 |
| Import-processing | | | | | | | | |
| Export-processing | | | | | | | | |
| Stock change | | | | | | | -2.9 | -50.1 |
| Bunkers | | | | | | | | |
| **Energy supplied** | **66978.5** | **4637.6** | **11489.3** | **1227.9** | **392.2** | **173475.0** | **30.8** | **11465.9** |
| ***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 | 66978.5 | | | | | | | |
| – small HPP | 1018.7 | | | | | | | |
| Wind power plants | | | 11489.3 | | | | | |
| Solar power plants | | | | 644.4 | | | | |
| Geothermal power plants | | | | | 72.0 | | | |
| thermal power plants | | | | | | 17819.0 | | |
| public cogeneration plants | | | | | | 149061.0 | | 7004.1 |
| public heating plants | | | | | | | | 2.7 |
| industrial cogeneration plants | | | | | | 6595.0 | | |
| – in rafineries | | | | | | | | |
| – in gas production | | | | | | | | |
| Industrial heating plants | | | | | | | | 244.6 |
| Petroleum refineries | | | | | | | | |
| NGL-plant | | | | | | | | |
| Coke plant | | | | | | | | |
| Gas works | | | | | | | | |
| **Total transformation sector** | **66978.5** | | **11489.3** | **644.4** | **72.0** | **173475.0** | | **7251.4** |
| ***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 | | | | | | | | |
| NGL-plant | | | | | | | | |
| Gas works | | | | | | | | |
| **Total energy sector own use** | | | | | | | | |
| **Losses** | | | | | | | | |
| **Final energy demand** | | **4637.6** | | **583.5** | **320.2** | | **30.8** | **4214.5** |
| **Non energy use** | | | | | | | | |
| Energy sector | | | | | | | | |
| Petrochemical industry | | | | | | | | |
| Other industry | | | | | | | | |
| Construction | | | | | | | | |
| Transport | | | | | | | | |
| Agriculture | | | | | | | | |
| **Energy consumption** | | **4637.6** | | **583.5** | **320.2** | | **30.8** | **4214.5** |
| **Industry** | | **48.3** | | | | | | **1552.5** |
| Iron and steel | | 0.4 | | | | | | 3.1 |
| Non-ferrous metals | | 0.3 | | | | | | |
| Non-metallic minerals | | | | | | | | 0.9 |
| Chemical | | | | | | | | |
| Construction materials | | 9.7 | | | | | | 885.5 |
| Pulp and paper | | | | | | | | 91.2 |
| Food production | | 2.4 | | | | | | 148.8 |
| Not elsewhere specified | | 35.5 | | | | | | 423.0 |
| **Transport** | | | | | | | **30.8** | |
| Rail | | | | | | | | |
| Road | | | | | | | 30.8 | |
| Air | | | | | | | | |
| – international | | | | | | | | |
| – domestic | | | | | | | | |
| Sea and River | | | | | | | | |
| Public transport | | | | | | | | |
| Not elsewhere specified | | | | | | | | |
| **Other sectors** | | **4589.3** | | **583.5** | **320.2** | | | **2662.0** |
| Households | | 4576.9 | | 408.5 | | | | 2350.8 |
| Services | | 12.4 | | 175.0 | 171.8 | | | 311.2 |
| Agriculture | | | | | 148.4 | | | |
| Construction | | | | | | | | |

Table A4-1: National Energy balance for 2018, natural units, cont.

| *ENERGY BALANCE 2016* *natural units* | Coke oven coke | petroleum gases | motor gasoline | motor gasoline | Petroleum | Jet fuel | Diesel oil | Light heating oil | Low sulphur fuel oil | Standard fuel oil |
|---|---|---|---|---|---|---|---|---|---|---|
| | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t |
| Production | | 253.6 | 894.8 | | | 192.2 | 1395.5 | 160.1 | 37.7 | 631.6 |
| Import | 31.0 | 40.9 | 133.9 | 0.5 | 2.9 | 25.0 | 1314.3 | 21.2 | 57.1 | |
| Export | 1.4 | 159.1 | 479.0 | | | 9.7 | 938.3 | 37.7 | 17.1 | 577.9 |
| Import-processing | | | | | | | | | | |
| Export-processing | | | | | | | | | | |
| Stock change | 1.1 | 2.7 | -51.0 | | | -22.3 | -38.3 | -0.3 | -8.0 | 1.7 |
| Bunkers | | | | | | | 16.2 | | | 4.5 |
| **Energy supplied** | **30.7** | **138.1** | **498.7** | **0.5** | **2.9** | **185.2** | **1717.0** | **143.3** | **69.7** | **50.9** |
| ***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 | | 216.1 | 894.8 | | | 192.2 | 1395.5 | 160.1 | 37.7 | 631.6 |
| NGL-plant | | 37.5 | | | | | | | | |
| Coke plant | | | | | | | | | | |
| Gas works | | | | | | | | | | |
| **Total production** | | **253.6** | **894.8** | | | **192.2** | **1395.5** | **160.1** | **37.7** | **631.6** |
| ***Transformation sector*** | | | | | | | | | | |
| hydro power plants | | | | | | | | | | |
| – small HPP | | | | | | | | | | |
| Wind power plants | | | | | | | | | | |
| Solar power plants | | | | | | | | | | |
| Geothermal power plants | | | | | | | | | | |
| thermal power plants | | | | | | | | 0.9 | | |
| public cogeneration plants | | | | | | | | | | |
| public heating plants | | | | | | | | 2.9 | 2.5 | |
| industrial cogeneration plants | | | | | | | | | 39.4 | 0.6 |
| – in rafineries | | | | | | | | | 39.4 | 0.6 |
| – in gas production | | | | | | | | | | |
| Industrial heating plants | | | | | | | | | 11.0 | 30.2 |
| Petroleum refineries | | | | | | | | | | |
| NGL-plant | | | | | | | | | | |
| Coke plant | | | | | | | | | | |
| Gas works | | | | | | | | | | |
| **Total transformation sector** | | | | | | | | **3.8** | **52.9** | **30.8** |
| ***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 | | | | | | | | | 12.7 | 16.0 |
| NGL-plant | | | | | | | | | | |
| Gas works | | | | | | | | | | |
| **Total energy sector own use** | | | | | | | | | **12.7** | **16.0** |
| **Losses** | | | | | | | | | | |
| **Final energy demand** | **30.7** | **138.1** | **498.7** | **0.5** | **2.9** | **185.2** | **1717.0** | **139.5** | **4.1** | **4.1** |
| **Non energy use** | | | | | | | | | | |
| Energy sector | | | | | | | | | | |
| Petrochemical industry | | | | | | | | | | |
| Other industry | | | | | | | | | | |
| Construction | | | | | | | | | | |
| Transport | | | | | | | | | | |
| Agriculture | | | | | | | | | | |
| **Energy consumption** | **30.7** | **138.1** | **498.7** | **0.5** | **2.9** | **185.2** | **1717.0** | **139.5** | **4.1** | **4.1** |
| **Industry** | **30.7** | **8.8** | | | **2.9** | | **12.3** | **15.0** | **4.1** | **4.1** |
| Iron and steel | 1.0 | 0.9 | | | | | | 0.7 | 0.4 | |
| Non-ferrous metals | | 0.8 | | | | | | 0.1 | | |
| Non-metallic minerals | | 0.3 | | | | | | | | |
| Chemical | | | | | 2.9 | | | 0.4 | | |
| Construction materials | 26.2 | 1.3 | | | | | 12.3 | 3.0 | 2.1 | 0.7 |
| Pulp and paper | | 0.2 | | | | | | | | |
| Food production | 3.5 | 1.1 | | | | | | 6.3 | 1.3 | 3.2 |
| Not elsewhere specified | | 4.2 | | | | | | 4.5 | 0.3 | 0.2 |
| **Transport** | | **70.4** | **487.9** | **0.5** | | **185.2** | **1446.7** | | | |
| Rail | | | | | | | 14.7 | | | |
| Road | | 70.4 | 487.9 | | | | 1360.2 | | | |
| Air | | | | 0.5 | | 185.2 | | | | |
| – international | | | | 0.1 | | 175.5 | | | | |
| – domestic | | | | 0.4 | | 9.7 | | | | |
| Sea and River | | | | | | | 47.2 | | | |
| Public transport | | | | | | | 24.6 | | | |
| Not elsewhere specified | | | | | | | | | | |
| **Other sectors** | | **58.9** | **10.8** | | | | **258.0** | **124.5** | | |
| Households | | 42.4 | | | | | | 70.6 | | |
| Services | | 11.7 | | | | | | 37.2 | | |
| Agriculture | | 2.6 | 7.6 | | | | 174.1 | 11.8 | | |
| Construction | | 2.2 | 3.2 | | | | 83.9 | 4.9 | | |

Table A4-1: National Energy balance for 2018, natural units, cont.

| *ENERGY BALANCE 2016* *natural units* | Naphta | White spirit | Bitumen | Other oils | Lubricants | Petroleum coke | Etan | Other derivates |
|---|---|---|---|---|---|---|---|---|
| | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t | 103 t |
| Production | 59.3 | | 0.5 | 10.8 | | 57.5 | | 106.2 |
| Import | | 3.0 | 125.7 | 31.8 | 6.6 | 180.9 | | |
| Export | 39.7 | 0.1 | 15.0 | 8.3 | 0.2 | 17.5 | | 125.9 |
| Import-processing | | | | | | | | |
| Export-processing | | | | | | | | |
| Stock change | -0.8 | | | | | -1.0 | | 26.0 |
| Bunkers | | | | | | | | |
| **Energy supplied** | **18.8** | **2.9** | **111.2** | **34.3** | **6.4** | **219.9** | | **6.3** |
| ***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 | 38.6 | | 0.5 | 10.8 | | 57.5 | | 106.2 |
| NGL-plant | 20.7 | | | | | | | |
| Coke plant | | | | | | | | |
| Gas works | | | | | | | | |
| **Total production** | **59.3** | | **0.5** | **10.8** | | **57.5** | | **106.2** |
| ***Transformation sector*** | | | | | | | | |
| hydro power plants | | | | | | | | |
| – small HPP | | | | | | | | |
| Wind power plants | | | | | | | | |
| Solar power plants | | | | | | | | |
| Geothermal power plants | | | | | | | | |
| thermal power plants | | | | | | | | |
| public cogeneration plants | | | | | | | | |
| public heating plants | | | | | | | | |
| industrial cogeneration plants | | | | | | | | |
| – in rafineries | | | | | | | | |
| – in gas production | | | | | | | | |
| Industrial heating plants | | | | | | | | |
| Petroleum refineries | 18.8 | | | | | | | |
| NGL-plant | | | | | | | | |
| Coke plant | | | | | | | | |
| Gas works | | | | | | | | |
| **Total transformation sector** | **18.8** | | | | | | | |
| ***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 | | | | | | 24.0 | | |
| NGL-plant | | | | | | | | |
| Gas works | | | | | | | | |
| **Total energy sector own use** | | | | | | **24.0** | | |
| **Losses** | | | | | | | | |
| **Final energy demand** | **0.0** | **2.9** | **111.2** | **34.3** | **6.4** | **195.9** | | **6.3** |
| **Non energy use** | | **2.9** | **111.2** | **34.3** | **6.4** | | | **6.3** |
| Energy sector | | | | 2.3 | | | | |
| Petrochemical industry | | | | | | | | 6.3 |
| Other industry | | 2.9 | 13.5 | 6.7 | 6.4 | | | |
| Construction | | | 97.7 | 1.4 | | | | |
| Transport | | | | 22.6 | | | | |
| Agriculture | | | | 1.3 | | | | |
| **Energy consumption** | **0.0** | | | | | **195.9** | | |
| **Industry** | | | | | | **195.9** | | |
| Iron and steel | | | | | | 0.3 | | |
| Non-ferrous metals | | | | | | 0.3 | | |
| Non-metallic minerals | | | | | | | | |
| Chemical | | | | | | | | |
| Construction materials | | | | | | 195.3 | | |
| Pulp and paper | | | | | | | | |
| Food production | | | | | | | | |
| Not elsewhere specified | | | | | | | | |
| **Transport** | | | | | | | | |
| Rail | | | | | | | | |
| Road | | | | | | | | |
| Air | | | | | | | | |
| – international | | | | | | | | |
| – domestic | | | | | | | | |
| Sea and River | | | | | | | | |
| Public transport | | | | | | | | |
| Not elsewhere specified | | | | | | | | |
| **Other sectors** | | | | | | | | |
| Households | | | | | | | | |
| Services | | | | | | | | |
| Agriculture | | | | | | | | |
| Construction | | | | | | | | |

Table A4-1: National Energy balance for 2018, natural units, cont.

| *ENERGY BALANCE 2016 natural units* | Refinery gas | Refinery semiproducts | Aditives | Gas works gas | Electricity | Steam and hot water | waste, non renewable |
|---|---|---|---|---|---|---|---|
| | 103 t | 103 t | 103 t | 103 m3 | GWh | TJ | |
| Production | 187.0 | | | | 13631.7 | 26615.3 | 817.7 |
| Import | | 242.7 | 54.2 | | 7404.3 | | |
| Export | | | | | 2016.7 | | |
| Import-processing | | | | | | | |
| Export-processing | | | | | | | |
| Stock change | | -0.2 | -0.8 | | | | |
| Bunkers | | | | | | | |
| **Energy supplied** | **187.0** | **242.5** | **53.4** | | **19019.3** | **26615.3** | **817.7** |
| ***Production*** | | | | | | | |
| hydro power plants | | | | | 7784.9 | | |
| – small HPP | | | | | 118.4 | | |
| Wind power plants | | | | | 1335.4 | | |
| Solar power plants | | | | | 74.9 | | |
| Geothermal power plants | | | | | 2.0 | | |
| thermal power plants | | | | | 1472.3 | | |
| public cogeneration plants | | | | | 2595.5 | 10967.9 | |
| public heating plants | | | | | | 1730.3 | |
| industrial cogeneration plants | | | | | 366.7 | 8888.4 | |
| – in rafineries | | | | | 109.1 | 3170.0 | |
| – in gas production | | | | | 129.3 | 575.0 | |
| Industrial heating plants | | | | | | 4397.4 | |
| Petroleum refineries | 187.0 | | | | | | |
| NGL-plant | | | | | | | |
| Coke plant | | | | | | | |
| Gas works | | | | | | | |
| **Total production** | **187.0** | | | | **13631.7** | **25984.0** | |
| ***Transformation sector*** | | | | | | | |
| hydro power plants | | | | | | | |
| – small HPP | | | | | | | |
| Wind power plants | | | | | | | |
| Solar power plants | | | | | | | |
| Geothermal power plants | | | | | | | |
| thermal power plants | | | | | | | |
| public cogeneration plants | | | | | | | |
| public heating plants | | | | | | | |
| industrial cogeneration plants | 23.4 | | | | | | |
| – in rafineries | 23.4 | | | | | | |
| – in gas production | | | | | | | |
| Industrial heating plants | 16.1 | | | | | | |
| Petroleum refineries | | 242.5 | 53.4 | | | | |
| NGL-plant | | | | | | | |
| Coke plant | | | | | | | |
| Gas works | | | | | | | |
| **Total transformation sector** | **39.5** | **242.5** | **53.4** | | | | |
| ***Energy sector own use*** | | | | | | | |
| Oil and gas extraction | | | | | 127.2 | 418.0 | |
| Coal production | | | | | | 276.8 | |
| Electric energy supply industry | | | | | 62.5 | | |
| hydro power plants | | | | | 207.8 | | |
| thermal power plants | | | | | 137.3 | | |
| public cogeneration plants | | | | | 200.3 | 1297.0 | |
| industrial cogeneration plants | | | | | | | |
| Wind power | | | | | 6.4 | | |
| Petroleum refineries | 147.5 | | | | 286.4 | 5007.7 | |
| NGL-plant | | | | | 48.3 | 157.0 | |
| Gas works | | | | | | | |
| **Total energy sector own use** | **147.5** | | | | **1076.2** | **7156.5** | |
| **Losses** | | | | | **1824.0** | **1689.0** | |
| **Final energy demand** | | **0.0** | **0.0** | | **16119.1** | **17769.8** | **817.7** |
| **Non energy use** | | | | | | | |
| Energy sector | | | | | | | |
| Petrochemical industry | | | | | | | |
| Other industry | | | | | | | |
| Construction | | | | | | | |
| Transport | | | | | | | |
| Agriculture | | | | | | | |
| **Energy consumption** | | **0.0** | **0.0** | | **16119.1** | **17769.8** | **817.7** |
| **Industry** | | | | | **3610.7** | **10829.0** | **817.7** |
| Iron and steel | | | | | 376.9 | 58.4 | |
| Non-ferrous metals | | | | | 98.7 | | |
| Non-metallic minerals | | | | | 153.2 | 10.1 | |
| Chemical | | | | | 313.8 | 4370.9 | |
| Construction materials | | | | | 559.8 | | 817.7 |
| Pulp and paper | | | | | 221.8 | 1008.3 | |
| Food production | | | | | 661.5 | 3002.4 | |
| Not elsewhere specified | | | | | 1225.0 | 2378.9 | |
| **Transport** | | | | | **340.3** | | |
| Rail | | | | | 174.4 | | |
| Road | | | | | 1.0 | | |
| Air | | | | | 35.8 | | |
| – international | | | | | | | |
| – domestic | | | | | 35.8 | | |
| Sea and River | | | | | 22.5 | | |
| Public transport | | | | | 63.3 | | |
| Not elsewhere specified | | | | | 43.3 | | |
| **Other sectors** | | | | | **12168.1** | **6940.8** | |
| Households | | | | | 6201.7 | 5302.2 | |
| Services | | | | | 5825.2 | 1391.8 | |
| Agriculture | | | | | 63.3 | 246.8 | |
| Construction | | | | | 77.9 | | |

Table A4-2: National Energy balance for 2018, energy units

| PJ | Anthracite | Hard coal | Brown coal | Lignite | Crude oil | Natural gas |
|---|---|---|---|---|---|---|
| Production | - | - | - | - | 31.26 | 43.075 |
| Import | 0.09 | 12.45 | 0.58 | 0.06 | 126.63 | 55.050 |
| Export | - | - | - | - | - | 3.925 |
| Import-processing | - | - | - | - | - | - |
| Export-processing | - | - | - | - | - | - |
| Stock change | - | 1.25 | - | - | - 2.71 | 2.234 |
| Bunkers | - | - | - | - | - | - |
| **Energy supplied** | **0.09** | **13.70** | **0.58** | **0.06** | **155.18** | **96.43** |
| ***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** | **0.09** | **13.70** | **0.58** | **0.06** | **155.18** | **96.43** |
| ***Transformation sector*** | - | - | - | - | - | - |
| hydro power plants | - | - | - | - | - | - |
| – small HPP | - | - | - | - | - | - |
| Wind power plants | - | - | - | - | - | - |
| Solar power plants | - | - | - | - | - | - |
| Geothermal power plants | - | - | - | - | - | - |
| thermal power plants | - | 12.30 | - | - | - | 0.02 |
| public cogeneration plants | - | - | - | - | - | 20.20 |
| public heating plants | - | - | - | - | - | 1.86 |
| industrial cogeneration plants | - | - | 0.53 | - | - | 9.61 |
| – in rafineries | - | - | - | - | - | 1.84 |
| – in gas production | - | - | - | - | - | 1.72 |
| Industrial heating plants | - | - | - | - | - | 2.62 |
| Petroleum refineries | - | - | - | - | 153.30 | 3.69 |
| NGL-plant | - | - | - | - | 1.88 | 0.81 |
| Coke plant | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - |
| **Total transformation sector** | **-** | **12.30** | **0.53** | **-** | **155.18** | **38.80** |
| ***Energy sector own use*** | - | - | - | - | - | - |
| Oil and gas extraction | - | - | - | - | - | 0.73 |
| Coal production | - | - | - | - | - | - |
| Electric energy supply industry | - | - | - | - | - | - |
| hydro power plants | - | - | - | - | - | - |
| thermal power plants | - | - | - | - | - | - |
| public cogeneration plants | - | - | - | - | - | - |
| industrial cogeneration plants | - | - | - | - | - | - |
| Industrial heating plants | - | - | - | - | - | - |
| Petroleum refineries | - | - | - | - | - | 2.53 |
| NGL-plant | - | - | - | - | - | 1.20 |
| Gas works | - | - | - | - | - | - |
| **Total energy sector own use** | **-** | **-** | **-** | **-** | **-** | **4.47** |
| **Losses** | - | - | - | - | - | 1.04 |
| **Final energy demand** | **0.09** | **1.40** | **0.04** | **0.06** | **- 0.00** | **52.12** |
| **Non energy use** | **-** | **-** | **-** | **-** | **-** | **14.82** |
| Energy sector | - | - | - | - | - | - |
| Petrochemical industry | - | - | - | - | - | 14.82 |
| Other industry | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - |
| Transport | - | - | - | - | - | - |
| Agriculture | - | - | - | - | - | - |
| **Energy consumption** | **0.09** | **1.40** | **0.04** | **0.06** | **- 0.00** | **37.31** |
| **Industry** | **0.09** | **1.40** | **0.02** | **0.00** | **-** | **8.29** |
| Iron and steel | 0.09 | - | - | - | - | 0.59 |
| Non-ferrous metals | - | - | - | - | - | 0.42 |
| Non-metallic minerals | - | - | - | - | - | 1.77 |
| Chemical | - | - | - | - | - | 0.35 |
| Construction materials | - | 1.39 | 0.02 | 0.00 | - | 1.97 |
| Pulp and paper | - | - | - | - | - | 0.25 |
| Food production | - | - | - | - | - | 1.57 |
| Not elsewhere specified | - | 0.01 | - | - | - | 1.39 |
| **Transport** | **-** | **-** | **-** | **-** | **-** | **0.18** |
| Rail | - | - | - | - | - | - |
| Road | - | - | - | - | - | 0.01 |
| Air | - | - | - | - | - | - |
| – international | - | - | - | - | - | - |
| – domestic | - | - | - | - | - | - |
| Sea and River | - | - | - | - | - | - |
| Public transport | - | - | - | - | - | 0.17 |
| Not elsewhere specified | - | - | - | - | - | - |
| **Other sectors** | **-** | **-** | **0.02** | **0.06** | **-** | **28.84** |
| Households | - | - | 0.02 | 0.06 | - | 19.56 |
| Services | - | - | - | 0.00 | - | 8.46 |
| Agriculture | - | - | - | - | - | 0.81 |
| Construction | - | - | - | - | - | - |

Table A4-2: National Energy balance for 2018, energy units, cont.

| PJ | Hydro energy | Fuel wood | Wind energy | Solar energy | Geothermal energy | Landfill gas | Biofuels | Other biomass |
|---|---|---|---|---|---|---|---|---|
| Production | 66.98 | 46.492 | 11.489 | 1.228 | 0.392 | 3.0812 | 0.015 | 16.566 |
| Import | - | 0.61 | - | - | - | - | 1.22 | 1.18 |
| Export | - | 5.36 | - | - | - | - | - | 6.23 |
| Import-processing | - | - | - | - | - | - | - | - |
| Export-processing | - | - | - | - | - | - | - | - |
| Stock change | - | - | - | - | - | - | - 0.11 | - 0.05 |
| Bunkers | - | - | - | - | - | - | - | - |
| **Energy supplied** | **66.98** | **41.74** | **11.49** | **1.23** | **0.39** | **3.0812** | **1.13** | **11.47** |
| ***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** | **66.98** | **41.74** | **11.49** | **1.23** | **0.39** | **3.0812** | **1.13** | **11.47** |
| ***Transformation sector*** | - | - | - | - | - | - | - | - |
| hydro power plants | 66.98 | - | - | - | - | - | - | - |
| – small HPP | 1.02 | - | - | - | - | - | - | - |
| Wind power plants | - | - | 11.49 | - | - | - | - | - |
| Solar power plants | - | - | - | 0.64 | - | - | - | - |
| Geothermal power plants | - | - | - | - | 0.07 | - | - | - |
| thermal power plants | - | - | - | - | - | 0.3079 | - | - |
| public cogeneration plants | - | - | - | - | - | 2.6392 | - | 7.00 |
| public heating plants | - | - | - | - | - | - | - | 0.00 |
| industrial cogeneration plants | - | - | - | - | - | 0.1341 | - | - |
| – in rafineries | - | - | - | - | - | - | - | - |
| – in gas production | - | - | - | - | - | - | - | - |
| Industrial heating plants | - | - | - | - | - | - | - | 0.24 |
| Petroleum refineries | - | - | - | - | - | - | - | - |
| NGL-plant | - | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - |
| **Total transformation sector** | **66.98** | **-** | **11.49** | **0.64** | **0.07** | **3.0812** | **-** | **7.25** |
| ***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** | **-** | **41.74** | **-** | **0.58** | **0.32** | **-** | **1.13** | **4.21** |
| **Non energy use** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Energy sector | - | - | - | - | - | - | - | - |
| Petrochemical industry | - | - | - | - | - | - | - | - |
| Other industry | - | - | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - | - | - |
| Transport | - | - | - | - | - | - | - | - |
| Agriculture | - | - | - | - | - | - | - | - |
| **Energy consumption** | **-** | **41.74** | **-** | **0.58** | **0.32** | **-** | **1.13** | **4.21** |
| **Industry** | **-** | **0.43** | **-** | **-** | **-** | **-** | **-** | **1.55** |
| Iron and steel | - | 0.00 | - | - | - | - | - | 0.00 |
| Non-ferrous metals | - | 0.00 | - | - | - | - | - | - |
| Non-metallic minerals | - | - | - | - | - | - | - | 0.00 |
| Chemical | - | - | - | - | - | - | - | - |
| Construction materials | - | 0.09 | - | - | - | - | - | 0.89 |
| Pulp and paper | - | - | - | - | - | - | - | 0.09 |
| Food production | - | 0.02 | - | - | - | - | - | 0.15 |
| Not elsewhere specified | - | 0.32 | - | - | - | - | - | 0.42 |
| **Transport** | **-** | **-** | **-** | **-** | **-** | **-** | **1.13** | **-** |
| Rail | - | - | - | - | - | - | - | - |
| Road | - | - | - | - | - | - | 1.13 | - |
| Air | - | - | - | - | - | - | - | - |
| – international | - | - | - | - | - | - | - | - |
| – domestic | - | - | - | - | - | - | - | - |
| Sea and River | - | - | - | - | - | - | - | - |
| Public transport | - | - | - | - | - | - | - | - |
| Not elsewhere specified | - | - | - | - | - | - | - | - |
| **Other sectors** | **-** | **41.30** | **-** | **0.58** | **0.32** | **-** | **-** | **2.66** |
| Households | - | 41.19 | - | 0.41 | - | - | - | 2.35 |
| Services | - | 0.11 | - | 0.18 | 0.17 | - | - | 0.31 |
| Agriculture | - | - | - | - | 0.15 | - | - | - |
| Construction | - | - | - | - | - | - | - | - |

Table A4-2: National Energy balance for 2018, 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 | 220.58 | - | - | - | - | - | - | - | - | - |
| Import | 197.87 | 0.91 | 1.92 | 5.97 | 0.02 | 0.13 | 1.10 | 56.13 | 0.91 | 2.29 |
| Export | 15.52 | 0.04 | 7.46 | 21.36 | - | - | 0.43 | 40.07 | 1.61 | 0.69 |
| Import-processing | - | - | - | - | - | - | - | - | - | - |
| Export-processing | - | - | - | - | - | - | - | - | - | - |
| Stock change | 0.62 | 0.03 | 0.13 | - 2.27 | - | - | - 0.98 | - 1.64 | - 0.01 | - 0.32 |
| Bunkers | - | - | - | - | - | - | - | 0.69 | - | - |
| **Energy supplied** | **403.54** | **0.90** | **- 5.42** | **- 17.66** | **0.02** | **0.13** | **- 0.31** | **13.73** | **- 0.72** | **1.29** |
| ***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 | - | - | 10.13 | 39.90 | - | - | 8.45 | 59.60 | 6.84 | 1.52 |
| NGL-plant | - | - | 1.76 | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - | - | - |
| **Total production** | **-** | **-** | **11.89** | **39.90** | **-** | **-** | **8.45** | **59.60** | **6.84** | **1.52** |
| **Gross production** | **403.54** | **0.90** | **6.48** | **22.24** | **0.02** | **0.13** | **8.14** | **73.33** | **6.12** | **2.80** |
| ***Transformation sector*** | - | - | - | - | - | - | - | - | - | - |
| hydro power plants | 66.98 | - | - | - | - | - | - | - | - | - |
| – small HPP | 1.02 | - | - | - | - | - | - | - | - | - |
| Wind power plants | 11.49 | - | - | - | - | - | - | - | - | - |
| Solar power plants | 0.64 | - | - | - | - | - | - | - | - | - |
| Geothermal power plants | 0.07 | - | - | - | - | - | - | - | - | - |
| thermal power plants | 12.63 | - | - | - | - | - | - | - | 0.04 | - |
| public cogeneration plants | 29.84 | - | - | - | - | - | - | - | - | - |
| public heating plants | 1.87 | - | - | - | - | - | - | - | 0.12 | 0.10 |
| industrial cogeneration plants | 10.28 | - | - | - | - | - | - | - | - | 1.58 |
| – in rafineries | 1.84 | - | - | - | - | - | - | - | - | 1.58 |
| – in gas production | 1.72 | - | - | - | - | - | - | - | - | - |
| Industrial heating plants | 2.86 | - | - | - | - | - | - | - | - | 0.44 |
| Petroleum refineries | 156.99 | - | - | - | - | - | - | - | - | - |
| NGL-plant | 2.69 | - | - | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - | - | - |
| **Total transformation sector** | **296.33** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **0.16** | **2.13** |
| ***Energy sector own use*** | - | - | - | - | - | - | - | - | - | - |
| Oil and gas extraction | 0.73 | - | - | - | - | - | - | - | - | - |
| Coal production | - | - | - | - | - | - | - | - | - | - |
| Electric energy supply industry | - | - | - | - | - | - | - | - | - | - |
| hydro power plants | - | - | - | - | - | - | - | - | - | - |
| thermal power plants | - | - | - | - | - | - | - | - | - | - |
| public cogeneration plants | - | - | - | - | - | - | - | - | - | - |
| industrial cogeneration plants | - | - | - | - | - | - | - | - | - | - |
| Industrial heating plants | - | - | - | - | - | - | - | - | - | - |
| Petroleum refineries | 2.53 | - | - | - | - | - | - | - | - | 0.51 |
| NGL-plant | 1.20 | - | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - | - | - |
| **Total energy sector own use** | **4.47** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **0.51** |
| **Losses** | 1.04 | - | - | - | - | - | - | - | - | - |
| **Final energy demand** | **101.70** | **0.90** | **6.48** | **22.24** | **0.02** | **0.13** | **8.14** | **73.33** | **5.96** | **0.16** |
| **Non energy use** | **14.82** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Energy sector | - | - | - | - | - | - | - | - | - | - |
| Petrochemical industry | 14.82 | - | - | - | - | - | - | - | - | - |
| Other industry | - | - | - | - | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - | - | - | - | - |
| Transport | - | - | - | - | - | - | - | - | - | - |
| Agriculture | - | - | - | - | - | - | - | - | - | - |
| **Energy consumption** | **86.89** | **0.90** | **6.48** | **22.24** | **0.02** | **0.13** | **8.14** | **73.33** | **5.96** | **0.16** |
| **Industry** | **11.79** | **0.90** | **0.41** | **-** | **-** | **0.13** | **-** | **0.53** | **0.64** | **0.16** |
| Iron and steel | 0.69 | 0.03 | 0.04 | - | - | - | - | - | 0.03 | 0.02 |
| Non-ferrous metals | 0.42 | - | 0.04 | - | - | - | - | - | 0.00 | - |
| Non-metallic minerals | 1.77 | - | 0.01 | - | - | - | - | - | - | - |
| Chemical | 0.35 | - | - | - | - | 0.13 | - | - | 0.02 | - |
| Construction materials | 4.35 | 0.77 | 0.06 | - | - | - | - | 0.53 | 0.13 | 0.08 |
| Pulp and paper | 0.34 | - | 0.01 | - | - | - | - | - | - | - |
| Food production | 1.74 | 0.10 | 0.05 | - | - | - | - | - | 0.27 | 0.05 |
| Not elsewhere specified | 2.14 | - | 0.20 | - | - | - | - | - | 0.19 | 0.01 |
| **Transport** | **1.31** | **-** | **3.30** | **21.76** | **0.02** | **-** | **8.14** | **61.79** | **-** | **-** |
| Rail | - | - | - | - | - | - | - | 0.63 | - | - |
| Road | 1.14 | - | 3.30 | 21.76 | - | - | - | 58.09 | - | - |
| Air | - | - | - | - | 0.02 | - | 8.14 | - | - | - |
| – international | - | - | - | - | 0.00 | - | 7.71 | - | - | - |
| – domestic | - | - | - | - | 0.02 | - | 0.43 | - | - | - |
| Sea and River | - | - | - | - | - | - | - | 2.02 | - | - |
| Public transport | 0.17 | - | - | - | - | - | - | 1.05 | - | - |
| Not elsewhere specified | - | - | - | - | - | - | - | - | - | - |
| **Other sectors** | **73.79** | **-** | **2.76** | **0.48** | **-** | **-** | **-** | **11.02** | **5.32** | **-** |
| Households | 63.60 | - | 1.99 | - | - | - | - | - | 3.02 | - |
| Services | 9.23 | - | 0.55 | - | - | - | - | - | 1.59 | - |
| Agriculture | 0.96 | - | 0.12 | 0.34 | - | - | - | 7.44 | 0.50 | - |
| Construction | - | - | 0.10 | 0.14 | - | - | - | 3.58 | 0.21 | - |

Table A4-2: National Energy balance for 2018, energy units, cont.

| PJ | Naphta | White spirit | Bitumen | Lubricants | Paraffin and wax | Petroleum coke | Etan | Other derivates |
|---|---|---|---|---|---|---|---|---|
| Production | - | - | - | - | - | - | - | - |
| Import | - | - | 0.10 | 4.21 | 1.07 | 0.22 | 5.61 | - |
| Export | 23.23 | 1.77 | 0.00 | 0.50 | 0.28 | 0.01 | 0.54 | - |
| Import-processing | - | - | - | - | - | - | - | - |
| Export-processing | - | - | - | - | - | - | - | - |
| Stock change | 0.07 | - 0.04 | - | - | - | - | - 0.03 | - |
| Bunkers | 0.18 | - | - | - | - | - | - | - |
| **Energy supplied** | **- 23.34** | **- 1.81** | **0.10** | **3.71** | **0.79** | **0.21** | **5.03** | **-** |
| ***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 | 25.38 | 1.72 | - | 0.02 | 0.36 | - | 1.78 | - |
| NGL-plant | - | 0.92 | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - |
| **Total production** | **25.38** | **2.64** | **-** | **0.02** | **0.36** | **-** | **1.78** | **-** |
| **Gross production** | **2.05** | **0.84** | **0.10** | **3.73** | **1.15** | **0.21** | **6.82** | **-** |
| ***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 | 0.02 | - | - | - | - | - | - | - |
| – in rafineries | 0.02 | - | - | - | - | - | - | - |
| – in gas production | - | - | - | - | - | - | - | - |
| Industrial heating plants | 1.21 | - | - | - | - | - | - | - |
| Petroleum refineries | - | 0.84 | - | - | - | - | - | - |
| NGL-plant | - | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - |
| **Total transformation sector** | **1.24** | **0.84** | **-** | **-** | **-** | **-** | **-** | **-** |
| ***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 | 0.64 | - | - | - | - | - | 0.74 | - |
| NGL-plant | - | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - | - |
| **Total energy sector own use** | **0.64** | **-** | **-** | **-** | **-** | **-** | **0.74** | **-** |
| **Losses** | - | - | - | - | - | - | - | - |
| **Final energy demand** | **0.16** | **0.00** | **0.10** | **3.73** | **1.15** | **0.21** | **6.07** | **-** |
| **Non energy use** | **-** | **-** | **0.0972** | **3.7252** | **1.1491** | **0.2144** | **-** | **-** |
| Energy sector | - | - | - | - | 0.08 | - | - | - |
| Petrochemical industry | - | - | - | - | - | - | - | - |
| Other industry | - | - | 0.10 | 0.45 | 0.22 | 0.21 | - | - |
| Construction | - | - | - | 3.27 | 0.05 | - | - | - |
| Transport | - | - | - | - | 0.76 | - | - | - |
| Agriculture | - | - | - | - | 0.04 | - | - | - |
| **Energy consumption** | **0.16** | **0.00** | **-** | **-** | **-** | **-** | **6.07** | **-** |
| **Industry** | **0.16** | **-** | **-** | **-** | **-** | **-** | **6.07** | **-** |
| Iron and steel | - | - | - | - | - | - | 0.01 | - |
| Non-ferrous metals | - | - | - | - | - | - | 0.01 | - |
| Non-metallic minerals | - | - | - | - | - | - | - | - |
| Chemical | - | - | - | - | - | - | - | - |
| Construction materials | 0.03 | - | - | - | - | - | 6.05 | - |
| Pulp and paper | - | - | - | - | - | - | - | - |
| Food production | 0.13 | - | - | - | - | - | - | - |
| Not elsewhere specified | 0.01 | - | - | - | - | - | - | - |
| **Transport** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Rail | - | - | - | - | - | - | - | - |
| Road | - | - | - | - | - | - | - | - |
| Air | - | - | - | - | - | - | - | - |
| – international | - | - | - | - | - | - | - | - |
| – domestic | - | - | - | - | - | - | - | - |
| Sea and River | - | - | - | - | - | - | - | - |
| Public transport | - | - | - | - | - | - | - | - |
| Not elsewhere specified | - | - | - | - | - | - | - | - |
| **Other sectors** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Households | - | - | - | - | - | - | - | - |
| Services | - | - | - | - | - | - | - | - |
| Agriculture | - | - | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - | - | - |

Table A4-2: National Energy balance for 2018, energy units, cont.

| PJ | Refinery gas | Refinery semiproducts | Aditives | Gas works gas | Electricity | Steam and hot water | Industrial waste, non renewable |
|---|---|---|---|---|---|---|---|
| Production | - | - | - | - | - | - | 0.63 |
| Import | - | - | 10.36 | 2.31 | - | 26.66 | - |
| Export | 5.06 | - | - | - | - | 7.26 | - |
| Import-processing | - | - | - | - | - | - | - |
| Export-processing | - | - | - | - | - | - | - |
| Stock change | 1.04 | - | - 0.01 | - 0.03 | - | - | - |
| Bunkers | - | - | - | - | - | - | - |
| **Energy supplied** | **- 4.01** | **-** | **10.35** | **2.28** | **-** | **19.40** | **0.63** |
| ***Production*** | - | - | - | - | - | - | - |
| hydro power plants | - | - | - | - | - | 28.03 | - |
| – small HPP | - | - | - | - | - | 0.43 | - |
| Wind power plants | - | - | - | - | - | 4.81 | - |
| Solar power plants | - | - | - | - | - | 0.27 | - |
| Geothermal power plants | - | - | - | - | - | 0.01 | - |
| thermal power plants | - | - | - | - | - | 5.30 | - |
| public cogeneration plants | - | - | - | - | - | 9.34 | 10.97 |
| public heating plants | - | - | - | - | - | - | 1.73 |
| industrial cogeneration plants | - | - | - | - | - | 1.32 | 8.89 |
| – in rafineries | - | - | - | - | - | 0.39 | 3.17 |
| – in gas production | - | - | - | - | - | 0.47 | 0.58 |
| Industrial heating plants | - | - | - | - | - | - | 4.40 |
| Petroleum refineries | 4.27 | 7.97 | - | - | - | - | - |
| NGL-plant | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - |
| **Total production** | **4.27** | **7.97** | **-** | **-** | **-** | **49.07** | **25.98** |
| **Gross production** | **0.25** | **7.97** | **10.35** | **2.28** | **-** | **68.47** | **26.62** |
| ***Transformation sector*** | - | - | - | - | - | - | - |
| hydro power plants | - | - | - | - | - | - | - |
| – small HPP | - | - | - | - | - | - | - |
| Wind power plants | - | - | - | - | - | - | - |
| Solar power plants | - | - | - | - | - | - | - |
| Geothermal power plants | - | - | - | - | - | - | - |
| thermal power plants | - | - | - | - | - | - | - |
| public cogeneration plants | - | - | - | - | - | - | - |
| public heating plants | - | - | - | - | - | - | - |
| industrial cogeneration plants | - | 1.00 | - | - | - | - | - |
| – in rafineries | - | 1.00 | - | - | - | - | - |
| – in gas production | - | - | - | - | - | - | - |
| Industrial heating plants | - | 0.69 | - | - | - | - | - |
| Petroleum refineries | - | - | 10.35 | 2.28 | - | - | - |
| NGL-plant | - | - | - | - | - | - | - |
| Coke plant | - | - | - | - | - | - | - |
| Gas works | - | - | - | - | - | - | - |
| **Total transformation sector** | **-** | **1.68** | **10.35** | **2.28** | **-** | **-** | **-** |
| ***Energy sector own use*** | - | - | - | - | - | - | - |
| Oil and gas extraction | - | - | - | - | - | 0.46 | 0.42 |
| Coal production | - | - | - | - | - | - | 0.28 |
| Electric energy supply industry | - | - | - | - | - | 0.23 | - |
| hydro power plants | - | - | - | - | - | 0.75 | - |
| thermal power plants | - | - | - | - | - | 0.49 | - |
| public cogeneration plants | - | - | - | - | - | 0.72 | 1.30 |
| industrial cogeneration plants | - | - | - | - | - | - | - |
| Industrial heating plants | - | - | - | - | - | 0.02 | - |
| Petroleum refineries | - | 6.28 | - | - | - | 1.03 | 5.01 |
| NGL-plant | - | - | - | - | - | 0.17 | 0.16 |
| Gas works | - | - | - | - | - | - | - |
| **Total energy sector own use** | **-** | **6.28** | **-** | **-** | **-** | **3.87** | **7.16** |
| **Losses** | - | - | - | - | - | 6.57 | 1.69 |
| **Final energy demand** | **0.25** | **- 0.00** | **0.00** | **-** | **-** | **58.03** | **17.77** |
| **Non energy use** | **0.25** | **-** | **-** | **-** | **-** | **-** | **-** |
| Energy sector | - | - | - | - | - | - | - |
| Petrochemical industry | 0.25 | - | - | - | - | - | - |
| Other industry | - | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - | - |
| Transport | - | - | - | - | - | - | - |
| Agriculture | - | - | - | - | - | - | - |
| **Energy consumption** | **- 0.00** | **- 0.00** | **0.00** | **-** | **-** | **58.03** | **17.77** |
| **Industry** | **-** | **-** | **-** | **-** | **-** | **13.00** | **10.83** |
| Iron and steel | - | - | - | - | - | 1.36 | 0.06 |
| Non-ferrous metals | - | - | - | - | - | 0.36 | - |
| Non-metallic minerals | - | - | - | - | - | 0.55 | 0.01 |
| Chemical | - | - | - | - | - | 1.13 | 4.37 |
| Construction materials | - | - | - | - | - | 2.02 | - |
| Pulp and paper | - | - | - | - | - | 0.80 | 1.01 |
| Food production | - | - | - | - | - | 2.38 | 3.00 |
| Not elsewhere specified | - | - | - | - | - | 4.41 | 2.38 |
| **Transport** | **-** | **-** | **-** | **-** | **-** | **1.23** | **-** |
| Rail | - | - | - | - | - | 0.63 | - |
| Road | - | - | - | - | - | 0.00 | - |
| Air | - | - | - | - | - | 0.13 | - |
| – international | - | - | - | - | - | - | - |
| – domestic | - | - | - | - | - | 0.13 | - |
| Sea and River | - | - | - | - | - | 0.08 | - |
| Public transport | - | - | - | - | - | 0.23 | - |
| Not elsewhere specified | - | - | - | - | - | 0.16 | - |
| **Other sectors** | **-** | **-** | **-** | **-** | **-** | **43.81** | **6.94** |
| Households | - | - | - | - | - | 22.33 | 5.30 |
| Services | - | - | - | - | - | 20.97 | 1.39 |
| Agriculture | - | - | - | - | - | 0.23 | 0.25 |
| Construction | - | - | - | - | - | 0.28 | - |

Table A4-3 Industry analisys balance for 2018, energy units, cont.

1. STANDARD ENERGY BALANCE

| | | Industrial cogenerations | | | | | | | | Industry 1A2 | | | | | | | | | Other sectors-Commercial |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Energy consumption | | Refineries | Production of oil and gas | Other sectors | Total | Industrial heating plants | Own use (production of oil and gas) | Own use (refineries) | Own use (biogas prod.) | Total | Iron and steal | Non ferous metals | Non metalic minerals | Chemical | Constructio n materials | Pulp and p | Food productiuo n | Other indus | |
| Anthracite | $10^3$ t | | | | 0.0 | | | | | 3.1 | 3.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Coking coal (kameni ugljen) | $10^3$ t | | | | 0.0 | | | | | 53.7 | 0.0 | 0 | 0 | 0 | 53.4 | 0 | 0 | 0.3 | 0.0 |
| Sub-Bituminous Coal (Mrki ug | $10^3$ t | | | 28.1 | 28.1 | | | | | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lignite | $10^3$ t | | | | 0.0 | | | | | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| Natural gas | $10^6$ $m^3$ | 53.1 | 49.7 | 174.7 | 277.5 | 75.5 | 55.9 | 73.1 | | 239.4 | 17.1 | 12.0 | 51.0 | 10.0 | 56.8 | 7.1 | 45.4 | 40.0 | 244.3 |
| Wood | $10^3$ $m^3$ | | | | 0.0 | | | | | 48.3 | 0.4 | 0.3 | 0.0 | 0.0 | 9.7 | 0.0 | 2.4 | 35.5 | 12.4 |
| Biogas | TJ | | | 134.1 | 134.1 | | | | 0.0 | 0.0 | | | | | | | | | 0.0 |
| Energija Sunca | TJ | | | | 0.0 | | | | | 0.0 | | | | | | | | | 175.0 |
| Geotermalna energija | TJ | | | | 0.0 | | | | | 0.0 | | | | | | | | | 171.8 |
| Other biomass | TJ | | | 0.0 | 0.0 | 244.6 | | | | 734.8 | 3.1 | 0.0 | 0.9 | 0.0 | 67.8 | 91.2 | 148.8 | 423.0 | 311.2 |
| Industral waste-non ren. | TJ | | | | 0.0 | | | | | 817.7 | | | | | 817.7 | | | | 0.0 |
| Coke oven coke | $10^3$ t | | | | 0.0 | | | | | 30.7 | 1.0 | 0.0 | 0.0 | 0.0 | 26.2 | 0.0 | 3.5 | 0.0 | 0.0 |
| Liquified petroleum gas | $10^3$ t | 0 | | | 0.0 | 0.0 | | 0.0 | | 8.8 | 0.9 | 0.8 | 0.3 | 0.0 | 1.3 | 0.2 | 1.1 | 4.2 | 11.7 |
| Motor Gasoline | $10^3$ t | | | | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Petroleum | $10^3$ t | | | | 0.0 | | | | | 2.9 | 0.0 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Diesel | $10^3$ t | | | | 0.0 | | | | | 12.3 | 0.0 | 0.0 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gas/Diesel oil | $10^3$ t | | | | 0.0 | 0.0 | | | | 15.0 | 0.7 | 0.1 | 0.0 | 0.4 | 3.0 | 0.0 | 6.3 | 4.5 | 37.2 |
| Residual fuel oil | $10^3$ t | 40.0 | | 0.0 | 40.0 | 41.2 | | 28.7 | | 8.2 | 0.4 | 0.0 | 0.0 | 0.0 | 2.8 | 0.0 | 4.5 | 0.5 | 0.0 |
| Petroleum coke | $10^3$ t | 0 | | | 0.0 | | | 24.0 | | 195.9 | 0.3 | 0.3 | 0.0 | 0.0 | 195.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Refinery gas | $10^3$ t | 23.4 | | | 23.4 | 16.1 | | 147.5 | | 0.0 | | | | | | | | | 0.0 |
| Other oil derivates | $10^3$ 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 |
| El. En | GWh | | | | 0.0 | | 175.5 | 286.4 | 0.0 | 3610.7 | 376.9 | 98.7 | 153.2 | 313.8 | 559.8 | 221.8 | 661.5 | 1225.0 | 5825.2 |
| Steam and heat water | TJ | | | | 0.0 | | 575.0 | 5007.7 | 276.8 | 10829.0 | 58.4 | 0.0 | 10.1 | 4370.9 | 0.0 | 1008.3 | 3002.4 | 2378.9 | 1391.8 |
| (P R O I Z V O D N J A) | | | | | | | | | | | | | | | | | | | |
| El. En | GWh | 109.1 | 129.3 | 128.3 | 366.7 | | | | | | | | | | | | | | |
| Steam and heat water | TJ | 3170.0 | 575.0 | 5143.4 | 8888.4 | 4397.4 | 13285.8 | | | | | | | | | | | | |

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

| | | Industrial cogenerations | | | | | | | | Industry 1A2 | | | | | | | | | Other sectors-Commercial |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Energy consumption | | Refineries | Production of oil and gas | Other sectors | Total | Industrial heating plants | 1A1cii Own use (production of oil and gas) | 1A2b Own use (refineries) | 1A1ciii Own use (biogas prod.) | Total | 1A2a Iron and steal | 1A2bNon ferous metals | 1A2f Non metalic minerals | 1A2c Chem | 1A2gv Construction materials | 1A2d Pulp and paper | 1A2e Food productiuon | 1A2gviii Other industry | |
| Anthracite | | | | | 0.0 | | | | | 3.1 | 3.1 | 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 | | | | | 53.7 | 0.0 | 0.0 | 0.0 | 0.0 | 53.4 | 0.0 | 0.0 | 0.3 | 0.0 |
| Sub-Bituminous Coal (Mrki ug | $10^3$ t | | | | 0.0 | | | | | 29.1 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 28.1 | 0.0 | 0.0 |
| Lignite | $10^3$ t | | | | 0.0 | | | | | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| Natural gas | $10^6$ $m^3$ | | | | 0.0 | | 105.6 | 130.9 | | 484.9 | 18.1 | 12.0 | 51.3 | 138.5 | 56.8 | 46.4 | 113.2 | 48.6 | 244.3 |
| Wood | $10^3$ $m^3$ | | | | 0.0 | | | | | 48.3 | 0.4 | 0.3 | 0.0 | 0.0 | 9.7 | 0.0 | 2.4 | 35.5 | 12.4 |
| Biogas | TJ | | | | 0.0 | | | | 19.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 114.7 |
| Energija Sunca | TJ | | | | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 175.0 |
| Geotermalna energija | TJ | | | | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 171.8 |
| Other biomass | TJ | | | | 0.0 | | | | | 979.4 | 3.1 | 0.0 | 0.9 | 0.0 | 67.8 | 97.5 | 219.4 | 590.7 | 311.2 |
| Industral waste-non ren. | TJ | | | | 0.0 | | | | | 817.7 | 0.0 | 0.0 | 0.0 | 0.0 | 817.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Coke oven coke | $10^3$ t | | | | 0.0 | | | | | 30.7 | 1.0 | 0.0 | 0.0 | 0.0 | 26.2 | 0.0 | 3.5 | 0.0 | 0.0 |
| Liquified petroleum gas | $10^3$ t | | | | 0.0 | | | 0.0 | | 8.8 | 0.9 | 0.8 | 0.3 | 0.0 | 1.3 | 0.2 | 1.1 | 4.2 | 11.7 |
| Motor Gasoline | $10^3$ t | | | | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Petroleum | $10^3$ t | | | | 0.0 | | | | | 2.9 | 0.0 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Diesel | $10^3$ t | | | | 0.0 | | | | | 12.3 | 0.0 | 0.0 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gas/Diesel oil | $10^3$ t | | | | 0.0 | | | 0.0 | | 15.0 | 0.7 | 0.1 | 0.0 | 0.4 | 3.0 | 0.0 | 6.3 | 4.5 | 37.2 |
| Residual fuel oil | $10^3$ t | | | | 0.0 | | | 102.0 | | 16.1 | 0.4 | 0.0 | 0.0 | 0.0 | 2.8 | 0.7 | 9.2 | 3.0 | 0.0 |
| Petroleum coke | $10^3$ t | | | | 0.0 | | | 24.0 | | 195.9 | 0.3 | 0.3 | 0.0 | 0.0 | 195.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Refinery gas | $10^3$ t | | | | 0.0 | | | 187.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 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 | 0.0 | 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 |
| El. En | GWh | | | | 0.0 | | 46.2 | 177.3 | 0.0 | 3498.4 | 376.9 | 98.7 | 153.2 | 278.7 | 559.8 | 174.4 | 631.7 | 1225.0 | 5809.2 |
| Steam and heat water | TJ | | | | 0.0 | | | | 258.3 | 3144.4 | 29.2 | 0.0 | 0.0 | 690.4 | 0.0 | 0.6 | 521.8 | 1902.4 | 1391.8 |
| (P R O I Z V O D N J A) | | | | | | | | | | | | | | | | | | | |
| El. En | GWh | | | | 0.0 | | | | | | | | | | | | | | |
| Steam and heat water | TJ | | | | 0.0 | | | | | | | | | | | | | | |

# Annex 5: Any additional information

# Annex 5-1: Archiving, inventory data record sheet

## 5.1.1. Inventory data record sheet

**Year**: 2017

<table>
<tr><td colspan="2">MODULE: ENERGY</td></tr>
<tr><td colspan="2">SUBMODULE: $CO_2$ from Fuel Combustion by Source Categories</td></tr>
<tr><td>WORKSHEET:<br>1_1A1A_PUBLIC_ELE_HEAT_1990-2018</td><td>SHEET: 1A1ai, 1A1aii, 1A1aiii</td></tr>
<tr><td>STEP: 1, 2, 3, 4, 5, 6</td><td>PAGE: 1 of 1</td></tr>
<tr><td colspan="2">DIRECT DATA SOURCE:<br>A. ACTIVITY DATA:<br>Institution/organization: Energy Institute ‘’Hrvoje Požar’’<br>Publications: National Energy Balance for 2018; Annual Energy Report: ‘’Energy in Croatia 2018’’<br>Contact person: dr.sc. Branko Vuk (phone: +385 1 6326 149, +385 1 6326 206)<br>Data: Fuel consumption data and net calorific values<br>B. METHODOLOGY/EMISSION FACTOR:<br>Publications:<br>IPCC (2006): 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Energy<br>Default values for carbon emission factors and fractions of carbon stored were used</td></tr>
<tr><td colspan="2">ORIGINAL DATA SOURCE:<br>A. ACTIVITY DATA:<br>Fuel consumption data and net calorific values for 1A1 sector were provided by National energy balance</td></tr>
<tr><td colspan="2">METHOD:<br>Tier 1 method based on fuel consumption data and net calorific values<br>Tier 2 method for 1A1ai (natural gas and hard coal) for $CO_2$ emision calculation – country specific EF from verified reports are used<br>Tier 2 method for 1A1aii (natural gas) for $CO_2$ emision calculation – country specific EF from verified reports are used</td></tr>
<tr><td colspan="2">ADDITIONAL INTERCALCULATION:<br>Not necessary</td></tr>
<tr><td colspan="2">DATA ARCHIVATION:<br>Hard copy and electronic copy</td></tr>
<tr><td colspan="2">DATA GAPS:</td></tr>
<tr><td colspan="2">SUGGESTION FOR THE FUTURE:</td></tr>
<tr><td colspan="2">NOTES:<br>Default value for carbon emission factor, fraction of carbon stored and fraction of carbon oxidized were used.</td></tr>
</table>

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 $CO_2$eq | Gg | Gg $CO_2$eq | Gg $CO_2$eq | Gg $CO_2$eq | % |
| **1. Energy** | **20582.79** | **69.13** | **1451.68** | **0.37** | **114.52** | **NO** | **22148.99** | **70.71** |
| A. Fuel Comb (Sectoral Appr.) | 20166.84 | 9.61 | 201.74 | 0.55 | 114.52 | NO | 20483.11 | 65.40 |
| 1. Energy Industries | 7126.54 | 0.17 | 3.61 | 0.07 | 13.80 | NO | 7143.95 | 22.81 |
| 2. Man. Ind. and Constr. | 5447.30 | 0.48 | 10.08 | 0.09 | 17.96 | NO | 5475.33 | 17.48 |
| 3. Transport | 3987.25 | 1.55 | 32.56 | 0.24 | 50.17 | NO | 4069.97 | 12.99 |
| 4. Comm./Inst, Resid., Agric. | 3605.76 | 7.40 | 155.50 | 0.16 | 32.59 | NO | 3793.85 | 12.11 |
| 5. Other | NO | NO | NO | NO | NO | NO | NO | NO |
| B. Fugitive Emissions from Fuels | 415.95 | 59.52 | 1249.94 | NO | NO | NO | 1665.89 | 5.32 |
| 1. Solid Fuels | NO | NO | 48.76 | NO | NO | NO | 48.76 | NO |
| 2. Oil and Natural Gas | 415.95 | 57.20 | 1201.18 | NO | NO | NO | 1617.13 | 5.16 |
| **2. Industrial Processes** | **2417.36** | **0.78** | **16.45** | **2.59** | **804.08** | **947.58** | **4185.46** | **13.36** |
| A. Mineral Products | 1315.38 | NE,NO | NE,NO | NE,NO | NE,NO | NO | 1315.38 | 4.20 |
| B. Chemical Industry | 870.99 | 16.45 | 16.45 | 2.59 | 804.08 | NO | 1691.52 | 5.40 |
| C. Metal Production | 230.99 | NE,NO | NE,NO | NO | NO | 936.56 | 1167.56 | 3.73 |
| D. Other Production | NE | NO | NO | NO | NO | NO | NE | NE |
| E. Prod. of Halocarbons & $SF_6$ | NO | NO | NO | NO | NO | NO | NO | NO |
| F. Cons. of Halocarbons & $SF_6$ | NO | NO | NO | NO | NO | 11.01 | 11.01 | 0.04 |
| G. Other | NO | NO | NO | NO | NO | NO | NO | NO |
| **3. Solvent and Other Product Use** | **80.21** | **NO** | **NO** | **NE** | **NE** | **NO** | **80.21** | **0.26** |
| **4. Agriculture** | **NO** | **69.42** | **1457.81** | **9.26** | **2870.60** | **NO** | **4328.40** | **13.82** |
| A. Enteric Fermentation | NO | 58.54 | 1229.36 | 0.00 | 0.00 | NO | 1229.36 | 3.92 |
| B. Manure Management | NO | 10.88 | 228.44 | 1.22 | 378.74 | NO | 607.18 | 1.94 |
| C. Rice Cultivation | NO | NO | NO | 0.00 | 0.00 | NO | NO | NO |
| D. Agricultural Soils | NO | NO | NO | 8.04 | 2491.86 | NO | 2491.86 | 7.96 |
| E. Burning of Savannas | NO | NO | NO | NO | NO | NO | NO | NO |
| F. Field Burning of Agr. Residues | NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NE,NO |
| G. Other | NO | NO | NO | NO | NO | NO | NO | NO |
| **5. Land-Use Change and Forestry** | **-4184.93** | **0.00** | **0.01** | **0.00** | **0.00** | **NO** | **-4184.92** | **-13.36** |
| A. Forest Land | -4184.93 | 0.00 | 0.01 | 0.00 | 0.00 | NO | -4184.92 | -13.36 |
| B. Cropland | NE,NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NO |
| C. Grassland | NE,NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NO |
| D. Wetlands | NE,NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NO |
| E. Settlements | NE,NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NO |
| F. Other Land | NE,NO | NE,NO | NE,NO | NE,NO | NE,NO | NO | NE,NO | NO |
| G. Other | NE | NE | NE | NE | NE | NO | NE | NE |
| **6. Waste** | **0.09** | **23.81** | **499.94** | **0.25** | **78.69** | **NO** | **578.72** | **1.85** |
| A. Solid Waste Disp. on Land | NE,NO | 10.53 | 221.21 | 0.00 | 0.00 | NO | 221.21 | 0.71 |
| B. Waste-water Handling | 0.00 | 13.27 | 278.73 | 0.25 | 78.69 | NO | 357.42 | 1.14 |
| C. Waste Incineration | 0.09 | NE,NO | NE,NO | NE,NO | NE,NO | NO | 0.09 | 0.00 |
| D. Other | NO | NO | NO | NO | NO | NO | NO | NO |
| **Total Em./Rem. with LUCF** | **18895.52** | **163.14** | **3425.89** | **12.48** | **3867.89** | **947.58** | **27136.87** | **86.64** |
| **Total Emissions without LUCF** | **23080.45** | **163.14** | **3425.89** | **12.48** | **3867.89** | **947.58** | **31321.79** | **100.0** |
| **Share of Gases in Total Em./Rem.** | **69.63** | | **12.62** | | **14.25** | | **100.00** | |
| **Share of Gases in Total Emissions** | **73.69** | | **10.94** | | **12.35** | | **100.00** | |
| **Memo Items:** | | | | | | | | |
| **International Bunkers** | 451.83 | 0.01 | 0.20 | 0.01 | 3.28 | NO | 455.31 | |
| Aviation | 343.29 | 0.00 | 0.05 | 0.01 | 3.01 | NO | 346.35 | |
| Marine | 108.54 | 0.01 | 0.15 | 0.00 | 0.27 | NO | 108.96 | |
| **Multilateral Operations** | C | C | C | C | C | NO | C | |
| **$CO_2$ Emissions from Biomass** | 2,436.76 | NO | NO | NO | NO | NO | 2436.76 | |

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

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

Inventory 1990
Submission 2020 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]** | 16858.48 | 4383.67 | 2961.56 | NO | 1240.24 | 10.45 | NO | NO | 25454.40 |
| **1. Energy** | 20656.67 | 842.68 | 231.91 | | | | | | 21731.26 |
| A. Fuel combustion (sectoral approach) | 20056.11 | 413.95 | 231.22 | | | | | | 20701.28 |
| 1. Energy industries | 7048.59 | 5.42 | 17.49 | | | | | | 7071.49 |
| 2. Manufacturing industries and construction | 5501.67 | 9.73 | 17.64 | | | | | | 5529.04 |
| 3. Transport | 3786.94 | 41.14 | 54.73 | | | | | | 3882.81 |
| 4. Other sectors | 3718.91 | 357.67 | 141.35 | | | | | | 4217.93 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 600.56 | 428.73 | 0.69 | | | | | | 1029.98 |
| 1. Solid fuels | NO | 59.64 | NO,NA | | | | | | 59.64 |
| 2. Oil and natural gas | 600.56 | 369.08 | 0.69 | | | | | | 970.34 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2622.02 | 9.35 | 787.64 | NO | 1240.24 | 10.45 | NO | NO | 4669.70 |
| A. Mineral industry | 1306.59 | | | | | | | | 1306.59 |
| B. Chemical industry | 751.10 | 5.45 | 754.27 | NO | NO | NO | NO | NO | 1510.81 |
| C. Metal industry | 336.40 | 3.90 | NO | NO | 1240.24 | NO | NO | NO | 1580.54 |
| D. Non-energy products from fuels and solvent use | 227.93 | NA | NA | | | | | | 227.93 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | NO |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 10.45 | NO | NO | 43.83 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 50.02 | 2546.40 | 1827.03 | | | | | | 4423.45 |
| A. Enteric fermentation | | 2120.22 | | | | | | | 2120.22 |
| B. Manure management | | 426.18 | 375.22 | | | | | | 801.40 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1451.81 | | | | | | 1451.81 |
| 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]** | -6470.77 | 1.23 | 48.09 | | | | | | -6421.45 |
| A. Forest land | -6718.09 | 1.12 | 0.74 | | | | | | -6716.23 |
| B. Cropland | 222.77 | NO | 3.95 | | | | | | 226.73 |
| C. Grassland | -8.08 | 0.11 | 0.12 | | | | | | -7.86 |
| D. Wetlands | 83.47 | NO | 11.11 | | | | | | 94.58 |
| E. Settlements | 250.71 | NO | 32.17 | | | | | | 282.88 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -301.54 | | | | | | | | -301.54 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 984.01 | 66.89 | | | | | | 1051.44 |
| A. Solid waste disposal | NA,NO | 539.01 | | | | | | | 539.01 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 445.00 | 66.88 | | | | | | 511.88 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 643.85 | 0.43 | 5.29 | | | | | | 649.57 |
| Aviation | 496.62 | 0.09 | 4.14 | | | | | | 500.84 |
| Navigation | 147.23 | 0.34 | 1.15 | | | | | | 148.72 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5126.24 | | | | | | | | 5126.24 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 1717.23 | | | | | | | | 1717.23 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 31875.85 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 25454.40 |
| **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 2020 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]** | 9458.31 | 4238.07 | 2804.47 | NO | 850.75 | 10.33 | NO | NO | 17361.94 |
| **1. Energy** | 15164.22 | 792.50 | 200.50 | | | | | | 16157.22 |
| A. Fuel combustion (sectoral approach) | 14570.70 | 442.31 | 199.99 | | | | | | 15213.01 |
| 1. Energy industries | 4722.56 | 3.97 | 12.00 | | | | | | 4738.53 |
| 2. Manufacturing industries and construction | 3919.00 | 7.08 | 12.57 | | | | | | 3938.65 |
| 3. Transport | 2866.87 | 31.12 | 44.87 | | | | | | 2942.86 |
| 4. Other sectors | 3062.28 | 400.14 | 130.55 | | | | | | 3592.97 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 593.52 | 350.19 | 0.50 | | | | | | 944.21 |
| 1. Solid fuels | NO | 53.15 | NO,NA | | | | | | 53.15 |
| 2. Oil and natural gas | 593.52 | 297.03 | 0.50 | | | | | | 891.06 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1966.60 | 8.74 | 696.16 | NO | 850.75 | 10.33 | NO | NO | 3532.58 |
| A. Mineral industry | 865.32 | | | | | | | | 865.32 |
| B. Chemical industry | 665.95 | 5.02 | 662.78 | NO | NO | NO | NO | NO | 1333.74 |
| C. Metal industry | 270.10 | 3.73 | NO | NO | 850.75 | NO | NO | NO | 1124.58 |
| D. Non-energy products from fuels and solvent use | 165.23 | NA | NA | | | | | | 165.23 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | NO |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 10.33 | NO | NO | 43.71 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 50.95 | 2426.22 | 1796.22 | | | | | | 4273.38 |
| A. Enteric fermentation | | 1991.27 | | | | | | | 1991.27 |
| B. Manure management | | 434.95 | 358.36 | | | | | | 793.31 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1437.86 | | | | | | 1437.86 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 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]** | -7723.99 | 3.18 | 48.32 | | | | | | -7672.49 |
| A. Forest land | -8481.64 | 3.00 | 1.98 | | | | | | -8476.65 |
| B. Cropland | 140.69 | NO | 4.36 | | | | | | 145.05 |
| C. Grassland | 107.18 | 0.18 | 0.19 | | | | | | 107.55 |
| D. Wetlands | 68.30 | NO | 10.63 | | | | | | 78.92 |
| E. Settlements | 219.10 | NO | 31.17 | | | | | | 250.26 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | 222.39 | | | | | | | | 222.39 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1007.42 | 63.27 | | | | | | 1071.23 |
| A. Solid waste disposal | NA,NO | 565.55 | | | | | | | 565.55 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 441.87 | 63.27 | | | | | | 505.14 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 94.29 | 0.02 | 0.79 | | | | | | 95.10 |
| Aviation | 94.29 | 0.02 | 0.79 | | | | | | 95.10 |
| Navigation | NO | NO | NO | | | | | | NO |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5986.51 | | | | | | | | 5986.51 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 1791.71 | | | | | | | | 1791.71 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 25034.42 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 17361.94 |
| **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 2020 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]** | 8626.19 | 3791.26 | 2800.70 | NO | NO | 10.42 | NO | NO | 15228.56 |
| **1. Energy** | 14438.14 | 827.66 | 180.53 | | | | | | 15446.33 |
| A. Fuel combustion (sectoral approach) | 13833.95 | 376.97 | 180.08 | | | | | | 14390.99 |
| 1. Energy industries | 5382.10 | 4.57 | 15.42 | | | | | | 5402.09 |
| 2. Manufacturing industries and construction | 3114.89 | 5.44 | 9.58 | | | | | | 3129.91 |
| 3. Transport | 2776.67 | 27.62 | 38.97 | | | | | | 2843.25 |
| 4. Other sectors | 2560.29 | 339.34 | 116.12 | | | | | | 3015.75 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 604.20 | 450.69 | 0.46 | | | | | | 1055.34 |
| 1. Solid fuels | NO | 41.30 | NO,NA | | | | | | 41.30 |
| 2. Oil and natural gas | 604.20 | 409.39 | 0.46 | | | | | | 1014.04 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2001.88 | 7.57 | 898.60 | NO | NO | 10.42 | NO | NO | 2918.47 |
| A. Mineral industry | 939.59 | | | | | | | | 939.59 |
| B. Chemical industry | 832.68 | 5.12 | 865.22 | NO | NO | NO | NO | NO | 1703.03 |
| C. Metal industry | 121.11 | 2.45 | NO | NO | NO | NO | NO | NO | 123.56 |
| D. Non-energy products from fuels and solvent use | 108.50 | NA | NA | | | | | | 108.50 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | NO |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 10.42 | NO | NO | 43.79 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 65.51 | 1911.49 | 1602.22 | | | | | | 3579.22 |
| A. Enteric fermentation | | 1562.03 | | | | | | | 1562.03 |
| B. Manure management | | 349.45 | 277.96 | | | | | | 627.42 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1324.26 | | | | | | 1324.26 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 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]** | -7879.89 | 15.15 | 55.70 | | | | | | -7809.04 |
| A. Forest land | -8722.96 | 13.64 | 9.00 | | | | | | -8700.32 |
| B. Cropland | 150.75 | NO | 4.76 | | | | | | 155.50 |
| C. Grassland | 89.97 | 1.51 | 1.64 | | | | | | 93.12 |
| D. Wetlands | 65.25 | NO | 10.14 | | | | | | 75.39 |
| E. Settlements | 212.55 | NO | 30.17 | | | | | | 242.72 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | 324.54 | | | | | | | | 324.54 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1029.39 | 63.65 | | | | | | 1093.58 |
| A. Solid waste disposal | NA,NO | 590.64 | | | | | | | 590.64 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 438.75 | 63.64 | | | | | | 502.39 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 72.29 | 0.01 | 0.60 | | | | | | 72.91 |
| Aviation | 72.29 | 0.01 | 0.60 | | | | | | 72.91 |
| Navigation | NO | NO | NO | | | | | | NO |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5219.31 | | | | | | | | 5219.31 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 1866.54 | | | | | | | | 1866.54 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23037.60 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 15228.56 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 1993
Submission 2020 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]** | 8777.16 | 3729.01 | 2412.19 | NO | NO | 10.53 | NO | NO | 14928.89 |
| **1. Energy** | 15213.61 | 728.33 | 188.19 | | | | | | 16130.13 |
| A. Fuel combustion (sectoral approach) | 14408.69 | 394.02 | 187.73 | | | | | | 14990.44 |
| 1. Energy industries | 5903.57 | 4.88 | 17.13 | | | | | | 5925.57 |
| 2. Manufacturing industries and construction | 3031.80 | 5.21 | 9.17 | | | | | | 3046.18 |
| 3. Transport | 2925.04 | 27.72 | 40.97 | | | | | | 2993.72 |
| 4. Other sectors | 2548.29 | 356.21 | 120.46 | | | | | | 3024.97 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 804.92 | 334.31 | 0.46 | | | | | | 1139.69 |
| 1. Solid fuels | NO | 39.52 | NO,NA | | | | | | 39.52 |
| 2. Oil and natural gas | 804.92 | 294.79 | 0.46 | | | | | | 1100.16 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1693.49 | 6.25 | 685.59 | NO | NO | 10.53 | NO | NO | 2395.86 |
| A. Mineral industry | 801.50 | | | | | | | | 801.50 |
| B. Chemical industry | 715.96 | 5.15 | 652.21 | NO | NO | NO | NO | NO | 1373.32 |
| C. Metal industry | 57.46 | 1.10 | NO | NO | NO | NO | NO | NO | 58.56 |
| D. Non-energy products from fuels and solvent use | 118.57 | NA | NA | | | | | | 118.57 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | NO |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 10.53 | NO | NO | 43.91 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 52.14 | 1909.73 | 1407.21 | | | | | | 3369.08 |
| A. Enteric fermentation | | 1539.56 | | | | | | | 1539.56 |
| B. Manure management | | 370.18 | 275.44 | | | | | | 645.62 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1131.77 | | | | | | 1131.77 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 52.14 | | | | | | | | 52.14 |
| I. Other carbon-containing fertilizers | NA | | | | | | | | NA |
| J. Other | NO | NO | NO | | | | | | NO |
| **4. Land use, land-use change and forestry[1]** | -8182.63 | 34.39 | 67.34 | | | | | | -8080.89 |
| A. Forest land | -8780.24 | 32.81 | 21.64 | | | | | | -8725.80 |
| B. Cropland | 142.68 | NO | 5.16 | | | | | | 147.84 |
| C. Grassland | 75.48 | 1.58 | 1.72 | | | | | | 78.78 |
| D. Wetlands | 62.21 | NO | 9.65 | | | | | | 71.86 |
| E. Settlements | 206.00 | NO | 29.17 | | | | | | 235.17 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | 111.24 | | | | | | | | 111.24 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1050.31 | 63.86 | | | | | | 1114.71 |
| A. Solid waste disposal | NA,NO | 614.68 | | | | | | | 614.68 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 435.63 | 63.86 | | | | | | 499.49 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 182.30 | 0.03 | 1.52 | | | | | | 183.85 |
| Aviation | 182.30 | 0.03 | 1.52 | | | | | | 183.85 |
| Navigation | NO | NO | NO | | | | | | NO |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5493.15 | | | | | | | | 5493.15 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 1941.87 | | | | | | | | 1941.87 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23009.78 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 14928.89 |
| **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 2020 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]** | 7776.60 | 3524.25 | 2429.40 | NO | NO | 10.64 | NO | NO | 13740.90 |
| **1. Energy** | 14277.28 | 662.60 | 182.21 | | | | | | 15122.09 |
| A. Fuel combustion (sectoral approach) | 13555.89 | 360.33 | 181.80 | | | | | | 14098.02 |
| 1. Energy industries | 4614.80 | 3.27 | 12.05 | | | | | | 4630.13 |
| 2. Manufacturing industries and construction | 3202.34 | 4.85 | 8.64 | | | | | | 3215.82 |
| 3. Transport | 3102.80 | 29.99 | 42.58 | | | | | | 3175.37 |
| 4. Other sectors | 2635.95 | 322.22 | 118.52 | | | | | | 3076.69 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 721.38 | 302.27 | 0.42 | | | | | | 1024.07 |
| 1. Solid fuels | NO | 35.44 | NO,NA | | | | | | 35.44 |
| 2. Oil and natural gas | 721.38 | 266.83 | 0.42 | | | | | | 988.63 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1888.84 | 6.53 | 739.64 | NO | NO | 10.64 | NO | NO | 2645.65 |
| A. Mineral industry | 963.30 | | | | | | | | 963.30 |
| B. Chemical industry | 715.58 | 4.90 | 706.26 | NO | NO | NO | NO | NO | 1426.74 |
| C. Metal industry | 81.17 | 1.63 | NO | NO | NO | NO | NO | NO | 82.80 |
| D. Non-energy products from fuels and solvent use | 128.78 | NA | NA | | | | | | 128.78 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | NO | NO | NO | NO | NO | NO |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 10.64 | NO | NO | 44.02 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 47.57 | 1766.85 | 1390.33 | | | | | | 3204.76 |
| A. Enteric fermentation | | 1391.75 | | | | | | | 1391.75 |
| B. Manure management | | 375.10 | 259.89 | | | | | | 634.99 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1130.44 | | | | | | 1130.44 |
| 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]** | -8437.62 | 11.51 | 50.83 | | | | | | -8375.29 |
| A. Forest land | -8897.78 | 10.68 | 7.04 | | | | | | -8880.06 |
| B. Cropland | 162.48 | NO | 5.56 | | | | | | 168.04 |
| C. Grassland | 56.53 | 0.82 | 0.90 | | | | | | 58.25 |
| D. Wetlands | 59.17 | NO | 9.17 | | | | | | 68.34 |
| E. Settlements | 198.39 | NO | 28.16 | | | | | | 226.55 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -16.42 | | | | | | | | -16.42 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1076.77 | 66.39 | | | | | | 1143.70 |
| A. Solid waste disposal | NA,NO | 639.10 | | | | | | | 639.10 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 437.67 | 66.38 | | | | | | 504.05 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| **Memo items:[2]** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 403.81 | 0.37 | 3.29 | | | | | | 407.47 |
| Aviation | 264.02 | 0.05 | 2.20 | | | | | | 266.27 |
| Navigation | 139.78 | 0.32 | 1.09 | | | | | | 141.20 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 4929.23 | | | | | | | | 4929.23 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2018.60 | | | | | | | | 2018.60 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 22116.19 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 13740.90 |
| **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 A5.2-7: GHG emission in Croatia, 1995

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

Inventory 1995
Submission 2020 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]** | 7917.21 | 3478.91 | 2348.29 | 29.32 | NO | 11.12 | NO | NO | 13784.86 |
| **1. Energy** | 15175.22 | 679.53 | 178.44 | | | | | | 16033.19 |
| A. Fuel combustion (sectoral approach) | 14321.54 | 380.20 | 178.04 | | | | | | 14879.77 |
| 1. Energy industries | 5217.28 | 4.04 | 12.35 | | | | | | 5233.67 |
| 2. Manufacturing industries and construction | 2954.66 | 4.74 | 8.46 | | | | | | 2967.87 |
| 3. Transport | 3292.78 | 31.41 | 43.23 | | | | | | 3367.41 |
| 4. Other sectors | 2856.82 | 340.01 | 114.00 | | | | | | 3310.83 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 853.68 | 299.33 | 0.40 | | | | | | 1153.41 |
| 1. Solid fuels | NO | 28.23 | NO,NA | | | | | | 28.23 |
| 2. Oil and natural gas | 853.68 | 271.10 | 0.40 | | | | | | 1125.19 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1704.29 | 5.85 | 711.25 | 29.32 | NO | 11.12 | NO | NO | 2461.83 |
| A. Mineral industry | 748.79 | | | | | | | | 748.79 |
| B. Chemical industry | 756.00 | 5.07 | 677.87 | NO | NO | NO | NO | NO | 1438.94 |
| C. Metal industry | 40.32 | 0.78 | NO | NO | NO | NO | NO | NO | 41.10 |
| D. Non-energy products from fuels and solvent use | 159.18 | NA | NA | | | | | | 159.18 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 29.32 | NO | NO | NO | NO | 29.32 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.12 | NO | NO | 44.50 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 46.29 | 1689.61 | 1339.54 | | | | | | 3075.44 |
| A. Enteric fermentation | | 1329.11 | | | | | | | 1329.11 |
| B. Manure management | | 360.50 | 242.45 | | | | | | 602.95 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1097.09 | | | | | | 1097.09 |
| 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]** | -9009.12 | 7.54 | 47.00 | | | | | | -8954.57 |
| A. Forest land | -9413.38 | 7.03 | 4.63 | | | | | | -9401.71 |
| B. Cropland | 171.94 | NO | 5.96 | | | | | | 177.90 |
| C. Grassland | 38.88 | 0.52 | 0.56 | | | | | | 39.96 |
| D. Wetlands | 56.12 | NO | 8.68 | | | | | | 64.81 |
| E. Settlements | 192.91 | NO | 27.16 | | | | | | 220.07 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -55.59 | | | | | | | | -55.59 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1096.38 | 72.06 | | | | | | 1168.98 |
| A. Solid waste disposal | NA,NO | 665.11 | | | | | | | 665.11 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 431.27 | 72.05 | | | | | | 503.32 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 348.25 | 0.28 | 2.85 | | | | | | 351.38 |
| Aviation | 245.16 | 0.04 | 2.04 | | | | | | 247.25 |
| Navigation | 103.08 | 0.24 | 0.81 | | | | | | 104.13 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5212.59 | | | | | | | | 5212.59 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2097.00 | | | | | | | | 2097.00 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 22739.43 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 13784.86 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without 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 2020 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]** | 8827.07 | 3455.80 | 2324.57 | 49.77 | NO | 11.57 | NO | NO | 14668.78 |
| **1. Energy** | 15743.63 | 710.93 | 205.30 | | | | | | 16659.86 |
| A. Fuel combustion (sectoral approach) | 14917.08 | 423.21 | 204.91 | | | | | | 15545.20 |
| 1. Energy industries | 5041.66 | 4.06 | 12.92 | | | | | | 5058.63 |
| 2. Manufacturing industries and construction | 2998.35 | 4.71 | 8.41 | | | | | | 3011.48 |
| 3. Transport | 3620.09 | 33.99 | 47.80 | | | | | | 3701.88 |
| 4. Other sectors | 3256.98 | 380.45 | 135.78 | | | | | | 3773.20 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 826.55 | 287.72 | 0.39 | | | | | | 1114.66 |
| 1. Solid fuels | NO | 22.77 | NO,NA | | | | | | 22.77 |
| 2. Oil and natural gas | 826.55 | 264.96 | 0.39 | | | | | | 1091.90 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1718.66 | 5.18 | 665.11 | 49.77 | NO | 11.57 | NO | NO | 2450.29 |
| A. Mineral industry | 833.51 | | | | | | | | 833.51 |
| B. Chemical industry | 701.63 | 4.86 | 631.73 | NO | NO | NO | NO | NO | 1338.22 |
| C. Metal industry | 19.17 | 0.32 | NO | NO | NO | NO | NO | NO | 19.49 |
| D. Non-energy products from fuels and solvent use | 164.35 | NA | NA | | | | | | 164.35 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 49.77 | NO | NO | NO | NO | 49.77 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.57 | NO | NO | 44.95 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 52.44 | 1606.45 | 1333.18 | | | | | | 2992.07 |
| A. Enteric fermentation | | 1244.94 | | | | | | | 1244.94 |
| B. Manure management | | 361.51 | 228.74 | | | | | | 590.25 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1104.44 | | | | | | 1104.44 |
| 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]** | -8688.19 | 16.53 | 52.22 | | | | | | -8619.44 |
| A. Forest land | -9128.72 | 15.14 | 9.99 | | | | | | -9103.59 |
| B. Cropland | 173.10 | NO | 6.36 | | | | | | 179.47 |
| C. Grassland | 22.54 | 1.39 | 1.51 | | | | | | 25.44 |
| D. Wetlands | 53.08 | NO | 8.20 | | | | | | 61.28 |
| E. Settlements | 186.45 | NO | 26.16 | | | | | | 212.62 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | 5.35 | | | | | | | | 5.35 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.54 | 1116.71 | 68.76 | | | | | | 1186.01 |
| A. Solid waste disposal | NA,NO | 694.84 | | | | | | | 694.84 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.54 | NA,NO | 0.01 | | | | | | 0.54 |
| D. Waste water treatment and discharge | | 421.87 | 68.75 | | | | | | 490.62 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 339.28 | 0.31 | 2.77 | | | | | | 342.36 |
| Aviation | 223.16 | 0.04 | 1.86 | | | | | | 225.06 |
| Navigation | 116.12 | 0.27 | 0.91 | | | | | | 117.30 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5801.38 | | | | | | | | 5801.38 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2176.21 | | | | | | | | 2176.21 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23288.23 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 14668.78 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 1997
Submission 2020 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]** | 10398.12 | 3436.79 | 2507.83 | 71.93 | NO | 11.43 | NO | NO | 16426.10 |
| **1. Energy** | 16616.78 | 677.67 | 193.64 | | | | | | 17488.08 |
| A. Fuel combustion (sectoral approach) | 15838.80 | 396.10 | 193.24 | | | | | | 16428.14 |
| 1. Energy industries | 5538.02 | 4.47 | 15.14 | | | | | | 5557.62 |
| 2. Manufacturing industries and construction | 3026.43 | 5.13 | 8.98 | | | | | | 3040.54 |
| 3. Transport | 3965.98 | 36.09 | 50.52 | | | | | | 4052.59 |
| 4. Other sectors | 3308.37 | 350.42 | 118.60 | | | | | | 3777.39 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 777.98 | 281.57 | 0.39 | | | | | | 1059.94 |
| 1. Solid fuels | NO | 16.65 | NO,NA | | | | | | 16.65 |
| 2. Oil and natural gas | 777.98 | 264.91 | 0.39 | | | | | | 1043.28 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1888.89 | 5.51 | 698.44 | 71.93 | NO | 11.43 | NO | NO | 2676.19 |
| A. Mineral industry | 956.53 | | | | | | | | 956.53 |
| B. Chemical industry | 743.07 | 4.77 | 665.06 | NO | NO | NO | NO | NO | 1412.90 |
| C. Metal industry | 40.82 | 0.74 | NO | NO | NO | NO | NO | NO | 41.56 |
| D. Non-energy products from fuels and solvent use | 148.46 | NA | NA | | | | | | 148.46 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 71.93 | NO | NO | NO | NO | 71.93 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.43 | NO | NO | 44.80 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 68.39 | 1585.61 | 1494.59 | | | | | | 3148.58 |
| A. Enteric fermentation | | 1218.80 | | | | | | | 1218.80 |
| B. Manure management | | 366.81 | 223.14 | | | | | | 589.95 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1271.45 | | | | | | 1271.45 |
| 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]** | -8177.76 | 17.63 | 51.83 | | | | | | -8108.30 |
| A. Forest land | -8539.85 | 16.28 | 10.73 | | | | | | -8512.84 |
| B. Cropland | 264.46 | NO | 6.76 | | | | | | 271.22 |
| C. Grassland | -67.31 | 1.35 | 1.47 | | | | | | -64.48 |
| D. Wetlands | 50.04 | NO | 7.71 | | | | | | 57.75 |
| E. Settlements | 177.72 | NO | 25.16 | | | | | | 202.87 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -62.82 | | | | | | | | -62.82 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 1.82 | 1150.38 | 69.34 | | | | | | 1221.54 |
| A. Solid waste disposal | NA,NO | 726.45 | | | | | | | 726.45 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 1.82 | NA,NO | 0.03 | | | | | | 1.86 |
| D. Waste water treatment and discharge | | 423.93 | 69.30 | | | | | | 493.24 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 310.14 | 0.21 | 2.55 | | | | | | 312.90 |
| Aviation | 235.74 | 0.04 | 1.97 | | | | | | 237.74 |
| Navigation | 74.41 | 0.17 | 0.58 | | | | | | 75.16 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5428.42 | | | | | | | | 5428.42 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2256.77 | | | | | | | | 2256.77 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 24534.40 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 16426.10 |
| **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 A5.2-10: GHG emission in Croatia, 1998

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

Inventory 1998
Submission 2020 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]** | 11320.54 | 3446.68 | 2199.72 | 101.88 | NO | 11.99 | NO | NO | 17080.82 |
| **1. Energy** | 17463.39 | 665.07 | 204.15 | | | | | | 18332.60 |
| A. Fuel combustion (sectoral approach) | 16771.64 | 399.91 | 203.78 | | | | | | 17375.33 |
| 1. Energy industries | 6192.08 | 5.18 | 16.82 | | | | | | 6214.08 |
| 2. Manufacturing industries and construction | 3313.18 | 5.14 | 9.16 | | | | | | 3327.47 |
| 3. Transport | 4098.64 | 36.89 | 52.70 | | | | | | 4188.23 |
| 4. Other sectors | 3167.75 | 352.70 | 125.11 | | | | | | 3645.55 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 691.74 | 265.16 | 0.37 | | | | | | 957.27 |
| 1. Solid fuels | NO | 17.44 | NO,NA | | | | | | 17.44 |
| 2. Oil and natural gas | 691.74 | 247.72 | 0.37 | | | | | | 939.83 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1767.57 | 4.89 | 534.06 | 101.88 | NO | 11.99 | NO | NO | 2420.39 |
| A. Mineral industry | 1021.13 | | | | | | | | 1021.13 |
| B. Chemical industry | 592.72 | 4.51 | 500.68 | NO | NO | NO | NO | NO | 1097.92 |
| C. Metal industry | 29.65 | 0.38 | NO | NO | NO | NO | NO | NO | 30.03 |
| D. Non-energy products from fuels and solvent use | 124.06 | NA | NA | | | | | | 124.06 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 101.88 | NO | NO | NO | NO | 101.88 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.99 | NO | NO | 45.37 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 44.25 | 1555.91 | 1323.52 | | | | | | 2923.68 |
| A. Enteric fermentation | | 1184.56 | | | | | | | 1184.56 |
| B. Manure management | | 371.35 | 216.19 | | | | | | 587.53 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1107.34 | | | | | | 1107.34 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 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]** | -7958.36 | 45.11 | 70.55 | | | | | | -7842.70 |
| A. Forest land | -8221.55 | 39.83 | 26.26 | | | | | | -8155.47 |
| B. Cropland | 277.37 | NO | 7.16 | | | | | | 284.53 |
| C. Grassland | -67.98 | 5.29 | 5.75 | | | | | | -56.95 |
| D. Wetlands | 47.00 | NO | 7.22 | | | | | | 54.22 |
| E. Settlements | 171.98 | NO | 24.14 | | | | | | 196.12 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -165.16 | | | | | | | | -165.16 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 3.70 | 1175.71 | 67.45 | | | | | | 1246.85 |
| A. Solid waste disposal | NA,NO | 761.16 | | | | | | | 761.16 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 3.70 | NA,NO | 0.06 | | | | | | 3.76 |
| D. Waste water treatment and discharge | | 414.55 | 67.38 | | | | | | 481.93 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 336.44 | 0.23 | 2.77 | | | | | | 339.44 |
| Aviation | 254.59 | 0.04 | 2.12 | | | | | | 256.76 |
| Navigation | 81.85 | 0.19 | 0.64 | | | | | | 82.68 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5442.75 | | | | | | | | 5442.75 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2338.23 | | | | | | | | 2338.23 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 24923.52 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 17080.82 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 1999
Submission 2020 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]** | 11534.87 | 3476.85 | 2374.82 | 122.08 | NO | 11.99 | NO | NO | 17520.62 |
| **1. Energy** | 17984.69 | 641.48 | 216.48 | | | | | | 18842.65 |
| A. Fuel combustion (sectoral approach) | 17308.72 | 394.65 | 216.14 | | | | | | 17919.50 |
| 1. Energy industries | 6420.48 | 5.45 | 17.42 | | | | | | 6443.35 |
| 2. Manufacturing industries and construction | 2980.25 | 4.26 | 7.69 | | | | | | 2992.21 |
| 3. Transport | 4329.03 | 37.61 | 55.80 | | | | | | 4422.43 |
| 4. Other sectors | 3578.95 | 347.33 | 135.23 | | | | | | 4061.51 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 675.98 | 246.83 | 0.34 | | | | | | 923.15 |
| 1. Solid fuels | NO | 5.25 | NO,NA | | | | | | 5.25 |
| 2. Oil and natural gas | 675.98 | 241.58 | 0.34 | | | | | | 917.89 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2075.89 | 4.95 | 623.59 | 122.08 | NO | 11.99 | NO | NO | 2838.50 |
| A. Mineral industry | 1276.13 | | | | | | | | 1276.13 |
| B. Chemical industry | 701.41 | 4.52 | 590.21 | NO | NO | NO | NO | NO | 1296.14 |
| C. Metal industry | 27.67 | 0.42 | NO | NO | NO | NO | NO | NO | 28.10 |
| D. Non-energy products from fuels and solvent use | 70.68 | NA | NA | | | | | | 70.68 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 122.08 | NO | NO | NO | NO | 122.08 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.99 | NO | NO | 45.37 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 50.49 | 1608.28 | 1420.07 | | | | | | 3078.84 |
| A. Enteric fermentation | | 1198.13 | | | | | | | 1198.13 |
| B. Manure management | | 410.15 | 239.08 | | | | | | 649.22 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1181.00 | | | | | | 1181.00 |
| 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]** | -8580.58 | 5.91 | 42.05 | | | | | | -8532.62 |
| A. Forest land | -8806.21 | 4.26 | 2.81 | | | | | | -8799.15 |
| B. Cropland | 270.04 | NO | 7.57 | | | | | | 277.60 |
| C. Grassland | -69.57 | 1.65 | 1.80 | | | | | | -66.11 |
| D. Wetlands | 43.95 | NO | 6.74 | | | | | | 50.69 |
| E. Settlements | 166.90 | NO | 23.14 | | | | | | 190.04 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -185.70 | | | | | | | | -185.70 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 4.38 | 1216.24 | 72.62 | | | | | | 1293.24 |
| A. Solid waste disposal | NA,NO | 796.75 | | | | | | | 796.75 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 4.38 | NA,NO | 0.08 | | | | | | 4.46 |
| D. Waste water treatment and discharge | | 419.48 | 72.54 | | | | | | 492.03 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 311.54 | 0.20 | 2.57 | | | | | | 314.30 |
| Aviation | 245.16 | 0.04 | 2.04 | | | | | | 247.25 |
| Navigation | 66.37 | 0.15 | 0.53 | | | | | | 67.05 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5257.71 | | | | | | | | 5257.71 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2422.54 | | | | | | | | 2422.54 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 26053.24 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 17520.62 |
| **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 2020 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]** | 12540.30 | 3522.64 | 2533.56 | 147.90 | NO | 11.62 | NO | NO | 18756.02 |
| **1. Energy** | 17385.42 | 591.61 | 217.78 | | | | | | 18194.81 |
| A. Fuel combustion (sectoral approach) | 16659.08 | 353.38 | 217.46 | | | | | | 17229.92 |
| 1. Energy industries | 5783.35 | 3.94 | 18.63 | | | | | | 5805.92 |
| 2. Manufacturing industries and construction | 3103.13 | 4.44 | 8.05 | | | | | | 3115.63 |
| 3. Transport | 4354.24 | 36.08 | 52.95 | | | | | | 4443.27 |
| 4. Other sectors | 3418.37 | 308.91 | 137.84 | | | | | | 3865.11 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 726.33 | 238.23 | 0.32 | | | | | | 964.89 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 726.33 | 238.23 | 0.32 | | | | | | 964.89 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2242.01 | 3.40 | 727.32 | 147.90 | NO | 11.62 | NO | NO | 3132.26 |
| A. Mineral industry | 1435.11 | | | | | | | | 1435.11 |
| B. Chemical industry | 704.40 | 2.92 | 693.94 | NO | NO | NO | NO | NO | 1401.26 |
| C. Metal industry | 29.68 | 0.48 | NO | NO | NO | NO | NO | NO | 30.17 |
| D. Non-energy products from fuels and solvent use | 72.82 | NA | NA | | | | | | 72.82 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 147.90 | NO | NO | NO | NO | 147.90 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.62 | NO | NO | 45.00 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 60.87 | 1567.51 | 1413.98 | | | | | | 3042.36 |
| A. Enteric fermentation | | 1168.05 | | | | | | | 1168.05 |
| B. Manure management | | 399.46 | 211.37 | | | | | | 610.83 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1202.62 | | | | | | 1202.62 |
| 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]** | -7154.15 | 96.91 | 104.45 | | | | | | -6952.79 |
| A. Forest land | -7455.03 | 87.11 | 57.44 | | | | | | -7310.48 |
| B. Cropland | 342.03 | NO | 7.97 | | | | | | 350.00 |
| C. Grassland | -71.69 | 9.80 | 10.67 | | | | | | -51.23 |
| D. Wetlands | 40.91 | NO | 6.25 | | | | | | 47.16 |
| E. Settlements | 159.68 | NO | 22.12 | | | | | | 181.80 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -170.05 | | | | | | | | -170.05 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 6.15 | 1263.21 | 70.02 | | | | | | 1339.39 |
| A. Solid waste disposal | NA,NO | 837.26 | | | | | | | 837.26 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 6.15 | NA,NO | 0.11 | | | | | | 6.26 |
| D. Waste water treatment and discharge | | 425.95 | 69.91 | | | | | | 495.86 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 258.78 | 0.17 | 2.13 | | | | | | 261.08 |
| Aviation | 201.16 | 0.04 | 1.68 | | | | | | 202.87 |
| Navigation | 57.62 | 0.13 | 0.45 | | | | | | 58.21 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 4694.77 | | | | | | | | 4694.77 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2513.55 | | | | | | | | 2513.55 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 25708.82 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 18756.02 |
| **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 2020 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]** | 12901.43 | 3527.63 | 2461.57 | 161.46 | NO | 11.69 | NO | NO | 19063.77 |
| **1. Energy** | 18376.94 | 632.61 | 218.39 | | | | | | 19227.94 |
| A. Fuel combustion (sectoral approach) | 17596.49 | 378.47 | 218.08 | | | | | | 18193.04 |
| 1. Energy industries | 6343.85 | 4.46 | 20.96 | | | | | | 6369.27 |
| 2. Manufacturing industries and construction | 3196.99 | 4.39 | 8.06 | | | | | | 3209.43 |
| 3. Transport | 4419.92 | 30.87 | 51.45 | | | | | | 4502.24 |
| 4. Other sectors | 3635.73 | 338.75 | 137.61 | | | | | | 4112.10 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 780.45 | 254.15 | 0.31 | | | | | | 1034.90 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 780.45 | 254.15 | 0.31 | | | | | | 1034.90 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2331.02 | 3.52 | 615.78 | 161.46 | NO | 11.69 | NO | NO | 3123.47 |
| A. Mineral industry | 1653.88 | | | | | | | | 1653.88 |
| B. Chemical industry | 595.81 | 3.50 | 582.41 | NO | NO | NO | NO | NO | 1181.71 |
| C. Metal industry | 7.15 | 0.02 | NO | NO | NO | NO | NO | NO | 7.17 |
| D. Non-energy products from fuels and solvent use | 74.18 | NA | NA | | | | | | 74.18 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 161.46 | NO | NO | NO | NO | 161.46 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.69 | NO | NO | 45.07 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 92.09 | 1589.55 | 1496.81 | | | | | | 3178.46 |
| A. Enteric fermentation | | 1177.27 | | | | | | | 1177.27 |
| B. Manure management | | 412.28 | 210.48 | | | | | | 622.77 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1286.33 | | | | | | 1286.33 |
| 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]** | -7905.30 | 19.00 | 55.93 | | | | | | -7830.37 |
| A. Forest land | -8402.77 | 16.02 | 10.56 | | | | | | -8376.19 |
| B. Cropland | 332.31 | NO | 8.37 | | | | | | 340.68 |
| C. Grassland | -129.91 | 2.98 | 3.24 | | | | | | -123.69 |
| D. Wetlands | 36.73 | NO | 5.73 | | | | | | 42.46 |
| E. Settlements | 364.80 | NO | 28.03 | | | | | | 392.83 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -106.47 | | | | | | | | -106.47 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 6.68 | 1282.95 | 74.65 | | | | | | 1364.28 |
| A. Solid waste disposal | NA,NO | 879.37 | | | | | | | 879.37 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 6.68 | NA,NO | 0.12 | | | | | | 6.80 |
| D. Waste water treatment and discharge | | 403.58 | 74.53 | | | | | | 478.11 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 291.47 | 0.24 | 2.39 | | | | | | 294.10 |
| Aviation | 201.16 | 0.04 | 1.68 | | | | | | 202.87 |
| Navigation | 90.31 | 0.21 | 0.71 | | | | | | 91.23 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5187.98 | | | | | | | | 5187.98 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2608.32 | | | | | | | | 2608.32 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 26894.15 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 19063.77 |
| **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 2020 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]** | 13730.49 | 3533.48 | 2423.10 | 185.34 | NO | 12.01 | NO | NO | 19884.41 |
| **1. Energy** | 19530.51 | 623.60 | 216.86 | | | | | | 20370.97 |
| A. Fuel combustion (sectoral approach) | 18734.85 | 364.21 | 216.56 | | | | | | 19315.61 |
| 1. Energy industries | 7225.52 | 4.90 | 24.91 | | | | | | 7255.33 |
| 2. Manufacturing industries and construction | 3057.13 | 4.32 | 7.93 | | | | | | 3069.38 |
| 3. Transport | 4729.16 | 29.87 | 54.23 | | | | | | 4813.26 |
| 4. Other sectors | 3723.03 | 325.12 | 129.48 | | | | | | 4177.63 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 795.66 | 259.39 | 0.31 | | | | | | 1055.36 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 795.66 | 259.39 | 0.31 | | | | | | 1055.36 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2297.70 | 3.27 | 600.08 | 185.34 | NO | 12.01 | NO | NO | 3098.40 |
| A. Mineral industry | 1654.36 | | | | | | | | 1654.36 |
| B. Chemical industry | 550.89 | 3.27 | 566.71 | NO | NO | NO | NO | NO | 1120.86 |
| C. Metal industry | 4.72 | 0.01 | NO | NO | NO | NO | NO | NO | 4.73 |
| D. Non-energy products from fuels and solvent use | 87.73 | NA | NA | | | | | | 87.73 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 185.34 | NO | NO | NO | NO | 185.34 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 12.01 | NO | NO | 45.39 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 80.76 | 1571.17 | 1475.12 | | | | | | 3127.04 |
| A. Enteric fermentation | | 1148.12 | | | | | | | 1148.12 |
| B. Manure management | | 423.05 | 218.78 | | | | | | 641.83 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1256.34 | | | | | | 1256.34 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 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]** | -8182.25 | 6.39 | 52.49 | | | | | | -8123.37 |
| A. Forest land | -8649.15 | 5.62 | 3.70 | | | | | | -8639.83 |
| B. Cropland | 315.34 | NO | 8.77 | | | | | | 324.11 |
| C. Grassland | -129.37 | 0.78 | 0.85 | | | | | | -127.75 |
| D. Wetlands | 33.46 | NO | 5.21 | | | | | | 38.67 |
| E. Settlements | 408.79 | NO | 33.96 | | | | | | 442.75 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -161.32 | | | | | | | | -161.32 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 3.78 | 1329.04 | 78.55 | | | | | | 1411.37 |
| A. Solid waste disposal | NA,NO | 928.01 | | | | | | | 928.01 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 3.78 | NA,NO | 0.07 | | | | | | 3.85 |
| D. Waste water treatment and discharge | | 401.03 | 78.48 | | | | | | 479.51 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 262.60 | 0.20 | 2.15 | | | | | | 264.95 |
| Aviation | 188.59 | 0.03 | 1.57 | | | | | | 190.19 |
| Navigation | 74.01 | 0.17 | 0.58 | | | | | | 74.76 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 4975.57 | | | | | | | | 4975.57 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2706.46 | | | | | | | | 2706.46 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 28007.78 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 19884.41 |
| **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 2020 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]** | 15853.91 | 3746.43 | 2349.92 | 212.23 | NO | 12.28 | NO | NO | 22174.76 |
| **1. Energy** | 20865.01 | 674.53 | 230.76 | | | | | | 21770.30 |
| A. Fuel combustion (sectoral approach) | 20116.28 | 413.76 | 230.47 | | | | | | 20760.52 |
| 1. Energy industries | 7900.31 | 5.84 | 25.93 | | | | | | 7932.07 |
| 2. Manufacturing industries and construction | 3136.78 | 4.94 | 8.93 | | | | | | 3150.65 |
| 3. Transport | 5126.60 | 28.94 | 55.87 | | | | | | 5211.41 |
| 4. Other sectors | 3952.60 | 374.04 | 139.74 | | | | | | 4466.39 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 748.73 | 260.76 | 0.29 | | | | | | 1009.79 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 748.73 | 260.76 | 0.29 | | | | | | 1009.79 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2330.60 | 3.12 | 569.27 | 212.23 | NO | 12.28 | NO | NO | 3127.49 |
| A. Mineral industry | 1660.35 | | | | | | | | 1660.35 |
| B. Chemical industry | 574.42 | 3.09 | 535.89 | NO | NO | NO | NO | NO | 1113.41 |
| C. Metal industry | 6.62 | 0.02 | NO | NO | NO | NO | NO | NO | 6.64 |
| D. Non-energy products from fuels and solvent use | 89.21 | NA | NA | | | | | | 89.21 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 212.23 | NO | NO | NO | NO | 212.23 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 12.28 | NO | NO | 45.65 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 71.79 | 1651.12 | 1390.55 | | | | | | 3113.46 |
| A. Enteric fermentation | | 1197.67 | | | | | | | 1197.67 |
| B. Manure management | | 453.46 | 212.21 | | | | | | 665.67 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1178.33 | | | | | | 1178.33 |
| 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]** | -7414.30 | 39.55 | 81.38 | | | | | | -7293.37 |
| A. Forest land | -7978.34 | 35.95 | 23.70 | | | | | | -7918.69 |
| B. Cropland | 302.95 | NO | 9.17 | | | | | | 312.12 |
| C. Grassland | -128.84 | 3.60 | 3.92 | | | | | | -121.31 |
| D. Wetlands | 30.19 | NO | 4.69 | | | | | | 34.88 |
| E. Settlements | 450.70 | NO | 39.90 | | | | | | 490.59 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -90.96 | | | | | | | | -90.96 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.80 | 1378.11 | 77.96 | | | | | | 1456.87 |
| A. Solid waste disposal | NA,NO | 982.59 | | | | | | | 982.59 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.80 | NA,NO | 0.01 | | | | | | 0.82 |
| D. Waste water treatment and discharge | | 395.53 | 77.94 | | | | | | 473.47 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| **Memo items:[2]** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 251.70 | 0.19 | 2.06 | | | | | | 253.95 |
| Aviation | 182.30 | 0.03 | 1.52 | | | | | | 183.85 |
| Navigation | 69.39 | 0.16 | 0.54 | | | | | | 70.09 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5755.73 | | | | | | | | 5755.73 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2807.68 | | | | | | | | 2807.68 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 29468.13 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 22174.76 |
| **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 A5.2-16: GHG emission in Croatia, 2004

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

Inventory 2004
Submission 2020 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]** | 15261.81 | 3814.65 | 2545.92 | 240.33 | NO | 12.57 | NO | NO | 21875.27 |
| **1. Energy** | 20291.96 | 661.31 | 223.38 | | | | | | 21176.65 |
| A. Fuel combustion (sectoral approach) | 19494.03 | 402.30 | 223.10 | | | | | | 20119.43 |
| 1. Energy industries | 6784.01 | 4.86 | 23.51 | | | | | | 6812.38 |
| 2. Manufacturing industries and construction | 3583.00 | 5.99 | 10.74 | | | | | | 3599.72 |
| 3. Transport | 5262.05 | 27.05 | 56.29 | | | | | | 5345.38 |
| 4. Other sectors | 3864.98 | 364.40 | 132.57 | | | | | | 4361.95 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 797.93 | 259.01 | 0.28 | | | | | | 1057.22 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 797.93 | 259.01 | 0.28 | | | | | | 1057.22 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2548.58 | 3.74 | 684.84 | 240.33 | NO | 12.57 | NO | NO | 3490.06 |
| A. Mineral industry | 1757.70 | | | | | | | | 1757.70 |
| B. Chemical industry | 665.57 | 3.74 | 651.47 | NO | NO | NO | NO | NO | 1320.78 |
| C. Metal industry | 13.72 | NA,NO | NO | NO | NO | NO | NO | NO | 13.72 |
| D. Non-energy products from fuels and solvent use | 111.59 | NA | NA | | | | | | 111.59 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 240.33 | NO | NO | NO | NO | 240.33 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 12.57 | NO | NO | 45.94 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 75.94 | 1708.51 | 1498.19 | | | | | | 3282.65 |
| A. Enteric fermentation | | 1227.79 | | | | | | | 1227.79 |
| B. Manure management | | 480.73 | 230.26 | | | | | | 710.99 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1267.93 | | | | | | 1267.93 |
| E. Prescribed burning of savannas | | NO | NO | | | | | | NO |
| F. Field burning of agricultural residues | | NO | NO | | | | | | NO |
| G. Liming | NO | | | | | | | | NO |
| H. Urea application | 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]** | -7655.02 | 2.92 | 61.89 | | | | | | -7590.22 |
| A. Forest land | -8233.40 | 1.95 | 1.29 | | | | | | -8230.16 |
| B. Cropland | 293.30 | NO | 9.57 | | | | | | 302.88 |
| C. Grassland | -128.31 | 0.97 | 1.05 | | | | | | -126.29 |
| D. Wetlands | 26.92 | NO | 4.16 | | | | | | 31.09 |
| E. Settlements | 491.09 | NO | 45.81 | | | | | | 536.91 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -104.64 | | | | | | | | -104.64 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.35 | 1438.17 | 77.62 | | | | | | 1516.13 |
| A. Solid waste disposal | NA,NO | 1036.43 | | | | | | | 1036.43 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.35 | NA,NO | 0.00 | | | | | | 0.35 |
| D. Waste water treatment and discharge | | 401.73 | 77.61 | | | | | | 479.35 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 284.43 | 0.21 | 2.33 | | | | | | 286.96 |
| Aviation | 210.59 | 0.04 | 1.76 | | | | | | 212.38 |
| Navigation | 73.83 | 0.17 | 0.58 | | | | | | 74.58 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5660.22 | | | | | | | | 5660.22 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 2911.70 | | | | | | | | 2911.70 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 29465.49 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 21875.27 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 2005
Submission 2020 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]** | 15451.38 | 3835.75 | 2545.83 | 265.80 | NO | 13.03 | NO | NO | 22111.79 |
| **1. Energy** | 20676.93 | 681.25 | 225.26 | | | | | | 21583.44 |
| A. Fuel combustion (sectoral approach) | 19899.40 | 421.43 | 224.99 | | | | | | 20545.82 |
| 1. Energy industries | 6810.03 | 4.61 | 22.86 | | | | | | 6837.50 |
| 2. Manufacturing industries and construction | 3723.73 | 5.41 | 9.90 | | | | | | 3739.05 |
| 3. Transport | 5467.52 | 25.18 | 56.51 | | | | | | 5549.21 |
| 4. Other sectors | 3898.12 | 386.23 | 135.72 | | | | | | 4420.06 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 777.53 | 259.83 | 0.27 | | | | | | 1037.62 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 777.53 | 259.83 | 0.27 | | | | | | 1037.62 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2567.55 | 3.77 | 670.12 | 265.80 | NO | 13.03 | NO | NO | 3520.26 |
| A. Mineral industry | 1779.11 | | | | | | | | 1779.11 |
| B. Chemical industry | 663.60 | 3.77 | 636.74 | NO | NO | NO | NO | NO | 1304.11 |
| C. Metal industry | 12.71 | NA,NO | NO | NO | NO | NO | NO | NO | 12.71 |
| D. Non-energy products from fuels and solvent use | 112.13 | NA | NA | | | | | | 112.13 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 265.80 | NO | NO | NO | NO | 265.80 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 13.03 | NO | NO | 46.40 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 85.46 | 1710.38 | 1502.43 | | | | | | 3298.28 |
| A. Enteric fermentation | | 1253.79 | | | | | | | 1253.79 |
| B. Manure management | | 456.60 | 205.51 | | | | | | 662.10 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1296.93 | | | | | | 1296.93 |
| 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]** | -7878.72 | 2.74 | 67.39 | | | | | | -7808.59 |
| A. Forest land | -8286.93 | 2.16 | 1.43 | | | | | | -8283.34 |
| B. Cropland | 259.13 | NO | 9.97 | | | | | | 269.10 |
| C. Grassland | -102.28 | 0.57 | 0.62 | | | | | | -101.09 |
| D. Wetlands | 23.65 | NO | 3.64 | | | | | | 27.29 |
| E. Settlements | 527.17 | NO | 51.73 | | | | | | 578.90 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -299.45 | | | | | | | | -299.45 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.16 | 1437.61 | 80.63 | | | | | | 1518.40 |
| A. Solid waste disposal | NA,NO | 1038.94 | | | | | | | 1038.94 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.16 | NA,NO | 0.00 | | | | | | 0.16 |
| D. Waste water treatment and discharge | | 398.67 | 80.63 | | | | | | 479.30 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 337.55 | 0.23 | 2.77 | | | | | | 340.55 |
| Aviation | 257.74 | 0.05 | 2.15 | | | | | | 259.93 |
| Navigation | 79.82 | 0.18 | 0.62 | | | | | | 80.62 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5908.79 | | | | | | | | 5908.79 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3018.32 | | | | | | | | 3018.32 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 29920.38 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 22111.79 |
| **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 2020 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]** | 15857.85 | 3976.04 | 2570.25 | 292.57 | NO | 13.01 | NO | NO | 22709.71 |
| **1. Energy** | 20756.61 | 671.92 | 226.52 | | | | | | 21655.05 |
| A. Fuel combustion (sectoral approach) | 19965.94 | 393.43 | 226.26 | | | | | | 20585.62 |
| 1. Energy industries | 6631.42 | 4.82 | 22.56 | | | | | | 6658.79 |
| 2. Manufacturing industries and construction | 3855.12 | 5.75 | 10.53 | | | | | | 3871.40 |
| 3. Transport | 5820.73 | 28.76 | 60.53 | | | | | | 5910.02 |
| 4. Other sectors | 3658.66 | 354.11 | 132.63 | | | | | | 4145.40 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 790.67 | 278.49 | 0.27 | | | | | | 1069.43 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 790.67 | 278.49 | 0.27 | | | | | | 1069.43 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2691.44 | 3.66 | 662.70 | 292.57 | NO | 13.01 | NO | NO | 3663.38 |
| A. Mineral industry | 1893.81 | | | | | | | | 1893.81 |
| B. Chemical industry | 657.88 | 3.66 | 629.32 | NO | NO | NO | NO | NO | 1290.87 |
| C. Metal industry | 13.31 | NA,NO | NO | NO | NO | NO | NO | NO | 13.31 |
| D. Non-energy products from fuels and solvent use | 126.43 | NA | NA | | | | | | 126.43 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 292.57 | NO | NO | NO | NO | 292.57 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 13.01 | NO | NO | 46.38 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 80.67 | 1762.10 | 1522.54 | | | | | | 3365.32 |
| A. Enteric fermentation | | 1251.49 | | | | | | | 1251.49 |
| B. Manure management | | 510.61 | 212.53 | | | | | | 723.14 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1310.01 | | | | | | 1310.01 |
| 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]** | -7671.61 | 6.06 | 75.39 | | | | | | -7590.16 |
| A. Forest land | -8100.08 | 5.46 | 3.60 | | | | | | -8091.01 |
| B. Cropland | 256.56 | NO | 10.38 | | | | | | 266.93 |
| C. Grassland | -127.51 | 0.60 | 0.65 | | | | | | -126.27 |
| D. Wetlands | 20.38 | NO | 3.12 | | | | | | 23.50 |
| E. Settlements | 564.96 | NO | 57.64 | | | | | | 622.60 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -285.91 | | | | | | | | -285.91 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.74 | 1532.29 | 83.09 | | | | | | 1616.13 |
| A. Solid waste disposal | NA,NO | 1129.38 | | | | | | | 1129.38 |
| B. Biological treatment of solid waste | | NO,NE,IE | NO,NE,IE | | | | | | NO,NE,IE |
| C. Incineration and open burning of waste | 0.74 | NA,NO | 0.01 | | | | | | 0.75 |
| D. Waste water treatment and discharge | | 402.91 | 83.08 | | | | | | 485.99 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 325.65 | 0.19 | 2.68 | | | | | | 328.52 |
| Aviation | 264.02 | 0.05 | 2.20 | | | | | | 266.27 |
| Navigation | 61.63 | 0.14 | 0.48 | | | | | | 62.25 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5497.41 | | | | | | | | 5497.41 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3128.01 | | | | | | | | 3128.01 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 30299.87 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 22709.71 |
| **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 2020 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]** | 17915.51 | 4026.31 | 2649.62 | 326.74 | NO | 13.05 | NO | NO | 24931.24 |
| **1. Energy** | 21991.29 | 673.15 | 232.50 | | | | | | 22896.94 |
| A. Fuel combustion (sectoral approach) | 21237.37 | 383.63 | 232.24 | | | | | | 21853.24 |
| 1. Energy industries | 7815.15 | 5.57 | 27.11 | | | | | | 7847.84 |
| 2. Manufacturing industries and construction | 3853.05 | 5.80 | 10.51 | | | | | | 3869.36 |
| 3. Transport | 6241.93 | 31.54 | 64.12 | | | | | | 6337.59 |
| 4. Other sectors | 3327.24 | 340.71 | 130.51 | | | | | | 3798.46 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 753.92 | 289.52 | 0.26 | | | | | | 1043.71 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 753.92 | 289.52 | 0.26 | | | | | | 1043.71 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2762.55 | 3.41 | 727.75 | 326.74 | NO | 13.05 | NO | NO | 3833.51 |
| A. Mineral industry | 1922.30 | | | | | | | | 1922.30 |
| B. Chemical industry | 696.32 | 3.41 | 694.38 | NO | NO | NO | NO | NO | 1394.11 |
| C. Metal industry | 13.69 | NA,NO | NO | NO | NO | NO | NO | NO | 13.69 |
| D. Non-energy products from fuels and solvent use | 130.24 | NA | NA | | | | | | 130.24 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 326.74 | NO | NO | NO | NO | 326.74 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 13.05 | NO | NO | 46.43 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 89.32 | 1696.66 | 1503.18 | | | | | | 3289.17 |
| A. Enteric fermentation | | 1203.93 | | | | | | | 1203.93 |
| B. Manure management | | 492.73 | 199.94 | | | | | | 692.67 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1303.24 | | | | | | 1303.24 |
| 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]** | -6928.30 | 31.76 | 100.95 | | | | | | -6795.59 |
| A. Forest land | -7296.04 | 29.59 | 19.51 | | | | | | -7246.94 |
| B. Cropland | 2.45 | NO | 12.89 | | | | | | 15.34 |
| C. Grassland | 10.38 | 2.17 | 2.37 | | | | | | 14.92 |
| D. Wetlands | 18.37 | NO | 2.64 | | | | | | 21.01 |
| E. Settlements | 622.12 | NO | 63.55 | | | | | | 685.67 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -285.59 | | | | | | | | -285.59 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.65 | 1621.32 | 85.23 | | | | | | 1707.21 |
| A. Solid waste disposal | NA,NO | 1211.63 | | | | | | | 1211.63 |
| B. Biological treatment of solid waste | | 1.52 | 1.09 | | | | | | 2.61 |
| C. Incineration and open burning of waste | 0.65 | NA,NO | 0.01 | | | | | | 0.66 |
| D. Waste water treatment and discharge | | 408.18 | 84.14 | | | | | | 492.31 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| **Memo items:[2]** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 353.05 | 0.22 | 2.90 | | | | | | 356.17 |
| Aviation | 276.60 | 0.05 | 2.31 | | | | | | 278.95 |
| Navigation | 76.45 | 0.17 | 0.59 | | | | | | 77.22 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5322.60 | | | | | | | | 5322.60 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3243.84 | | | | | | | | 3243.84 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 31726.83 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 24931.24 |
| **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 A5.2-20: GHG emission in Croatia, 2008

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

Inventory 2008
Submission 2020 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]** | 16366.76 | 4000.32 | 2947.21 | 338.04 | NO | 11.98 | NO | NO | 23664.31 |
| **1. Energy** | 20826.66 | 663.24 | 231.69 | | | | | | 21721.58 |
| A. Fuel combustion (sectoral approach) | 20164.99 | 385.60 | 231.44 | | | | | | 20782.03 |
| 1. Energy industries | 6771.62 | 4.79 | 24.21 | | | | | | 6800.63 |
| 2. Manufacturing industries and construction | 3872.78 | 5.59 | 10.17 | | | | | | 3888.55 |
| 3. Transport | 6078.81 | 33.26 | 62.15 | | | | | | 6174.22 |
| 4. Other sectors | 3441.78 | 341.95 | 134.90 | | | | | | 3918.63 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 661.66 | 277.64 | 0.25 | | | | | | 939.55 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 661.66 | 277.64 | 0.25 | | | | | | 939.55 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2704.65 | 3.23 | 743.16 | 338.04 | NO | 11.98 | NO | NO | 3801.07 |
| A. Mineral industry | 1875.24 | | | | | | | | 1875.24 |
| B. Chemical industry | 676.64 | 3.23 | 709.79 | NO | NO | NO | NO | NO | 1389.66 |
| C. Metal industry | 23.41 | NA,NO | NO | NO | NO | NO | NO | NO | 23.41 |
| D. Non-energy products from fuels and solvent use | 129.36 | NA | NA | | | | | | 129.36 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 338.04 | NO | NO | NO | NO | 338.04 |
| G. Other product manufacture and use | NO | NO | 33.38 | NO | NO | 11.98 | NO | NO | 45.35 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 96.60 | 1610.00 | 1792.38 | | | | | | 3498.98 |
| A. Enteric fermentation | | 1155.57 | | | | | | | 1155.57 |
| B. Manure management | | 454.43 | 186.36 | | | | | | 640.79 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1606.02 | | | | | | 1606.02 |
| 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]** | -7261.82 | 9.58 | 93.70 | | | | | | -7158.54 |
| A. Forest land | -7617.73 | 8.64 | 5.70 | | | | | | -7603.39 |
| B. Cropland | 10.12 | NO | 15.39 | | | | | | 25.51 |
| C. Grassland | -31.16 | 0.94 | 1.02 | | | | | | -29.19 |
| D. Wetlands | 15.36 | NO | 2.16 | | | | | | 17.51 |
| E. Settlements | 657.54 | NO | 69.43 | | | | | | 726.97 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -295.95 | | | | | | | | -295.95 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.67 | 1714.28 | 86.28 | | | | | | 1801.22 |
| A. Solid waste disposal | NA,NO | 1311.62 | | | | | | | 1311.62 |
| B. Biological treatment of solid waste | | 1.49 | 1.06 | | | | | | 2.55 |
| C. Incineration and open burning of waste | 0.67 | NA,NO | 0.01 | | | | | | 0.68 |
| D. Waste water treatment and discharge | | 401.17 | 85.21 | | | | | | 486.38 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 384.96 | 0.21 | 3.17 | | | | | | 388.33 |
| Aviation | 317.46 | 0.06 | 2.65 | | | | | | 320.16 |
| Navigation | 67.50 | 0.15 | 0.52 | | | | | | 68.17 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5298.65 | | | | | | | | 5298.65 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3363.32 | | | | | | | | 3363.32 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 30822.85 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 23664.31 |
| **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 A5.2-21: GHG emission in Croatia, 2009

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

Inventory 2009
Submission 2020 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]** | 14616.90 | 4074.62 | 2309.82 | 341.35 | 0.26 | 8.03 | NO | NO | 21350.98 |
| **1. Energy** | 19666.36 | 669.37 | 225.37 | | | | | | 20561.11 |
| A. Fuel combustion (sectoral approach) | 19067.88 | 399.78 | 225.14 | | | | | | 19692.81 |
| 1. Energy industries | 6365.42 | 4.77 | 21.01 | | | | | | 6391.20 |
| 2. Manufacturing industries and construction | 3157.36 | 5.28 | 9.34 | | | | | | 3171.98 |
| 3. Transport | 6090.76 | 33.73 | 61.12 | | | | | | 6185.61 |
| 4. Other sectors | 3454.34 | 356.00 | 133.68 | | | | | | 3944.02 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 598.48 | 269.59 | 0.23 | | | | | | 868.30 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 598.48 | 269.59 | 0.23 | | | | | | 868.30 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2094.31 | 2.91 | 625.49 | 341.35 | 0.26 | 8.03 | NO | NO | 3072.35 |
| A. Mineral industry | 1460.36 | | | | | | | | 1460.36 |
| B. Chemical industry | 529.27 | 2.91 | 593.20 | NO | NO | NO | NO | NO | 1125.38 |
| C. Metal industry | 4.84 | NA,NO | NO | NO | NO | NO | NO | NO | 4.84 |
| D. Non-energy products from fuels and solvent use | 99.84 | NA | NA | | | | | | 99.84 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 341.35 | 0.26 | NO | NO | NO | 341.61 |
| G. Other product manufacture and use | NO | NO | 32.29 | NO | NO | 8.03 | NO | NO | 40.32 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 76.96 | 1632.33 | 1273.03 | | | | | | 2982.33 |
| A. Enteric fermentation | | 1145.60 | | | | | | | 1145.60 |
| B. Manure management | | 486.73 | 185.53 | | | | | | 672.26 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1087.51 | | | | | | 1087.51 |
| 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]** | -7220.90 | 5.10 | 98.37 | | | | | | -7117.43 |
| A. Forest land | -7822.38 | 4.87 | 3.21 | | | | | | -7814.29 |
| B. Cropland | 0.59 | NO | 17.90 | | | | | | 18.49 |
| C. Grassland | 10.82 | 0.22 | 0.24 | | | | | | 11.28 |
| D. Wetlands | 12.34 | NO | 1.68 | | | | | | 14.02 |
| E. Settlements | 742.74 | NO | 75.33 | | | | | | 818.07 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -165.01 | | | | | | | | -165.01 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.16 | 1764.91 | 87.56 | | | | | | 1852.63 |
| A. Solid waste disposal | NA,NO | 1412.90 | | | | | | | 1412.90 |
| B. Biological treatment of solid waste | | 1.25 | 0.89 | | | | | | 2.14 |
| C. Incineration and open burning of waste | 0.16 | NA,NO | NA,NO,IE | | | | | | 0.16 |
| D. Waste water treatment and discharge | | 350.76 | 86.67 | | | | | | 437.43 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 292.16 | 0.10 | 2.42 | | | | | | 294.68 |
| Aviation | 270.31 | 0.05 | 2.25 | | | | | | 272.61 |
| Navigation | 21.85 | 0.05 | 0.17 | | | | | | 22.07 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5576.02 | | | | | | | | 5576.02 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3485.54 | | | | | | | | 3485.54 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 28468.42 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 21350.98 |
| **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 A5.2-22: GHG emission in Croatia, 2010

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

Inventory 2010
Submission 2020 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]** | 14014.89 | 4146.94 | 2553.88 | 378.87 | 0.03 | 8.95 | NO | NO | 21103.56 |
| **1. Energy** | 18831.12 | 693.86 | 224.50 | | | | | | 19749.48 |
| A. Fuel combustion (sectoral approach) | 18264.78 | 423.47 | 224.28 | | | | | | 18912.53 |
| 1. Energy industries | 5877.34 | 4.34 | 21.72 | | | | | | 5903.40 |
| 2. Manufacturing industries and construction | 3015.80 | 5.21 | 9.09 | | | | | | 3030.11 |
| 3. Transport | 5865.48 | 30.93 | 58.25 | | | | | | 5954.67 |
| 4. Other sectors | 3506.16 | 382.98 | 135.21 | | | | | | 4024.35 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 566.34 | 270.39 | 0.22 | | | | | | 836.96 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 566.34 | 270.39 | 0.22 | | | | | | 836.96 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2131.65 | 2.72 | 794.86 | 378.87 | 0.03 | 8.95 | NO | NO | 3317.09 |
| A. Mineral industry | 1409.70 | | | | | | | | 1409.70 |
| B. Chemical industry | 615.36 | 2.72 | 765.00 | NO | NO | NO | NO | NO | 1383.07 |
| C. Metal industry | 14.68 | NA,NO | NO | NO | NO | NO | NO | NO | 14.68 |
| D. Non-energy products from fuels and solvent use | 91.92 | NA | NA | | | | | | 91.92 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 378.87 | 0.03 | NO | NO | NO | 378.91 |
| G. Other product manufacture and use | NO | NO | 29.86 | NO | NO | 8.95 | NO | NO | 38.81 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 88.04 | 1621.54 | 1346.70 | | | | | | 3056.27 |
| A. Enteric fermentation | | 1134.56 | | | | | | | 1134.56 |
| B. Manure management | | 486.98 | 178.48 | | | | | | 665.46 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1168.22 | | | | | | 1168.22 |
| 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]** | -7035.97 | 1.76 | 104.05 | | | | | | -6930.17 |
| A. Forest land | -7644.20 | 1.64 | 1.08 | | | | | | -7641.48 |
| B. Cropland | 99.84 | NO | 20.41 | | | | | | 120.26 |
| C. Grassland | -4.92 | 0.12 | 0.13 | | | | | | -4.67 |
| D. Wetlands | 9.32 | NO | 1.19 | | | | | | 10.52 |
| E. Settlements | 741.41 | NO | 81.23 | | | | | | 822.64 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -237.43 | | | | | | | | -237.43 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.05 | 1827.06 | 83.77 | | | | | | 1910.88 |
| A. Solid waste disposal | NA,NO | 1451.99 | | | | | | | 1451.99 |
| B. Biological treatment of solid waste | | 1.35 | 0.96 | | | | | | 2.31 |
| C. Incineration and open burning of waste | 0.05 | NA,NO | NA,NO,IE | | | | | | 0.05 |
| D. Waste water treatment and discharge | | 373.72 | 82.81 | | | | | | 456.53 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other *(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 315.09 | 0.10 | 2.61 | | | | | | 317.80 |
| Aviation | 295.46 | 0.05 | 2.46 | | | | | | 297.97 |
| Navigation | 19.64 | 0.04 | 0.15 | | | | | | 19.83 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5940.55 | | | | | | | | 5940.55 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3583.56 | | | | | | | | 3583.56 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 28033.73 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 21103.56 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 2011
Submission 2020 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]** | 14811.79 | 4113.96 | 2650.19 | 396.20 | 0.02 | 9.37 | NO | NO | 21981.51 |
| **1. Energy** | 18617.19 | 661.16 | 221.20 | | | | | | 19499.55 |
| A. Fuel combustion (sectoral approach) | 18035.81 | 412.05 | 220.99 | | | | | | 18668.85 |
| 1. Energy industries | 6247.86 | 5.02 | 23.00 | | | | | | 6275.88 |
| 2. Manufacturing industries and construction | 2779.55 | 4.57 | 8.00 | | | | | | 2792.12 |
| 3. Transport | 5726.55 | 29.42 | 56.43 | | | | | | 5812.39 |
| 4. Other sectors | 3281.84 | 373.05 | 133.57 | | | | | | 3788.46 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 581.38 | 249.11 | 0.20 | | | | | | 830.69 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 581.38 | 249.11 | 0.20 | | | | | | 830.69 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1960.02 | 1.75 | 789.27 | 396.20 | 0.02 | 9.37 | NO | NO | 3156.62 |
| A. Mineral industry | 1264.01 | | | | | | | | 1264.01 |
| B. Chemical industry | 593.19 | 1.75 | 753.93 | NO | NO | NO | NO | NO | 1348.87 |
| C. Metal industry | 16.64 | NA,NO | NO | NO | NO | NO | NO | NO | 16.64 |
| D. Non-energy products from fuels and solvent use | 86.19 | NA | NA | | | | | | 86.19 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 396.20 | 0.02 | NO | NO | NO | 396.21 |
| G. Other product manufacture and use | NO | NO | 35.33 | NO | NO | 9.37 | NO | NO | 44.70 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 105.18 | 1575.30 | 1429.41 | | | | | | 3109.89 |
| A. Enteric fermentation | | 1106.85 | | | | | | | 1106.85 |
| B. Manure management | | 468.45 | 168.20 | | | | | | 636.65 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1261.21 | | | | | | 1261.21 |
| 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]** | -5870.65 | 18.63 | 125.62 | | | | | | -5726.41 |
| A. Forest land | -6555.10 | 15.20 | 10.02 | | | | | | -6529.88 |
| B. Cropland | 130.83 | NO | 22.52 | | | | | | 153.35 |
| C. Grassland | 16.37 | 3.43 | 3.74 | | | | | | 23.53 |
| D. Wetlands | 9.35 | NO | 1.20 | | | | | | 10.55 |
| E. Settlements | 787.53 | NO | 88.14 | | | | | | 875.67 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -259.63 | | | | | | | | -259.63 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.05 | 1857.12 | 84.70 | | | | | | 1941.87 |
| A. Solid waste disposal | NA,NO | 1493.11 | | | | | | | 1493.11 |
| B. Biological treatment of solid waste | | 1.40 | 1.00 | | | | | | 2.40 |
| C. Incineration and open burning of waste | 0.05 | NA,NO | NA,NO,IE | | | | | | 0.05 |
| D. Waste water treatment and discharge | | 362.61 | 83.70 | | | | | | 446.31 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 387.14 | 0.23 | 3.18 | | | | | | 390.55 |
| Aviation | 311.17 | 0.05 | 2.59 | | | | | | 313.82 |
| Navigation | 75.97 | 0.17 | 0.59 | | | | | | 76.73 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5834.09 | | | | | | | | 5834.09 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3696.79 | | | | | | | | 3696.79 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 27707.92 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 21981.51 |
| **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 2020 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]** | 13648.08 | 4087.37 | 2465.42 | 397.28 | 0.03 | 9.18 | NO | NO | 20607.35 |
| **1. Energy** | 17242.22 | 622.07 | 212.92 | | | | | | 18077.21 |
| A. Fuel combustion (sectoral approach) | 16750.66 | 406.55 | 212.74 | | | | | | 17369.95 |
| 1. Energy industries | 5849.20 | 4.88 | 21.78 | | | | | | 5875.87 |
| 2. Manufacturing industries and construction | 2409.07 | 4.69 | 8.12 | | | | | | 2421.88 |
| 3. Transport | 5550.77 | 25.42 | 54.81 | | | | | | 5631.01 |
| 4. Other sectors | 2941.62 | 371.55 | 128.03 | | | | | | 3441.19 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 491.56 | 215.52 | 0.18 | | | | | | 707.27 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 491.56 | 215.52 | 0.18 | | | | | | 707.27 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1771.24 | NO,NE,IE,NA | 701.69 | 397.28 | 0.03 | 9.18 | NO | NO | 2879.42 |
| A. Mineral industry | 1188.20 | | | | | | | | 1188.20 |
| B. Chemical industry | 502.01 | NO,NE,IE | 652.37 | NO | NO | NO | NO | NO | 1154.37 |
| C. Metal industry | 1.43 | NA,NO | NO | NO | NO | NO | NO | NO | 1.43 |
| D. Non-energy products from fuels and solvent use | 79.60 | NA | NA | | | | | | 79.60 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 397.28 | 0.03 | NO | NO | NO | 397.31 |
| G. Other product manufacture and use | NO | NO | 49.32 | NO | NO | 9.18 | NO | NO | 58.50 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 101.23 | 1572.54 | 1315.95 | | | | | | 2989.72 |
| A. Enteric fermentation | | 1114.37 | | | | | | | 1114.37 |
| B. Manure management | | 458.17 | 164.92 | | | | | | 623.09 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1151.03 | | | | | | 1151.03 |
| 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]** | -5466.70 | 38.88 | 147.71 | | | | | | -5280.11 |
| A. Forest land | -6182.78 | 36.09 | 23.80 | | | | | | -6122.89 |
| B. Cropland | 210.39 | NO | 24.63 | | | | | | 235.02 |
| C. Grassland | -17.61 | 2.79 | 3.04 | | | | | | -11.78 |
| D. Wetlands | 9.38 | NO | 1.20 | | | | | | 10.58 |
| E. Settlements | 824.10 | NO | 95.04 | | | | | | 919.14 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -310.18 | | | | | | | | -310.18 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.08 | 1853.87 | 87.16 | | | | | | 1941.11 |
| A. Solid waste disposal | NA,NO | 1534.59 | | | | | | | 1534.59 |
| B. Biological treatment of solid waste | | 2.60 | 1.86 | | | | | | 4.45 |
| C. Incineration and open burning of waste | 0.08 | NA,NO | NA,NO,IE | | | | | | 0.08 |
| D. Waste water treatment and discharge | | 316.68 | 85.30 | | | | | | 401.98 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 342.53 | 0.09 | 2.85 | | | | | | 345.46 |
| Aviation | 330.03 | 0.06 | 2.75 | | | | | | 332.84 |
| Navigation | 12.50 | 0.03 | 0.10 | | | | | | 12.62 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 6011.36 | | | | | | | | 6011.36 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3832.35 | | | | | | | | 3832.35 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 25887.46 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 20607.35 |
| **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 2020 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]** | 12270.00 | 3814.10 | 1844.11 | 469.19 | NO | 6.05 | NO | NO | 18403.46 |
| **1. Energy** | 16504.21 | 609.08 | 209.77 | | | | | | 17323.06 |
| A. Fuel combustion (sectoral approach) | 16034.53 | 404.36 | 209.59 | | | | | | 16648.49 |
| 1. Energy industries | 5238.07 | 4.16 | 20.92 | | | | | | 5263.15 |
| 2. Manufacturing industries and construction | 2380.65 | 4.40 | 7.72 | | | | | | 2392.78 |
| 3. Transport | 5636.16 | 26.57 | 55.07 | | | | | | 5717.80 |
| 4. Other sectors | 2779.65 | 369.23 | 125.88 | | | | | | 3274.76 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 469.67 | 204.72 | 0.18 | | | | | | 674.57 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 469.67 | 204.72 | 0.18 | | | | | | 674.57 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1875.76 | NO,NE,IE,NA | 275.15 | 469.19 | NO | 6.05 | NO | NO | 2626.15 |
| A. Mineral industry | 1278.46 | | | | | | | | 1278.46 |
| B. Chemical industry | 509.33 | NO,NE,IE | 240.27 | NO | NO | NO | NO | NO | 749.60 |
| C. Metal industry | 13.93 | NA,NO | NO | NO | NO | NO | NO | NO | 13.93 |
| D. Non-energy products from fuels and solvent use | 74.04 | NA | NA | | | | | | 74.04 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 469.19 | NO | NO | NO | NO | 469.19 |
| G. Other product manufacture and use | NO | NO | 34.88 | NO | NO | 6.05 | NO | NO | 40.93 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 74.61 | 1501.07 | 1147.99 | | | | | | 2723.67 |
| A. Enteric fermentation | | 1067.16 | | | | | | | 1067.16 |
| B. Manure management | | 433.91 | 156.75 | | | | | | 590.66 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 991.24 | | | | | | 991.24 |
| 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]** | -6184.62 | 1.93 | 122.37 | | | | | | -6060.32 |
| A. Forest land | -6705.27 | 1.46 | 0.96 | | | | | | -6702.85 |
| B. Cropland | 372.45 | NO | 24.08 | | | | | | 396.53 |
| C. Grassland | -68.17 | 0.47 | 0.51 | | | | | | -67.19 |
| D. Wetlands | 10.70 | NO | 1.25 | | | | | | 11.95 |
| E. Settlements | 666.69 | NO | 95.57 | | | | | | 762.25 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -461.02 | | | | | | | | -461.02 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.04 | 1702.02 | 88.84 | | | | | | 1790.90 |
| A. Solid waste disposal | NA,NO | 1544.76 | | | | | | | 1544.76 |
| B. Biological treatment of solid waste | | 4.11 | 2.94 | | | | | | 7.05 |
| C. Incineration and open burning of waste | 0.04 | NA,NO | NA,NO,IE | | | | | | 0.04 |
| D. Waste water treatment and discharge | | 153.15 | 85.90 | | | | | | 239.05 |
| 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** | 379.01 | 0.09 | 3.11 | | | | | | 382.22 |
| Aviation | 366.52 | 0.06 | 3.01 | | | | | | 369.59 |
| Navigation | 12.50 | 0.03 | 0.10 | | | | | | 12.62 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5957.30 | | | | | | | | 5957.30 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 3971.56 | | | | | | | | 3971.56 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 24463.77 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 18403.46 |
| **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 2020 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]** | 11496.44 | 3854.83 | 1777.38 | 474.76 | NO | 6.77 | NO | NO | 17610.19 |
| **1. Energy** | 15634.59 | 553.38 | 198.28 | | | | | | 16386.24 |
| A. Fuel combustion (sectoral approach) | 15179.13 | 362.17 | 198.10 | | | | | | 15739.40 |
| 1. Energy industries | 4743.91 | 3.23 | 17.95 | | | | | | 4765.09 |
| 2. Manufacturing industries and construction | 2324.33 | 3.84 | 6.79 | | | | | | 2334.97 |
| 3. Transport | 5580.36 | 29.77 | 54.60 | | | | | | 5664.73 |
| 4. Other sectors | 2530.53 | 325.33 | 118.76 | | | | | | 2974.62 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 455.46 | 191.22 | 0.17 | | | | | | 646.85 |
| 1. Solid fuels | NO | NO | NA,NO | | | | | | NO,NA |
| 2. Oil and natural gas | 455.46 | 191.22 | 0.17 | | | | | | 646.85 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2000.89 | NO,NE,IE,NA | 269.52 | 474.76 | NO | 6.77 | NO | NO | 2751.94 |
| A. Mineral industry | 1361.94 | | | | | | | | 1361.94 |
| B. Chemical industry | 559.83 | NO,NE,IE | 266.19 | NO | NO | NO | NO | NO | 826.03 |
| C. Metal industry | 10.11 | NA,NO | NO | NO | NO | NO | NO | NO | 10.11 |
| D. Non-energy products from fuels and solvent use | 69.00 | NA | NA | | | | | | 69.00 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 474.76 | NO | NO | NO | NO | 474.76 |
| G. Other product manufacture and use | NO | NO | 3.33 | NO | NO | 6.77 | NO | NO | 10.09 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 69.47 | 1482.29 | 1098.56 | | | | | | 2650.31 |
| A. Enteric fermentation | | 1048.97 | | | | | | | 1048.97 |
| B. Manure management | | 433.31 | 157.73 | | | | | | 591.04 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 940.83 | | | | | | 940.83 |
| 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]** | -6208.54 | 0.32 | 121.13 | | | | | | -6087.09 |
| A. Forest land | -6412.25 | 0.22 | 0.14 | | | | | | -6411.89 |
| B. Cropland | 239.19 | 0.08 | 23.59 | | | | | | 262.86 |
| C. Grassland | -52.49 | 0.03 | 0.03 | | | | | | -52.44 |
| D. Wetlands | 10.99 | NO | 1.29 | | | | | | 12.29 |
| E. Settlements | 664.09 | NO | 96.07 | | | | | | 760.16 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -658.07 | | | | | | | | -658.07 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.04 | 1818.84 | 89.90 | | | | | | 1908.79 |
| A. Solid waste disposal | NA,NO | 1608.20 | | | | | | | 1608.20 |
| B. Biological treatment of solid waste | | 3.97 | 2.84 | | | | | | 6.81 |
| C. Incineration and open burning of waste | 0.04 | NA,NO | NA,NO,IE | | | | | | 0.04 |
| D. Waste water treatment and discharge | | 206.67 | 87.06 | | | | | | 293.73 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 383.77 | 0.10 | 3.15 | | | | | | 387.01 |
| Aviation | 368.10 | 0.06 | 3.03 | | | | | | 371.19 |
| Navigation | 15.66 | 0.04 | 0.12 | | | | | | 15.82 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5245.05 | | | | | | | | 5245.05 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 4097.53 | | | | | | | | 4097.53 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23697.28 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 17610.19 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 2015
Submission 2020 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]** | 12570.92 | 3960.49 | 1981.12 | 482.50 | NO | 5.22 | NO | NO | 19000.25 |
| **1. Energy** | 15804.39 | 611.49 | 209.32 | | | | | | 16625.21 |
| A. Fuel combustion (sectoral approach) | 15548.70 | 409.33 | 209.13 | | | | | | 16167.16 |
| 1. Energy industries | 4718.82 | 4.13 | 19.62 | | | | | | 4742.57 |
| 2. Manufacturing industries and construction | 2222.70 | 3.33 | 5.98 | | | | | | 2232.02 |
| 3. Transport | 5887.42 | 28.83 | 56.81 | | | | | | 5973.06 |
| 4. Other sectors | 2719.76 | 373.03 | 126.72 | | | | | | 3219.51 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 255.69 | 202.17 | 0.19 | | | | | | 458.05 |
| 1. Solid fuels | NO | NO | NA,NO | | | | | | NO,NA |
| 2. Oil and natural gas | 255.69 | 202.17 | 0.19 | | | | | | 458.05 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1966.97 | NO,NE,IE,NA | 368.50 | 482.50 | NO | 5.22 | NO | NO | 2823.19 |
| A. Mineral industry | 1314.68 | | | | | | | | 1314.68 |
| B. Chemical industry | 572.27 | NO,NE,IE | 311.35 | NO | NO | NO | NO | NO | 883.62 |
| C. Metal industry | 9.30 | NA,NO | NO | NO | NO | NO | NO | NO | 9.30 |
| D. Non-energy products from fuels and solvent use | 70.72 | NA | NA | | | | | | 70.72 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 482.50 | NO | NO | NO | NO | 482.50 |
| G. Other product manufacture and use | NO | NO | 57.16 | NO | NO | 5.22 | NO | NO | 62.37 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 69.34 | 1473.44 | 1179.50 | | | | | | 2722.28 |
| A. Enteric fermentation | | 1038.96 | | | | | | | 1038.96 |
| B. Manure management | | 434.48 | 155.67 | | | | | | 590.15 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1023.83 | | | | | | 1023.83 |
| 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]** | -5269.83 | 13.96 | 130.80 | | | | | | -5125.07 |
| A. Forest land | -5428.19 | 9.82 | 6.48 | | | | | | -5411.89 |
| B. Cropland | 383.44 | 2.58 | 24.69 | | | | | | 410.70 |
| C. Grassland | -107.41 | 1.57 | 1.70 | | | | | | -104.14 |
| D. Wetlands | 11.28 | NO | 1.34 | | | | | | 12.62 |
| E. Settlements | 677.15 | NO | 96.59 | | | | | | 773.74 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -806.10 | | | | | | | | -806.10 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.05 | 1861.60 | 93.00 | | | | | | 1954.64 |
| A. Solid waste disposal | NA,NO | 1670.06 | | | | | | | 1670.06 |
| B. Biological treatment of solid waste | | 7.49 | 5.36 | | | | | | 12.84 |
| C. Incineration and open burning of waste | 0.05 | NA,NO | NA,NO,IE | | | | | | 0.05 |
| D. Waste water treatment and discharge | | 184.05 | 87.64 | | | | | | 271.69 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 365.05 | 0.09 | 3.00 | | | | | | 368.13 |
| Aviation | 354.08 | 0.06 | 2.91 | | | | | | 357.05 |
| Navigation | 10.97 | 0.03 | 0.09 | | | | | | 11.08 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 6006.75 | | | | | | | | 6006.75 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 4246.97 | | | | | | | | 4246.97 |
| **Indirect $N_2O$** | | | NA,NO | | | | | | |
| **Indirect $CO_2$ [3]** | NA,NO | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 24125.31 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 19000.25 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 2016
Submission 2020 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]** | 12788.70 | 4093.94 | 1722.78 | 483.53 | NO | 6.39 | NO | NO | 19095.34 |
| **1. Energy** | 16194.04 | 602.70 | 212.76 | | | | | | 17009.50 |
| A. Fuel combustion (sectoral approach) | 15971.52 | 399.72 | 212.55 | | | | | | 16583.79 |
| 1. Energy industries | 4846.79 | 5.45 | 23.03 | | | | | | 4875.27 |
| 2. Manufacturing industries and construction | 2228.67 | 2.89 | 5.25 | | | | | | 2236.81 |
| 3. Transport | 6106.03 | 28.97 | 59.88 | | | | | | 6194.88 |
| 4. Other sectors | 2790.02 | 362.42 | 124.40 | | | | | | 3276.83 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 222.52 | 202.98 | 0.21 | | | | | | 425.71 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 222.52 | 202.98 | 0.21 | | | | | | 425.71 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1834.79 | NO,NE,IE,NA | 164.24 | 483.53 | NO | 6.39 | NO | NO | 2488.96 |
| A. Mineral industry | 1209.33 | | | | | | | | 1209.33 |
| B. Chemical industry | 547.86 | NO,NE,IE | 109.36 | NO | NO | NO | NO | NO | 657.22 |
| C. Metal industry | 1.05 | NO,NA | NO | NO | NO | NO | NO | NO | 1.05 |
| D. Non-energy products from fuels and solvent use | 76.54 | NA | NA | | | | | | 76.54 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 483.53 | NO | NO | NO | NO | 483.53 |
| G. Other product manufacture and use | NO | NO | 54.89 | NO | NO | 6.39 | NO | NO | 61.28 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 76.17 | 1475.27 | 1127.35 | | | | | | 2678.79 |
| A. Enteric fermentation | | 1042.27 | | | | | | | 1042.27 |
| B. Manure management | | 432.99 | 152.78 | | | | | | 585.78 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 974.57 | | | | | | 974.57 |
| 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]** | -5316.35 | 8.92 | 127.43 | | | | | | -5180.00 |
| A. Forest land | -5536.68 | 7.42 | 4.89 | | | | | | -5524.36 |
| B. Cropland | 500.65 | 0.05 | 22.48 | | | | | | 523.18 |
| C. Grassland | -196.65 | 1.44 | 1.57 | | | | | | -193.64 |
| D. Wetlands | 11.57 | NO | 1.39 | | | | | | 12.95 |
| E. Settlements | 668.18 | NO | 97.10 | | | | | | 765.28 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -763.42 | | | | | | | | -763.42 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | 0.05 | 2007.06 | 91.00 | | | | | | 2098.10 |
| A. Solid waste disposal | NO,NA | 1716.34 | | | | | | | 1716.34 |
| B. Biological treatment of solid waste | | 3.75 | 2.68 | | | | | | 6.43 |
| C. Incineration and open burning of waste | 0.05 | NO,NA | NO,IE,NA | | | | | | 0.05 |
| D. Waste water treatment and discharge | | 286.97 | 88.31 | | | | | | 375.28 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Memo items:[2]** | | | | | | | | | |
| **International bunkers** | 388.96 | 0.10 | 3.19 | | | | | | 392.25 |
| Aviation | 375.75 | 0.06 | 3.09 | | | | | | 378.91 |
| Navigation | 13.21 | 0.03 | 0.10 | | | | | | 13.35 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5970.35 | | | | | | | | 5970.35 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 4373.62 | | | | | | | | 4373.62 |
| **Indirect $N_2O$** | | | NO,NA | | | | | | |
| **Indirect $CO_2$ [3]** | NO,NA | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 24275.34 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 19095.34 |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, without land use, land-use change and forestry** | | | | | | | | | NA |
| **Total $CO_2$ equivalent emissions, including indirect $CO_2$, with land use, land-use change and forestry** | | | | | | | | | NA |

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

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

Inventory 2017
Submission 2020 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]** | 14008.72 | 4138.35 | 1900.42 | 489.00 | NO | 5.71 | NO | NO | 20542.20 |
| **1. Energy** | 16581.63 | 591.92 | 214.53 | | | | | | 17388.08 |
| A. Fuel combustion (sectoral approach) | 16285.79 | 391.27 | 214.33 | | | | | | 16891.39 |
| 1. Energy industries | 4464.77 | 6.91 | 21.55 | | | | | | 4493.22 |
| 2. Manufacturing industries and construction | 2429.58 | 3.52 | 6.29 | | | | | | 2439.39 |
| 3. Transport | 6569.95 | 28.52 | 63.72 | | | | | | 6662.20 |
| 4. Other sectors | 2821.50 | 352.31 | 122.76 | | | | | | 3296.57 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 295.84 | 200.65 | 0.21 | | | | | | 496.69 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 295.84 | 200.65 | 0.21 | | | | | | 496.69 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 2074.93 | NO,NE,IE,NA | 168.38 | 489.00 | NO | 5.71 | NO | NO | 2738.02 |
| A. Mineral industry | 1432.74 | | | | | | | | 1432.74 |
| B. Chemical industry | 566.79 | NO,NE,IE | 98.60 | NO | NO | NO | NO | NO | 665.39 |
| C. Metal industry | 1.87 | NO,NA | NO | NO | NO | NO | NO | NO | 1.87 |
| D. Non-energy products from fuels and solvent use | 73.54 | NA | NA | | | | | | 73.54 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 489.00 | NO | NO | NO | NO | 489.00 |
| G. Other product manufacture and use | NO | NO | 69.78 | NO | NO | 5.71 | NO | NO | 75.49 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 81.13 | 1467.83 | 1256.09 | | | | | | 2805.05 |
| A. Enteric fermentation | | 1042.93 | | | | | | | 1042.93 |
| B. Manure management | | 424.90 | 149.22 | | | | | | 574.12 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1106.87 | | | | | | 1106.87 |
| 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]** | -4728.97 | 69.23 | 169.85 | | | | | | -4489.88 |
| A. Forest land | -4645.92 | 61.21 | 40.36 | | | | | | -4544.34 |
| B. Cropland | 387.79 | 0.48 | 22.22 | | | | | | 410.49 |
| C. Grassland | -146.26 | 7.54 | 8.21 | | | | | | -130.50 |
| D. Wetlands | 11.85 | NO | 1.43 | | | | | | 13.28 |
| E. Settlements | 671.81 | NO | 97.63 | | | | | | 769.44 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -1008.25 | | | | | | | | -1008.25 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | NO,NA | 2009.36 | 91.57 | | | | | | 2100.93 |
| A. Solid waste disposal | NO,NA | 1775.23 | | | | | | | 1775.23 |
| B. Biological treatment of solid waste | | 4.24 | 3.04 | | | | | | 7.28 |
| C. Incineration and open burning of waste | NO | NO,NA | NO,NA | | | | | | NO,NA |
| D. Waste water treatment and discharge | | 229.89 | 88.53 | | | | | | 318.42 |
| E. Other | NO | NO | NO | | | | | | NO |
| **6. Other** ***(as specified in summary 1.A)*** | NO | NO | NO | NO | NO | NO | NO | NO | NO |

| **Memo items:[2]** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **International bunkers** | 469.17 | 0.12 | 3.85 | | | | | | 473.14 |
| Aviation | 449.06 | 0.08 | 3.69 | | | | | | 452.82 |
| Navigation | 20.11 | 0.05 | 0.16 | | | | | | 20.32 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 5906.57 | | | | | | | | 5906.57 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 4486.55 | | | | | | | | 4486.55 |
| **Indirect $N_2O$** | | | NO,NA | | | | | | |
| **Indirect $CO_2$ [3]** | NO,NA | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 25032.08 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 20542.20 |
| **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 2020 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]** | 12501.06 | 3890.02 | 1807.90 | 494.05 | NO | 5.53 | NO | NO | 18698.57 |
| **1. Energy** | 15672.91 | 558.04 | 212.09 | | | | | | 16443.04 |
| A. Fuel combustion (sectoral approach) | 15406.34 | 374.53 | 211.90 | | | | | | 15992.77 |
| 1. Energy industries | 3907.81 | 7.84 | 22.22 | | | | | | 3937.87 |
| 2. Manufacturing industries and construction | 2411.05 | 3.69 | 6.56 | | | | | | 2421.30 |
| 3. Transport | 6340.45 | 26.61 | 61.18 | | | | | | 6428.25 |
| 4. Other sectors | 2747.03 | 336.38 | 121.94 | | | | | | 3205.35 |
| 5. Other | NO,IE | NO,IE | NO,IE | | | | | | NO,IE |
| B. Fugitive emissions from fuels | 266.57 | 183.51 | 0.19 | | | | | | 450.27 |
| 1. Solid fuels | NO | NO | NO,NA | | | | | | NO,NA |
| 2. Oil and natural gas | 266.57 | 183.51 | 0.19 | | | | | | 450.27 |
| C. $CO_2$ transport and storage | NO | | | | | | | | NO |
| **2. Industrial processes and product use** | 1969.77 | NO,NE,IE,NA | 121.55 | 494.05 | NO | 5.53 | NO | NO | 2590.90 |
| A. Mineral industry | 1364.80 | | | | | | | | 1364.80 |
| B. Chemical industry | 513.06 | NO,NE,IE | 50.11 | NO | NO | NO | NO | NO | 563.17 |
| C. Metal industry | 8.99 | NO,NA | NO | NO | NO | NO | NO | NO | 8.99 |
| D. Non-energy products from fuels and solvent use | 82.91 | NA | NA | | | | | | 82.91 |
| E. Electronic Industry | | | | NO | NO | NO | NO | NO | NO |
| F. Product uses as ODS substitutes | | | | 494.05 | NO | NO | NO | NO | 494.05 |
| G. Other product manufacture and use | NO | NO | 71.44 | NO | NO | 5.53 | NO | NO | 76.97 |
| H. Other | NA | NA | NA | | | | | | NA |
| **3. Agriculture** | 75.96 | 1384.53 | 1259.80 | | | | | | 2720.30 |
| A. Enteric fermentation | | 983.26 | | | | | | | 983.26 |
| B. Manure management | | 401.27 | 136.32 | | | | | | 537.59 |
| C. Rice cultivation | | NO | | | | | | | NO |
| D. Agricultural soils | | NE | 1123.49 | | | | | | 1123.49 |
| 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 | 65.05 | | | | | | | | 65.05 |
| I. Other carbon-containing fertilizers | NA | | | | | | | | NA |
| J. Other | NO | NO | NO | | | | | | NO |
| **4. Land use, land-use change and forestry[1]** | -5217.58 | 1.30 | 122.05 | | | | | | -5094.23 |
| A. Forest land | -5384.61 | 0.84 | 0.56 | | | | | | -5383.21 |
| B. Cropland | 448.97 | 0.01 | 21.35 | | | | | | 470.33 |
| C. Grassland | -223.38 | 0.45 | 0.49 | | | | | | -222.44 |
| D. Wetlands | 12.14 | NO | 1.48 | | | | | | 13.62 |
| E. Settlements | 675.29 | NO | 98.18 | | | | | | 773.47 |
| F. Other land | NO | NO | NO | | | | | | NO |
| G. Harvested wood products | -746.00 | | | | | | | | -746.00 |
| H. Other | NO | NO | NO | | | | | | NO |
| **5. Waste** | NO,NA | 1946.15 | 92.40 | | | | | | 2038.55 |
| A. Solid waste disposal | NO,NA | 1771.44 | | | | | | | 1771.44 |
| B. Biological treatment of solid waste | | 4.76 | 3.40 | | | | | | 8.16 |
| C. Incineration and open burning of waste | NO | NO,NA | NO,NA | | | | | | NO,NA |
| D. Waste water treatment and discharge | | 169.95 | 89.00 | | | | | | 258.95 |
| 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** | 624.92 | 0.25 | 5.12 | | | | | | 630.29 |
| Aviation | 559.65 | 0.10 | 4.60 | | | | | | 564.35 |
| Navigation | 65.27 | 0.15 | 0.52 | | | | | | 65.94 |
| **Multilateral operations** | C | C | C | | | | | | C |
| **$CO_2$ emissions from biomass** | 6053.22 | | | | | | | | 6053.22 |
| **$CO_2$ captured** | NO | | | | | | | | NO |
| **Long-term storage of C in waste disposal sites** | 4597.68 | | | | | | | | 4597.68 |
| **Indirect $N_2O$** | | | NO,NA | | | | | | |
| **Indirect $CO_2$ [3]** | NO,NA | | | | | | | | |
| **Total $CO_2$ equivalent emissions without land use, land-use change and forestry** | | | | | | | | | 23792.80 |
| **Total $CO_2$ equivalent emissions with land use, land-use change and forestry** | | | | | | | | | 18698.57 |
| **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 |

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

Table 5.3-1: National net calorific values, CO2 emission factors and oxidation factors for 2018 (needed for monitoring and reporting on $CO_2$ emission)

| Gorivo | | DOV | | $CO_2$ Emisijski faktor (t $CO_2$/TJ) | Oksidacijski faktor (OF) |
|---|---|---|---|---|---|
| | | Jedinica | 2018 | | |
| 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 | 26,0000 | 94,60 | 1 |
| Kameni ugljen-*Termoelektrane* | Other bituminous coal *Thermal power plant* | GJ/t | 25,0020 | 94,60 | 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 | 19,0000 | 96,10 | 1 |
| Lignit | Lignite | GJ/t | 11,8500 | 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/$10^3m^3$ | 34,6400 | 56,10 | 1 |
| Gradski plin | Gas Works Gas | GJ/t | 38,7000 | 44,40 | 1 |
| Koksni plin | Coke Oven Gas | GJ/t | 38,7000 | 44,40 | 1 |
| Rafinerijski plin | Refinery Gas | GJ/t | 42,6000 | 57,60 | 1 |

*Proračuna emisije CO2 _ (Emisija = Potrošnja goriva*DOV*EF ($CO_2$)*OF)

Napomene:

- podcrtane vrijednosti za DOV su preuzete iz 2006 IPCC Vodiča jer u 2018. godini u Nacionalnoj energetskoj bilanci nisu specificirane

# Annex 5-4: Reporting on consistency of the reported data on air pollutants, for 2018.

| Pollutant: | CO | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EMISSION CATEGORIES | Pollutant | Emissions in greenhouse gas (GHG) inventory (in kt) | Emissions reported under Directive 2001/81/EC (NEC) (in kt) | Absolute difference in kt (1) | Relative difference in % (2) | Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt) | Absolute difference in kt (1) 2 | Relative difference in % (2) 3 | Explanations for differences |
| **Total (Net Emissions)** | | 233.78 | 234.87 | -1.09 | 0% | 234.8707563 | 1.09 | 0% | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| **1. Energy** | CO | 233.55 | 233.91 | -0.37 | 0.00 | 233.91 | 0.37 | 0.00 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| A. Fuel combustion (sector | CO | 211.18 | 211.54 | -0.37 | 0.00 | 211.54 | 0.37 | 0.00 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 1. Energy industries | CO | 1.35 | 1.35 | 0.00 | 0.00 | 1.35 | 0.00 | 0.00 | |
| 2. Manufacturing industr | CO | 8.66 | 8.66 | 0.00 | 0.00 | 8.66 | 0.00 | 0.00 | |
| 3. Transport | CO | 29.86 | 30.22 | -0.37 | -0.01 | 30.22 | 0.37 | 0.01 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 4. Other sectors | CO | 171.31 | 171.31 | 0.00 | 0.00 | 171.31 | 0.00 | 0.00 | |
| 5. Other | CO | NO | NO | NO | NO | NO | NO | NO | |
| B. Fugitive emissions from | CO | 22.37 | 22.37 | 0.00 | 0.00 | 22.37 | 0.00 | 0.00 | |
| 1. Solid fuels | CO | NO | NO | NO | NO | NO | NO | NO | |
| and other emissions from energy production | CO | 22.37 | 22.37 | 0.00 | 0.00 | 22.37 | 0.00 | 0.00 | |
| **2. Industrial processes and p** | CO | 0.23 | | 0.23 | NO | 0.23 | 0.00 | 0.00 | |
| A. Mineral industry | CO | NO,NA | | NO | NO | 0.00 | NO | NO | |
| B. Chemical industry | CO | 0.00 | 0.00 | 0.00 | -0.01 | 0.00 | 0.00 | 0.01 | |
| C. Metal industry | CO | 0.23 | 0.23 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | |
| D. Non-energy products fro | CO | 0.00 | NO | NO | NO | NO | NO | NO | |
| G. Other product manufact | CO | NO | NO | NO | NO | NO | NO | NO | |
| H. Other | CO | NE,NA | NE,NA | NO | NO | NE,NA | NO | NO | |
| **3. Agriculture** | CO | NO | NO | NO | NO | NO | NO | NO | |
| B. Manure management | CO | NO | NO | NO | NO | NO | NO | NO | |
| D. Agricultural soils | CO | NO | NO | NO | NO | NO | NO | NO | |
| F. Field burning of agricult | CO | NO | NO | NO | NO | NO | NO | NO | |
| J. Other | CO | NO | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | CO | NO,NE,IE,NA | | NO | NO | 0.00 | NO | NO | |
| A. Solid waste disposal | CO | NO,NE | | NO | NO | 0.00 | NO | NO | |
| B. Biological treatment of s | CO | NE,IE | | NO | NO | 0.00 | NO | NO | |
| C. Incineration and open b | CO | NO | NO | NO | NO | NO | NO | NO | |
| D. Wastewater treatment a | CO | NO,NA | | NO | NO | 0.00 | NO | NO | |
| E. Other | CO | NO | | NO | NO | 0.00 | NO | NO | |
| **6. Other** | CO | NO | | NO | NO | 0.00 | NO | NO | |

| Pollutant: | SO2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EMISSION CATEGORIES | Pollutant | Emissions in greenhouse gas (GHG) inventory (in kt) | Emissions reported under Directive 2001/81/EC (NEC) (in kt) | Absolute difference in kt (1) | Relative difference in % (2) | Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt) | Absolute difference in kt (1) 2 | Relative difference in % (2) 3 | Explanations for differences |
| **Total (Net Emissions)** | | NO | 10.30 | NO | NO | NO | 1.09 | NO | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| **1. Energy** | SO2 | 10.16 | 10.17 | -0.01 | 0.00 | 10.16 | 0.37 | 3.61 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| A. Fuel combustion (sectoral approach) | SO2 | 5.76 | 5.77 | -0.01 | 0.00 | 5.76 | 0.37 | 6.36 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 1. Energy industries | SO2 | 2.67 | 2.67 | 0.00 | 0.00 | 2.67 | 0.00 | 0.00 | |
| 2. Manufacturing industries and construction | SO2 | 2.18 | 2.18 | 0.00 | 0.00 | 2.18 | 0.00 | 0.00 | |
| 3. Transport | SO2 | 0.04 | 0.05 | -0.01 | -0.20 | 0.04 | 0.00 | 0.00 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 4. Other sectors | SO2 | 0.88 | 0.88 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | |
| 5. Other | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| B. Fugitive emissions from fuels | SO2 | 4.39 | 4.39 | 0.00 | 0.00 | 4.39 | 0.00 | 0.00 | |
| 1. Solid fuels | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas and other emissions from energy production | SO2 | 4.39 | 4.39 | 0.00 | 0.00 | 4.39 | 0.00 | 0.00 | |
| **2. Industrial processes and product use** | SO2 | NO | | NO | NO | NO | | NO | |
| A. Mineral industry | SO2 | | | NO | NO | | NO | NO | |
| B. Chemical industry | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| C. Metal industry | SO2 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | |
| D. Non-energy products from fuels and solvent use | SO2 | | NO | NO | NO | | NO | NO | |
| G. Other product manufacture and use | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| H. Other | SO2 | | NE,NA | NO | NO | | NO | NO | |
| **3. Agriculture** | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| B. Manure management | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| D. Agricultural soils | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| F. Field burning of agricultural residues | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| J. Other | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| A. Solid waste disposal | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| B. Biological treatment of solid waste | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| C. Incineration and open burning of waste | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| D. Wastewater treatment and discharge | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| E. Other | SO2 | NO | NO | NO | NO | NO | NO | NO | |
| **6. Other** | SO2 | NO | NO | NO | NO | NO | NO | NO | |

| Pollutant: | NOx | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EMISSION CATEGORIES | Pollutant | Emissions in greenhouse gas (GHG) inventory (in kt) | Emissions reported under Directive 2001/81/EC (NEC) (in kt) | Absolute difference in kt (1) | Relative difference in % (2) | Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt) | Absolute difference in kt (1) 2 | Relative difference in % (2) 3 | Explanations for differences |
| **Total (Net Emissions)** | | 45.92 | 50.53 | -4.62 | -9% | 50.53 | -4.62 | -9% | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| **1. Energy** | | 42.60 | 42.79 | -0.20 | 0.00 | 42.79 | -0.20 | 0.00 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| A. Fuel combustion (sectoral approach) | NOx | 42.44 | 42.63 | -0.20 | 0.00 | 42.63 | -0.20 | 0.00 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 1. Energy industries | NOx | 4.28 | 4.28 | 0.00 | 0.00 | 4.28 | 0.00 | 0.00 | |
| 2. Manufacturing industries and construction | NOx | 5.45 | 5.45 | 0.00 | 0.00 | 5.45 | 0.00 | 0.00 | |
| 3. Transport | NOx | 24.45 | 24.65 | -0.20 | -0.01 | 24.65 | -0.20 | -0.01 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 4. Other sectors | NOx | 8.26 | 8.26 | 0.00 | 0.00 | 8.26 | 0.00 | 0.00 | |
| 5. Other | NOx | NO | NO | NO | NO | NO | NO | NO | |
| B. Fugitive emissions from fuels | NOx | 0.16 | 0.16 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | |
| 1. Solid fuels | NOx | NO,NA | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas and other emissions from energy production | NOx | 0.16 | 0.16 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | |
| **2. Industrial processes and product use** | NOx | 0.89 | 0.94 | -0.05 | -0.05 | 0.94 | -0.05 | -0.05 | |
| A. Mineral industry | NOx | NO | NO | NO | NO | NO | NO | NO | |
| B. Chemical industry | NOx | 0.87 | 0.90 | -0.02 | -0.03 | 0.90 | -0.02 | -0.03 | |
| C. Metal industry | NOx | 0.02 | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | |
| D. Non-energy products from fuels and solvent use | NOx | NE,NA | 0.00 | NO | NO | 0.00 | NO | NO | |
| G. Other product manufacture and use | NOx | NO | NO | NO | NO | NO | NO | NO | |
| H. Other | NOx | | NE,NA | NO | NO | NE,NA | NO | NO | |
| **3. Agriculture** | NOx | 2.43 | 6.80 | -4.37 | -0.64 | 6.80 | -4.37 | -0.64 | In CRF data on Nox emissions cannot be entered |
| B. Manure management | NOx | NO | 0.08 | 2.62 | 33.10 | 0.08 | NO | NO | In CRF data on Nox emissions cannot be entered |
| D. Agricultural soils | NOx | 2.43 | 2.58 | -0.15 | -0.06 | 2.58 | -0.15 | -0.06 | |
| F. Field burning of agricultural residues | NOx | NO | NO | NO | NO | NO | NO | NO | |
| J. Other | NOx | NO | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | NOx | NO | NO | NO | NO | NO | NO | NO | |
| A. Solid waste disposal | NOx | NO,NA | | NO | NO | 0.00 | NO | NO | |
| B. Biological treatment of solid waste | NOx | NE,IE | | NO | NO | 0.00 | NO | NO | |
| C. Incineration and open burning of waste | NOx | NO | NO | NO | NO | NO | NO | NO | |
| D. Wastewater treatment and discharge | NOx | NO,NA | | NO | NO | 0.00 | NO | NO | |
| E. Other | NOx | NO | | NO | NO | 0.00 | NO | NO | |
| **6. Other** | NOx | NO | | NO | NO | 0.00 | NO | NO | |

| Pollutant: | NMVOC | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EMISSION CATEGORIES | Pollutant | Emissions in greenhouse gas (GHG) inventory (in kt) | Emissions reported under Directive 2001/81/EC (NEC) (in kt) | Absolute difference in kt (1) | Relative difference in % (2) | Emissions reported in the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) inventory (in kt) | Absolute difference in kt (1) 2 | Relative difference in % (2) 3 | Explanations for differences |
| **Total (Net Emissions)** | | 68.55 | 72.17 | -3.62 | -5% | 72.17 | -3.62 | -5% | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| **1. Energy** | NMVOC | 30.48 | 32.05 | -1.57 | -0.05 | 32.05 | -1.57 | -0.05 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| A. Fuel combustion (sectoral approach) | NMVOC | 26.79 | 28.36 | -1.57 | -0.06 | 28.36 | -1.57 | -0.06 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 1. Energy industries | NMVOC | 0.41 | 0.41 | 0.00 | 0.00 | 0.41 | 0.00 | 0.00 | |
| 2. Manufacturing industries and construction | NMVOC | 1.26 | 1.26 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 | |
| 3. Transport | NMVOC | 4.50 | 6.06 | -1.57 | -0.26 | 6.06 | -1.57 | -0.26 | In LRTAP report International aviation is reported in total country emisisons while in GHG inventory those emissions are excluded |
| 4. Other sectors | NMVOC | 20.62 | 20.62 | 0.00 | 0.00 | 20.62 | 0.00 | 0.00 | |
| 5. Other | NMVOC | NO | NO | NO | NO | NO | NO | NO | |
| B. Fugitive emissions from fuels | NMVOC | 3.69 | 3.69 | 0.00 | 0.00 | 3.69 | 0.00 | 0.00 | |
| 1. Solid fuels | NMVOC | NO,NA | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas and other emissions from energy production | NMVOC | 3.69 | 3.69 | 0.00 | 0.00 | 3.69 | 0.00 | 0.00 | |
| **2. Industrial processes and product use** | NMVOC | 29.06 | 29.98 | -0.97 | -0.03 | 29.98 | -0.97 | -0.03 | |
| A. Mineral industry | NMVOC | NO | 0.02 | NO | NO | 0.02 | NO | NO | In CRF NMVOC emission cannot be entered in glass sector |
| B. Chemical industry | NMVOC | 0.04 | 0.04 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | |
| C. Metal industry | NMVOC | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | |
| D. Non-energy products from fuels and solvent use | NMVOC | 25.60 | 25.60 | 0.00 | 0.00 | 25.60 | 0.00 | 0.00 | |
| G. Other product manufacture and use | NMVOC | NO | 0.91 | NO | NO | 0.91 | NO | NO | NMVOC emission in NRF is from product use. In CRF that NMVOC emission cannot be entered |
| H. Other | NMVOC | 3.41 | 3.40 | 0.00 | 0.00 | 3.40 | 0.00 | 0.00 | |
| **3. Agriculture** | NMVOC | 7.93 | 9.02 | -1.08 | -0.12 | 9.02 | -1.08 | -0.12 | |
| B. Manure management | NMVOC | 7.31 | 7.31 | 0.00 | 0.00 | 7.31 | 0.00 | 0.00 | |
| D. Agricultural soils | NMVOC | 0.63 | 1.71 | -1.08 | -0.63 | 1.71 | -1.08 | -0.63 | |
| F. Field burning of agricultural residues | NMVOC | NO | NO | NO | NO | NO | NO | NO | |
| J. Other | NMVOC | NO | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | NMVOC | 1.13 | 1.13 | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | |
| A. Solid waste disposal | NMVOC | 1.12 | 1.13 | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | |
| B. Biological treatment of solid waste | NMVOC | NE,IE | | NO | NO | 0.00 | NO | NO | |
| C. Incineration and open burning of waste | NMVOC | NO | NO | NO | NO | NO | NO | NO | |
| D. Wastewater treatment and discharge | NMVOC | 0.00 | | 0.00 | NO | 0.00 | 0.00 | NO | |
| E. Other | NMVOC | NO | | NO | NO | 0.00 | NO | NO | |
| **6. Other** | NMVOC | NO | | NO | NO | 0.00 | NO | NO | |

# ANNEX 5-5: REPORTING ON RECALCULATIONS OF THE 2018 AND 1990

| Recalculated year | 2017 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Greenhouse gas | CO2 | *Note: Replicate table below if more gases need reporting.* | | | | | | | |
| **GREENHOUSE GAS SOURCE AND SINK CATEGORIES** | **Gas (CO2, N2O, CH4)** | **Previous submission (CO2-eq, kt)** | **Latest submission (CO2-eq, kt)** | **Difference (CO2-eq, kt)** | **Difference(1) %** | **Impact of recalculation on total emissions excluding** | **Impact of recalculation on total emissions including** | **Explanation for recalculations** |
| **Total National Emissions and Removals** | **CO2** | 13,751.31 | 14,008.72 | 257.4125233 | 2% | 1% | 1% | |
| **1. Energy** | **CO2** | 16,560.14 | 16,581.63 | 21.49463199 | 0% | 0% | 0% | |
| A. Fuel combustion activities | **CO2** | 16,264.30 | 16,285.79 | 21.49334981 | 0% | 0% | 0% | |
| 1. Energy industries | **CO2** | 4,464.77 | 4,464.77 | 0 | 0% | 0% | 0% | |
| 2. Manufacturing industries and construction | **CO2** | 2,408.17 | 2,429.58 | 21.4044867 | 0% | 0% | 0% | In 1A2gviii small part of liquid fosil fuels were not added from energy balance by mistake in previous submission |
| 3. Transport | **CO2** | 6,569.86 | 6,569.95 | 0.088863111 | 0% | 0% | 0% | Fossil part of biodiesel added |
| 4. Other sectors | **CO2** | 2,821.50 | 2,821.50 | 0 | 0% | 0% | 0% | |
| 5. Other | **CO2** | NO,IE | NO,IE | NO | NO | NO | NO | |
| B. Fugitive Emissions from Fuels | **CO2** | 295.84 | 295.84 | 0.001282176 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation |
| 1. Solid fuels | **CO2** | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas | **CO2** | 295.84 | 295.84 | 0.001282176 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation |
| C. CO2 transport and storage | **CO2** | NO | NO | NO | NO | NO | NO | |
| **2. Industrial processes and product use** | **CO2** | 2,075.51 | 2,074.93 | -0.576466014 | 0% | 0% | 0% | |
| A. Mineral industry | **CO2** | 1,438.62 | 1,432.74 | -5.887992739 | 0% | 0% | 0% | Emission from sugar factories was excluded from calculations due to new infromation provided. Also, revised activity data from ceramics industry were used. |
| B. Chemical industry | **CO2** | 566.79 | 566.79 | 0 | 0% | 0% | 0% | |
| C. Metal industry | **CO2** | 1.87 | 1.87 | 0 | 0% | 0% | 0% | |
| D. Non-energy products from fuels and solvent use | **CO2** | 68.22 | 73.54 | 5.311526724 | 0% | 0% | 0% | Activity data from solvent use were corrected due to harmonization with national Informative Inventory Report. |
| G. Other product manufacture and use | **CO2** | NO | NO | NO | NO | NO | NO | |
| H. Other | **CO2** | NA | NA | NO | NO | NO | NO | |
| **3. Agriculture** | **CO2** | 81.13 | 81.13 | 0 | 0% | 0% | 0% | |
| A. Enteric fermentation | **CO2** | | | NO | NO | NO | NO | |
| B. Manure management | **CO2** | | | NO | NO | NO | NO | |
| C. Rice cultivation | **CO2** | | | NO | NO | NO | NO | |
| D. Agricultural soils | **CO2** | | | NO | NO | NO | NO | |
| E. Prescribed burning of savannahs | **CO2** | | | NO | NO | NO | NO | |
| F. Field burning of agricultural residues | **CO2** | | | NO | NO | NO | NO | |
| G. Liming | **CO2** | 10.92 | 10.92 | 0 | 0% | 0% | 0% | |
| H. Urea application | **CO2** | 70.21 | 70.21 | 0 | 0% | 0% | 0% | |
| I. Other carbon-containing fertilizer | **CO2** | NA | NA | NO | NO | NO | NO | |
| J. Other | **CO2** | | NO | NO | NO | NO | NO | |
| **4. Land use, land-use change and forestry (net) (4)** | **CO2** | -4,965.46 | -4,728.97 | 236.4943573 | 2% | 1% | 1% | New LULUCF matrix |
| A. Forestland | **CO2** | -4,599.37 | -4,645.92 | -46.54065611 | 0% | 0% | 0% | |
| B. Cropland | **CO2** | 259.08 | 387.79 | 128.7080387 | 1% | 1% | 1% | New LULUCF matrix |
| C. Grassland | **CO2** | -160.46 | -146.26 | 14.20635918 | 0% | 0% | 0% | New LULUCF matrix |
| D. Wetlands | **CO2** | 8.95 | 11.85 | 2.907974077 | 0% | 0% | 0% | New LULUCF matrix |
| E. Settlements | **CO2** | 534.60 | 671.81 | 137.2126415 | 1% | 1% | 1% | New LULUCF matrix |
| F. Other land | **CO2** | NO | NO | NO | NO | NO | NO | |
| G. Harvested wood products | **CO2** | -1,008.25 | -1,008.25 | 0 | 0% | 0% | 0% | |
| H. Other | **CO2** | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | **CO2** | NO,NA | NO,NA | NO | NO | NO | NO | |
| A. Solid waste disposal | **CO2** | NO,NA | NO,NA | NO | NO | NO | NO | |
| B. Biological treatment of solid waste | **CO2** | | | NO | NO | NO | NO | |
| C. Incineration and open burning of waste | **CO2** | NO | NO | NO | NO | NO | NO | |
| D. Waste water treatment and discharge | **CO2** | | | NO | NO | NO | NO | |
| E. Other | **CO2** | NO | NO | NO | NO | NO | NO | |
| **6. Other (As specified in summary 1.A)** | **CO2** | NO | NO | NO | NO | NO | NO | |
| **Memo items:** | **CO2** | | | 0 | 0% | 0% | 0% | |
| **International bunkers** | **CO2** | 469.17 | 469.17 | 0 | 0% | 0% | 0% | |
| Aviation | **CO2** | 449.06 | 449.06 | 0 | 0% | 0% | 0% | |
| Navigation | **CO2** | 20.11 | 20.11 | 0 | 0% | 0% | 0% | |
| **Multilateral operations** | **CO2** | C | C | NO | NO | NO | NO | |
| **CO2 emissions from biomass** | **CO2** | 5,906.62 | 5,906.57 | -0.057767316 | 0% | 0% | 0% | |
| **CO2 captured** | **CO2** | NO | NO | NO | NO | NO | NO | |
| **Long-term storage of C in waste disposal sites** | **CO2** | 4,486.55 | 4,486.55 | 0 | 0% | 0% | 0% | |
| **Indirect N2O** | | | | NO | NO | NO | NO | |
| **Indirect CO2** | | | NO,NA | NO | NO | NO | NO | |

| Recalculated year | 2017 |
|---|---|
| Greenhouse gas | CH4 |

***Note: Replicate table below if more gases need reporting.***

| GREENHOUSE GAS SOURCE AND SINK CATEGORI | Gas (CO2, N2O, CH4) | Previous submission (CO2-eq, kt) | Latest submission (CO2-eq, kt) | Difference (CO2-eq, kt) | Difference(1) % | Impact of recalculation on total emissions excluding LULUCF (2) % | Impact of recalculation on total emissions including LULUCF(3) % | Explanation for recalculations |
|---|---|---|---|---|---|---|---|---|
| **Total National Emissions and Removals** | **CH4** | 4,177.49 | 4,138.35 | -39.14005612 | -1% | 0% | 0% | |
| **1. Energy** | **CH4** | 574.52 | 591.92 | 17.4015289 | 0% | 0% | 0% | |
| A. Fuel combustion activities | **CH4** | 374.22 | 391.27 | 17.04827644 | 0% | 0% | 0% | |
| 1. Energy industries | **CH4** | 6.91 | 6.91 | 1.4238E-05 | 0% | 0% | 0% | |
| 2. Manufacturing industries and construction | **CH4** | 3.51 | 3.52 | 0.017837325 | 0% | 0% | 0% | In 1A2gviii small part of liquid fosil fuels were not added from energy balance by mistake in previous submission |
| 3. Transport | **CH4** | 11.49 | 28.52 | 17.03042488 | 0% | 0% | 0% | COPERT 5 used for emission calculation |
| 4. Other sectors | **CH4** | 352.31 | 352.31 | 0 | 0% | 0% | 0% | |
| 5. Other | **CH4** | NO,IE | NO,IE | NO | NO | NO | NO | |
| B. Fugitive Emissions from Fuels | **CH4** | 200.30 | 200.65 | 0.353252464 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation |
| 1. Solid fuels | **CH4** | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas | **CH4** | 200.30 | 200.65 | 0.353252464 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation |
| C. CO2 transport and storage | **CH4** | NO | NO | NO | NO | NO | NO | |
| **2. Industrial processes and product use** | **CH4** | NO,NE,IE,NA | NO,NE,IE,NA | NO | NO | NO | NO | |
| A. Mineral industry | **CH4** | | | NO | NO | NO | NO | |
| B. Chemical industry | **CH4** | NO,NE,IE | NO,NE,IE | NO | NO | NO | NO | |
| C. Metal industry | **CH4** | NO,NA | NO,NA | NO | NO | NO | NO | |
| D. Non-energy products from fuels and solvent use | **CH4** | NA | NA | NO | NO | NO | NO | |
| G. Other product manufacture and use | **CH4** | NO | NO | NO | NO | NO | NO | |
| H. Other | **CH4** | NA | NA | NO | NO | NO | NO | |
| **3. Agriculture** | **CH4** | 1,530.58 | 1,467.83 | -62.75324815 | -2% | 0% | 0% | Updated activity data for cattle, change of emissions factors to default TierI |
| A. Enteric fermentation | **CH4** | 1,106.92 | 1,042.93 | -63.99034155 | -2% | 0% | 0% | Updated activity data for cattle, change of emissions factors to default TierI |
| B. Manure management | **CH4** | 423.66 | 424.90 | 1.237093396 | 0% | 0% | 0% | |
| C. Rice cultivation | **CH4** | NO | NO | NO | NO | NO | NO | |
| D. Agricultural soils | **CH4** | NA | NE | NO | NO | NO | NO | |
| E. Prescribed burning of savannahs | **CH4** | NO | NO | NO | NO | NO | NO | |
| F. Field burning of agricultural residues | **CH4** | NO | NO | NO | NO | NO | NO | |
| G. Liming | **CH4** | | | NO | NO | NO | NO | |
| H. Urea application | **CH4** | | | NO | NO | NO | NO | |
| I. Other carbon-containing fertilizer | **CH4** | | | NO | NO | NO | NO | |
| J. Other | **CH4** | | NO | NO | NO | NO | NO | |
| **4. Land use, land-use change and forestry (net) (4)** | **CH4** | 69.23 | 69.23 | 0 | 0% | 0% | 0% | |
| A. Forestland | **CH4** | 61.21 | 61.21 | 0 | 0% | 0% | 0% | |
| B. Cropland | **CH4** | 0.48 | 0.48 | 0 | 0% | 0% | 0% | |
| C. Grassland | **CH4** | 7.54 | 7.54 | 0 | 0% | 0% | 0% | |
| D. Wetlands | **CH4** | NO | NO | NO | NO | NO | NO | |
| E. Settlements | **CH4** | NO | NO | NO | NO | NO | NO | |
| F. Other land | **CH4** | NO | NO | NO | NO | NO | NO | |
| G. Harvested wood products | **CH4** | | | NO | NO | NO | NO | |
| H. Other | **CH4** | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | **CH4** | 2,003.15 | 2,009.36 | 6.211663128 | 0% | 0% | 0% | New data on sludge removed for 5.D are included. |
| A. Solid waste disposal | **CH4** | 1,775.23 | 1,775.23 | 0 | 0% | 0% | 0% | |
| B. Biological treatment of solid waste | **CH4** | 3.75 | 4.24 | 0.495635 | 0% | 0% | 0% | |
| C. Incineration and open burning of waste | **CH4** | NO,NA | NO,NA | NO | NO | NO | NO | |
| D. Waste water treatment and discharge | **CH4** | 224.17 | 229.89 | 5.716028128 | 0% | 0% | 0% | New data on sludge removed are included. |
| E. Other | **CH4** | NO | NO | NO | NO | NO | NO | |
| **6. Other (As specified in summary 1.A)** | **CH4** | NO | NO | NO | NO | NO | NO | |
| **Memo items:** | **CH4** | | | 0 | 0% | 0% | 0% | |
| **International bunkers** | **CH4** | 0.08 | 0.12 | 0.0466886 | 0% | 0% | 0% | |
| Aviation | **CH4** | 0.05 | 0.08 | 0.030736738 | 0% | 0% | 0% | |
| Navigation | **CH4** | C | 0.05 | NO | NO | NO | NO | |
| **Multilateral operations** | **CH4** | | C | NO | NO | NO | NO | |
| **CO2 emissions from biomass** | **CH4** | 0.00 | | NO | NO | NO | NO | |
| **CO2 captured** | **CH4** | NO | | NO | NO | NO | NO | |
| **Long-term storage of C in waste disposal sites** | **CH4** | NE | | NO | NO | NO | NO | |
| **Indirect N2O** | | | | NO | NO | NO | NO | |
| **Indirect CO2** | | | | NO | NO | NO | NO | |

| Recalculated year | 2017 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Greenhouse gas | N2O | *Note: Replicate table below if more gases need reporting.* | | | | | | | |
| **GREENHOUSE GAS SOURCE AND SINK CATEGORI** | **Gas** | **Previous** | **Latest** | **Difference (CC** | **Difference(1)** | **Impact of** | **Impact of** | **Explanation for recalculations** | |
| **Total National Emissions and Removals** | **N2O** | 1,829.27 | 1,900.42 | 71.15052476 | 2% | 0% | 0% | | |
| **1. Energy** | **N2O** | 214.56 | 214.53 | -0.024100233 | 0% | 0% | 0% | | |
| A. Fuel combustion activities | **N2O** | 214.35 | 214.33 | -0.024100233 | 0% | 0% | 0% | | |
| 1. Energy industries | **N2O** | 21.55 | 21.55 | 1.69717E-05 | 0% | 0% | 0% | | |
| 2. Manufacturing industries and construction | **N2O** | 6.25 | 6.29 | 0.039589807 | 0% | 0% | 0% | In 1A2gviii small part of liquid fosil fuels were not added from energy balance by mistake in previous submission | |
| 3. Transport | **N2O** | 63.79 | 63.72 | -0.063707011 | 0% | 0% | 0% | COPERT 5 used for emission calculation | |
| 4. Other sectors | **N2O** | 122.76 | 122.76 | 0 | 0% | 0% | 0% | | |
| 5. Other | **N2O** | NO,IE | NO,IE | NO | NO | NO | NO | | |
| B. Fugitive Emissions from Fuels | **N2O** | 0.21 | 0.21 | 0 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation | |
| 1. Solid fuels | **N2O** | NO,NA | NO,NA | NO | NO | NO | NO | | |
| 2. Oil and natural gas | **N2O** | 0.21 | 0.21 | 0 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation | |
| C. CO2 transport and storage | **N2O** | NO | | NO | NO | NO | NO | | |
| **2. Industrial processes and product use** | **N2O** | 160.93 | 168.38 | 7.44702 | 0% | 0% | 0% | | |
| A. Mineral industry | **N2O** | | | NO | NO | NO | NO | | |
| B. Chemical industry | **N2O** | 98.60 | 98.60 | 0 | 0% | 0% | 0% | | |
| C. Metal industry | **N2O** | NO | NO | NO | NO | NO | NO | | |
| D. Non-energy products from fuels and solvent use | **N2O** | NA | NA | NO | NO | NO | NO | | |
| G. Other product manufacture and use | **N2O** | 62.33 | 69.78 | 7.44702 | 0% | 0% | 0% | Revised IEF used for emissions from medical applications and propellant for pressure and aerosol products. | |
| H. Other | **N2O** | NA | NA | NO | NO | NO | NO | | |
| **3. Agriculture** | **N2O** | 1,232.93 | 1,256.09 | 23.1627602 | 1% | 0% | 0% | | |
| A. Enteric fermentation | **N2O** | | | NO | NO | NO | NO | | |
| B. Manure management | **N2O** | 153.53 | 149.22 | -4.305669107 | 0% | 0% | 0% | Change of emissions factors (NEX) calculation to default IPCC methodology | |
| C. Rice cultivation | **N2O** | | | NO | NO | NO | NO | | |
| D. Agricultural soils | **N2O** | 1,079.40 | 1,106.87 | 27.46842931 | 1% | 0% | 0% | Change due to the 3B recalculations | |
| E. Prescribed burning of savannahs | **N2O** | NO | NO | NO | NO | NO | NO | | |
| F. Field burning of agricultural residues | **N2O** | NO | NO | NO | NO | NO | NO | | |
| G. Liming | **N2O** | | | NO | NO | NO | NO | | |
| H. Urea application | **N2O** | | | NO | NO | NO | NO | | |
| I. Other carbon-containing fertilizer | **N2O** | | | NO | NO | NO | NO | | |
| J. Other | **N2O** | | NO | NO | NO | NO | NO | | |
| **4. Land use, land-use change and forestry (net) (4)** | **N2O** | 129.64 | 169.85 | 40.21036664 | 1% | 0% | 0% | New LULUCF matrix | |
| A. Forestland | **N2O** | 40.36 | 40.36 | 0 | 0% | 0% | 0% | | |
| B. Cropland | **N2O** | 5.99 | 22.22 | 16.23437552 | 0% | 0% | 0% | New LULUCF matrix | |
| C. Grassland | **N2O** | 8.21 | 8.21 | 0 | 0% | 0% | 0% | New LULUCF matrix | |
| D. Wetlands | **N2O** | 1.35 | 1.43 | 0.07944934 | 0% | 0% | 0% | New LULUCF matrix | |
| E. Settlements | **N2O** | 73.73 | 97.63 | 23.89654178 | 1% | 0% | 0% | New LULUCF matrix | |
| F. Other land | **N2O** | NO | NO | NO | NO | NO | NO | | |
| G. Harvested wood products | **N2O** | | | NO | NO | NO | NO | | |
| H. Other | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **5. Waste** | **N2O** | 91.21 | 91.57 | 0.354478152 | 0% | 0% | 0% | | |
| A. Solid waste disposal | **N2O** | | | NO | NO | NO | NO | | |
| B. Biological treatment of solid waste | **N2O** | 2.68 | 3.04 | 0.354478152 | 0% | 0% | 0% | | |
| C. Incineration and open burning of waste | **N2O** | NO,NA | NO,NA | NO | NO | NO | NO | | |
| D. Waste water treatment and discharge | **N2O** | 88.53 | 88.53 | 0 | 0% | 0% | 0% | | |
| E. Other | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **6. Other (As specified in summary 1.A)** | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **Memo items:** | **N2O** | | | 0 | 0% | 0% | 0% | | |
| **International bunkers** | **N2O** | 3.85 | 3.85 | 0 | 0% | 0% | 0% | | |
| Aviation | **N2O** | 3.69 | 3.69 | 0 | 0% | 0% | 0% | | |
| Navigation | **N2O** | 0.16 | 0.16 | 0 | 0% | 0% | 0% | | |
| **Multilateral operations** | **N2O** | C | C | NO | NO | NO | NO | | |
| **CO2 emissions from biomass** | **N2O** | | | NO | NO | NO | NO | | |
| **CO2 captured** | **N2O** | NO | | NO | NO | NO | NO | | |
| **Long-term storage of C in waste disposal sites** | **N2O** | NE | | NO | NO | NO | NO | | |
| **Indirect N2O** | | | NO,NA | NO | NO | NO | NO | | |
| **Indirect CO2** | | | | NO | NO | NO | NO | | |

| Recalculated year | 1990 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Greenhouse gas | CO2 | *Note: Replicate table below if more gases need reporting.* | | | | | | |

| GREENHOUSE GAS SOURCE AND SINK CATEGORI | Gas (CO2, N2O, CH4) | Previous submission (CO2-eq, kt) | Latest submission (CO2-eq, kt) | Difference (CO2-eq, kt) | Difference(1) | Impact of recalculation on total emissions excluding | Impact of recalculation on total emissions including | Explanation for recalculations |
|---|---|---|---|---|---|---|---|---|
| **Total National Emissions and Removals** | **CO2** | 16,648.52 | 16,858.47 | 209.9476555 | 1% | 1% | 1% | |
| **1. Energy** | **CO2** | 20,656.68 | 20,656.67 | -0.000627697 | 0% | 0% | 0% | |
| A. Fuel combustion activities | **CO2** | 20,056.11 | 20,056.11 | 0 | 0% | 0% | 0% | |
| 1. Energy industries | **CO2** | 7,048.59 | 7,048.59 | 0 | 0% | 0% | 0% | |
| 2. Manufacturing industries and construction | **CO2** | 5,501.67 | 5,501.67 | 0 | 0% | 0% | 0% | |
| 3. Transport | **CO2** | 3,786.94 | 3,786.94 | 0 | 0% | 0% | 0% | |
| 4. Other sectors | **CO2** | 3,718.91 | 3,718.91 | 0 | 0% | 0% | 0% | |
| 5. Other | **CO2** | NO,IE | NO,IE | NO | NO | NO | NO | |
| B. Fugitive Emissions from Fuels | **CO2** | 600.56 | 600.56 | -0.000627697 | 0% | 0% | 0% | |
| 1. Solid fuels | **CO2** | NO | NO | NO | NO | NO | NO | |
| 2. Oil and natural gas | **CO2** | 600.56 | 600.56 | -0.000627697 | 0% | 0% | 0% | Data provider for oil transport has changed. Data from CBS used for emission calculation |
| C. CO2 transport and storage | **CO2** | NO | NO | NO | NO | NO | NO | |
| **2. Industrial processes and product use** | **CO2** | 2,629.87 | 2,622.02 | -7.846991547 | 0% | 0% | 0% | |
| A. Mineral industry | **CO2** | 1,310.39 | 1,306.59 | -3.793329215 | 0% | 0% | 0% | Revised activity data from ceramics industry were used in emission calculation. |
| B. Chemical industry | **CO2** | 751.10 | 751.10 | 0 | 0% | 0% | 0% | |
| C. Metal industry | **CO2** | 336.40 | 336.40 | 0 | 0% | 0% | 0% | |
| D. Non-energy products from fuels and solvent use | **CO2** | 231.98 | 227.93 | -4.053662331 | 0% | 0% | 0% | Activity data from solvent use were corrected due to harmonization with national Informative Inventory Report. |
| G. Other product manufacture and use | **CO2** | NO | NO | NO | NO | NO | NO | |
| H. Other | **CO2** | NA | NA | NO | NO | NO | NO | |
| **3. Agriculture** | **CO2** | 50.02 | 50.02 | 0 | 0% | 0% | 0% | |
| A. Enteric fermentation | **CO2** | | | NO | NO | NO | NO | |
| B. Manure management | **CO2** | | | NO | NO | NO | NO | |
| C. Rice cultivation | **CO2** | | | NO | NO | NO | NO | |
| D. Agricultural soils | **CO2** | | | NO | NO | NO | NO | |
| E. Prescribed burning of savannahs | **CO2** | | | NO | NO | NO | NO | |
| F. Field burning of agricultural residues | **CO2** | | | NO | NO | NO | NO | |
| G. Liming | **CO2** | NO | NO | NO | NO | NO | NO | |
| H. Urea application | **CO2** | 50.02 | 50.02 | 0 | 0% | 0% | 0% | |
| I. Other carbon-containing fertilizer | **CO2** | NA | NA | NO | NO | NO | NO | |
| J. Other | **CO2** | NO | NO | NO | NO | NO | NO | |
| **4. Land use, land-use change and forestry (net) (4)** | **CO2** | -6,688.57 | -6,470.78 | 217.7952748 | 1% | 1% | 1% | New LULUCF matrix |
| A. Forestland | **CO2** | -6,717.75 | -6,718.09 | -0.345614937 | 0% | 0% | 0% | |
| B. Cropland | **CO2** | 220.04 | 222.77 | 2.73905203 | 0% | 0% | 0% | New LULUCF matrix |
| C. Grassland | **CO2** | -101.85 | -8.08 | 93.7684837 | 1% | 0% | 0% | New LULUCF matrix |
| D. Wetlands | **CO2** | 46.78 | 83.47 | 36.68455995 | 0% | 0% | 0% | New LULUCF matrix |
| E. Settlements | **CO2** | 165.75 | 250.70 | 84.94879402 | 1% | 0% | 0% | New LULUCF matrix |
| F. Other land | **CO2** | NO | NO | NO | NO | NO | NO | |
| G. Harvested wood products | **CO2** | -301.54 | -301.54 | 0 | 0% | 0% | 0% | |
| H. Other | **CO2** | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | **CO2** | 0.54 | 0.54 | 0 | 0% | 0% | 0% | |
| A. Solid waste disposal | **CO2** | NA,NO | NA,NO | NO | NO | NO | NO | |
| B. Biological treatment of solid waste | **CO2** | | | NO | NO | NO | NO | |
| C. Incineration and open burning of waste | **CO2** | 0.54 | 0.54 | 0 | 0% | 0% | 0% | |
| D. Waste water treatment and discharge | **CO2** | | | NO | NO | NO | NO | |
| E. Other | **CO2** | NO | NO | NO | NO | NO | NO | |
| **6. Other (As specified in summary 1.A)** | **CO2** | NO | NO | NO | NO | NO | NO | |
| **Memo items:** | **CO2** | | | 0 | 0% | 0% | 0% | |
| **International bunkers** | **CO2** | 643.85 | 643.85 | 0 | 0% | 0% | 0% | |
| Aviation | **CO2** | 496.62 | 496.62 | 0 | 0% | 0% | 0% | |
| Navigation | **CO2** | 147.23 | 147.23 | 0 | 0% | 0% | 0% | |
| **Multilateral operations** | **CO2** | C | C | NO | NO | NO | NO | |
| **CO2 emissions from biomass** | **CO2** | 5,126.24 | 5,126.24 | 0 | 0% | 0% | 0% | |
| **CO2 captured** | **CO2** | NO | NO | NO | NO | NO | NO | |
| **Long-term storage of C in waste disposal sites** | **CO2** | 1,717.23 | 1,717.23 | 0 | 0% | 0% | 0% | |
| **Indirect N2O** | | | | NO | NO | NO | NO | |
| **Indirect CO2** | | NA,NO | NA,NO | NO | NO | NO | NO | |

| Recalculated year | 1990 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Greenhouse gas | CH4 | ***Note: Replicate table below if more gases need reporting.*** | | | | | | |
| **GREENHOUSE GAS SOURCE AND SINK CATEGORI** | **Gas (CO2, N2O, CH4)** | **Previous submission (CO2-eq, kt)** | **Latest submission (CO2-eq, kt)** | **Difference (CO2-eq, kt)** | **Difference(1) %** | **recalculation on total emissions excluding LULUCF (2) %** | **recalculation on total emissions including LULUCF(3) %** | **Explanation for recalculations** |
| **Total National Emissions and Removals** | **CH4** | 4,425.06 | 4,383.67 | -41.39137994 | -1% | 0% | 0% | |
| **1. Energy** | **CH4** | 842.81 | 842.68 | -0.133607264 | 0% | 0% | 0% | |
| A. Fuel combustion activities | **CH4** | 413.91 | 413.95 | 0.03932962 | 0% | 0% | 0% | |
| 1. Energy industries | **CH4** | 5.42 | 5.42 | 0 | 0% | 0% | 0% | |
| 2. Manufacturing industries and construction | **CH4** | 9.73 | 9.73 | 0 | 0% | 0% | 0% | |
| 3. Transport | **CH4** | 41.10 | 41.14 | 0.03932962 | 0% | 0% | 0% | COPERT 5 used for CH4 and N2O emission calculation. |
| 4. Other sectors | **CH4** | 357.67 | 357.67 | 0 | 0% | 0% | 0% | |
| 5. Other | **CH4** | NO,IE | NO,IE | NO | NO | NO | NO | |
| B. Fugitive Emissions from Fuels | **CH4** | 428.90 | 428.73 | -0.172936884 | 0% | 0% | 0% | |
| 1. Solid fuels | **CH4** | 59.64 | 59.64 | 0 | 0% | 0% | 0% | |
| 2. Oil and natural gas | **CH4** | 369.26 | 369.08 | -0.172936884 | 0% | 0% | 0% | |
| C. CO2 transport and storage | **CH4** | NO | | NO | NO | NO | NO | |
| **2. Industrial processes and product use** | **CH4** | 9.35 | 9.35 | 0 | 0% | 0% | 0% | |
| A. Mineral industry | **CH4** | | | NO | NO | NO | NO | |
| B. Chemical industry | **CH4** | 5.45 | 5.45 | 0 | 0% | 0% | 0% | |
| C. Metal industry | **CH4** | 3.90 | 3.90 | 0 | 0% | 0% | 0% | |
| D. Non-energy products from fuels and solvent use | **CH4** | NA | NA | NO | NO | NO | NO | |
| G. Other product manufacture and use | **CH4** | NO | NO | NO | NO | NO | NO | |
| H. Other | **CH4** | NA | NA | NO | NO | NO | NO | |
| **3. Agriculture** | **CH4** | 2,587.66 | 2,546.40 | -41.25777268 | -1% | 0% | 0% | Updated activity data for cattle, change of emissions factors to default TierI |
| A. Enteric fermentation | **CH4** | 2,171.55 | 2,120.22 | -51.32419853 | -1% | 0% | 0% | Updated activity data for cattle, change of emissions factors to default TierI |
| B. Manure management | **CH4** | 416.11 | 426.18 | 10.06642585 | 0% | 0% | 0% | Updated activity data for cattle, change of emissions factors to default TierI |
| C. Rice cultivation | **CH4** | NO | NO | NO | NO | NO | NO | |
| D. Agricultural soils | **CH4** | NA | NE | NO | NO | NO | NO | |
| E. Prescribed burning of savannahs | **CH4** | NO | NO | NO | NO | NO | NO | |
| F. Field burning of agricultural residues | **CH4** | NO | NO | NO | NO | NO | NO | |
| G. Liming | **CH4** | | | NO | NO | NO | NO | |
| H. Urea application | **CH4** | | | NO | NO | NO | NO | |
| I. Other carbon-containing fertilizer | **CH4** | | | NO | NO | NO | NO | |
| J. Other | **CH4** | NO | NO | NO | NO | NO | NO | |
| **4. Land use, land-use change and forestry (net) (4)** | **CH4** | 1.23 | 1.23 | 0 | 0% | 0% | 0% | |
| A. Forestland | **CH4** | 1.12 | 1.12 | 0 | 0% | 0% | 0% | |
| B. Cropland | **CH4** | NO | NO | NO | NO | NO | NO | |
| C. Grassland | **CH4** | 0.11 | 0.11 | 0 | 0% | 0% | 0% | |
| D. Wetlands | **CH4** | NO | NO | NO | NO | NO | NO | |
| E. Settlements | **CH4** | NO | NO | NO | NO | NO | NO | |
| F. Other land | **CH4** | NO | NO | NO | NO | NO | NO | |
| G. Harvested wood products | **CH4** | | | NO | NO | NO | NO | |
| H. Other | **CH4** | NO | NO | NO | NO | NO | NO | |
| **5. Waste** | **CH4** | 984.01 | 984.01 | 0 | 0% | 0% | 0% | |
| A. Solid waste disposal | **CH4** | 539.01 | 539.01 | 0 | 0% | 0% | 0% | |
| B. Biological treatment of solid waste | **CH4** | NO,NE,IE | NO,NE,IE | NO | NO | NO | NO | |
| C. Incineration and open burning of waste | **CH4** | NA,NO | NA,NO | NO | NO | NO | NO | |
| D. Waste water treatment and discharge | **CH4** | 445.00 | 445.00 | 0 | 0% | 0% | 0% | |
| E. Other | **CH4** | NO | NO | NO | NO | NO | NO | |
| **6. Other (As specified in summary 1.A)** | **CH4** | NO | NO | NO | NO | NO | NO | |
| **Memo items:** | **CH4** | | | 0 | 0% | 0% | 0% | |
| **International bunkers** | **CH4** | 0.43 | 0.43 | 0 | 0% | 0% | 0% | |
| Aviation | **CH4** | 0.09 | 0.09 | 0 | 0% | 0% | 0% | |
| Navigation | **CH4** | 0.34 | 0.34 | 0 | 0% | 0% | 0% | |
| **Multilateral operations** | **CH4** | | C | NO | NO | NO | NO | |
| **CO2 emissions from biomass** | **CH4** | 0.00 | | NO | NO | NO | NO | |
| **CO2 captured** | **CH4** | NO | | NO | NO | NO | NO | |
| **Long-term storage of C in waste disposal sites** | **CH4** | NE | | NO | NO | NO | NO | |
| **Indirect N2O** | | | | NO | NO | NO | NO | |
| **Indirect CO2** | | | | NO | NO | NO | NO | |

| Recalculated year | 1990 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Greenhouse gas | N2O | *Note: Replicate table below if more gases need reporting.* | | | | | | | |
| **GREENHOUSE GAS SOURCE AND SINK CATEGORI** | **Gas** | **Previous** | **Latest** | **Difference (CC** | **Difference(1)** | **Impact of** | **Impact of** | **Explanation for recalculations** | |
| **Total National Emissions and Removals** | **N2O** | 2,879.51 | 2,961.56 | 82.05260673 | 2% | 0% | 0% | | |
| **1. Energy** | **N2O** | 230.24 | 231.91 | 1.66605821 | 0% | 0% | 0% | | |
| A. Fuel combustion activities | **N2O** | 229.55 | 231.22 | 1.66605821 | 0% | 0% | 0% | | |
| 1. Energy industries | **N2O** | 17.49 | 17.49 | 0 | 0% | 0% | 0% | | |
| 2. Manufacturing industries and construction | **N2O** | 17.64 | 17.64 | 0 | 0% | 0% | 0% | | |
| 3. Transport | **N2O** | 53.07 | 54.73 | 1.66605821 | 0% | 0% | 0% | COPERT 5 used for CH4 and N2O emission calculation. | |
| 4. Other sectors | **N2O** | 141.35 | 141.35 | 0 | 0% | 0% | 0% | | |
| 5. Other | **N2O** | NO,IE | NO,IE | NO | NO | NO | NO | | |
| B. Fugitive Emissions from Fuels | **N2O** | 0.69 | 0.69 | 0 | 0% | 0% | 0% | | |
| 1. Solid fuels | **N2O** | NO,NA | NO,NA | NO | NO | NO | NO | | |
| 2. Oil and natural gas | **N2O** | 0.69 | 0.69 | 0 | 0% | 0% | 0% | | |
| C. CO2 transport and storage | **N2O** | NO | | NO | NO | NO | NO | | |
| **2. Industrial processes and product use** | **N2O** | 787.64 | 787.64 | 0 | 0% | 0% | 0% | | |
| A. Mineral industry | **N2O** | | | NO | NO | NO | NO | | |
| B. Chemical industry | **N2O** | 754.27 | 754.27 | 0 | 0% | 0% | 0% | | |
| C. Metal industry | **N2O** | NO | NO | NO | NO | NO | NO | | |
| D. Non-energy products from fuels and solvent use | **N2O** | NA | NA | NO | NO | NO | NO | | |
| G. Other product manufacture and use | **N2O** | 0.11 | 0.11 | 0 | 0% | 0% | 0% | | |
| H. Other | **N2O** | | NA | NO | NO | NO | NO | | |
| **3. Agriculture** | **N2O** | 1,761.97 | 1,827.03 | 65.05995144 | 1% | 0% | 0% | | |
| A. Enteric fermentation | **N2O** | | | NO | NO | NO | NO | | |
| B. Manure management | **N2O** | 361.58 | 375.22 | 13.63974061 | 0% | 0% | 0% | Change of emissions factors (NEX) calculation to default IPCC methodology | |
| C. Rice cultivation | **N2O** | | | NO | NO | NO | NO | | |
| D. Agricultural soils | **N2O** | 1,400.39 | 1,451.81 | 51.42021083 | 1% | 0% | 0% | Change due to the 3B recalculations | |
| E. Prescribed burning of savannahs | **N2O** | NO | NO | NO | NO | NO | NO | | |
| F. Field burning of agricultural residues | **N2O** | NO | NO | NO | NO | NO | NO | | |
| G. Liming | **N2O** | | | NO | NO | NO | NO | | |
| H. Urea application | **N2O** | | | NO | NO | NO | NO | | |
| I. Other carbon-containing fertilizer | **N2O** | | | NO | NO | NO | NO | | |
| J. Other | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **4. Land use, land-use change and forestry (net) (4)** | **N2O** | 32.76 | 48.09 | 15.32659708 | 0% | 0% | 0% | New LULUCF matrix | |
| A. Forestland | **N2O** | 0.74 | 0.74 | 0 | 0% | 0% | 0% | | |
| B. Cropland | **N2O** | 3.95 | 3.95 | 2.98E-09 | 0% | 0% | 0% | New LULUCF matrix | |
| C. Grassland | **N2O** | 0.12 | 0.12 | 0 | 0% | 0% | 0% | New LULUCF matrix | |
| D. Wetlands | **N2O** | 6.23 | 11.11 | 4.8834984 | 0% | 0% | 0% | New LULUCF matrix | |
| E. Settlements | **N2O** | 21.72 | 32.17 | 10.44309867 | 0% | 0% | 0% | New LULUCF matrix | |
| F. Other land | **N2O** | NO | NO | NO | NO | NO | NO | | |
| G. Harvested wood products | **N2O** | | | NO | NO | NO | NO | | |
| H. Other | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **5. Waste** | **N2O** | 66.89 | 66.89 | 0 | 0% | 0% | 0% | | |
| A. Solid waste disposal | **N2O** | | | NO | NO | NO | NO | | |
| B. Biological treatment of solid waste | **N2O** | NO,NE,IE | NO,NE,IE | NO | NO | NO | NO | | |
| C. Incineration and open burning of waste | **N2O** | 0.01 | 0.01 | 0 | 0% | 0% | 0% | | |
| D. Waste water treatment and discharge | **N2O** | 66.88 | 66.88 | 0 | 0% | 0% | 0% | | |
| E. Other | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **6. Other (As specified in summary 1.A)** | **N2O** | NO | NO | NO | NO | NO | NO | | |
| **Memo items:** | **N2O** | | | 0 | 0% | 0% | 0% | | |
| **International bunkers** | **N2O** | 4.14 | 5.29 | 1.15433876 | 0% | 0% | 0% | | |
| Aviation | **N2O** | 1.15 | 4.14 | 2.98528652 | 0% | 0% | 0% | | |
| Navigation | **N2O** | C | 1.15 | NO | NO | NO | NO | | |
| **Multilateral operations** | **N2O** | | C | NO | NO | NO | NO | | |
| **CO2 emissions from biomass** | **N2O** | 0.00 | | NO | NO | NO | NO | | |
| **CO2 captured** | **N2O** | NO | | NO | NO | NO | NO | | |
| **Long-term storage of C in waste disposal sites** | **N2O** | NE | | NO | NO | NO | NO | | |
| **Indirect N2O** | | | NA,NO | NO | NO | NO | NO | | |
| **Indirect CO2** | | | | NO | NO | NO | NO | | |
| | | | | NO | NO | NO | NO | | |

| Recalculated year | 2017 | |
|---|---|---|
| Greenhouse gas | HFC | ***Note: Replicate table below if more gases need reporting.*** |

| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | Gas (PFC, HFC, NF3, SF6, HFC-PFC Mix) | Previous submission (CO2-eq, kt) | Latest submission (CO2-eq, kt) | Difference (CO2-eq, kt) | Difference(1) % | Impact of recalculation on total emissions excluding LULUCF (2) % | Impact of recalculation on total emissions including LULUCF(3) % | Explanation for recalculations |
|---|---|---|---|---|---|---|---|---|
| **F-gases: Total actual Emissions** | **HFC** | 488.71 | 488.71 | 0 | 0% | NO | 0% | |
| 2.B.9. Flurochemical production | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.B.10. Other | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.C.3. Aluminium production | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.C.4. Magnesium production | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.C.7. Other | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.E.1. Integrated circuit or semiconductor | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.E.2. TFT flat panel display | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.E.3. Photovoltaics | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.E.4. Heat transfer fluid | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.E.5. Other *(as specified in table 2(II))* | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.F.1. Refrigeration and air conditioning | **HFC** | 475.30 | 475.30 | 0 | 0% | NO | 0% | |
| 2.F.2. Foam blowing agents | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.F.3. Fire protection | **HFC** | 4.71 | 4.71 | 0 | 0% | NO | 0% | |
| 2.F.4. Aerosols | **HFC** | 8.69 | 8.69 | 0 | 0% | NO | 0% | |
| 2.F.5. Solvents | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.F.6. Other applications | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.G.1. Electrical equipment | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.G.2. SF6 and PFCs from other product use | **HFC** | NO | NO | NO | NO | NO | NO | |
| 2.G.4. Other | **HFC** | NO | NO | NO | NO | NO | NO | |
| **2.H. Other (please specify)** | **HFC** | NO | NO | NO | NO | NO | NO | |

| Recalculated year | 2017 | |
|---|---|---|
| Greenhouse gas | PFC | ***Note: Replicate table below if more gases need reporting.*** |

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

| | |
|---|---|
| Recalculated year | 2017 |
| Greenhouse gas | SF6 |

***Note: Replicate table below if more gases need reporting.***

| GREENHOUSE GAS SOURCE AND SINK CATEGORI | Gas (PFC, HFC, NF3, SF6, HFC-PFC Mix) | Previous submission (CO2-eq, kt) | Latest submission (CO2-eq, kt) | Difference (CO2-eq, kt) | Difference(1) % | Impact of recalculation on total emissions excluding LULUCF (2) % | Impact of recalculation on total emissions including LULUCF(3) % | Explanation for recalculations |
|---|---|---|---|---|---|---|---|---|
| **F-gases: Total actual Emissions** | **SF6** | 0.00 | 0.00 | 0 | 0% | NO | 0% | |
| 2.B.9. Flurochemical production | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.B.10. Other | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.C.3. Aluminium production | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.C.4. Magnesium production | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.C.7. Other | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.E.1. Integrated circuit or semiconductor | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.E.2. TFT flat panel display | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.E.3. Photovoltaics | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.E.4. Heat transfer fluid | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.E.5. Other *(as specified in table 2(II))* | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.1. Refrigeration and air conditioning | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.2. Foam blowing agents | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.3. Fire protection | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.4. Aerosols | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.5. Solvents | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.F.6. Other applications | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.G.1. Electrical equipment | **SF6** | 0.00 | 0.00 | 0 | 0% | NO | 0% | |
| 2.G.2. SF6 and PFCs from other product use | **SF6** | NO | NO | NO | NO | NO | NO | |
| 2.G.4. Other | **SF6** | NO | NO | NO | NO | NO | NO | |
| **2.H. Other (please specify)** | **SF6** | NO | NO | NO | NO | NO | NO | |

| | |
|---|---|
| Recalculated year | 1990 |
| Greenhouse gas | PFC |

***Note: Replicate table below if more gases need reporting.***

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

| Recalculated year | 1990 | |
|---|---|---|
| Greenhouse gas | SF6 | ***Note: Replicate table below if more gases need reporting.*** |

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

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

| Reporting year: | 2013 |
|---|---|

**Total emissions (CO2 -eq)**

| Category[1] | Gas | Greenhouse gas inventory emissions [kt | Verified emissions under Directive 2003/87/EC [kt | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
|---|---|---|---|---|---|
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 24,432.10 | 8,785.79 | 0.36 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 18,423.21 | 8,545.51 | 0.46 | |

**CO2 emissions**

| Category[1] | | Greenhouse gas inventory emissions [kt | Verified emissions under Directive 2003/87/EC [kt | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
|---|---|---|---|---|---|
| **1.A Fuel combustion activities, total** | CO2 | 14,868.44 | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 9,232.28 | 7,259.43 | 78.63% | |
| 1.A.1 Energy industries | CO2 | 5,238.07 | 4,918.89 | 93.91% | In inventory dana from ETS are not used for emission |
| 1.A.1.a Public electricity and heat production | CO2 | 3,614.08 | 3,493.80 | 96.67% | |
| 1.A.1.b Petroleum refining | CO2 | 1,394.72 | 1,328.74 | 95.27% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 229.27 | 96.35 | 42.02% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,380.65 | 2,340.54 | 98.32% | |
| 1.A.2.a Iron and steel | CO2 | 58.36 | 19.83 | 33.98% | |
| 1.A.2.b Non-ferrous metals | CO2 | 19.93 | 0.00 | NO | |
| 1.A.2.c Chemicals | CO2 | 253.20 | 1,157.79 | 457.27% | In Inventory emissions from consumption of natural gas |
| 1.A.2.d Pulp, paper and print | CO2 | 113.37 | 60.63 | 53.49% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 388.01 | 170.55 | 43.96% | |
| 1.A.2.f Non-metallic minerals | CO2 | 96.50 | 931.73 | 965.50% | In Inventory emissions from Construction sector are |
| 1.A.2.g Other | CO2 | 1,451.29 | NO | NO | In Inventory emissions from Construction sector are |
| 1.A.3. Transport | CO2 | 5,636.16 | NO | NO | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 1,143.88 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 508.91 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 634.97 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 469.67 | NO | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C.3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,278.46 | 1,270.28 | 99.36% | |
| 2.A.1 Cement Production | CO2 | 1,141.03 | 1,141.03 | 100.00% | |
| 2.A.2. Lime production | CO2 | 74.26 | 74.26 | 100.00% | |
| 2.A.3. Glass production | CO2 | 29.48 | 49.87 | 169.17% | |
| 2.A.4. Other process uses of carbonates | CO2 | 33.70 | 5.12 | 15.20% | |
| **2.B Chemical industry** | CO2 | 509.33 | 0.00 | NO | |
| 2.B.1. Ammonia production | CO2 | 509.33 | | NO | |
| 2.B.3. Adipic acid production (CO2) | CO2 | NO | | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | | NO | |
| 2.B.5. Carbide production | CO2 | NO | | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | | NO | |
| 2.B.7 Soda ash production | CO2 | NO | | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO,IE | | NO | |
| **2.C Metal production** | CO2 | 13.93 | 15.80 | 113.43% | |
| 2.C.1. Iron and steel production | CO2 | 13.93 | 15.80 | 113.43% | |
| 2.C.2 Ferroalloys production | CO2 | NO | | NO | |
| 2.C.3 Aluminium production | CO2 | NO | | NO | |
| 2.C.4 Magnesium production | CO2 | NO | | NO | |
| 2.C.5 Lead production | CO2 | NO | | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

**N2O emissions**

| Category[1] | Gas | Greenhouse gas inventory emissions [kt | Verified emissions under Directive 2003/87/EC [kt | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
|---|---|---|---|---|---|
| 2.B.2. Nitric acid production | N2O | 240.2717276 | 240.27 | 100.00% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

| Reporting year: | 2014 |
|---|---|

| Total emissions (CO2 -eq) | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | Verified emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 23,666.56 | 8,387.46 | 0.35 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 17,674.26 | 8,121.27 | 0.46 | |

| CO2 emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt | (Verified emissions/ inventory emissions)[3] | Comment[2] |
| **1.A Fuel combustion activities, total** | CO2 | | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 7,068.24 | 6,751.28 | 95.52% | |
| 1.A.1 Energy industries | CO2 | 4,743.91 | 4,276.80 | 90.15% | In inventory dana from ETS are not used for emission calculation |
| 1.A.1.a Public electricity and heat production | CO2 | 3,049.69 | 2,969.30 | 97.36% | |
| 1.A.1.b Petroleum refining | CO2 | 1,516.22 | 1,210.10 | 79.81% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 178.00 | 97.40 | 54.72% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,324.33 | 2,474.49 | 106.46% | |
| 1.A.2.a Iron and steel | CO2 | 55.80 | 19.10 | 34.22% | |
| 1.A.2.b Non-ferrous metals | CO2 | 18.68 | NO | NO | |
| 1.A.2.c Chemicals | CO2 | 288.09 | 1,219.60 | 423.34% | In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c |
| 1.A.2.d Pulp, paper and print | CO2 | 71.38 | 58.79 | 82.36% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 399.58 | 188.06 | 47.06% | |
| 1.A.2.f Non-metallic minerals | CO2 | 94.73 | NO | NO | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.2.g Other | CO2 | 1,396.07 | 988.94 | 70.84% | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.3. Transport | CO2 | 5,580.36 | 27.24 | 0.49% | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 2,530.53 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 471.32 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 1,425.29 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 455.46 | NO | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C:3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,361.94 | 1,354.10 | 99.42% | |
| 2.A.1 Cement Production | CO2 | 1,225.09 | 1,225.09 | 100.00% | |
| 2.A.2. Lime production | CO2 | 71.49 | 74.72 | 104.53% | |
| 2.A.3. Glass production | CO2 | 30.48 | 43.31 | 142.06% | |
| 2.A.4. Other process uses of carbonates | CO2 | 34.88 | 10.98 | NO | |
| **2.B Chemical industry** | CO2 | 559.83 | NO | NO | |
| 2.B.1. Ammonia production | CO2 | 559.83 | NO | NO | |
| 2.B.3. Adipic acid production (CO2) | CO2 | | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | NO | NO | |
| 2.B.5. Carbide production | CO2 | NO | NO | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | NO | NO | |
| 2.B.7 Soda ash production | CO2 | NO | NO | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO | NO | NO | |
| **2.C Metal production** | CO2 | 10.11 | 15.89 | 157.12% | |
| 2.C.1. Iron and steel production | CO2 | 10.11 | 15.89 | 157.12% | |
| 2.C.2 Ferroalloys production | CO2 | NO | NO | NO | |
| 2.C.3 Aluminium production | CO2 | NO | NO | NO | |
| 2.C.4 Magnesium production | CO2 | NO | NO | NO | |
| 2.C.5 Lead production | CO2 | NO | NO | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

| N2O emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| 2.B.2. Nitric acid production | N2O | 266.1946478 | 266.19 | 100.00% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

| Reporting year: | 2015 |
|---|---|

| Total emissions (CO2 -eq) | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | Verified emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 24,094.26 | 8,386.21 | 0.35 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 17,809.95 | 8,074.87 | 0.45 | |

| CO2 emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt | (Verified emissions/ inventory emissions)[3] | Comment[2] |
| **1.A Fuel combustion activities, total** | CO2 | | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 6,941.52 | 6,652.45 | 95.84% | |
| 1.A.1 Energy industries | CO2 | 4,718.82 | 4,293.86 | 90.99% | In inventory dana from ETS are not used for emission calculation |
| 1.A.1.a Public electricity and heat production | CO2 | 3,095.98 | 2,969.98 | 95.93% | |
| 1.A.1.b Petroleum refining | CO2 | 1,387.39 | 1,217.48 | 87.75% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 235.45 | 106.40 | 45.19% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,222.70 | 2,358.58 | 106.11% | |
| 1.A.2.a Iron and steel | CO2 | 51.58 | 10.98 | 21.29% | |
| 1.A.2.b Non-ferrous metals | CO2 | 10.90 | NO | NO | |
| 1.A.2.c Chemicals | CO2 | 294.34 | 2.99 | 1.02% | In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c |
| 1.A.2.d Pulp, paper and print | CO2 | 70.04 | 43.21 | 61.69% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 350.71 | 20.75 | 5.92% | |
| 1.A.2.f Non-metallic minerals | CO2 | 81.73 | 2,280.65 | 2790.53% | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f |
| 1.A.2.g Other | CO2 | 1,363.40 | NO | NO | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.3. Transport | CO2 | 5,887.42 | NO | NO | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 2,719.76 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 583.88 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 1,502.52 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 255.69 | NO | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C:3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,314.68 | 1,306.39 | 99.37% | |
| 2.A.1 Cement Production | CO2 | 1,169.23 | 1,169.23 | 100.00% | |
| 2.A.2. Lime production | CO2 | 73.40 | 73.40 | 100.00% | |
| 2.A.3. Glass production | CO2 | 30.68 | 30.68 | 100.00% | |
| 2.A.4. Other process uses of carbonates | CO2 | 41.37 | 33.07 | 79.95% | |
| **2.B Chemical industry** | CO2 | 572.27 | 102.48 | NO | |
| 2.B.1. Ammonia production | CO2 | 572.27 | NO | NO | |
| 2.B.3. Adipic acid production (CO2) | CO2 | | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | NO | NO | |
| 2.B.5. Carbide production | CO2 | NO | 102.48 | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | NO | NO | |
| 2.B.7 Soda ash production | CO2 | NO | NO | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO | NO | NO | |
| **2.C Metal production** | CO2 | 9.30 | 13.55 | 145.68% | |
| 2.C.1. Iron and steel production | CO2 | 9.30 | 13.55 | 145.68% | |
| 2.C.2 Ferroalloys production | CO2 | NO | NO | NO | |
| 2.C.3 Aluminium production | CO2 | NO | NO | NO | |
| 2.C.4 Magnesium production | CO2 | NO | NO | NO | |
| 2.C.5 Lead production | CO2 | NO | NO | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

| N2O emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| 2.B.2. Nitric acid production | N2O | 311.3476689 | 311.35 | 100.00% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

| Reporting year: | 2016 |
|---|---|

| Total emissions (CO2 -eq) | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | Verified emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 24,243.97 | 8,267.11 | 0.34 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 17,809.64 | 8,157.76 | 0.46 | |

| CO2 emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt | (Verified emissions/ inventory emissions)[3] | Comment[2] |
| **1.A Fuel combustion activities, total** | CO2 | 7,297.98 | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 7,075.46 | 6,321.20 | 89.34% | |
| 1.A.1 Energy industries | CO2 | 4,846.79 | 4,494.58 | 92.73% | In inventory dana from ETS are not used for emission calculation |
| 1.A.1.a Public electricity and heat production | CO2 | 3,347.32 | 3,203.95 | 95.72% | |
| 1.A.1.b Petroleum refining | CO2 | 1,298.59 | 1,177.66 | 90.69% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 200.89 | 112.97 | 56.23% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,228.67 | 1,826.62 | 81.96% | |
| 1.A.2.a Iron and steel | CO2 | 33.97 | 5.60 | 16.50% | |
| 1.A.2.b Non-ferrous metals | CO2 | 10.66 | | NO | |
| 1.A.2.c Chemicals | CO2 | 296.38 | 3.21 | 1.08% | In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c |
| 1.A.2.d Pulp, paper and print | CO2 | 105.50 | 78.14 | 74.07% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 376.65 | 19.85 | 5.27% | |
| 1.A.2.f Non-metallic minerals | CO2 | 110.23 | 1,719.81 | 1560.17% | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f |
| 1.A.2.g Other | CO2 | 1,295.27 | NO | NO | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.3. Transport | CO2 | 6,106.03 | NO | NO | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 2,790.02 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 607.71 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 1,544.39 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 222.52 | 124.04 | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C:3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,209.33 | 1,201.24 | 99.33% | |
| 2.A.1 Cement Production | CO2 | 1,076.51 | 1,076.51 | 100.00% | |
| 2.A.2. Lime production | CO2 | 63.79 | 63.79 | 100.00% | |
| 2.A.3. Glass production | CO2 | 32.62 | 32.62 | 100.00% | |
| 2.A.4. Other process uses of carbonates | CO2 | 36.41 | 28.32 | 77.79% | |
| **2.B Chemical industry** | CO2 | 547.86 | 510.22 | NO | |
| 2.B.1. Ammonia production | CO2 | 547.86 | 510.22 | 93.13% | |
| 2.B.3. Adipic acid production (CO2) | CO2 | | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | NO | NO | |
| 2.B.5. Carbide production | CO2 | NO | NO | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | NO | NO | |
| 2.B.7 Soda ash production | CO2 | NO | NO | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO | NO | NO | |
| **2.C Metal production** | CO2 | 1.05 | 1.05 | 100.00% | |
| 2.C.1. Iron and steel production | CO2 | 1.05 | 1.05 | 100.00% | |
| 2.C.2 Ferroalloys production | CO2 | NO | NO | NO | |
| 2.C.3 Aluminium production | CO2 | NO | NO | NO | |
| 2.C.4 Magnesium production | CO2 | NO | NO | NO | |
| 2.C.5 Lead production | CO2 | NO | NO | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

| N2O emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| 2.B.2. Nitric acid production | N2O | 109.3585794 | 109.36 | 100.00% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

| Reporting year: | 2017 |
|---|---|

| Total emissions (CO2 -eq) | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | Verified emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 23,760.79 | 8,367.77 | 0.35 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 17,809.01 | 8,269.17 | 0.46 | |

| CO2 emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt | (Verified emissions/ inventory emissions)[3] | Comment[2] |
| **1.A Fuel combustion activities, total** | CO2 | 6,585.43 | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 6,318.86 | 6,261.51 | 99.09% | |
| 1.A.1 Energy industries | CO2 | 3,907.81 | 4,268.40 | 109.23% | In inventory dana from ETS are not used for emission calculation |
| 1.A.1.a Public electricity and heat production | CO2 | 2,385.31 | 2,792.92 | 117.09% | |
| 1.A.1.b Petroleum refining | CO2 | 1,317.29 | 1,343.89 | 102.02% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 205.21 | 131.60 | 64.13% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,411.05 | 1,993.11 | 82.67% | |
| 1.A.2.a Iron and steel | CO2 | 54.27 | 2.72 | 5.01% | |
| 1.A.2.b Non-ferrous metals | CO2 | 26.91 | NO | NO | |
| 1.A.2.c Chemicals | CO2 | 279.62 | 2.71 | 0.97% | In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c |
| 1.A.2.d Pulp, paper and print | CO2 | 92.94 | 89.82 | 96.65% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 334.08 | 176.62 | 52.87% | |
| 1.A.2.f Non-metallic minerals | CO2 | 100.58 | 1,721.25 | 1711.34% | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f |
| 1.A.2.g Other | CO2 | 1,522.65 | NO | NO | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.3. Transport | CO2 | 6,340.45 | NO | NO | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 2,747.03 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 627.22 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 1,478.11 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 266.57 | | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C:3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,364.80 | 1,425.54 | 104.45% | |
| 2.A.1 Cement Production | CO2 | 1,210.72 | 1,287.25 | 106.32% | |
| 2.A.2. Lime production | CO2 | 88.95 | 82.08 | 92.29% | |
| 2.A.3. Glass production | CO2 | 30.50 | 31.90 | 104.59% | |
| 2.A.4. Other process uses of carbonates | CO2 | 34.64 | 24.31 | 70.17% | |
| **2.B Chemical industry** | CO2 | 513.06 | 580.12 | 113.07% | |
| 2.B.1. Ammonia production | CO2 | 513.06 | 580.12 | 113.07% | |
| 2.B.3. Adipic acid production (CO2) | CO2 | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | NO | NO | |
| 2.B.5. Carbide production | CO2 | NO | NO | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | NO | NO | |
| 2.B.7 Soda ash production | CO2 | NO | NO | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO | NO | NO | |
| **2.C Metal production** | CO2 | 8.99 | 2.00 | 22.29% | |
| 2.C.1. Iron and steel production | CO2 | 8.99 | 2.00 | 22.29% | |
| 2.C.2 Ferroalloys production | CO2 | NO | NO | NO | |
| 2.C.3 Aluminium production | CO2 | NO | NO | NO | |
| 2.C.4 Magnesium production | CO2 | NO | NO | NO | |
| 2.C.5 Lead production | CO2 | NO | NO | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

| N2O emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| 2.B.2. Nitric acid production | N2O | 50.10914065 | 98.60 | 196.77% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

| Reporting year: | 2018 |
|---|---|

| Total emissions (CO2 -eq) | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | Verified emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| Greenhouse gas emissions (total emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 23,760.79 | 7,444.62 | 0.31 | |
| CO2 emissions (total CO2 emissions without LULUCF for GHG inventory and without emissions from 1A3a Civil aviation, total emissions from installations under Article 3h of Directive 2003/87/EC) | Total GHG | 17,809.01 | 7,394.51 | 0.42 | |

| CO2 emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt | (Verified emissions/ inventory emissions)[3] | Comment[2] |
| **1.A Fuel combustion activities, total** | CO2 | 6,585.43 | NA | NA | |
| **1.A Fuel combustion activities, stationary combustion [4]** | CO2 | 6,318.86 | 5,527.44 | 87.48% | |
| 1.A.1 Energy industries | CO2 | 3,907.81 | 3,735.90 | 95.60% | In inventory dana from ETS are not used for emission calculation |
| 1.A.1.a Public electricity and heat production | CO2 | 2,385.31 | 2,284.87 | 95.79% | |
| 1.A.1.b Petroleum refining | CO2 | 1,317.29 | 1,316.70 | 99.96% | |
| 1.A.1.c Manufacture of solid fuels and other energy industries | CO2 | 205.21 | 134.33 | 65.46% | |
| 1.A.2. Manufacturing industries and construction | CO2 | 2,411.05 | 1,791.54 | 74.31% | |
| 1.A.2.a Iron and steel | CO2 | 54.27 | 9.33 | 17.19% | |
| 1.A.2.b Non-ferrous metals | CO2 | 26.91 | | NO | |
| 1.A.2.c Chemicals | CO2 | 279.62 | 0.02 | 0.01% | In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2c |
| 1.A.2.d Pulp, paper and print | CO2 | 92.94 | 90.31 | 97.17% | |
| 1.A.2.e Food processing, beverages and tobacco | CO2 | 334.08 | 17.18 | 5.14% | |
| 1.A.2.f Non-metallic minerals | CO2 | 100.58 | 1,672.85 | 1663.22% | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f. In Inventory emissions from consumption of natural gas as feedstock for ammonia production is calculated under 2B1. IN ETS are calculated under 1A2f |
| 1.A.2.g Other | CO2 | 1,522.65 | 1.84 | NO | In Inventory emissions from Construction sector are calculated under 1A2gv sector. In ETS are calculated under 1a2f |
| 1.A.3. Transport | CO2 | 6,340.45 | NO | NO | |
| 1.A.3.e Other transportation (pipeline transport) | CO2 | NO | NO | NO | |
| 1.A.4 Other sectors | CO2 | 2,747.03 | NO | NO | |
| 1.A.4.a Commercial / Institutional | CO2 | 627.22 | NO | NO | |
| 1.A.4.c Agriculture/ Forestry / Fisheries | CO2 | 1,478.11 | NO | NO | |
| **1.B Fugitive emissions from Fuels** | CO2 | 266.57 | NO | NO | |
| **1.C CO2 Transport and storage** | CO2 | NO | NO | NO | |
| 1.C.1 Transport of CO2 | CO2 | NO | NO | NO | |
| 1.C.2 Injection and storage | CO2 | NO | NO | NO | |
| 1.C:3 Other 2.A Mineral products | CO2 | NO | NO | NO | |
| **2.A Mineral products** | CO2 | 1,364.80 | 1,358.35 | 99.53% | |
| 2.A.1 Cement Production | CO2 | 1,210.72 | 1,210.72 | 100.00% | |
| 2.A.2. Lime production | CO2 | 88.95 | 88.95 | 100.00% | |
| 2.A.3. Glass production | CO2 | 30.50 | 30.50 | 100.00% | |
| 2.A.4. Other process uses of carbonates | CO2 | 34.64 | 28.18 | 81.36% | |
| **2.B Chemical industry** | CO2 | 513.06 | 494.95 | 96.47% | |
| 2.B.1. Ammonia production | CO2 | 513.06 | 494.95 | 96.47% | |
| 2.B.3. Adipic acid production (CO2) | CO2 | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | CO2 | NO | NO | NO | |
| 2.B.5. Carbide production | CO2 | NO | NO | NO | |
| 2.B.6 Titanium dioxide production | CO2 | NO | NO | NO | |
| 2.B.7 Soda ash production | CO2 | NO | NO | NO | |
| 2.B.8 Petrochemical and carbon black production | CO2 | NO | NO | NO | |
| **2.C Metal production** | CO2 | 8.99 | 13.77 | 153.16% | |
| 2.C.1. Iron and steel production | CO2 | 8.99 | 13.77 | 153.16% | |
| 2.C.2 Ferroalloys production | CO2 | NO | NO | NO | |
| 2.C.3 Aluminium production | CO2 | NO | NO | NO | |
| 2.C.4 Magnesium production | CO2 | NO | NO | NO | |
| 2.C.5 Lead production | CO2 | NO | NO | NO | |
| 2.C.6 Zinc production | CO2 | NO | NO | NO | |
| 2.C.7 Other metal production | CO2 | NO | NO | NO | |

| N2O emissions | | | | | |
|---|---|---|---|---|---|
| Category[1] | Gas | Greenhouse gas inventory emissions [kt CO2eq][3] | emissions under Directive 2003/87/EC [kt CO2eq][3] | Ratio in % (Verified emissions/ inventory emissions)[3] | Comment[2] |
| 2.B.2. Nitric acid production | N2O | 50.10914065 | 50.11 | 100.00% | |
| 2.B.3. Adipic acid production | N2O | NO | NO | NO | |
| 2.B.4. Caprolactam, glyoxal and glyoxylic acid production | N2O | NO | NO | NO | |

# Annex 5-7: Reporting on major changes to methodoogical descriptions

| Reporting year: | 2018 | | |
|---|---|---|---|
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | DESCRIPTION OF METHODS<br>Please **mark the relevant cell** where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year | RECALCULATIONS<br>Please **mark the relevant cell** where this is also reflected in recalculations compared to the previous years' CRF | REFERENCE<br>If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed. |
| **Total (Net Emissions)** | | | |
| **1. Energy** | | | |
| A. Fuel Combustion (sectoral approach) | | | |
| 1. Energy industries | | | |
| 2. Manufacturing industries and construction | 1A2gviii | In 1A2gviii small part of liquid fosil fuels were not added from energy balance by mistake in previous submission | 3.2.5. page 83 |
| 3. Transport | 1A3bi-1A3biv | Fossil part of biodiesel added, COPERT 5 used | 3.2.6. page 86 |
| 4. Other sector | | | |
| 5. Other | | | |
| B. Fugitive emissions from fuels | | | |
| 1. Solid fuels | | | |
| 2. Oil and natural gas and other emissions from energy production | 1. B. 2. a. 3. Oil transport | Data provider for oil transport has changed. Data from CBS used for emission calculation | 3.3.2. page 101 |
| C. CO2 transport and storage | | | |

| Reporting year: | 2018 | | |
|---|---|---|---|
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | DESCRIPTION OF METHODS<br>Please **mark the relevant cell** where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year | RECALCULATIONS<br>Please **mark the relevant cell** where this is also reflected in recalculations compared to the previous years' CRF | REFERENCE<br>If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed. |
| **2. Industrial processes and product use** | | | |
| A. Mineral industry | 2.A. | Emission from sugar factories was excluded from | 4.2. page 113 |
| B. Chemical industry | | | |
| C. Metal industry | | | |
| D. Non-energy products from fuels and solvent use | 2.D. | Activity data from solvent use were corrected due to harmonization with national Informative Inventory Report. | 4.5. page 153 |
| E. Electronic industry | | | |
| F. Product uses as substitutes for ODS | | | |
| G. Other product manufacture and use | 2.G. | Revised IEF used for emissions from medical applications and propellant for pressure and aerosol products. | 4.8 page 169 |
| H. Other | | | |

| Reporting year: | 2018 | | |
|---|---|---|---|
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | DESCRIPTION OF METHODS<br>Please **mark the relevant cell** where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year | RECALCULATIONS<br>Please **mark the relevant cell** where this is also reflected in recalculations compared to the previous years' CRF | REFERENCE<br>If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed. |
| **3. Agriculture** | | Updated activity data for cattle, change of emissions factors to default TierI | |
| A. Enteric fermentation | 3.A. | Updated activity data for cattle, change of emissions factors to default TierI | 5.2. page 176 |
| B. Manure management | 3.B | Change of emissions factors (NEX) calculation to | |
| C. Rice cultivation | | | |
| D. Agricultural soils | 3.D | Change due to the 3B recalculations | 5.3. page 180 |
| E. Prescribed burning of savannahs | | | |
| F. Field burning of agricultural residues | | | |
| G. Liming | | | |
| H. Urea application | | | |
| I. Other carbon containing fertilisers | | | |
| J. Other | | | |

| Reporting year: | 2018 | | |
|---|---|---|---|
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | DESCRIPTION OF METHODS<br>Please **mark the relevant cell** where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year | RECALCULATIONS<br>Please **mark the relevant cell** where this is also reflected in recalculations compared to the previous years' CRF | REFERENCE<br>If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed. |
| **4. Land use, land-use change and forestry** | | New LULUCF matrix | 6.2 page 212 |
| A. Forest land | | | |
| B. Cropland | 4.B | New LULUCF matrix | 6.2 page 212 |
| C. Grassland | 4.C | New LULUCF matrix | 6.2 page 212 |
| D. Wetlands | 4.D | New LULUCF matrix | 6.2 page 212 |
| E. Settlements | 4.E | New LULUCF matrix | 6.2 page 212 |
| F. Other land | | | |
| G. Harvested wood products | | | |
| H. Other | | | |

| Reporting year: | 2018 | | |
|---|---|---|---|
| GREENHOUSE GAS SOURCE AND SINK CATEGORIES | DESCRIPTION OF METHODS<br>Please **mark the relevant cell** where the latest NIR includes major changes in methodological descriptions compared to the NIR of the previous year | RECALCULATIONS<br>Please **mark the relevant cell** where this is also reflected in recalculations compared to the previous years' CRF | REFERENCE<br>If the cell is marked please provide a reference to the relevant section or pages in the NIR and if applicable some more detailed information such as the sub-category or gas concerned for which the description was changed. |
| **5. Waste** | | | |
| A. Solid waste disposal | | | |
| B. Biological treatment of solid waste | | | |
| C. Incineration and open burning of waste | | | |
| D. Wastewater treatment and discharge | 5.D. | New data on sludge removed are included for | 7.5 page 322 |
| E. Other | | | |

REPUBLIC OF CROATIA
MINISTRY OF ENVIRONMENT AND ENERGY
Radnička cesta 80/7, 10000 Zagreb
Tel + 385 1 1234 567
info@mzoe.hr
www.mzoe.hr