LITHUANIA‘S NATIONAL INVENTORY REPORT 2017

GREENHOUSE GAS EMISSIONS 1990-2015

ANNEXES

VILNIUS, 2017

Contents

ANNEX I. Approach 1 and Approach 2 key categories analysis

Approach 1 Level Assessment for 1990

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
4.A.1 Forest land remaining forest land - carbon stock change in biomass	*CO_2*	*-6,680.01*	*0.10*	*10.3%*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*6,021.25*	*0.09*	*19.5%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*5,796.59*	*0.09*	*28.4%*
1.A.3.b Road transportation	*CO_2*	*5,247.15*	*0.08*	*36.5%*
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	*CO_2*	*4,615.44*	*0.07*	*43.6%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*4,148.15*	*0.06*	*50.0%*
1.A.2 Manufacturing industries and construction-Liquid fuels	*CO_2*	*3,873.72*	*0.06*	*55.9%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*2,760.55*	*0.04*	*60.2%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*2,735.39*	*0.04*	*64.4%*
1.A.2 Manufacturing industries and construction-Gaseous fuels	*CO_2*	*2,045.42*	*0.03*	*67.5%*
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	*CO_2*	*-1,876.61*	*0.03*	*70.4%*
2.A.1 Cement Production	*CO_2*	*1,668.07*	*0.03*	*72.9%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,509.64*	*0.02*	*75.3%*
1.A.4 Other sectors-Gaseous fuels	*CO_2*	*1,379.27*	*0.02*	*77.4%*
2.B.1 Ammonia Production	*CO_2*	*1,253.68*	*0.02*	*79.3%*
5.A Solid Waste Disposal	*CH_4*	*1,028.83*	*0.02*	*80.9%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*992.77*	*0.02*	*82.4%*
2.B.2 Nitric Acid Production	*N_2O*	*893.01*	*0.01*	*83.8%*
4.A.2 Land converted to forest land - carbon stock change in biomass	*CO_2*	*-585.97*	*0.01*	*84.7%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*578.01*	*0.01*	*85.6%*
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	*CO_2*	*517.32*	*0.01*	*86.4%*
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	*CO_2*	*-474.03*	*0.01*	*87.1%*
5.D Wastewater Treatment and Discharge	*CH_4*	*471.00*	*0.01*	*87.8%*
4.A.2 Land converted to forest land - net carbon stock change in litter	*CO_2*	*-448.14*	*0.01*	*88.5%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*431.39*	*0.01*	*89.2%*
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	*N_2O*	*416.40*	*0.01*	*89.8%*
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	*CO_2*	*406.03*	*0.01*	*90.4%*
4.B Cropland	*N_2O*	*392.99*	*0.01*	*91.0%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop	*N_2O*	*364.53*	*0.01*	*91.6%*

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
Residues				
1.A.3.c Railways	***CO_2***	***349.97***	***0.01***	***92.1%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***341.29***	***0.01***	***92.7%***
3.B.1.3 Manure Management - Swine	***CH_4***	***287.09***	***0.00***	***93.1%***
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	***CO_2***	***266.06***	***0.00***	***93.5%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***264.70***	***0.00***	***93.9%***
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	***CH_4***	***260.55***	***0.00***	***94.3%***
4.G Harvested wood products	***CO_2***	***-252.55***	***0.00***	***94.7%***
3.B.1.1 Manure Management - Cattle	***CH_4***	***250.20***	***0.00***	***95.1%***
2.A.4 Other process use of carbonates	***CO_2***	***239.52***	***0.00***	***95.5%***
2.A.2 Lime Production	CO_2	222.68	0.00	95.8%
3.B.2 Manure Management - Cattle	N_2O	202.86	0.00	96.1%
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	195.63	0.00	96.4%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	174.15	0.00	96.7%
1.A.1 Energy industries-Solid fuels	CO_2	174.05	0.00	97.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	171.63	0.00	97.2%
1.A.4 Other sectors-Liquid fuels	N_2O	149.42	0.00	97.4%
3.A. Enteric Fermentation - Others	CH_4	134.19	0.00	97.7%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	0.00	97.9%
3.B.1 Manure Management - Other	N_2O	126.70	0.00	98.0%
4.B.2 Land converted to cropland- carbon stock change in biomass	CO_2	98.41	0.00	98.2%
4.C Grassland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	98.29	0.00	98.3%
2.G Other product manufacture and use	N_2O	96.05	0.00	98.5%
1.A.3.e Other transportation	CO_2	85.36	0.00	98.6%
3.B.1 Manure Management - Other	CH_4	84.74	0.00	98.8%
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	77.39	0.00	98.9%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	0.00	99.0%
1.A.4 Other sectors-Biomass	CH_4	70.28	0.00	99.1%
5.D Wastewater Treatment and Discharge	N_2O	67.21	0.00	99.2%
1.A.3.b Road transportation	CH_4	48.11	0.00	99.3%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	0.00	99.3%
1.A.3.c Railways	N_2O	40.92	0.00	99.4%
1.A.3.b Road transportation	N_2O	39.09	0.00	99.5%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
3.H Urea Application	CO_2	35.71	0.00	99.5%
4.A Forest land	N_2O	33.68	0.00	99.6%
1.A.4 Other sectors-Peat	CO_2	27.13	0.00	99.6%
2.B.8.a Methanol	CO_2	24.35	0.00	99.7%
3.G Liming	CO_2	20.59	0.00	99.7%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	0.00	99.7%
2.C.1 Iron and Steel Production	CO_2	16.98	0.00	99.7%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	0.00	99.8%
1.A.3.d Domestic Navigation	CO_2	15.49	0.00	99.8%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	0.00	99.8%
1.A.4 Other sectors-Biomass	N_2O	12.97	0.00	99.8%
2.A.3 Glass Production	CO_2	11.70	0.00	99.8%
1.A.1 Energy industries-Peat	CO_2	11.06	0.00	99.9%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	0.00	99.9%
1.A.3.a Domestic aviation	CO_2	8.16	0.00	99.9%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.00	99.9%
4.D Wetlands	N_2O	6.08	0.00	99.9%
2.B.8.a Methanol	CH_4	5.24	0.00	99.9%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.00	99.9%
4.A.1 Forest land remaining forest land	CO_2	4.28	0.00	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	0.00	99.9%
5.B Biological Treatment of Solid Waste	CH_4	4.04	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	0.00	100.0%
5.B Biological Treatment of Solid Waste	N_2O	2.89	0.00	100.0%
5.C Incineration and Open Burning of Waste	CO_2	2.66	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.00	100.0%
4.C Grassland	N_2O	2.31	0.00	100.0%
4.C Grassland	CH_4	2.12	0.00	100.0%
1.A.4 Other sectors-Peat	CH_4	1.12	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy	CO_2	0.72	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
production				
4.A Forest land	CH_4	0.72	0.00	100.0%
1.A.1 Energy industries-Biomass	N_2O	0.63	0.00	100.0%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	0.00	100.0%
1.A.3.c Railways	CH_4	0.50	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	0.00	100.0%
1.A.1 Energy industries-Biomass	CH_4	0.40	0.00	100.0%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	0.00	100.0%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.00	100.0%
4.B Cropland	CH_4	0.05	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.00	100.0%
2. E Electronic Industry	SF_6, NF_3	0.00	0.00	100.0%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	0.00	0.00	100.0%
2.F.2 Foam Blowing Agents	HFCs	0.00	0.00	100.0%
2.F.3 Fire Protection	HFCs	0.00	0.00	100.0%

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2.F.4 Aerosols/metered dose inhalers	HFCs	0.00	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.00	0.00	100.0%
4.E.1 Settlements remaining settlements	CO_2	0.00	0.00	100.0%
4.E.2 Land converted to settlements	CO_2	0.00	0.00	100.0%
4.F Other land	CO_2	0.00	0.00	100.0%
Total		***44,439.64***		

Approach 1 Level Assessment for 1990 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.1.a Public electricity and heat production - Liquid Fuels	***CO_2***	***6,021.25***	***0.13***	***12.5%***
1.A.1.a Public electricity and heat production - Gaseous Fuels	***CO_2***	***5,796.59***	***0.12***	***24.6%***
1.A.3.b Road transportation	***CO_2***	***5,247.15***	***0.11***	***35.5%***
3.A.1 Enteric Fermentation - Cattle	***CH_4***	***4,148.15***	***0.09***	***44.2%***
1.A.2 Manufacturing industries and construction-Liquid fuels	***CO_2***	***3,873.72***	***0.08***	***52.2%***
1.A.4 Other sectors-Solid fuels	***CO_2***	***2,760.55***	***0.06***	***58.0%***
1.A.4 Other sectors-Liquid fuels	***CO_2***	***2,735.39***	***0.06***	***63.7%***
1.A.2 Manufacturing industries and construction-Gaseous fuels	***CO_2***	***2,045.42***	***0.04***	***67.9%***
2.A.1 Cement Production	***CO_2***	***1,668.07***	***0.03***	***71.4%***
1.A.1.b Petroleum refining - Liquid Fuels	***CO_2***	***1,509.64***	***0.03***	***74.5%***
1.A.4 Other sectors-Gaseous fuels	***CO_2***	***1,379.27***	***0.03***	***77.4%***
2.B.1 Ammonia Production	***CO_2***	***1,253.68***	***0.03***	***80.0%***
5.A Solid Waste Disposal	***CH_4***	***1,028.83***	***0.02***	***82.2%***
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	***N_2O***	***992.77***	***0.02***	***84.2%***
2.B.2 Nitric Acid Production	***N_2O***	***893.01***	***0.02***	***86.1%***
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	***N_2O***	***578.01***	***0.01***	***87.3%***
5.D Wastewater Treatment and Discharge	***CH_4***	***471.00***	***0.01***	***88.3%***
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	***N_2O***	***431.39***	***0.01***	***89.2%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***416.40***	***0.01***	***90.0%***
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	***N_2O***	***364.53***	***0.01***	***90.8%***
1.A.3.c Railways	***CO_2***	***349.97***	***0.01***	***91.5%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***341.29***	***0.01***	***92.2%***
3.B.1.3 Manure Management - Swine	***CH_4***	***287.09***	***0.01***	***92.8%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***264.70***	***0.01***	***93.4%***
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	***CH_4***	***260.55***	***0.01***	***93.9%***
3.B.1.1 Manure Management - Cattle	***CH_4***	***250.20***	***0.01***	***94.4%***
2.A.4 Other process use of carbonates	***CO_2***	***239.52***	***0.00***	***94.9%***
2.A.2 Lime Production	***CO_2***	***222.68***	***0.00***	***95.4%***
3.B.2 Manure Management - Cattle	N_2O	202.86	0.00	95.8%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	174.15	0.00	96.2%
1.A.1 Energy industries-Solid fuels	CO_2	174.05	0.00	96.5%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	171.63	0.00	96.9%
1.A.4 Other sectors-Liquid fuels	N_2O	149.42	0.00	97.2%
3.A. Enteric Fermentation - Others	CH_4	134.19	0.00	97.5%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.4 Other sectors-Solid fuels	CH_4	128.56	0.00	97.8%
3.B.1 Manure Management - Other	N_2O	126.70	0.00	98.0%
2.G Other product manufacture and use	N_2O	96.05	0.00	98.2%
1.A.3.e Other transportation	CO_2	85.36	0.00	98.4%
3.B.1 Manure Management - Other	CH_4	84.74	0.00	98.6%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	0.00	98.7%
1.A.4 Other sectors-Biomass	CH_4	70.28	0.00	98.9%
5.D Wastewater Treatment and Discharge	N_2O	67.21	0.00	99.0%
1.A.3.b Road transportation	CH_4	48.11	0.00	99.1%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	0.00	99.2%
1.A.3.c Railways	N_2O	40.92	0.00	99.3%
1.A.3.b Road transportation	N_2O	39.09	0.00	99.4%
3.H Urea Application	CO_2	35.71	0.00	99.5%
1.A.4 Other sectors-Peat	CO_2	27.13	0.00	99.5%
2.B.8.a Methanol	CO_2	24.35	0.00	99.6%
3.G Liming	CO_2	20.59	0.00	99.6%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	0.00	99.6%
2.C.1 Iron and Steel Production	CO_2	16.98	0.00	99.7%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	0.00	99.7%
1.A.3.d Domestic Navigation	CO_2	15.49	0.00	99.7%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	0.00	99.8%
1.A.4 Other sectors-Biomass	N_2O	12.97	0.00	99.8%
2.A.3 Glass Production	CO_2	11.70	0.00	99.8%
1.A.1 Energy industries-Peat	CO_2	11.06	0.00	99.8%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	0.00	99.9%
1.A.3.a Domestic aviation	CO_2	8.16	0.00	99.9%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.00	99.9%
2.B.8.a Methanol	CH_4	5.24	0.00	99.9%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.00	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	0.00	99.9%
5.B Biological Treatment of Solid Waste	CH_4	4.04	0.00	99.9%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	0.00	100.0%
5.B Biological Treatment of Solid Waste	N_2O	2.89	0.00	100.0%
5.C Incineration and Open Burning of Waste	CO_2	2.66	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.00	100.0%
1.A.4 Other sectors-Peat	CH_4	1.12	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	0.00	100.0%
1.A.1 Energy industries-Biomass	N_2O	0.63	0.00	100.0%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	0.00	100.0%
1.A.3.c Railways	CH_4	0.50	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	0.00	100.0%
1.A.1 Energy industries-Biomass	CH_4	0.40	0.00	100.0%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	0.00	100.0%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.00	100.0%
2. E Electronic Industry	SF_6, NF_3	0.00	0.00	100.0%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	0.00	0.00	100.0%
2.F.2 Foam Blowing Agents	HFCs	0.00	0.00	100.0%
2.F.3 Fire Protection	HFCs	0.00	0.00	100.0%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.00	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
2.G Other product manufacture and use	SF_6	0.00	0.00	100.0%
Total		***48,040.17***		

Approach 1 Level Assessment for 2015

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
4.A.1 Forest land remaining forest land - carbon stock change in biomass	*CO_2*	*-7,872.79*	*0.20*	*19.8%*
1.A.3.b Road transportation	*CO_2*	*4,801.73*	*0.12*	*31.9%*
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	*CO_2*	*3,562.88*	*0.09*	*40.8%*
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	*CO_2*	*-2,570.34*	*0.06*	*47.3%*
2.B.1 Ammonia Production	*CO_2*	*2,019.66*	*0.05*	*52.3%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*1,561.00*	*0.04*	*56.3%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,365.81*	*0.03*	*59.7%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*1,338.50*	*0.03*	*63.1%*
4.G Harvested wood products	*CO_2*	*-1,289.53*	*0.03*	*66.3%*
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	*CO_2*	*960.14*	*0.02*	*68.7%*
5.A Solid Waste Disposal	*CH_4*	*802.20*	*0.02*	*70.7%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*780.22*	*0.02*	*72.7%*
4.A.2 Land converted to forest land - carbon stock change in biomass	*CO_2*	*-668.11*	*0.02*	*74.4%*
1.A.2 Manufacturing industries and construction-Gaseous fuels	*CO_2*	*660.47*	*0.02*	*76.0%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*651.57*	*0.02*	*77.7%*
2.A.1 Cement Production	*CO_2*	*518.31*	*0.01*	*79.0%*
4.A.2 Land converted to forest land - net carbon stock change in litter	*CO_2*	*-513.17*	*0.01*	*80.3%*
1.A.4 Other sectors-Gaseous fuels	*CO_2*	*476.67*	*0.01*	*81.5%*
2.F.1 Refrigeration and Air Conditioning Equipment	*HFCs*	*454.37*	*0.01*	*82.6%*
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	*CO_2*	*434.51*	*0.01*	*83.7%*
1.A.2 Manufacturing industries and construction-Solid fuels	*CO_2*	*386.65*	*0.01*	*84.7%*
4.E.2 Land converted to settlements	*CO_2*	*382.09*	*0.01*	*85.6%*
4.B.2 Land converted to cropland- carbon stock change in biomass	*CO_2*	*365.54*	*0.01*	*86.5%*
4.B Cropland	*N_2O*	*304.03*	*0.01*	*87.3%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*291.68*	*0.01*	*88.0%*
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	*CH_4*	*289.36*	*0.01*	*88.8%*
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	*CO_2*	*-280.28*	*0.01*	*89.5%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	*N_2O*	*264.70*	*0.01*	*90.1%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*259.56*	*0.01*	*90.8%*
2.B.2 Nitric Acid Production	*N_2O*	*257.89*	*0.01*	*91.4%*

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.4 Other sectors-Solid fuels	***CO_2***	***250.69***	***0.01***	***92.1%***
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	***CO_2***	***235.19***	***0.01***	***92.7%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***182.81***	***0.00***	***93.1%***
1.A.1.a Public electricity and heat production - Liquid Fuels	***CO_2***	***180.70***	***0.00***	***93.6%***
1.A.3.c Railways	***CO_2***	***161.90***	***0.00***	***94.0%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***156.62***	***0.00***	***94.4%***
5.D Wastewater Treatment and Discharge	***CH_4***	***146.73***	***0.00***	***94.7%***
1.A.4 Other sectors-Biomass	***CH_4***	***145.18***	***0.00***	***95.1%***
3.B.1.1 Manure Management - Cattle	***CH_4***	***139.09***	***0.00***	***95.5%***
1.A.2 Manufacturing industries and construction-Liquid fuels	CO_2	118.22	0.00	95.8%
4.C Grassland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	114.76	0.00	96.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	114.38	0.00	96.3%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	104.11	0.00	96.6%
3.B.2 Manure Management - Indirect N_2O Emissions	N_2O	98.30	0.00	96.8%
3.B.1.3 Manure Management - Swine	CH_4	78.95	0.00	97.0%
3.B.2 Manure Management - Cattle	N_2O	78.75	0.00	97.2%
3.A. Enteric Fermentation - Others	CH_4	76.45	0.00	97.4%
1.A.4 Other sectors-Peat	CO_2	75.65	0.00	97.6%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	71.24	0.00	97.8%
1.A.3.e Other transportation	CO_2	69.41	0.00	98.0%
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	-53.90	0.00	98.1%
4.F Other land	CO_2	53.65	0.00	98.2%
2. D Non-energy products from fuels and solvent use	CO_2	49.36	0.00	98.4%
3.B.1 Manure Management - Other	CH_4	48.48	0.00	98.5%
5.D Wastewater Treatment and Discharge	N_2O	44.85	0.00	98.6%
3.H Urea Application	CO_2	42.54	0.00	98.7%
2.A.2 Lime Production	CO_2	39.08	0.00	98.8%
4.A Forest land	N_2O	35.81	0.00	98.9%
1.A.3.b Road transportation	N_2O	32.83	0.00	99.0%
1.A.1 Energy industries-Biomass	N_2O	29.89	0.00	99.1%
5.B Biological Treatment of Solid Waste	CH_4	27.88	0.00	99.1%
1.A.4 Other sectors-Biomass	N_2O	26.67	0.00	99.2%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	-25.09	0.00	99.3%
3.B.1 Manure Management - Other	N_2O	24.14	0.00	99.3%
3.G Liming	CO_2	20.91	0.00	99.4%
1.A.3.c Railways	N_2O	18.97	0.00	99.4%
1.A.1 Energy industries-Biomass	CH_4	18.81	0.00	99.5%
2.F.2 Foam Blowing Agents	HFCs	15.90	0.00	99.5%
5.B Biological Treatment of Solid Waste	N_2O	14.68	0.00	99.5%
2.A.4 Other process use of carbonates	CO_2	14.62	0.00	99.6%
1.A.3.d Domestic Navigation	CO_2	13.60	0.00	99.6%
1.A.3.b Road transportation	CH_4	13.29	0.00	99.6%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	12.95	0.00	99.7%
1.A.4 Other sectors-Liquid fuels	N_2O	12.64	0.00	99.7%
1.A.4 Other sectors-Solid fuels	CH_4	11.87	0.00	99.7%
1.A.1 Energy industries-Solid fuels	CO_2	8.46	0.00	99.8%
1.A.1 Energy industries-Peat	CO_2	7.30	0.00	99.8%
2.A.3 Glass Production	CO_2	6.42	0.00	99.8%
2.F.4 Aerosols/metered dose inhalers	HFCs	5.92	0.00	99.8%
5.C Incineration and Open Burning of Waste	CO_2	5.73	0.00	99.8%
1.A.2 Manufacturing industries and construction-Peat	CO_2	5.11	0.00	99.8%
2. E Electronic Industry	SF_6, NF_3	5.00	0.00	99.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	4.99	0.00	99.9%
4.D Wetlands	N_2O	4.97	0.00	99.9%
2.G Other product manufacture and use	N_2O	4.89	0.00	99.9%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	4.32	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	4.29	0.00	99.9%
1.A.4 Other sectors-Peat	CH_4	3.81	0.00	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	3.19	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	2.70	0.00	99.9%
2.F.3 Fire Protection	HFCs	2.17	0.00	99.9%
2.C.1 Iron and Steel Production	CO_2	2.02	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	N_2O	1.94	0.00	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	1.79	0.00	100.0%
4.A.1 Forest land remaining forest land	CO_2	1.68	0.00	100.0%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	1.60	0.00	100.0%
1.A.3.a Domestic aviation	CO_2	1.56	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	1.23	0.00	100.0%
1.A.4 Other sectors-Solid fuels	N_2O	1.18	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	1.12	0.00	100.0%
4.C Grassland	N_2O	1.11	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	1.07	0.00	100.0%
4.C Grassland	CH_4	1.02	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	1.00	0.00	100.0%
1.A.1 Energy industries-Liquid fuels	CH_4	0.99	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.80	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	N_2O	0.76	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.71	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	0.64	0.00	100.0%
1.A.4 Other sectors-Liquid fuels	CH_4	0.59	0.00	100.0%
4.A Forest land	CH_4	0.42	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	0.35	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.30	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.30	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.26	0.00	100.0%
1.A.3.c Railways	CH_4	0.23	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.17	0.00	100.0%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	0.15	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.11	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.04	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.03	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.03	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.03	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.02	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.02	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.01	0.00	100.0%
4.B Cropland	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.00	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.1 Energy industries-Solid fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CH_4	0.00	0.00	100.0%
4.E.1 Settlements remaining settlements	CO_2	0.00	0.00	100.0%
Total		***13,243.50***		

Approach 1 Level Assessment for 2015 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.A.3.b Road transportation	*CO_2*	*4,801.73*	*0.24*	*23.9%*
2.B.1 Ammonia Production	*CO_2*	*2,019.66*	*0.10*	*34.0%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*1,561.00*	*0.08*	*41.8%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,365.81*	*0.07*	*48.6%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*1,338.50*	*0.07*	*55.3%*
5.A Solid Waste Disposal	*CH_4*	*802.20*	*0.04*	*59.3%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*780.22*	*0.04*	*63.2%*
1.A.2 Manufacturing industries and construction-Gaseous fuels	*CO_2*	*660.47*	*0.03*	*66.5%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*651.57*	*0.03*	*69.7%*
2.A.1 Cement Production	*CO_2*	*518.31*	*0.03*	*72.3%*
1.A.4 Other sectors-Gaseous fuels	*CO_2*	*476.67*	*0.02*	*74.7%*
2.F.1 Refrigeration and Air Conditioning Equipment	*HFCs*	*454.37*	*0.02*	*76.9%*
1.A.2 Manufacturing industries and construction-Solid fuels	*CO_2*	*386.65*	*0.02*	*78.9%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*291.68*	*0.01*	*80.3%*
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	*CH_4*	*289.36*	*0.01*	*81.8%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	*N_2O*	*264.70*	*0.01*	*83.1%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*259.56*	*0.01*	*84.4%*
2.B.2 Nitric Acid Production	*N_2O*	*257.89*	*0.01*	*85.6%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*250.69*	*0.01*	*86.9%*
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	*N_2O*	*182.81*	*0.01*	*87.8%*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*180.70*	*0.01*	*88.7%*
1.A.3.c Railways	*CO_2*	*161.90*	*0.01*	*89.5%*
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	*N_2O*	*156.62*	*0.01*	*90.3%*
5.D Wastewater Treatment and Discharge	*CH_4*	*146.73*	*0.01*	*91.0%*
1.A.4 Other sectors-Biomass	*CH_4*	*145.18*	*0.01*	*91.8%*
3.B.1.1 Manure Management - Cattle	*CH_4*	*139.09*	*0.01*	*92.4%*
1.A.2 Manufacturing industries and construction-Liquid fuels	*CO_2*	*118.22*	*0.01*	*93.0%*
1.A.1 Energy industries-Other fossil fuels	*CO_2*	*114.38*	*0.01*	*93.6%*
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	*N_2O*	*104.11*	*0.01*	*94.1%*
3.B.2 Manure Management - Indirect N_2O Emissions	*N_2O*	*98.30*	*0.00*	*94.6%*
3.B.1.3 Manure Management - Swine	*CH_4*	*78.95*	*0.00*	*95.0%*

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
3.B.2 Manure Management - Cattle	***N_2O***	***78.75***	***0.00***	***95.4%***
3.A. Enteric Fermentation - Others	CH_4	76.45	0.00	95.8%
1.A.4 Other sectors-Peat	CO_2	75.65	0.00	96.2%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	71.24	0.00	96.5%
1.A.3.e Other transportation	CO_2	69.41	0.00	96.9%
2. D Non-energy products from fuels and solvent use	CO_2	49.36	0.00	97.1%
3.B.1 Manure Management - Other	CH_4	48.48	0.00	97.4%
5.D Wastewater Treatment and Discharge	N_2O	44.85	0.00	97.6%
3.H Urea Application	CO_2	42.54	0.00	97.8%
2.A.2 Lime Production	CO_2	39.08	0.00	98.0%
1.A.3.b Road transportation	N_2O	32.83	0.00	98.1%
1.A.1 Energy industries-Biomass	N_2O	29.89	0.00	98.3%
5.B Biological Treatment of Solid Waste	CH_4	27.88	0.00	98.4%
1.A.4 Other sectors-Biomass	N_2O	26.67	0.00	98.6%
3.B.1 Manure Management - Other	N_2O	24.14	0.00	98.7%
3.G Liming	CO_2	20.91	0.00	98.8%
1.A.3.c Railways	N_2O	18.97	0.00	98.9%
1.A.1 Energy industries-Biomass	CH_4	18.81	0.00	99.0%
2.F.2 Foam Blowing Agents	HFCs	15.90	0.00	99.1%
5.B Biological Treatment of Solid Waste	N_2O	14.68	0.00	99.1%
2.A.4 Other process use of carbonates	CO_2	14.62	0.00	99.2%
1.A.3.d Domestic Navigation	CO_2	13.60	0.00	99.3%
1.A.3.b Road transportation	CH_4	13.29	0.00	99.3%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	12.95	0.00	99.4%
1.A.4 Other sectors-Liquid fuels	N_2O	12.64	0.00	99.5%
1.A.4 Other sectors-Solid fuels	CH_4	11.87	0.00	99.5%
1.A.1 Energy industries-Solid fuels	CO_2	8.46	0.00	99.6%
1.A.1 Energy industries-Peat	CO_2	7.30	0.00	99.6%
2.A.3 Glass Production	CO_2	6.42	0.00	99.6%
2.F.4 Aerosols/metered dose inhalers	HFCs	5.92	0.00	99.7%
5.C Incineration and Open Burning of Waste	CO_2	5.73	0.00	99.7%
1.A.2 Manufacturing industries and construction-Peat	CO_2	5.11	0.00	99.7%
2. E Electronic Industry	SF_6, NF_3	5.00	0.00	99.7%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	4.99	0.00	99.8%
2.G Other product manufacture and use	N_2O	4.89	0.00	99.8%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	4.32	0.00	99.8%
1.A.2 Manufacturing industries and	N_2O	4.29	0.00	99.8%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
construction-Biomass				
1.A.4 Other sectors-Peat	CH_4	3.81	0.00	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	3.19	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	2.70	0.00	99.9%
2.F.3 Fire Protection	HFCs	2.17	0.00	99.9%
2.C.1 Iron and Steel Production	CO_2	2.02	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	N_2O	1.94	0.00	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	1.79	0.00	99.9%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	1.60	0.00	99.9%
1.A.3.a Domestic aviation	CO_2	1.56	0.00	99.9%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	1.23	0.00	99.9%
1.A.4 Other sectors-Solid fuels	N_2O	1.18	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	1.12	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	1.07	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	1.00	0.00	100.0%
1.A.1 Energy industries-Liquid fuels	CH_4	0.99	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.80	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	N_2O	0.76	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.71	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	0.64	0.00	100.0%
1.A.4 Other sectors-Liquid fuels	CH_4	0.59	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	0.35	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.30	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.30	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.26	0.00	100.0%
1.A.3.c Railways	CH_4	0.23	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.17	0.00	100.0%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	0.15	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.11	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.04	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.03	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.03	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.03	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.02	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment*	*Cumulative total*
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.02	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CH_4	0.00	0.00	100.0%
Total		***20,058.88***		

Approach 1 Trend Assessment for 2015

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*6,021.25*	*180.70*	*0.15*	*13.6%*	*13.6%*
4.A.1 Forest land remaining forest land - carbon stock change in biomass	*CO_2*	*-6,680.01*	*-7,872.79*	*0.11*	*10.0%*	*23.6%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*5,796.59*	*1,338.50*	*0.10*	*9.3%*	*32.8%*
1.A.2 Manufacturing industries and construction-Liquid fuels	*CO_2*	*3,873.72*	*118.22*	*0.09*	*8.7%*	*41.6%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*2,760.55*	*250.69*	*0.06*	*5.7%*	*47.2%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*2,735.39*	*259.56*	*0.06*	*5.6%*	*52.8%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*4,148.15*	*1,561.00*	*0.05*	*4.7%*	*57.5%*
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	*CO_2*	*-1,876.61*	*-2,570.34*	*0.04*	*4.0%*	*61.5%*
2.B.1 Ammonia Production	*CO_2*	*1,253.68*	*2,019.66*	*0.04*	*3.6%*	*65.1%*
4.G Harvested wood products	*CO_2*	*-252.55*	*-1,289.53*	*0.04*	*3.6%*	*68.7%*
1.A.3.b Road transportation	*CO_2*	*5,247.15*	*4,801.73*	*0.04*	*3.3%*	*72.1%*
1.A.2 Manufacturing industries and construction-Gaseous fuels	*CO_2*	*2,045.42*	*660.47*	*0.03*	*2.7%*	*74.7%*
2.A.1 Cement Production	*CO_2*	*1,668.07*	*518.31*	*0.02*	*2.2%*	*77.0%*
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	*CO_2*	*517.32*	*960.14*	*0.02*	*1.9%*	*78.9%*
1.A.4 Other sectors-Gaseous fuels	*CO_2*	*1,379.27*	*476.67*	*0.02*	*1.7%*	*80.6%*
2.F.1 Refrigeration and Air Conditioning Equipment	*HFCs*	*5.36*	*454.37*	*0.02*	*1.5%*	*82.0%*
2.B.2 Nitric Acid Production	*N_2O*	*893.01*	*257.89*	*0.01*	*1.3%*	*83.3%*
4.E.2 Land converted to settlements	*CO_2*	*0.00*	*382.09*	*0.01*	*1.2%*	*84.5%*
4.B.2 Land converted to cropland- carbon stock change in biomass	*CO_2*	*98.41*	*365.54*	*0.01*	*1.0%*	*85.5%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,509.64*	*1,365.81*	*0.01*	*0.9%*	*86.4%*
1.A.2 Manufacturing industries and construction-Solid fuels	*CO_2*	*171.63*	*386.65*	*0.01*	*0.9%*	*87.3%*
4.A.2 Land converted to forest land - carbon stock change in biomass	*CO_2*	*-585.97*	*-668.11*	*0.01*	*0.8%*	*88.1%*
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	*CO_2*	*4,615.44*	*3,562.88*	*0.01*	*0.8%*	*88.9%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*578.01*	*651.57*	*0.01*	*0.8%*	*89.6%*
5.D Wastewater Treatment and Discharge	*CH_4*	*471.00*	*146.73*	*0.01*	*0.6%*	*90.3%*

IPCC Category	Greenhouse gas	1990 kt CO_2 eqv.	2015 kt CO_2 eqv.	Trend assessment	% Contribution to Trend	Cumulative total
4.A.2 Land converted to forest land - net carbon stock change in litter	***CO_2***	***-448.14***	***-513.17***	***0.01***	***0.6%***	***90.9%***
2.A.4 Other process use of carbonates	***CO_2***	***239.52***	***14.62***	***0.01***	***0.5%***	***91.4%***
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	***CO_2***	***406.03***	***434.51***	***0.00***	***0.5%***	***91.9%***
3.B.1.3 Manure Management - Swine	***CH_4***	***287.09***	***78.95***	***0.00***	***0.4%***	***92.3%***
2.A.2 Lime Production	***CO_2***	***222.68***	***39.08***	***0.00***	***0.4%***	***92.7%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***416.40***	***182.81***	***0.00***	***0.4%***	***93.1%***
1.A.1. Energy industries-Solid fuels	***CO_2***	***174.05***	***8.46***	***0.00***	***0.4%***	***93.4%***
1.A.1. Energy industries-Other fossil fuels	***CO_2***	***0.00***	***114.38***	***0.00***	***0.4%***	***93.8%***
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	***CH_4***	***260.55***	***289.36***	***0.00***	***0.3%***	***94.1%***
1.A.4 Other sectors-Liquid fuels	***N_2O***	***149.42***	***12.64***	***0.00***	***0.3%***	***94.5%***
1.A.4 Other sectors-Biomass	***CH_4***	***70.28***	***145.18***	***0.00***	***0.3%***	***94.8%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***264.70***	***98.30***	***0.00***	***0.3%***	***95.1%***
1.A.3.c Railways	***CO_2***	***349.97***	***161.90***	***0.00***	***0.3%***	***95.4%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	N_2O	341.29	156.62	0.00	0.3%	95.6%
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	195.63	-53.90	0.00	0.3%	95.9%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	11.87	0.00	0.3%	96.2%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	71.24	0.00	0.2%	96.4%
3.B.2 Manure Management - Cattle	N_2O	202.86	78.75	0.00	0.2%	96.6%
3.B.1 Manure Management - Other	N_2O	126.70	24.14	0.00	0.2%	96.9%
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	N_2O	992.77	780.22	0.00	0.2%	97.1%
2.G Other product manufacture and use	N_2O	96.05	4.89	0.00	0.2%	97.3%
5.A Solid Waste Disposal	CH_4	1,028.83	802.20	0.00	0.2%	97.5%
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	CO_2	-474.03	-280.28	0.00	0.2%	97.7%
1.A.4 Other sectors-Peat	CO_2	27.13	75.65	0.00	0.2%	97.9%
4.F Other land	CO_2	0.00	53.65	0.00	0.2%	98.0%
4.C Grassland, Emissions and removals from drainage and rewetting and other	CO_2	98.29	114.76	0.00	0.1%	98.2%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
management of organic and mineral soils						
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	266.06	235.19	0.00	0.1%	98.3%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	139.09	0.00	0.1%	98.5%
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	77.39	-25.09	0.00	0.1%	98.6%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	4.99	0.00	0.1%	98.7%
1.A.1. Energy industries-Biomass	N_2O	0.63	29.89	0.00	0.1%	98.8%
5.B Biological Treatment of Solid Waste	CH_4	4.04	27.88	0.00	0.1%	98.8%
1.A.3.b Road transportation	CH_4	48.11	13.29	0.00	0.1%	98.9%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	174.15	104.11	0.00	0.1%	99.0%
4.B Cropland	N_2O	392.99	304.03	0.00	0.1%	99.1%
3.A. Enteric Fermentation - Others	CH_4	134.19	76.45	0.00	0.1%	99.1%
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	N_2O	431.39	291.68	0.00	0.1%	99.2%
1.A.1. Energy industries-Biomass	CH_4	0.40	18.81	0.00	0.1%	99.2%
1.A.4 Other sectors-Biomass	N_2O	12.97	26.67	0.00	0.1%	99.3%
3.H Urea Application	CO_2	35.71	42.54	0.00	0.1%	99.4%
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	0.00	0.1%	99.4%
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	0.00	0.0%	99.4%
3.B.1 Manure Management - Other	CH_4	84.74	48.48	0.00	0.0%	99.5%
4.A Forest land	N_2O	33.68	35.81	0.00	0.0%	99.5%
1.A.3.c Railways	N_2O	40.92	18.97	0.00	0.0%	99.6%
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	0.00	0.0%	99.6%
1.A.1. Energy industries-Liquid fuels	N_2O	16.11	1.94	0.00	0.0%	99.6%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	1.18	0.00	0.0%	99.6%
1.A.3.e Other transportation	CO_2	85.36	69.41	0.00	0.0%	99.7%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	5.11	0.00	0.0%	99.7%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	12.95	0.00	0.0%	99.7%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
3.G Liming	CO_2	20.59	20.91	0.00	0.0%	99.7%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	0.00	0.0%	99.8%
2. E Electronic Industry	SF_6, NF_3	0.00	5.00	0.00	0.0%	99.8%
1.A.3.b Road transportation	N_2O	39.09	32.83	0.00	0.0%	99.8%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.59	0.00	0.0%	99.8%
1.A.3.a Domestic aviation	CO_2	8.16	1.56	0.00	0.0%	99.8%
1.A.1. Energy industries-Liquid fuels	CH_4	6.90	0.99	0.00	0.0%	99.8%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	4.29	0.00	0.0%	99.8%
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	0.00	0.0%	99.9%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	4.32	0.00	0.0%	99.9%
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.15	0.00	0.0%	99.9%
1.A.4 Other sectors-Peat	CH_4	1.12	3.81	0.00	0.0%	99.9%
1.A.3.d Domestic Navigation	CO_2	15.49	13.60	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	2.70	0.00	0.0%	99.9%
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	N_2O	364.53	264.70	0.00	0.0%	99.9%
2.F.3 Fire Protection	HFCs	0.00	2.17	0.00	0.0%	99.9%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	49.36	0.00	0.0%	99.9%
2.A.3 Glass Production	CO_2	11.70	6.42	0.00	0.0%	99.9%
1.A.1. Energy industries-Gaseous fuels	N_2O	3.13	0.76	0.00	0.0%	99.9%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	0.00	0.0%	100.0%
4.A.1 Forest land remaining forest land	CO_2	4.28	1.68	0.00	0.0%	100.0%
1.A.1. Energy industries-Gaseous fuels	CH_4	2.63	0.64	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	1.23	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	1.79	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	1.07	0.00	0.0%	100.0%
1.A.1. Energy industries-Other fossil fuels	N_2O	0.00	1.12	0.00	0.0%	100.0%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
2.G Other product manufacture and use	SF_6	0.05	0.80	0.00	0.0%	100.0%
1.A.1. Energy industries-Other fossil fuels	CH_4	0.00	0.71	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	1.00	0.00	0.0%	100.0%
1.A.1. Energy industries-Peat	CO_2	11.06	7.30	0.00	0.0%	100.0%
4.D Wetlands	N_2O	6.08	4.97	0.00	0.0%	100.0%
4.C Grassland	N_2O	2.31	1.11	0.00	0.0%	100.0%
1.A.1. Energy industries-Solid fuels	N_2O	0.82	0.04	0.00	0.0%	100.0%
4.C Grassland	CH_4	2.12	1.02	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.35	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.30	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.26	0.00	0.0%	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.30	0.00	0.0%	100.0%
1.A.3.c Railways	CH_4	0.50	0.23	0.00	0.0%	100.0%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	3.19	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	0.00	0.0%	100.0%
4.A Forest land	CH_4	0.72	0.42	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.02	0.00	0.0%	100.0%
1.A.1. Energy industries-Solid fuels	CH_4	0.05	0.00	0.00	0.0%	100.0%
4.B Cropland	CH_4	0.05	0.01	0.00	0.0%	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.11	0.00	0.0%	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.02	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.01	0.00	0.0%	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.03	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	0.00	0.0%	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.04	0.00	0.0%	100.0%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	0.00	0.0%	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.03	0.00	0.0%	100.0%
1.A.1. Energy industries-Peat	N_2O	0.05	0.03	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.1. Energy industries-Peat	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.1. Energy industries-Biomass	CO_2	0.00	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CO_2	24.35	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CH_4	5.24	0.00	0.00	0.0%	100.0%
4.E.1 Settlements remaining settlements	CO_2	0.00	0.00	0.00	0.0%	100.0%
Total		***44,445.90***	***13,243.50***	***1.07***	***1.00***	

Approach 1 Trend Assessment for 2015 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.3.b Road transportation	*CO_2*	*5,247.15*	*4,801.73*	*0.31*	*16.4%*	*16.4%*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*6,021.25*	*180.70*	*0.28*	*14.6%*	*31.0%*
1.A.2 Manufacturing industries and construction-Liquid fuels	*CO_2*	*3,873.72*	*118.22*	*0.18*	*9.4%*	*40.4%*
2.B.1 Ammonia Production	*CO_2*	*1,253.68*	*2,019.66*	*0.18*	*9.4%*	*49.8%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*5,796.59*	*1,338.50*	*0.13*	*6.8%*	*56.5%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*2,760.55*	*250.69*	*0.11*	*5.7%*	*62.2%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*2,735.39*	*259.56*	*0.11*	*5.5%*	*67.7%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,509.64*	*1,365.81*	*0.09*	*4.6%*	*72.3%*
2.F.1 Refrigeration and Air Conditioning Equipment	*HFCs*	*5.36*	*454.37*	*0.05*	*2.8%*	*75.2%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*578.01*	*651.57*	*0.05*	*2.6%*	*77.8%*
5.A Solid Waste Disposal	*CH_4*	*1,028.83*	*802.20*	*0.04*	*2.3%*	*80.1%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*992.77*	*780.22*	*0.04*	*2.3%*	*82.4%*
1.A.2 Manufacturing industries and construction-Solid fuels	*CO_2*	*171.63*	*386.65*	*0.04*	*2.0%*	*84.4%*
1.A.2 Manufacturing industries and construction-Gaseous fuels	*CO_2*	*2,045.42*	*660.47*	*0.02*	*1.2%*	*85.6%*
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	*CH_4*	*260.55*	*289.36*	*0.02*	*1.1%*	*86.7%*
2.A.1 Cement Production	*CO_2*	*1,668.07*	*518.31*	*0.02*	*1.1%*	*87.8%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*4,148.15*	*1,561.00*	*0.02*	*1.1%*	*88.9%*
1.A.4 Other sectors-Biomass	*CH_4*	*70.28*	*145.18*	*0.01*	*0.7%*	*89.6%*
2.B.2 Nitric Acid Production	*N_2O*	*893.01*	*257.89*	*0.01*	*0.7%*	*90.3%*
1.A.1 Energy industries-Other fossil fuels	*CO_2*	*0.00*	*114.38*	*0.01*	*0.7%*	*91.0%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	*N_2O*	*364.53*	*264.70*	*0.01*	*0.7%*	*91.8%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*431.39*	*291.68*	*0.01*	*0.7%*	*92.5%*
1.A.4 Other sectors-Gaseous fuels	*CO_2*	*1,379.27*	*476.67*	*0.01*	*0.6%*	*93.1%*

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
2.A.4 Other process use of carbonates	***CO_2***	***239.52***	***14.62***	***0.01***	***0.5%***	***93.6%***
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	***CO_2***	***0.00***	***71.24***	***0.01***	***0.4%***	***94.1%***
1.A.4 Other sectors-Peat	***CO_2***	***27.13***	***75.65***	***0.01***	***0.4%***	***94.5%***
1.A.1 Energy industries-Solid fuels	***CO_2***	***174.05***	***8.46***	***0.01***	***0.4%***	***94.9%***
2.A.2 Lime Production	***CO_2***	***222.68***	***39.08***	***0.01***	***0.3%***	***95.2%***
5.D Wastewater Treatment and Discharge	***CH_4***	***471.00***	***146.73***	***0.01***	***0.3%***	***95.5%***
1.A.4 Other sectors-Liquid fuels	N_2O	149.42	12.64	0.01	0.3%	95.8%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	11.87	0.00	0.3%	96.1%
3.B.1.3 Manure Management - Swine	CH_4	287.09	78.95	0.00	0.3%	96.3%
2.G Other product manufacture and use	N_2O	96.05	4.89	0.00	0.2%	96.6%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	139.09	0.00	0.2%	96.8%
1.A.3.e Other transportation	CO_2	85.36	69.41	0.00	0.2%	97.0%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	174.15	104.11	0.00	0.2%	97.2%
1.A.1 Energy industries-Biomass	N_2O	0.63	29.89	0.00	0.2%	97.4%
3.B.1 Manure Management - Other	N_2O	126.70	24.14	0.00	0.2%	97.6%
3.H Urea Application	CO_2	35.71	42.54	0.00	0.2%	97.7%
5.B Biological Treatment of Solid Waste	CH_4	4.04	27.88	0.00	0.2%	97.9%
1.A.4 Other sectors-Biomass	N_2O	12.97	26.67	0.00	0.1%	98.0%
3.A. Enteric Fermentation - Others	CH_4	134.19	76.45	0.00	0.1%	98.2%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	49.36	0.00	0.1%	98.3%
1.A.1 Energy industries-Biomass	CH_4	0.40	18.81	0.00	0.1%	98.4%
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	0.00	0.1%	98.5%
1.A.3.b Road transportation	N_2O	39.09	32.83	0.00	0.1%	98.6%
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	0.00	0.1%	98.7%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.3.c Railways	CO_2	349.97	161.90	0.00	0.1%	98.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	4.99	0.00	0.1%	98.9%
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	N_2O	341.29	156.62	0.00	0.1%	99.0%
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	0.00	0.1%	99.1%
3.B.1 Manure Management - Other	CH_4	84.74	48.48	0.00	0.1%	99.2%
3.G Liming	CO_2	20.59	20.91	0.00	0.1%	99.2%
3.B.2 Manure Management - Indirect N_2O Emissions	N_2O	264.70	98.30	0.00	0.1%	99.3%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	12.95	0.00	0.1%	99.4%
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	N_2O	416.40	182.81	0.00	0.1%	99.4%
1.A.3.d Domestic Navigation	CO_2	15.49	13.60	0.00	0.0%	99.5%
1.A.3.b Road transportation	CH_4	48.11	13.29	0.00	0.0%	99.5%
3.B.2 Manure Management - Cattle	N_2O	202.86	78.75	0.00	0.0%	99.5%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	0.00	0.0%	99.6%
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	0.00	0.0%	99.6%
2. E Electronic Industry	SF_6, NF_3	0.00	5.00	0.00	0.0%	99.6%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	1.94	0.00	0.0%	99.7%
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	0.00	0.0%	99.7%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	1.18	0.00	0.0%	99.7%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	4.29	0.00	0.0%	99.8%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	4.32	0.00	0.0%	99.8%
1.A.4 Other sectors-Peat	CH_4	1.12	3.81	0.00	0.0%	99.8%
1.A.1 Energy industries-Peat	CO_2	11.06	7.30	0.00	0.0%	99.8%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	2.70	0.00	0.0%	99.8%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.59	0.00	0.0%	99.8%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	5.11	0.00	0.0%	99.9%
2.F.3 Fire Protection	HFCs	0.00	2.17	0.00	0.0%	99.9%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.99	0.00	0.0%	99.9%
1.A.3.c Railways	N_2O	40.92	18.97	0.00	0.0%	99.9%
1.A.3.a Domestic aviation	CO_2	8.16	1.56	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.15	0.00	0.0%	99.9%
2.A.3 Glass Production	CO_2	11.70	6.42	0.00	0.0%	99.9%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	1.79	0.00	0.0%	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	3.19	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	1.23	0.00	0.0%	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	1.12	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	1.00	0.00	0.0%	100.0%
2.G Other product manufacture and use	SF_6	0.05	0.80	0.00	0.0%	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.71	0.00	0.0%	100.0%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.76	0.00	0.0%	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.64	0.00	0.0%	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.04	0.00	0.0%	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.30	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	1.07	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.35	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.30	0.00	0.0%	100.0%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment*	*% Contribution to Trend*	*Cumulative total*
1.A.3.d Domestic Navigation	N_2O	0.13	0.11	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.26	0.00	0.0%	100.0%
1.A.3.c Railways	CH_4	0.50	0.23	0.00	0.0%	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.04	0.00	0.0%	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.03	0.00	0.0%	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	0.00	0.0%	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.02	0.00	0.0%	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.03	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.01	0.00	0.0%	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.03	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.02	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	0.00	0.0%	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CO_2	24.35	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CH_4	5.24	0.00	0.00	0.0%	100.0%
Total		***48,046.43***	***20,058.88***	***1.90***	***1.00***	

Approach 2 Level Assessment for 1990

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	*CO_2*	*4,615.44*	*0.17*	*17.1%*
4.A.1 Forest land remaining forest land - carbon stock change in biomass	*CO_2*	*-6,680.01*	*0.13*	*30.3%*
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	*CO_2*	*-1,876.61*	*0.08*	*38.1%*
5.A Solid Waste Disposal	*CH_4*	*1,028.83*	*0.07*	*45.3%*
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	*CO_2*	*517.32*	*0.06*	*51.1%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*992.77*	*0.05*	*55.9%*
3.B.2 Manure Management - Indirect N_2O Emissions	*N_2O*	*264.70*	*0.04*	*59.8%*
4.B Cropland	*N_2O*	*392.99*	*0.04*	*63.5%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*431.39*	*0.03*	*66.7%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*578.01*	*0.03*	*69.6%*
5.D Wastewater Treatment and Discharge	*CH_4*	*471.00*	*0.02*	*72.0%*
3.A.1 Enteric Fermentation - Cattle	*CH_4*	*4,148.15*	*0.02*	*74.0%*
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	*N_2O*	*416.40*	*0.02*	*76.0%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	*N_2O*	*364.53*	*0.02*	*77.8%*
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	*N_2O*	*341.29*	*0.02*	*79.5%*
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	*N_2O*	*174.15*	*0.01*	*80.8%*
4.A.2 Land converted to forest land - carbon stock change in biomass	*CO_2*	*-585.97*	*0.01*	*82.1%*
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	*CO_2*	*406.03*	*0.01*	*83.3%*
4.A.2 Land converted to forest land - net carbon stock change in litter	*CO_2*	*-448.14*	*0.01*	*84.2%*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*6,021.25*	*0.01*	*85.2%*
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	*CO_2*	*-474.03*	*0.01*	*86.1%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*5,796.59*	*0.01*	*87.0%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*2,760.55*	*0.01*	*87.9%*
4.G Harvested wood products	*CO_2*	*-252.55*	*0.01*	*88.8%*
1.A.3.b Road transportation	*CO_2*	*5,247.15*	*0.01*	*89.6%*
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	*CO_2*	*266.06*	*0.01*	*90.4%*

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	195.63	0.01	91.1%
1.A.4 Other sectors-Biomass	CH_4	70.28	0.01	91.7%
1.A.2 Manufacturing industries and construction-Liquid fuels	CO_2	3,873.72	0.01	92.3%
1.A.4 Other sectors-Liquid fuels	CO_2	2,735.39	0.01	92.9%
2.B.2 Nitric Acid Production	N_2O	893.01	0.01	93.4%
2.A.1 Cement Production	CO_2	1,668.07	0.00	93.9%
1.A.4 Other sectors-Liquid fuels	N_2O	149.42	0.00	94.3%
2.A.2 Lime Production	CO_2	222.68	0.00	94.7%
4.B.2 Land converted to cropland- carbon stock change in biomass	CO_2	98.41	0.00	95.0%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	0.00	95.4%
4.A Forest land	N_2O	33.68	0.00	95.7%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	2,045.42	0.00	96.0%
4.C Grassland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	98.29	0.00	96.3%
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	77.39	0.00	96.6%
1.A.4 Other sectors-Gaseous fuels	CO_2	1,379.27	0.00	96.9%
1.A.1.b Petroleum refining - Liquid Fuels	CO_2	1,509.64	0.00	97.1%
2.G Other product manufacture and use	N_2O	96.05	0.00	97.4%
5.D Wastewater Treatment and Discharge	N_2O	67.21	0.00	97.6%
1.A.3.b Road transportation	CH_4	48.11	0.00	97.8%
2.B.1 Ammonia Production	CO_2	1,253.68	0.00	98.0%
1.A.3.c Railways	N_2O	40.92	0.00	98.1%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	260.55	0.00	98.3%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	0.00	98.4%
3.H Urea Application	CO_2	35.71	0.00	98.6%
1.A.4 Other sectors-Biomass	N_2O	12.97	0.00	98.7%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	0.00	98.8%
1.A.3.b Road transportation	N_2O	39.09	0.00	98.9%
1.A.3.c Railways	CO_2	349.97	0.00	99.0%
2.A.4 Other process use of carbonates	CO_2	239.52	0.00	99.1%
3.A. Enteric Fermentation - Others	CH_4	134.19	0.00	99.1%
3.B.1.3 Manure Management - Swine	CH_4	287.09	0.00	99.2%
3.G Liming	CO_2	20.59	0.00	99.3%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	0.00	99.3%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.D Wetlands	N_2O	6.08	0.00	99.4%
3.B.2 Manure Management - Cattle	N_2O	202.86	0.00	99.4%
1.A.1 Energy industries-Solid fuels	CO_2	174.05	0.00	99.5%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	171.63	0.00	99.5%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	0.00	99.6%
2.B.8.a Methanol	CO_2	24.35	0.00	99.6%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	0.00	99.7%
3.B.1 Manure Management - Other	N_2O	126.70	0.00	99.7%
1.A.3.e Other transportation	CO_2	85.36	0.00	99.7%
5.B Biological Treatment of Solid Waste	CH_4	4.04	0.00	99.7%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.00	99.8%
3.B.1 Manure Management - Other	CH_4	84.74	0.00	99.8%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.00	99.8%
5.B Biological Treatment of Solid Waste	N_2O	2.89	0.00	99.8%
2.C.1 Iron and Steel Production	CO_2	16.98	0.00	99.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.00	99.8%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	0.00	99.9%
5.C Incineration and Open Burning of Waste	CO_2	2.66	0.00	99.9%
4.C Grassland	N_2O	2.31	0.00	99.9%
2.B.8.a Methanol	CH_4	5.24	0.00	99.9%
1.A.4 Other sectors-Peat	CO_2	27.13	0.00	99.9%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.00	99.9%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	0.00	99.9%
4.A.1 Forest land remaining forest land	CO_2	4.28	0.00	99.9%
4.C Grassland	CH_4	2.12	0.00	99.9%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.00	99.9%
2.A.3 Glass Production	CO_2	11.70	0.00	99.9%
1.A.1 Energy industries-Biomass	N_2O	0.63	0.00	99.9%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	0.00	100.0%
1.A.3.d Domestic Navigation	CO_2	15.49	0.00	100.0%
1.A.3.a Domestic aviation	CO_2	8.16	0.00	100.0%
1.A.1 Energy industries-Biomass	CH_4	0.40	0.00	100.0%
1.A.1 Energy industries-Peat	CO_2	11.06	0.00	100.0%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.A Forest land	CH_4	0.72	0.00	100.0%
1.A.4 Other sectors-Peat	CH_4	1.12	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	0.00	100.0%
1.A.3.c Railways	CH_4	0.50	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	0.00	100.0%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.00	100.0%
4.B Cropland	CH_4	0.05	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.00	100.0%
2. E Electronic Industry	SF_6, NF_3	0.00	0.00	100.0%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	0.00	0.00	100.0%
2.F.2 Foam Blowing Agents	HFCs	0.00	0.00	100.0%
2.F.3 Fire Protection	HFCs	0.00	0.00	100.0%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.00	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.00	0.00	100.0%
4.E.1 Settlements remaining settlements	CO_2	0.00	0.00	100.0%
4.E.2 Land converted to settlements	CO_2	0.00	0.00	100.0%
4.F Other land	CO_2	0.00	0.00	100.0%
Total		***46,429.64***		

Approach 2 Level Assessment for 1990 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
5.A Solid Waste Disposal	***CH_4***	***1,028.83***	***0.16***	***16.2%***
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	***N_2O***	***992.77***	***0.11***	***27.1%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***264.70***	***0.09***	***35.9%***
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	***N_2O***	***431.39***	***0.07***	***43.2%***
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	***N_2O***	***578.01***	***0.06***	***49.6%***
5.D Wastewater Treatment and Discharge	***CH_4***	***471.00***	***0.05***	***55.1%***
3.A.1 Enteric Fermentation - Cattle	***CH_4***	***4,148.15***	***0.05***	***59.7%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***416.40***	***0.05***	***64.2%***
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	***N_2O***	***364.53***	***0.04***	***68.2%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***341.29***	***0.04***	***72.0%***
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	***N_2O***	***174.15***	***0.03***	***74.9%***
1.A.1.a Public electricity and heat production - Liquid Fuels	***CO_2***	***6,021.25***	***0.02***	***77.1%***
1.A.1.a Public electricity and heat production - Gaseous Fuels	***CO_2***	***5,796.59***	***0.02***	***79.1%***
1.A.4 Other sectors-Solid fuels	***CO_2***	***2,760.55***	***0.02***	***81.1%***
1.A.3.b Road transportation	***CO_2***	***5,247.15***	***0.02***	***83.0%***
1.A.4 Other sectors-Biomass	***CH_4***	***70.28***	***0.01***	***84.4%***
1.A.2 Manufacturing industries and construction-Liquid fuels	***CO_2***	***3,873.72***	***0.01***	***85.7%***
1.A.4 Other sectors-Liquid fuels	***CO_2***	***2,735.39***	***0.01***	***87.0%***
2.B.2 Nitric Acid Production	***N_2O***	***893.01***	***0.01***	***88.1%***
2.A.1 Cement Production	***CO_2***	***1,668.07***	***0.01***	***89.2%***
1.A.4 Other sectors-Liquid fuels	***N_2O***	***149.42***	***0.01***	***90.2%***
2.A.2 Lime Production	CO_2	222.68	0.01	91.0%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	0.01	91.8%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	2,045.42	0.01	92.5%
1.A.4 Other sectors-Gaseous fuels	CO_2	1,379.27	0.01	93.1%
1.A.1.b Petroleum refining - Liquid Fuels	CO_2	1,509.64	0.01	93.7%
2.G Other product manufacture and use	N_2O	96.05	0.01	94.2%
5.D Wastewater Treatment and Discharge	N_2O	67.21	0.00	94.7%
1.A.3.b Road transportation	CH_4	48.11	0.00	95.2%
2.B.1 Ammonia Production	CO_2	1,253.68	0.00	95.6%
1.A.3.c Railways	N_2O	40.92	0.00	96.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	260.55	0.00	96.4%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	0.00	96.7%
3.H Urea Application	CO_2	35.71	0.00	96.9%
1.A.4 Other sectors-Biomass	N_2O	12.97	0.00	97.2%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	0.00	97.4%
1.A.3.b Road transportation	N_2O	39.09	0.00	97.7%
1.A.3.c Railways	CO_2	349.97	0.00	97.9%
2.A.4 Other process use of carbonates	CO_2	239.52	0.00	98.1%
3.A. Enteric Fermentation - Others	CH_4	134.19	0.00	98.3%
3.B.1.3 Manure Management - Swine	CH_4	287.09	0.00	98.4%
3.G Liming	CO_2	20.59	0.00	98.5%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	0.00	98.7%
3.B.2 Manure Management - Cattle	N_2O	202.86	0.00	98.8%
1.A.1 Energy industries-Solid fuels	CO_2	174.05	0.00	98.9%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	171.63	0.00	99.0%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	0.00	99.1%
2.B.8.a Methanol	CO_2	24.35	0.00	99.2%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	0.00	99.3%
3.B.1 Manure Management - Other	N_2O	126.70	0.00	99.4%
1.A.3.e Other transportation	CO_2	85.36	0.00	99.4%
5.B Biological Treatment of Solid Waste	CH_4	4.04	0.00	99.5%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.00	99.5%
3.B.1 Manure Management - Other	CH_4	84.74	0.00	99.6%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.00	99.6%
5.B Biological Treatment of Solid Waste	N_2O	2.89	0.00	99.6%
2.C.1 Iron and Steel Production	CO_2	16.98	0.00	99.7%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.00	99.7%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	0.00	99.7%
5.C Incineration and Open Burning of Waste	CO_2	2.66	0.00	99.8%
2.B.8.a Methanol	CH_4	5.24	0.00	99.8%
1.A.4 Other sectors-Peat	CO_2	27.13	0.00	99.8%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.00	99.8%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	0.00	99.8%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.00	99.8%
2.A.3 Glass Production	CO_2	11.70	0.00	99.9%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.1 Energy industries-Biomass	N_2O	0.63	0.00	99.9%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	0.00	99.9%
1.A.3.d Domestic Navigation	CO_2	15.49	0.00	99.9%
1.A.3.a Domestic aviation	CO_2	8.16	0.00	99.9%
1.A.1 Energy industries-Biomass	CH_4	0.40	0.00	99.9%
1.A.1 Energy industries-Peat	CO_2	11.06	0.00	99.9%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	0.00	99.9%
1.A.4 Other sectors-Peat	CH_4	1.12	0.00	99.9%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	0.00	100.0%
1.A.3.c Railways	CH_4	0.50	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	0.00	100.0%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.00	100.0%
2. E Electronic Industry	SF_6, NF_3	0.00	0.00	100.0%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	0.00	0.00	100.0%
2.F.2 Foam Blowing Agents	HFCs	0.00	0.00	100.0%
2.F.3 Fire Protection	HFCs	0.00	0.00	100.0%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.00	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.00	0.00	100.0%
Total		***48,040.17***		

Approach 2 Level Assessment for 2015

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.A.1 Forest land remaining forest land - carbon stock change in biomass	***CO_2***	***-7,872.79***	***0.16***	***16.4%***
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	***CO_2***	***3,562.88***	***0.14***	***30.3%***
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	***CO_2***	***960.14***	***0.11***	***41.8%***
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	***CO_2***	***-2,570.34***	***0.11***	***53.0%***
5.A Solid Waste Disposal	***CH_4***	***802.20***	***0.06***	***59.0%***
4.G Harvested wood products	***CO_2***	***-1,289.53***	***0.05***	***63.5%***
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	***N_2O***	***780.22***	***0.04***	***67.5%***
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	***N_2O***	***651.57***	***0.03***	***70.9%***
4.B Cropland	***N_2O***	***304.03***	***0.03***	***73.9%***
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	***N_2O***	***291.68***	***0.02***	***76.2%***
4.E.2 Land converted to settlements	***CO_2***	***382.09***	***0.02***	***77.8%***
4.A.2 Land converted to forest land - carbon stock change in biomass	***CO_2***	***-668.11***	***0.02***	***79.3%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***98.30***	***0.02***	***80.8%***
4.B.2 Land converted to cropland- carbon stock change in biomass	***CO_2***	***365.54***	***0.01***	***82.3%***
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	***CO_2***	***434.51***	***0.01***	***83.6%***
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	***N_2O***	***264.70***	***0.01***	***85.0%***
1.A.4 Other sectors-Biomass	***CH_4***	***145.18***	***0.01***	***86.3%***
4.A.2 Land converted to forest land - net carbon stock change in litter	***CO_2***	***-513.17***	***0.01***	***87.5%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***182.81***	***0.01***	***88.4%***
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	***N_2O***	***104.11***	***0.01***	***89.3%***
3.A.1 Enteric Fermentation - Cattle	***CH_4***	***1,561.00***	***0.01***	***90.1%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	N_2O	156.62	0.01	90.9%
5.D Wastewater Treatment and Discharge	CH_4	146.73	0.01	91.7%
1.A.3.b Road transportation	CO_2	4,801.73	0.01	92.5%
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	235.19	0.01	93.2%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	454.37	0.01	94.0%
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	CO_2	-280.28	0.01	94.5%
4.C Grassland, Emissions and removals from drainage and rewetting and other management of organic and	CO_2	114.76	0.00	94.9%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
mineral soils				
4.A Forest land	N_2O	35.81	0.00	95.3%
2.B.1 Ammonia Production	CO_2	2,019.66	0.00	95.6%
1.A.1 Energy industries-Biomass	N_2O	29.89	0.00	95.9%
1.A.4 Other sectors-Biomass	N_2O	26.67	0.00	96.1%
4.F Other land	CO_2	53.65	0.00	96.4%
1.A.1.b Petroleum refining - Liquid Fuels	CO_2	1,365.81	0.00	96.6%
1.A.1.a Public electricity and heat production - Gaseous Fuels	CO_2	1,338.50	0.00	96.8%
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	-53.90	0.00	97.0%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	289.36	0.00	97.2%
5.B Biological Treatment of Solid Waste	CH_4	27.88	0.00	97.4%
1.A.1 Energy industries-Biomass	CH_4	18.81	0.00	97.5%
2.A.1 Cement Production	CO_2	518.31	0.00	97.7%
2.B.2 Nitric Acid Production	N_2O	257.89	0.00	97.9%
5.D Wastewater Treatment and Discharge	N_2O	44.85	0.00	98.0%
3.H Urea Application	CO_2	42.54	0.00	98.2%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	386.65	0.00	98.3%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	660.47	0.00	98.4%
1.A.4 Other sectors-Gaseous fuels	CO_2	476.67	0.00	98.5%
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	-25.09	0.00	98.6%
1.A.3.b Road transportation	N_2O	32.83	0.00	98.7%
5.B Biological Treatment of Solid Waste	N_2O	14.68	0.00	98.8%
1.A.4 Other sectors-Solid fuels	CO_2	250.69	0.00	98.9%
1.A.3.c Railways	N_2O	18.97	0.00	98.9%
2. D Non-energy products from fuels and solvent use	CO_2	49.36	0.00	99.0%
2.A.2 Lime Production	CO_2	39.08	0.00	99.1%
3.G Liming	CO_2	20.91	0.00	99.2%
1.A.3.b Road transportation	CH_4	13.29	0.00	99.2%
1.A.4 Other sectors-Liquid fuels	CO_2	259.56	0.00	99.3%
1.A.3.c Railways	CO_2	161.90	0.00	99.3%
4.D Wetlands	N_2O	4.97	0.00	99.4%
3.A. Enteric Fermentation - Others	CH_4	76.45	0.00	99.4%
2.F.2 Foam Blowing Agents	HFCs	15.90	0.00	99.4%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	4.29	0.00	99.5%
1.A.4 Other sectors-Liquid fuels	N_2O	12.64	0.00	99.5%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.4 Other sectors-Solid fuels	CH_4	11.87	0.00	99.6%
1.A.1 Energy industries-Other fossil fuels	CO_2	114.38	0.00	99.6%
3.B.1.1 Manure Management - Cattle	CH_4	139.09	0.00	99.6%
1.A.1.a Public electricity and heat production - Liquid Fuels	CO_2	180.70	0.00	99.7%
1.A.4 Other sectors-Peat	CO_2	75.65	0.00	99.7%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	2.70	0.00	99.7%
5.C Incineration and Open Burning of Waste	CO_2	5.73	0.00	99.7%
1.A.3.e Other transportation	CO_2	69.41	0.00	99.8%
3.B.2 Manure Management - Cattle	N_2O	78.75	0.00	99.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	CO_2	118.22	0.00	99.8%
3.B.1.3 Manure Management - Swine	CH_4	78.95	0.00	99.8%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	4.32	0.00	99.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	4.99	0.00	99.8%
2.G Other product manufacture and use	N_2O	4.89	0.00	99.9%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	71.24	0.00	99.9%
3.B.1 Manure Management - Other	CH_4	48.48	0.00	99.9%
1.A.4 Other sectors-Peat	CH_4	3.81	0.00	99.9%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	3.19	0.00	99.9%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	1.60	0.00	99.9%
3.B.1 Manure Management - Other	N_2O	24.14	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	N_2O	1.94	0.00	99.9%
2.A.4 Other process use of carbonates	CO_2	14.62	0.00	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	1.79	0.00	99.9%
1.A.3.d Domestic Navigation	CO_2	13.60	0.00	99.9%
4.C Grassland	N_2O	1.11	0.00	99.9%
4.C Grassland	CH_4	1.02	0.00	99.9%
2.F.3 Fire Protection	HFCs	2.17	0.00	99.9%
4.A.1 Forest land remaining forest land	CO_2	1.68	0.00	99.9%
1.A.4 Other sectors-Solid fuels	N_2O	1.18	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	N_2O	1.12	0.00	100.0%
2.A.3 Glass Production	CO_2	6.42	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	1.07	0.00	100.0%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	1.00	0.00	100.0%
1.A.1 Energy industries-Liquid fuels	CH_4	0.99	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.1 Energy industries-Solid fuels	CO_2	8.46	0.00	100.0%
2.F.4 Aerosols/metered dose inhalers	HFCs	5.92	0.00	100.0%
1.A.1 Energy industries-Peat	CO_2	7.30	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	N_2O	0.76	0.00	100.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	12.95	0.00	100.0%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.71	0.00	100.0%
2. E Electronic Industry	SF_6, NF_3	5.00	0.00	100.0%
4.A Forest land	CH_4	0.42	0.00	100.0%
1.A.1 Energy industries-Gaseous fuels	CH_4	0.64	0.00	100.0%
1.A.4 Other sectors-Liquid fuels	CH_4	0.59	0.00	100.0%
2.C.1 Iron and Steel Production	CO_2	2.02	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CO_2	5.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	0.35	0.00	100.0%
1.A.3.c Railways	CH_4	0.23	0.00	100.0%
1.A.3.a Domestic aviation	CO_2	1.56	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.30	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.30	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.26	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.17	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	0.15	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	1.23	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.80	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.04	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.03	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.03	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.03	0.00	100.0%
1.A.3.a Domestic aviation	N_2O	0.01	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.02	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.02	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.01	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
4.B Cropland	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
Total		***13,243.50***		

Approach 2 Level Assessment for 2015 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
5.A Solid Waste Disposal	***CH_4***	***802.20***	***0.20***	***20.0%***
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	***N_2O***	***780.22***	***0.13***	***33.5%***
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	***N_2O***	***651.57***	***0.11***	***44.7%***
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	***N_2O***	***291.68***	***0.08***	***52.6%***
3.B.2 Manure Management - Indirect N_2O Emissions	***N_2O***	***98.30***	***0.05***	***57.7%***
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	***N_2O***	***264.70***	***0.05***	***62.3%***
1.A.4 Other sectors-Biomass	***CH_4***	***145.18***	***0.05***	***66.8%***
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	***N_2O***	***182.81***	***0.03***	***70.0%***
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	***N_2O***	***104.11***	***0.03***	***72.8%***
3.A.1 Enteric Fermentation - Cattle	***CH_4***	***1,561.00***	***0.03***	***75.5%***
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***156.62***	***0.03***	***78.2%***
5.D Wastewater Treatment and Discharge	***CH_4***	***146.73***	***0.03***	***80.9%***
1.A.3.b Road transportation	***CO_2***	***4,801.73***	***0.03***	***83.6%***
2.F.1 Refrigeration and Air Conditioning Equipment	***HFCs***	***454.37***	***0.02***	***86.1%***
2.B.1 Ammonia Production	***CO_2***	***2,019.66***	***0.01***	***87.2%***
1.A.1 Energy industries-Biomass	***N_2O***	***29.89***	***0.01***	***88.1%***
1.A.4 Other sectors-Biomass	***N_2O***	***26.67***	***0.01***	***88.9%***
1.A.1.b Petroleum refining - Liquid Fuels	***CO_2***	***1,365.81***	***0.01***	***89.7%***
1.A.1.a Public electricity and heat production - Gaseous Fuels	***CO_2***	***1,338.50***	***0.01***	***90.4%***
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	289.36	0.01	91.1%
5.B Biological Treatment of Solid Waste	CH_4	27.88	0.01	91.7%
1.A.1 Energy industries-Biomass	CH_4	18.81	0.01	92.2%
2.A.1 Cement Production	CO_2	518.31	0.01	92.8%
2.B.2 Nitric Acid Production	N_2O	257.89	0.01	93.3%
5.D Wastewater Treatment and Discharge	N_2O	44.85	0.01	93.8%
3.H Urea Application	CO_2	42.54	0.00	94.3%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	386.65	0.00	94.7%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	660.47	0.00	95.1%
1.A.4 Other sectors-Gaseous fuels	CO_2	476.67	0.00	95.4%
1.A.3.b Road transportation	N_2O	32.83	0.00	95.8%
5.B Biological Treatment of Solid Waste	N_2O	14.68	0.00	96.1%
1.A.4 Other sectors-Solid fuels	CO_2	250.69	0.00	96.4%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.3.c Railways	N_2O	18.97	0.00	96.6%
2. D Non-energy products from fuels and solvent use	CO_2	49.36	0.00	96.9%
2.A.2 Lime Production	CO_2	39.08	0.00	97.1%
3.G Liming	CO_2	20.91	0.00	97.4%
1.A.3.b Road transportation	CH_4	13.29	0.00	97.6%
1.A.4 Other sectors-Liquid fuels	CO_2	259.56	0.00	97.7%
1.A.3.c Railways	CO_2	161.90	0.00	97.9%
3.A. Enteric Fermentation - Others	CH_4	76.45	0.00	98.1%
2.F.2 Foam Blowing Agents	HFCs	15.90	0.00	98.2%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	4.29	0.00	98.3%
1.A.4 Other sectors-Liquid fuels	N_2O	12.64	0.00	98.4%
1.A.4 Other sectors-Solid fuels	CH_4	11.87	0.00	98.6%
1.A.1 Energy industries-Other fossil fuels	CO_2	114.38	0.00	98.7%
3.B.1.1 Manure Management - Cattle	CH_4	139.09	0.00	98.8%
1.A.1.a Public electricity and heat production - Liquid Fuels	CO_2	180.70	0.00	98.9%
1.A.4 Other sectors-Peat	CO_2	75.65	0.00	99.0%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	2.70	0.00	99.1%
5.C Incineration and Open Burning of Waste	CO_2	5.73	0.00	99.1%
1.A.3.e Other transportation	CO_2	69.41	0.00	99.2%
3.B.2 Manure Management - Cattle	N_2O	78.75	0.00	99.3%
1.A.2 Manufacturing industries and construction-Liquid fuels	CO_2	118.22	0.00	99.3%
3.B.1.3 Manure Management - Swine	CH_4	78.95	0.00	99.4%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	4.32	0.00	99.5%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	4.99	0.00	99.5%
2.G Other product manufacture and use	N_2O	4.89	0.00	99.6%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	71.24	0.00	99.6%
3.B.1 Manure Management - Other	CH_4	48.48	0.00	99.6%
1.A.4 Other sectors-Peat	CH_4	3.81	0.00	99.7%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	3.19	0.00	99.7%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	1.60	0.00	99.7%
3.B.1 Manure Management - Other	N_2O	24.14	0.00	99.7%
1.A.1 Energy industries-Liquid fuels	N_2O	1.94	0.00	99.8%
2.A.4 Other process use of carbonates	CO_2	14.62	0.00	99.8%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	1.79	0.00	99.8%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.3.d Domestic Navigation	CO_2	13.60	0.00	99.8%
2.F.3 Fire Protection	HFCs	2.17	0.00	99.8%
1.A.4 Other sectors-Solid fuels	N_2O	1.18	0.00	99.8%
1.A.1 Energy industries-Other fossil fuels	N_2O	1.12	0.00	99.9%
2.A.3 Glass Production	CO_2	6.42	0.00	99.9%
1.A.4 Other sectors-Gaseous fuels	CH_4	1.07	0.00	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	1.00	0.00	99.9%
1.A.1 Energy industries-Liquid fuels	CH_4	0.99	0.00	99.9%
1.A.1 Energy industries-Solid fuels	CO_2	8.46	0.00	99.9%
2.F.4 Aerosols/metered dose inhalers	HFCs	5.92	0.00	99.9%
1.A.1 Energy industries-Peat	CO_2	7.30	0.00	99.9%
1.A.1 Energy industries-Gaseous fuels	N_2O	0.76	0.00	99.9%
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	12.95	0.00	99.9%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.71	0.00	99.9%
2. E Electronic Industry	SF_6, NF_3	5.00	0.00	99.9%
1.A.1 Energy industries-Gaseous fuels	CH_4	0.64	0.00	100.0%
1.A.4 Other sectors-Liquid fuels	CH_4	0.59	0.00	100.0%
2.C.1 Iron and Steel Production	CO_2	2.02	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CO_2	5.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	0.35	0.00	100.0%
1.A.3.c Railways	CH_4	0.23	0.00	100.0%
1.A.3.a Domestic aviation	CO_2	1.56	0.00	100.0%
1.A.4 Other sectors-Peat	N_2O	0.30	0.00	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.30	0.00	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.26	0.00	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.17	0.00	100.0%
1.A.3.d Domestic Navigation	N_2O	0.11	0.00	100.0%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	0.15	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	1.23	0.00	100.0%
2.G Other product manufacture and use	SF_6	0.80	0.00	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.04	0.00	100.0%
1.A.3.e Other transportation	N_2O	0.04	0.00	100.0%
1.A.3.d Domestic Navigation	CH_4	0.03	0.00	100.0%
1.A.3.e Other transportation	CH_4	0.03	0.00	100.0%
1.A.1 Energy industries-Peat	N_2O	0.03	0.00	100.0%

IPCC Category	*Greenhouse gas*	*GHG emissions, kt CO_2 eqv.*	*Level assessment with uncertainty*	*Cumulative total*
1.A.3.a Domestic aviation	N_2O	0.01	0.00	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.02	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.02	0.00	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.01	0.00	100.0%
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CO_2	0.00	0.00	100.0%
2.B.8.a Methanol	CH_4	0.00	0.00	100.0%
Total		***20,058.88***		

Approach 2 Trend Assessment for 2015

IPCC Category	Greenhouse gas	1990 kt CO_2 eqv.	2015 kt CO_2 eqv.	Trend assessment with uncertainty	% Contribution to Trend	Cumulative total
4.A.1 Forest land remaining forest land - carbon stock change in biomass	CO_2	-6,680.01	-7,872.79	0.06	15.9%	15.9%
4.D.1 Wetlands remaining wetlands -net carbon stock change in organic soils	CO_2	517.32	960.14	0.05	15.5%	31.4%
4.C.2 Land converted to grassland - net carbon stock change in mineral soils	CO_2	-1,876.61	-2,570.34	0.04	12.6%	44.0%
4.G Harvested wood products	CO_2	-252.55	-1,289.53	0.03	8.1%	52.1%
4.B.2 Land converted to cropland - net carbon stock change in mineral soils	CO_2	4,615.44	3,562.88	0.02	5.8%	57.9%
4.E.2 Land converted to settlements	CO_2	0.00	382.09	0.01	3.2%	61.2%
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	N_2O	578.01	651.57	0.01	3.1%	64.2%
5.A Solid Waste Disposal	CH_4	1,028.83	802.20	0.01	2.6%	66.8%
4.B.2 Land converted to cropland- carbon stock change in biomass	CO_2	98.41	365.54	0.01	2.4%	69.2%
3.B.2 Manure Management - Indirect N_2O Emissions	N_2O	264.70	98.30	0.01	2.0%	71.2%
1.A.4 Other sectors-Biomass	CH_4	70.28	145.18	0.01	1.9%	73.1%
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	N_2O	992.77	780.22	0.01	1.8%	74.9%
5.D Wastewater Treatment and Discharge	CH_4	471.00	146.73	0.01	1.6%	76.5%
2.F.1 Refrigeration and Air Conditioning Equipment	HFCs	5.36	454.37	0.01	1.5%	77.9%
4.A.2 Land converted to forest land - carbon stock change in biomass	CO_2	-585.97	-668.11	0.01	1.4%	79.4%
4.B Cropland	N_2O	392.99	304.03	0.00	1.3%	80.6%
4.A Forest land, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	406.03	434.51	0.00	1.2%	81.8%
1.A.1.a Public electricity and heat production - Liquid Fuels	CO_2	6,021.25	180.70	0.00	1.2%	83.0%
4.A.2 Land converted to forest land - net carbon stock change in litter	CO_2	-448.14	-513.17	0.00	1.1%	84.1%
3.A.1 Enteric Fermentation - Cattle	CH_4	4,148.15	1,561.00	0.00	1.0%	85.1%
1.A.4 Other sectors-Solid fuels	CO_2	2,760.55	250.69	0.00	1.0%	86.1%
1.A.2 Manufacturing industries and construction-Liquid fuels	CO_2	3,873.72	118.22	0.00	0.7%	86.8%
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	N_2O	416.40	182.81	0.00	0.7%	87.6%
1.A.1.a Public electricity and heat production - Gaseous Fuels	CO_2	5,796.59	1,338.50	0.00	0.7%	88.3%
1.A.4 Other sectors-Liquid fuels	CO_2	2,735.39	259.56	0.00	0.6%	88.9%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	***N_2O***	***341.29***	***156.62***	***0.00***	***0.5%***	***89.4%***
1.A.1 Energy industries-Biomass	***N_2O***	***0.63***	***29.89***	***0.00***	***0.5%***	***90.0%***
1.A.3.b Road transportation	***CO_2***	***5,247.15***	***4,801.73***	***0.00***	***0.5%***	***90.5%***
4.B.1 Cropland remaining cropland - net carbon stock change in mineral soils	CO_2	195.63	-53.90	0.00	0.5%	91.0%
4.F Other land	CO_2	0.00	53.65	0.00	0.5%	91.5%
1.A.4 Other sectors-Liquid fuels	N_2O	149.42	12.64	0.00	0.5%	92.0%
4.B Cropland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	266.06	235.19	0.00	0.5%	92.4%
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	N_2O	431.39	291.68	0.00	0.4%	92.9%
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	N_2O	364.53	264.70	0.00	0.4%	93.3%
2.B.1 Ammonia Production	CO_2	1,253.68	2,019.66	0.00	0.4%	93.7%
1.A.4 Other sectors-Solid fuels	CH_4	128.56	11.87	0.00	0.4%	94.1%
1.A.4 Other sectors-Biomass	N_2O	12.97	26.67	0.00	0.3%	94.5%
2.A.2 Lime Production	CO_2	222.68	39.08	0.00	0.3%	94.8%
4.C Grassland, Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	98.29	114.76	0.00	0.3%	95.2%
2.B.2 Nitric Acid Production	N_2O	893.01	257.89	0.00	0.3%	95.5%
1.A.1 Energy industries-Biomass	CH_4	0.40	18.81	0.00	0.3%	95.8%
5.B Biological Treatment of Solid Waste	CH_4	4.04	27.88	0.00	0.3%	96.2%
2.A.1 Cement Production	CO_2	1,668.07	518.31	0.00	0.3%	96.5%
4.A Forest land	N_2O	33.68	35.81	0.00	0.3%	96.8%
2.G Other product manufacture and use	N_2O	96.05	4.89	0.00	0.3%	97.1%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	2,045.42	660.47	0.00	0.2%	97.3%
1.A.2 Manufacturing industries and construction-Solid fuels	CO_2	171.63	386.65	0.00	0.2%	97.5%
4.B.1 Cropland remaining cropland - carbon stock change in biomass	CO_2	77.39	-25.09	0.00	0.2%	97.6%
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	260.55	289.36	0.00	0.2%	97.8%
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	0.00	0.2%	98.0%
1.A.4 Other sectors-Gaseous fuels	CO_2	1,379.27	476.67	0.00	0.2%	98.1%
1.A.3.b Road transportation	CH_4	48.11	13.29	0.00	0.2%	98.3%
1.A.1.b Petroleum refining - Liquid Fuels	CO_2	1,509.64	1,365.81	0.00	0.1%	98.4%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	4.99	0.00	0.1%	98.6%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
3.H Urea Application	CO_2	35.71	42.54	0.00	0.1%	98.7%
2.A.4 Other process use of carbonates	CO_2	239.52	14.62	0.00	0.1%	98.8%
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	0.00	0.1%	98.9%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	4.29	0.00	0.1%	99.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	114.38	0.00	0.1%	99.0%
1.A.1 Energy industries-Solid fuels	CO_2	174.05	8.46	0.00	0.1%	99.1%
1.A.3.c Railways	N_2O	40.92	18.97	0.00	0.1%	99.1%
1.A.3.b Road transportation	N_2O	39.09	32.83	0.00	0.1%	99.2%
3.G Liming	CO_2	20.59	20.91	0.00	0.0%	99.2%
3.B.1.3 Manure Management - Swine	CH_4	287.09	78.95	0.00	0.0%	99.3%
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	1.94	0.00	0.0%	99.3%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	2.70	0.00	0.0%	99.4%
1.A.4 Other sectors-Peat	CO_2	27.13	75.65	0.00	0.0%	99.4%
4.A.1 Forest land remaining forest land - net carbon stock change in dead wood	CO_2	-474.03	-280.28	0.00	0.0%	99.5%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	1.18	0.00	0.0%	99.5%
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	N_2O	174.15	104.11	0.00	0.0%	99.5%
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	0.00	0.0%	99.6%
1.A.3.c Railways	CO_2	349.97	161.90	0.00	0.0%	99.6%
3.B.1 Manure Management - Other	N_2O	126.70	24.14	0.00	0.0%	99.6%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	4.32	0.00	0.0%	99.7%
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	0.00	0.0%	99.7%
4.D Wetlands	N_2O	6.08	4.97	0.00	0.0%	99.7%
3.B.2 Manure Management - Cattle	N_2O	202.86	78.75	0.00	0.0%	99.7%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	71.24	0.00	0.0%	99.8%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.59	0.00	0.0%	99.8%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.99	0.00	0.0%	99.8%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	49.36	0.00	0.0%	99.8%
1.A.4 Other sectors-Peat	CH_4	1.12	3.81	0.00	0.0%	99.8%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.15	0.00	0.0%	99.9%
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	0.00	0.0%	99.9%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	0.00	0.0%	99.9%
1.A.3.e Other transportation	CO_2	85.36	69.41	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	1.79	0.00	0.0%	99.9%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
2.F.3 Fire Protection	HFCs	0.00	2.17	0.00	0.0%	99.9%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.76	0.00	0.0%	99.9%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	139.09	0.00	0.0%	99.9%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	1.12	0.00	0.0%	99.9%
3.A. Enteric Fermentation - Others	CH_4	134.19	76.45	0.00	0.0%	99.9%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.64	0.00	0.0%	99.9%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	1.07	0.00	0.0%	99.9%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	0.00	0.0%	99.9%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	1.00	0.00	0.0%	100.0 %
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.71	0.00	0.0%	100.0 %
1.A.3.a Domestic aviation	CO_2	8.16	1.56	0.00	0.0%	100.0 %
2. E Electronic Industry	SF_6, NF_3	0.00	5.00	0.00	0.0%	100.0 %
4.A.1 Forest land remaining forest land	CO_2	4.28	1.68	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	5.11	0.00	0.0%	100.0 %
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	3.19	0.00	0.0%	100.0 %
1.A.3.d Domestic Navigation	CO_2	15.49	13.60	0.00	0.0%	100.0 %
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.04	0.00	0.0%	100.0 %
4.C Grassland	N_2O	2.31	1.11	0.00	0.0%	100.0 %
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	12.95	0.00	0.0%	100.0 %
4.C Grassland	CH_4	2.12	1.02	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.35	0.00	0.0%	100.0 %
3.B.1 Manure Management - Other	CH_4	84.74	48.48	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.30	0.00	0.0%	100.0 %
1.A.4 Other sectors-Peat	N_2O	0.11	0.30	0.00	0.0%	100.0 %
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.26	0.00	0.0%	100.0 %
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	1.23	0.00	0.0%	100.0 %
2.A.3 Glass Production	CO_2	11.70	6.42	0.00	0.0%	100.0 %

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
1.A.3.c Railways	CH_4	0.50	0.23	0.00	0.0%	100.0 %
2.G Other product manufacture and use	SF_6	0.05	0.80	0.00	0.0%	100.0 %
1.A.3.a Domestic aviation	N_2O	0.07	0.01	0.00	0.0%	100.0 %
1.A.3.d Domestic Navigation	N_2O	0.13	0.11	0.00	0.0%	100.0 %
1.A.1 Energy industries-Peat	CO_2	11.06	7.30	0.00	0.0%	100.0 %
4.A Forest land	CH_4	0.72	0.42	0.00	0.0%	100.0 %
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.02	0.00	0.0%	100.0 %
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.02	0.00	0.0%	100.0 %
4.B Cropland	CH_4	0.05	0.01	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.01	0.00	0.0%	100.0 %
1.A.3.d Domestic Navigation	CH_4	0.04	0.03	0.00	0.0%	100.0 %
1.A.3.e Other transportation	N_2O	0.05	0.04	0.00	0.0%	100.0 %
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	0.00	0.0%	100.0 %
1.A.3.e Other transportation	CH_4	0.04	0.03	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Other fossil fuels	CH_4	0.00	0.01	0.00	0.0%	100.0 %
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	0.00	0.0%	100.0 %
1.A.1 Energy industries-Peat	N_2O	0.05	0.03	0.00	0.0%	100.0 %
1.A.3.a Domestic aviation	CH_4	0.00	0.00	0.00	0.0%	100.0 %
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	0.00	0.0%	100.0 %
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	0.00	0.0%	100.0 %
2.B.8.a Methanol	CO_2	24.35	0.00	0.00	0.0%	100.0 %
2.B.8.a Methanol	CH_4	5.24	0.00	0.00	0.0%	100.0 %
4.E.1 Settlements remaining settlements	CO_2	0.00	0.00	0.00	0.0%	100.0 %
Total		***44,445.90***	***13,243.50***	***0.35***	***1.00***	

Approach 2 Trend Assessment for 2015 using a subset (LULUCF was excluded from analysis)

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
5.A Solid Waste Disposal	*CH_4*	*1,028.83*	*802.20*	*0.06*	*17.7%*	*17.7%*
3.D.1.6 Direct N_2O Emissions From Managed Soils - Cultivation of organic soils	*N_2O*	*578.01*	*651.57*	*0.04*	*13.6%*	*31.3%*
3.D.1.1 Direct N_2O Emissions From Managed Soils - Inorganic N Fertilizers	*N_2O*	*992.77*	*780.22*	*0.04*	*12.1%*	*43.4%*
1.A.4 Other sectors-Biomass	*CH_4*	*70.28*	*145.18*	*0.02*	*6.9%*	*50.3%*
3.D.2.2 Indirect N_2O Emissions From Managed Soils - Nitrogen leaching and run-off	*N_2O*	*431.39*	*291.68*	*0.02*	*5.7%*	*56.0%*
2.F.1 Refrigeration and Air Conditioning Equipment	*HFCs*	*5.36*	*454.37*	*0.02*	*4.7%*	*60.7%*
3.D.1.4 Direct N_2O Emissions From Managed Soils - Crop Residues	*N_2O*	*364.53*	*264.70*	*0.01*	*3.7%*	*64.5%*
1.A.3.b Road transportation	*CO_2*	*5,247.15*	*4,801.73*	*0.01*	*2.8%*	*67.2%*
1.A.1.a Public electricity and heat production - Liquid Fuels	*CO_2*	*6,021.25*	*180.70*	*0.01*	*2.5%*	*69.7%*
1.A.4 Other sectors-Solid fuels	*CO_2*	*2,760.55*	*250.69*	*0.01*	*2.0%*	*71.7%*
5.D Wastewater Treatment and Discharge	*CH_4*	*471.00*	*146.73*	*0.01*	*1.8%*	*73.5%*
1.A.1 Energy industries-Biomass	*N_2O*	*0.63*	*29.89*	*0.01*	*1.7%*	*75.2%*
3.D.2.1 Indirect N_2O Emissions From Managed Soils - Atmospheric deposition	*N_2O*	*174.15*	*104.11*	*0.01*	*1.6%*	*76.8%*
1.A.2 Manufacturing industries and construction-Liquid fuels	*CO_2*	*3,873.72*	*118.22*	*0.01*	*1.6%*	*78.4%*
2.B.1 Ammonia Production	*CO_2*	*1,253.68*	*2,019.66*	*0.01*	*1.6%*	*80.0%*
1.A.4 Other sectors-Biomass	*N_2O*	*12.97*	*26.67*	*0.00*	*1.3%*	*81.2%*
3.B.2 Manure Management - Indirect N_2O Emissions	*N_2O*	*264.70*	*98.30*	*0.00*	*1.2%*	*82.4%*
1.A.4 Other sectors-Liquid fuels	*CO_2*	*2,735.39*	*259.56*	*0.00*	*1.2%*	*83.6%*
1.A.1.a Public electricity and heat production - Gaseous Fuels	*CO_2*	*5,796.59*	*1,338.50*	*0.00*	*1.2%*	*84.8%*
1.A.1 Energy industries-Biomass	*CH_4*	*0.40*	*18.81*	*0.00*	*1.1%*	*85.9%*
5.B Biological Treatment of Solid Waste	*CH_4*	*4.04*	*27.88*	*0.00*	*1.1%*	*86.9%*
1.A.4 Other sectors-Liquid fuels	*N_2O*	*149.42*	*12.64*	*0.00*	*0.9%*	*87.9%*
1.A.4 Other sectors-Solid fuels	*CH_4*	*128.56*	*11.87*	*0.00*	*0.8%*	*88.7%*
1.A.1.b Petroleum refining - Liquid Fuels	*CO_2*	*1,509.64*	*1,365.81*	*0.00*	*0.8%*	*89.4%*
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	*CH_4*	*260.55*	*289.36*	*0.00*	*0.8%*	*90.2%*
1.A.2 Manufacturing industries	CO_2	171.63	386.65	0.00	0.6%	90.8%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
and construction-Solid fuels						
2.A.2 Lime Production	CO_2	222.68	39.08	0.00	0.6%	91.5%
3.H Urea Application	CO_2	35.71	42.54	0.00	0.6%	92.1%
2.G Other product manufacture and use	N_2O	96.05	4.89	0.00	0.6%	92.7%
3.A.1 Enteric Fermentation - Cattle	CH_4	4,148.15	1,561.00	0.00	0.6%	93.2%
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	0.00	0.5%	93.8%
3.D.1.2 Direct N_2O Emissions From Managed Soils - Organic N Fertilizers	N_2O	341.29	156.62	0.00	0.5%	94.2%
2.B.2 Nitric Acid Production	N_2O	893.01	257.89	0.00	0.4%	94.7%
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	0.00	0.4%	95.0%
2.A.1 Cement Production	CO_2	1,668.07	518.31	0.00	0.4%	95.4%
1.A.3.b Road transportation	N_2O	39.09	32.83	0.00	0.3%	95.7%
3.D.1.3 Direct N_2O Emissions From Managed Soils - Urine and dung deposited by grazing animals	N_2O	416.40	182.81	0.00	0.3%	96.0%
1.A.2 Manufacturing industries and construction-Liquid fuels	N_2O	47.81	4.99	0.00	0.3%	96.3%
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	0.00	0.3%	96.6%
3.G Liming	CO_2	20.59	20.91	0.00	0.2%	96.8%
1.A.2 Manufacturing industries and construction-Biomass	N_2O	0.60	4.29	0.00	0.2%	97.0%
1.A.1 Energy industries-Other fossil fuels	CO_2	0.00	114.38	0.00	0.2%	97.2%
2.A.4 Other process use of carbonates	CO_2	239.52	14.62	0.00	0.2%	97.4%
2. D Non-energy products from fuels and solvent use	CO_2	71.39	49.36	0.00	0.2%	97.7%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CO_2	2,045.42	660.47	0.00	0.2%	97.9%
1.A.3.b Road transportation	CH_4	48.11	13.29	0.00	0.2%	98.1%
1.A.2 Manufacturing industries and construction-Biomass	CH_4	0.38	2.70	0.00	0.1%	98.2%
1.A.4 Other sectors-Peat	CO_2	27.13	75.65	0.00	0.1%	98.3%
1.A.4 Other sectors-Gaseous fuels	CO_2	1,379.27	476.67	0.00	0.1%	98.5%
1.A.1. Energy industries-Solid fuels	CO_2	174.05	8.46	0.00	0.1%	98.6%
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	0.00	0.1%	98.7%
1.B.2 Oil, natural gas and other emissions from energy production	CO_2	0.72	4.32	0.00	0.1%	98.8%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
1.A.1 Energy industries-Liquid fuels	N_2O	16.11	1.94	0.00	0.1%	98.9%
1.A.4 Other sectors-Solid fuels	N_2O	13.00	1.18	0.00	0.1%	99.0%
1.A.1.c Manufacture of solid fuels and other energy industries - Gaseous fuels	CO_2	0.00	71.24	0.00	0.1%	99.1%
1.A.3.e Other transportation	CO_2	85.36	69.41	0.00	0.1%	99.1%
3.A. Enteric Fermentation - Others	CH_4	134.19	76.45	0.00	0.1%	99.2%
3.B.1.3 Manure Management - Swine	CH_4	287.09	78.95	0.00	0.1%	99.3%
1.A.4 Other sectors-Peat	CH_4	1.12	3.81	0.00	0.1%	99.3%
3.B.1.1 Manure Management - Cattle	CH_4	250.20	139.09	0.00	0.1%	99.4%
1.A.3.c Railways	N_2O	40.92	18.97	0.00	0.1%	99.4%
3.B.1 Manure Management - Other	N_2O	126.70	24.14	0.00	0.1%	99.5%
1.A.4 Other sectors-Liquid fuels	CH_4	7.22	0.59	0.00	0.0%	99.5%
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	0.00	0.0%	99.6%
1.A.1 Energy industries-Liquid fuels	CH_4	6.90	0.99	0.00	0.0%	99.6%
1.A.2 Manufacturing industries and construction-Liquid fuels	CH_4	4.46	0.15	0.00	0.0%	99.7%
1.A.3.c Railways	CO_2	349.97	161.90	0.00	0.0%	99.7%
1.A.2 Manufacturing industries and construction-Solid fuels	N_2O	0.81	1.79	0.00	0.0%	99.7%
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	0.00	0.0%	99.7%
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	3.19	0.00	0.0%	99.8%
2.F.3 Fire Protection	HFCs	0.00	2.17	0.00	0.0%	99.8%
1.A.1 Energy industries-Other fossil fuels	N_2O	0.00	1.12	0.00	0.0%	99.8%
3.B.1 Manure Management - Other	CH_4	84.74	48.48	0.00	0.0%	99.8%
1.A.3.d Domestic Navigation	CO_2	15.49	13.60	0.00	0.0%	99.8%
1.A.2 Manufacturing industries and construction-Solid fuels	CH_4	0.45	1.00	0.00	0.0%	99.9%
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	0.00	0.0%	99.9%
1.A.1 Energy industries-Other fossil fuels	CH_4	0.00	0.71	0.00	0.0%	99.9%
2. E Electronic Industry	SF_6, NF_3	0.00	5.00	0.00	0.0%	99.9%
1.A.1 Energy industries-Gaseous fuels	N_2O	3.13	0.76	0.00	0.0%	99.9%
3.B.2 Manure Management - Cattle	N_2O	202.86	78.75	0.00	0.0%	99.9%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
1.A.1.c Manufacture of solid fuels and other energy industries - Liquid fuels	CO_2	9.33	12.95	0.00	0.0%	99.9%
1.A.1 Energy industries-Gaseous fuels	CH_4	2.63	0.64	0.00	0.0%	99.9%
1.A.3.a Domestic aviation	CO_2	8.16	1.56	0.00	0.0%	100.0%
1.A.1 Energy industries-Solid fuels	N_2O	0.82	0.04	0.00	0.0%	100.0%
1.A.1 Energy industries-Peat	CO_2	11.06	7.30	0.00	0.0%	100.0%
2.A.3 Glass Production	CO_2	11.70	6.42	0.00	0.0%	100.0%
1.A.4 Other sectors-Peat	N_2O	0.11	0.30	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Peat	CO_2	17.53	5.11	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	CH_4	3.13	1.07	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	CO_2	0.00	1.23	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	N_2O	1.11	0.35	0.00	0.0%	100.0%
1.A.3.d Domestic Navigation	N_2O	0.13	0.11	0.00	0.0%	100.0%
2.G Other product manufacture and use	SF_6	0.05	0.80	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Gaseous fuels	CH_4	0.93	0.30	0.00	0.0%	100.0%
1.A.4 Other sectors-Gaseous fuels	N_2O	0.75	0.26	0.00	0.0%	100.0%
1.A.3.c Railways	CH_4	0.50	0.23	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	N_2O	0.07	0.01	0.00	0.0%	100.0%
1.B.2 Oil, natural gas and other emissions from energy production	N_2O	0.00	0.02	0.00	0.0%	100.0%
1.A.3.e Other transportation	N_2O	0.05	0.04	0.00	0.0%	100.0%
1.A.3.d Domestic Navigation	CH_4	0.04	0.03	0.00	0.0%	100.0%
1.A.1 Energy industries-Solid fuels	CH_4	0.05	0.00	0.00	0.0%	100.0%
1.A.3.e Other transportation	CH_4	0.04	0.03	0.00	0.0%	100.0%
1.A.1 Energy industries-Peat	N_2O	0.05	0.03	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil fuels	N_2O	0.00	0.01	0.00	0.0%	100.0%
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Peat	N_2O	0.08	0.02	0.00	0.0%	100.0%
1.A.2 Manufacturing industries and construction-Other fossil	CH_4	0.00	0.01	0.00	0.0%	100.0%

IPCC Category	*Greenhouse gas*	*1990 kt CO_2 eqv.*	*2015 kt CO_2 eqv.*	*Trend assessment with uncertainty*	*% Contribution to Trend*	*Cumulative total*
fuels						
1.A.2 Manufacturing industries and construction-Peat	CH_4	0.01	0.00	0.00	0.0%	100.0%
1.A.1 Energy industries-Peat	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.3.a Domestic aviation	CH_4	0.00	0.00	0.00	0.0%	100.0%
1.A.1 Energy industries-Biomass	CO_2	0.00	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CO_2	24.35	0.00	0.00	0.0%	100.0%
2.B.8.a Methanol	CH_4	5.24	0.00	0.00	0.0%	100.0%
Total		***48,046.4***	***20,058.9***	***0.32***	***1.00***	

ANNEX II. Tier 1 Uncertainty assessment

Table 1a. Uncertainty evaluation including LULUCF

IPCC Source category	*Gas*	*Base year (1990) emissions**	*Emissions in 2014*	*Activity data uncertainty*	*Emission factor uncertainty*	*Combined uncertainty*	*Combined uncertainty as % of total national emissions in 2012*	*Type A sensitivity*	*Type B sensitivity*	*Uncertainty in trend in national emissions introduced by emission factor uncertainty*	*Uncertainty in trend in national emissions introduced by activity data uncertainty*	*Uncertainty introduced into the trend in total national emissions*
		kt CO_2 eqv.	*kt CO_2 eqv.*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	7,540.22	1,559.45	2%	2%	3%	0.000	0.016	0.035	0.000	0.001	0.000
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	6.90	0.99	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	16.11	1.94	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	174.05	8.46	2%	5%	5%	0.000	0.001	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.05	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	0.82	0.04	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	5,796.59	1,410.57	2%	2%	3%	0.000	0.008	0.031	0.000	0.001	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	2.63	0.64	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	3.13	0.76	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	CO_2	0.00	114.38	2%	5%	5%	0.000	0.003	0.003	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	CH_4	0.00	0.71	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000

1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	N_2O	0.00	1.12	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Peat	CO_2	11.06	7.30	2%	5%	5%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Peat	CH_4	0.00	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Peat	N_2O	0.05	0.03	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	CO_2			30%	15%	34%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.40	18.81	30%	150%	153%	0.000	0.000	0.000	0.001	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.63	29.89	30%	150%	153%	0.000	0.001	0.001	0.001	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	3,873.72	118.22	2%	2%	3%	0.000	0.024	0.003	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	4.46	0.15	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	47.81	4.99	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	171.63	386.65	2%	5%	5%	0.000	0.007	0.009	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	0.45	1.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	0.81	1.79	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	2,045.42	660.47	2%	2%	3%	0.000	0.001	0.015	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.93	0.30	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	1.11	0.35	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000

1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	CO_2	17.53	5.11	2%	5%	5%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	CH_4	0.01	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	N_2O	0.08	0.02	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CO_2			30%	15%	34%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	0.38	2.70	30%	150%	153%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	N_2O	0.60	4.29	30%	150%	153%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.a Domestic Aviation	CO_2	8.16	1.56	10%	2%	10%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.a Domestic Aviation	CH_4	0.00	0.00	10%	79%	79%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.a Domestic Aviation	N_2O	0.07	0.01	10%	110%	110%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.b Road Transportation	CO_2	5,247.15	4,801.73	2%	2%	3%	0.000	0.071	0.107	0.001	0.003	0.000
1.A.3.b Road Transportation	CH_4	48.11	13.29	2%	40%	40%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.b Road Transportation	N_2O	39.09	32.83	2%	50%	50%	0.000	0.000	0.001	0.000	0.000	0.000
1.A.3.c Railways	CO_2	349.97	161.90	5%	2%	5%	0.000	0.001	0.004	0.000	0.000	0.000
1.A.3.c Railways	CH_4	0.50	0.23	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.c Railways	N_2O	40.92	18.97	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	15.49	13.60	5%	3%	6%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.04	0.03	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.13	0.11	5%	90%	90%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	CO_2	85.36	69.41	5%	2%	5%	0.000	0.001	0.002	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	CH_4	0.04	0.03	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	N_2O	0.05	0.04	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,735.39	259.56	3%	2%	4%	0.000	0.013	0.006	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.22	0.59	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	N_2O	149.42	12.64	3%	50%	50%	0.000	0.001	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Solid Fuels	CO_2	2,760.55	250.69	3%	5%	6%	0.000	0.013	0.006	0.001	0.000	0.000

1.A.4 Other Sectors - Solid Fuels	CH_4	128.56	11.87	3%	50%	50%	0.000	0.001	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Solid Fuels	N_2O	13.00	1.18	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	CO_2	1,379.27	476.67	3%	2%	4%	0.000	0.001	0.011	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	CH_4	3.13	1.07	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.75	0.26	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	CO_2	27.13	75.65	3%	5%	6%	0.000	0.002	0.002	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	CH_4	1.12	3.81	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	N_2O	0.11	0.30	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors- Biomass	CO_2			50%	15%	52%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors- Biomass	CH_4	70.28	145.18	50%	150%	158%	0.000	0.003	0.003	0.004	0.002	0.000
1.A.4 Other Sectors- Biomass	N_2O	12.97	26.67	50%	150%	158%	0.000	0.001	0.001	0.001	0.000	0.000
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	0.14	0.79	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CH_4	4.25	3.19	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.00	0.00	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	0.01	0.01	5%	10%	11%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	260.55	289.36	5%	10%	11%	0.000	0.005	0.006	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CO_2	0.58	3.52	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	N_2O	0.00	0.02	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.1 Cement Production	CO_2	1,668.07	518.31	2%	5%	5%	0.000	0.000	0.012	0.000	0.000	0.000
2.A.2 Lime Production	CO_2	222.68	39.08	5%	30%	30%	0.000	0.001	0.001	0.000	0.000	0.000
2.A.3 Glass Production	CO_2	11.70	6.42	7%	5%	9%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.4.a Ceramics	CO_2	227.92	3.66	5%	5%	7%	0.000	0.001	0.000	0.000	0.000	0.000
2.A.4.b Other use of soda ash	CO_2	5.32	0.42	15%	5%	16%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.4.d Mineral wool production	CO_2	6.28	10.54	7%	5%	9%	0.000	0.000	0.000	0.000	0.000	0.000
2.B.1 Ammonia Production	CO_2	1,253.68	2,019.66	2%	2%	3%	0.000	0.037	0.045	0.001	0.001	0.000

2.B.2 Nitric Acid Production	N_2O	893.01	257.89	2%	10%	10%	0.000	0.000	0.006	0.000	0.000	0.000
2.B.8.a Methanol	CO_2	24.35	0.00	5%	30%	30%	0.000	0.000	0.000	0.000	0.000	0.000
2.B.8.a Methanol	CH_4	5.24	0.00	5%	30%	30%	0.000	0.000	0.000	0.000	0.000	0.000
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	10%	10%	14%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.1 Lubricant use	CO_2	6.06	11.85	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.2 Parafin wax use	CO_2	0.00	2.16	5%	100%	100%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Solvent use	CO_2	65.31	33.65	30%	20%	36%	0.000	0.000	0.001	0.000	0.000	0.000
2.D.3 Asphalt roofing	CO_2	0.02	0.01	5%	25%	25%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Road paving with asphalt	CO_2	0.00	0.00	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Urea-based catalyst	CO_2	0.00	1.69	10%	2%	10%	0.000	0.000	0.000	0.000	0.000	0.000
2.E.1 Semiconductor	SF_6	0.00	4.74	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.E.3 Photovoltaics	NF_3	0.00	0.26	5%	20%	21%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.1.a Domestic Refrigeration	HFCs	0.24	1.46	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.1.a Commercial Refrigeration	HFCs	3.77	174.36	20%	50%	54%	0.000	0.004	0.004	0.002	0.001	0.000
2.F.1.a Transport Refrigeration	HFCs	0.14	84.67	20%	50%	54%	0.000	0.002	0.002	0.001	0.001	0.000
2.F.1.a Industrial Refrigeration	HFCs	0.95	64.93	20%	50%	54%	0.000	0.001	0.001	0.001	0.000	0.000
2.F.1.a Stationary Air-Conditioning	HFCs	0.15	14.81	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.1.b Mobile Air-Conditioning	HFCs	0.12	114.14	20%	50%	54%	0.000	0.003	0.003	0.001	0.001	0.000
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	30%	30%	42%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.3 Fire Protection	HFCs	0.00	2.17	20%	20%	28%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.1 Manufacture of electrical equipments	SF_6	0.05	0.64	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.2.b Accelerators	SF_6	0.00	0.16	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.3.a Medical applications	N_2O	93.35	2.77	5%	5%	7%	0.000	0.001	0.000	0.000	0.000	0.000
2.G.3.b Propellant for pressure and aerosol products	N_2O	2.70	2.12	20%	100%	102%	0.000	0.000	0.000	0.000	0.000	0.000
3.A Enteric Fermentation	CH_4	4,282.35	1,637.44	3%	9%	9%	0.000	0.007	0.037	0.001	0.001	0.000
3.B Manure Management	CH_4	622.03	266.51	4%	2%	4%	0.000	0.002	0.006	0.000	0.000	0.000
3.B Manure Management	N_2O	594.26	201.18	5%	210%	210%	0.001	0.000	0.004	0.001	0.000	0.000
3.D.1 Direct N_2O Emissions From Managed Soils	N_2O	2,693.01	2,035.92	8%	87%	88%	0.017	0.027	0.045	0.024	0.005	0.001
3.D.2 Indirect N_2O Emissions From	N_2O	605.54	395.79	16%	136%	137%	0.002	0.005	0.009	0.006	0.002	0.000

Managed Soils												
3.G Liming	CO_2	20.59	20.91	10%	50%	51%	0.000	0.000	0.000	0.000	0.000	0.000
3.H Urea Application	CO_2	35.71	42.54	30%	50%	58%	0.000	0.001	0.001	0.000	0.000	0.000
4.A.1 Forest Land Remaining Forest Land	CO_2	-7,149.77	-8,151.38	4%	36%	36%	0.045	0.134	0.182	0.047	0.009	0.002
4.A.1 Forest Land Remaining Forest Land	CH_4	0.68	0.40	35%	70%	78%	0.000	0.000	0.000	0.000	0.000	0.000
4.A.1 Forest Land Remaining Forest Land	N_2O	0.45	0.26	11%	172%	172%	0.000	0.000	0.000	0.000	0.000	0.000
4.A.2 Land Converted to Forest Land	CO_2	-1,033.89	-1,181.17	17%	35%	39%	0.001	0.019	0.026	0.007	0.006	0.000
4.A.2 Land Converted to Forest Land	CH_4	0.04	0.02	35%	70%	78%	0.000	0.000	0.000	0.000	0.000	0.000
4.A.2 Land Converted to Forest Land	N_2O	0.02	0.02	11%	172%	172%	0.000	0.000	0.000	0.000	0.000	0.000
4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils	CO_2	770.39	784.46	14%	52%	54%	0.001	0.012	0.018	0.006	0.004	0.000
4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils	N_2O	39.29	40.50	14%	64%	65%	0.000	0.001	0.001	0.000	0.000	0.000
4.B Cropland	CO_2	5,252.93	4,084.62	2%	67%	67%	0.040	0.055	0.091	0.037	0.003	0.001
4.B Cropland	CH_4	0.05	0.01	20%	20%	28%	0.000	0.000	0.000	0.000	0.000	0.000
4.B Cropland	N_2O	392.99	304.03	75%	151%	169%	0.001	0.004	0.007	0.006	0.007	0.000
4.C Grassland	CO_2	-1,778.32	-2,460.85	3%	75%	75%	0.018	0.043	0.055	0.032	0.002	0.001
4.C Grassland	CH_4	2.12	1.02	50%	50%	71%	0.000	0.000	0.000	0.000	0.000	0.000
4.C Grassland	N_2O	2.31	1.11	50%	50%	71%	0.000	0.000	0.000	0.000	0.000	0.000
4.D Wetlands	CO_2	517.32	960.14	6%	204%	204%	0.021	0.018	0.021	0.037	0.002	0.001
4.D Wetlands	N_2O	6.08	4.97	75%	151%	169%	0.000	0.000	0.000	0.000	0.000	0.000
4.E Settlements	CO_2	0.00	382.09	11%	71%	72%	0.000	0.009	0.009	0.006	0.001	0.000
4.E Settlements	N_2O	0.00	30.71	76%	151%	169%	0.000	0.001	0.001	0.001	0.001	0.000
4.F Other Land	CO_2	0.00	53.65	30%	70%	76%	0.000	0.001	0.001	0.001	0.001	0.000
4.F Other Land	N_2O	0.00	8.54	81%	151%	172%	0.000	0.000	0.000	0.000	0.000	0.000
4.G Harvested Wood Products	CO_2	-252.55	-1,289.53	15%	59%	61%	0.003	0.027	0.029	0.016	0.006	0.000
5.A Solid Waste Disposal	CH_4	1,028.83	802.20	30%	123%	126%	0.006	0.011	0.018	0.013	0.008	0.000
5.B Biological Treatment of Solid Waste	CH_4	4.04	27.88	40%	100%	108%	0.000	0.001	0.001	0.001	0.000	0.000
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	40%	100%	108%	0.000	0.000	0.000	0.000	0.000	0.000
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000

5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000
5.D Wastewater Treatment and Discharge	CH_4	471.00	146.73	59%	73%	93%	0.000	0.000	0.003	0.000	0.003	0.000
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	30%	50%	58%	0.000	0.001	0.001	0.000	0.000	0.000
Total emission		**44,816.58**	**13,632.08**	**Overall uncertainty (%)**			**39.8**	**Trend uncertainty (%)**				**8.7**

* Base year for F-gases is 1995

Table 1b. Uncertainty evaluation excluding LULUCF

IPCC Source category	*Gas*	*Base year (1990) emissions**	*Emissions in 2014*	*Activity data uncertainty*	*Emission factor uncertainty*	*Combined uncertainty*	*Combined uncertainty as % of total national emissions in 2012*	*Type A sensitivity*	*Type B sensitivity*	*Uncertainty in trend in national emissions introduced by emission factor uncertainty*	*Uncertainty in trend in national emissions introduced by activity data uncertainty*	*Uncertainty introduced into the trend in total national emissions*
		kt CO_2 eqv.	*kt CO_2 eqv.*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*	*%*
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO_2	7,540.22	1,559.45	2%	2%	3%	0.000	0.033	0.032	0.001	0.001	0.000
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CH_4	6.90	0.99	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	N_2O	16.11	1.94	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO_2	174.05	8.46	2%	5%	5%	0.000	0.001	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CH_4	0.05	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	N_2O	0.82	0.04	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO_2	5,796.59	1,410.57	2%	2%	3%	0.000	0.021	0.029	0.000	0.001	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CH_4	2.63	0.64	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	N_2O	3.13	0.76	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	CO_2	0.00	114.38	2%	5%	5%	0.000	0.002	0.002	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	CH_4	0.00	0.71	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	N_2O	0.00	1.12	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Peat	CO_2	11.06	7.30	2%	5%	5%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Peat	CH_4	0.00	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000

1.A.1 Fuel combustion - Energy Industries - Peat	N_2O	0.05	0.03	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	CO_2			30%	15%	34%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	CH_4	0.40	18.81	30%	150%	153%	0.000	0.000	0.000	0.001	0.000	0.000
1.A.1 Fuel combustion - Energy Industries - Biomass	N_2O	0.63	29.89	30%	150%	153%	0.000	0.001	0.001	0.001	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO_2	3,873.72	118.22	2%	2%	3%	0.000	0.031	0.002	0.001	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CH_4	4.46	0.15	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	N_2O	47.81	4.99	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO_2	171.63	386.65	2%	5%	5%	0.000	0.007	0.008	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CH_4	0.45	1.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	N_2O	0.81	1.79	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO_2	2,045.42	660.47	2%	2%	3%	0.000	0.004	0.014	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CH_4	0.93	0.30	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	N_2O	1.11	0.35	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	CO_2	17.53	5.11	2%	5%	5%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	CH_4	0.01	0.00	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Peat	N_2O	0.08	0.02	2%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CO_2			30%	15%	34%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Biomass	CH_4	0.38	2.70	30%	150%	153%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.2 Fuel combustion - Manufacturing	N_2O	0.60	4.29	30%	150%	153%	0.000	0.000	0.000	0.000	0.000	0.000

Industries and Construction - Biomass												
1.A.3.a Domestic Aviation	CO_2	8.16	1.56	10%	2%	10%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.a Domestic Aviation	CH_4	0.00	0.00	10%	79%	79%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.a Domestic Aviation	N_2O	0.07	0.01	10%	110%	110%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.b Road Transportation	CO_2	5,247.15	4,801.73	2%	2%	3%	0.000	0.054	0.100	0.001	0.003	0.000
1.A.3.b Road Transportation	CH_4	48.11	13.29	2%	40%	40%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.b Road Transportation	N_2O	39.09	32.83	2%	50%	50%	0.000	0.000	0.001	0.000	0.000	0.000
1.A.3.c Railways	CO_2	349.97	161.90	5%	2%	5%	0.000	0.000	0.003	0.000	0.000	0.000
1.A.3.c Railways	CH_4	0.50	0.23	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.c Railways	N_2O	40.92	18.97	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	CO_2	15.49	13.60	5%	3%	6%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	CH_4	0.04	0.03	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.d Domestic Navigation - Liquid Fuels	N_2O	0.13	0.11	5%	90%	90%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	CO_2	85.36	69.41	5%	2%	5%	0.000	0.001	0.001	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	CH_4	0.04	0.03	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.3.e.i Other Transportation - Pipeline Transportation	N_2O	0.05	0.04	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	CO_2	2,735.39	259.56	3%	2%	4%	0.000	0.018	0.005	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	CH_4	7.22	0.59	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Liquid Fuels	N_2O	149.42	12.64	3%	50%	50%	0.000	0.001	0.000	0.001	0.000	0.000
1.A.4 Other Sectors - Solid Fuels	CO_2	2,760.55	250.69	3%	5%	6%	0.000	0.019	0.005	0.001	0.000	0.000
1.A.4 Other Sectors - Solid Fuels	CH_4	128.56	11.87	3%	50%	50%	0.000	0.001	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Solid Fuels	N_2O	13.00	1.18	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	CO_2	1,379.27	476.67	3%	2%	4%	0.000	0.002	0.010	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	CH_4	3.13	1.07	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Gaseous Fuels	N_2O	0.75	0.26	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	CO_2	27.13	75.65	3%	5%	6%	0.000	0.001	0.002	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	CH_4	1.12	3.81	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors - Peat	N_2O	0.11	0.30	3%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors- Biomass	CO_2			50%	15%	52%	0.000	0.000	0.000	0.000	0.000	0.000
1.A.4 Other Sectors- Biomass	CH_4	70.28	145.18	50%	150%	158%	0.000	0.002	0.003	0.004	0.002	0.000
1.A.4 Other Sectors- Biomass	N_2O	12.97	26.67	50%	150%	158%	0.000	0.000	0.001	0.001	0.000	0.000
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	CO_2	0.14	0.79	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.a Fugitive Emissions from Fuels - Oil	CH_4	4.25	3.19	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000

and Natural Gas - Oil												
1.B.2.a Fugitive Emissions from Fuels - Oil and Natural Gas - Oil	N_2O	0.00	0.00	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CO_2	0.01	0.01	5%	10%	11%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.b Fugitive Emissions from Fuels - Oil and Natural Gas - Natural Gas	CH_4	260.55	289.36	5%	10%	11%	0.000	0.004	0.006	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CO_2	0.58	3.52	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH_4	0.26	1.60	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	N_2O	0.00	0.02	5%	75%	75%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.1 Cement Production	CO_2	1,668.07	518.31	2%	5%	5%	0.000	0.004	0.011	0.000	0.000	0.000
2.A.2 Lime Production	CO_2	222.68	39.08	5%	30%	30%	0.000	0.001	0.001	0.000	0.000	0.000
2.A.3 Glass Production	CO_2	11.70	6.42	7%	5%	9%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.4.a Ceramics	CO_2	227.92	3.66	5%	5%	7%	0.000	0.002	0.000	0.000	0.000	0.000
2.A.4.b Other use of soda ash	CO_2	5.32	0.42	15%	5%	16%	0.000	0.000	0.000	0.000	0.000	0.000
2.A.4.d Mineral wool production	CO_2	6.28	10.54	7%	5%	9%	0.000	0.000	0.000	0.000	0.000	0.000
2.B.1 Ammonia Production	CO_2	1,253.68	2,019.66	2%	2%	3%	0.000	0.031	0.042	0.001	0.001	0.000
2.B.2 Nitric Acid Production	N_2O	893.01	257.89	2%	10%	10%	0.000	0.002	0.005	0.000	0.000	0.000
2.B.8.a Methanol	CO_2	24.35	0.00	5%	30%	30%	0.000	0.000	0.000	0.000	0.000	0.000
2.B.8.a Methanol	CH_4	5.24	0.00	5%	30%	30%	0.000	0.000	0.000	0.000	0.000	0.000
2.C.1 Iron and Steel Production	CO_2	16.98	2.02	10%	10%	14%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.1 Lubricant use	CO_2	6.06	11.85	5%	50%	50%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.2 Parafin wax use	CO_2	0.00	2.16	5%	100%	100%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Solvent use	CO_2	65.31	33.65	30%	20%	36%	0.000	0.000	0.001	0.000	0.000	0.000
2.D.3 Asphalt roofing	CO_2	0.02	0.01	5%	25%	25%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Road paving with asphalt	CO_2	0.00	0.00	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000
2.D.3 Urea-based catalyst	CO_2	0.00	1.69	10%	2%	10%	0.000	0.000	0.000	0.000	0.000	0.000
2.E.1 Semiconductor	SF_6	0.00	4.74	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.E.3 Photovoltaics	NF_3	0.00	0.26	5%	20%	21%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.1.a Domestic Refrigeration	HFCs	0.24	1.46	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.1.a Commercial Refrigeration	HFCs	3.77	174.36	20%	50%	54%	0.000	0.004	0.004	0.002	0.001	0.000
2.F.1.a Transport Refrigeration	HFCs	0.14	84.67	20%	50%	54%	0.000	0.002	0.002	0.001	0.000	0.000
2.F.1.a Industrial Refrigeration	HFCs	0.95	64.93	20%	50%	54%	0.000	0.001	0.001	0.001	0.000	0.000
2.F.1.a Stationary Air-Conditioning	HFCs	0.15	14.81	20%	50%	54%	0.000	0.000	0.000	0.000	0.000	0.000

2.F.1.b Mobile Air-Conditioning	HFCs	0.12	114.14	20%	50%	54%	0.000	0.002	0.002	0.001	0.001	0.000
2.F.2 Foam Blowing Agents	HFCs	0.00	15.90	30%	30%	42%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.3 Fire Protection	HFCs	0.00	2.17	20%	20%	28%	0.000	0.000	0.000	0.000	0.000	0.000
2.F.4 Aerosols/metered dose inhalers	HFCs	0.85	5.92	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.1 Manufacture of electrical equipments	SF_6	0.05	0.64	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.2.b Accelerators	SF_6	0.00	0.16	5%	5%	7%	0.000	0.000	0.000	0.000	0.000	0.000
2.G.3.a Medical applications	N_2O	93.35	2.77	5%	5%	7%	0.000	0.001	0.000	0.000	0.000	0.000
2.G.3.b Propellant for pressure and aerosol products	N_2O	2.70	2.12	20%	100%	102%	0.000	0.000	0.000	0.000	0.000	0.000
3.A Enteric Fermentation	CH_4	4,282.35	1,637.44	3%	9%	9%	0.000	0.003	0.034	0.000	0.001	0.000
3.B Manure Management	CH_4	622.03	266.51	4%	2%	4%	0.000	0.000	0.006	0.000	0.000	0.000
3.B Manure Management	N_2O	594.26	201.18	5%	210%	210%	0.000	0.001	0.004	0.002	0.000	0.000
3.D.1 Direct N_2O Emissions From Managed Soils	N_2O	2,693.01	2,035.92	8%	87%	88%	0.008	0.019	0.042	0.017	0.005	0.000
3.D.2 Indirect N_2O Emissions From Managed Soils	N_2O	605.54	395.79	16%	136%	137%	0.001	0.003	0.008	0.004	0.002	0.000
3.G Liming	CO_2	20.59	20.91	10%	50%	51%	0.000	0.000	0.000	0.000	0.000	0.000
3.H Urea Application	CO_2	35.71	42.54	30%	50%	58%	0.000	0.001	0.001	0.000	0.000	0.000
5.A Solid Waste Disposal	CH_4	1,028.83	802.20	30%	123%	126%	0.003	0.008	0.017	0.010	0.007	0.000
5.B Biological Treatment of Solid Waste	CH_4	4.04	27.88	40%	100%	108%	0.000	0.001	0.001	0.001	0.000	0.000
5.B Biological Treatment of Solid Waste	N_2O	2.89	14.68	40%	100%	108%	0.000	0.000	0.000	0.000	0.000	0.000
5.C Incineration and Open Burning of Waste	CO_2	2.66	5.73	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000
5.C Incineration and Open Burning of Waste	CH_4	0.00	0.01	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000
5.C Incineration and Open Burning of Waste	N_2O	0.08	0.17	40%	60%	72%	0.000	0.000	0.000	0.000	0.000	0.000
5.D Wastewater Treatment and Discharge	CH_4	471.00	146.73	59%	73%	93%	0.000	0.001	0.003	0.001	0.003	0.000
5.D Wastewater Treatment and Discharge	N_2O	67.21	44.85	30%	50%	58%	0.000	0.000	0.001	0.000	0.000	0.000
Total emission		**48,046.45**	**20,058.48**	**Overall uncertainty (%)**			**11.0**	**Trend uncertainty (%)**				**2.3**

* Base year for F-gases is 1995

ANNEX III. Lithuanian energy balance by fuel type

Table 3-1. Balance of crude oil, TJ

Production	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Biofuel blended	502	5,358	13,491	9,217	4,909	4,892	4,379	3,560	3,514	3,065
Import										
Export	396,707	131,189	199,709	380,035	385,276	382,015	364,146	383,408	319,455	356,108
International marine bunkers		335	13,254	6,312	4,736	3,438	3,408	2,863	2,677	2,067
Changes in stocks										
Gross inland consumption	2,093	-4,730	-1,169	9,169	-1,081	1,857	-90	1,345	439	-1,194
Statistical difference	**399,302**	**131,482**	**198,777**	**392,109**	**384,368**	**385,326**	**365,027**	**385,450**	**320,731**	**355,912**
Transformed in power, heat and other plants:		-42								
- in public CHP plant	399,302	131,440	198,777	392,101	384,357	385,326	365,019	385,450	320,731	355,912
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants	84	167	99							
- in other industries										
Consumed in energy sector, total:	399,218	131,273	198,678	392,101	384,357	385,326	365,019	385,450	320,731	355,912
- in peat extraction enterprises				3						
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterp.				3						
Non-energy use										
Distribution and transmission losses										
Final consumption:				5	11		8	0		
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										
Production										

Table 3-2. Balance of motor gasoline, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	87,988	37,709	68,838	112,699	123,626	124,021	115,648	116,610	96,781	107,664
Biofuel blended				26	445	610	528	433	293	600
Import	220	14,328	736	1,115	2,616	1,141	996	667	1,004	2,881
Export	42,104	23,601	50,765	95,698	114,237	114,611	105,566	110,591	89,539	101,063
International marine bunkers										
Changes in stocks	-2,725	-1,758	-2,012	-3,193	506	151	-1,479	1,999	353	-1,256
Gross inland consumption	**43,379**	**26,678**	**16,797**	**14,949**	**12,956**	**11,312**	**10,127**	**9,118**	**8,892**	**8,826**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:			15	5			3	3	4	2
- in peat extraction enterprises				1						1
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises			15	4			3	3	4	1
Non-energy use										
Distribution and transmission losses	308	176	68	61	22	17	17	10	8	5
Final consumption:	**43,071**	**26,502**	**16,714**	**14,883**	**12,934**	**11,295**	**10,107**	**9,105**	**8,880**	**8,819**
- in industry	44	88	48	31	15	17	14	13	13	8
- in construction	439	176	101	69	28	29	24	17	16	16
- in transport	41,840	25,887	16,337	14,711	12,841	11,201	10,025	9,033	8,809	8,761
- in agriculture	440	307	170	53	43	38	33	32	35	28
- in fishing										
- in commercial / public services	308	44	58	19	7	10	11	10	7	6
- in households										

Table 3-3. Balance of aviation gasoline, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			14	20	18	18	18	16	19	19
Export										
International marine bunkers										
Changes in stocks										
Gross inland consumption			**14**	**20**	**18**	**18**	**18**	**16**	**19**	**19**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:			**14**	**20**	**18**	**18**	**18**	**16**	**19**	**19**
- in industry										
- in construction										
- in transport			14	20	18	18	18	16	19	19
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-4. Balance of gasoline type jet fuel, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			65	3						
Export										
International marine bunkers										
Changes in stocks			-65							
Gross inland consumption				**3**						
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**3**						
- in industry										
- in construction										
- in transport				3						
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-5. Balance of kerosene type jet fuel, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	28,125	9,088	18,566	24,705	10,352	11,862	10,874	12,168	9,267	7,780
Biofuel blended										
Import	387	948	846		837	303	7,263	2,078	1,255	2,244
Export	22,956	8,442	16,673	21,406	9,062	9,882	14,527	11,876	6,587	6,113
International marine bunkers										
Changes in stocks	86	129	-1,651	-1,185	115	222	-846	799	-203	10
Gross inland consumption	**5,642**	**1,723**	**1,088**	**2,114**	**2,242**	**2,505**	**2,764**	**3,169**	**3,732**	**3,921**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses				14	5	9				
Final consumption:	**5,642**	**1,723**	**1,088**	**2,100**	**2,237**	**2,496**	**2,764**	**3,169**	**3,732**	**3,921**
- in industry										
- in construction										
- in transport	5,642	1,723	1,080	2,100	2,237	2,496	2,764	3,169	3,732	3,921
- in agriculture										
- in fishing										
- in commercial / public services			5							
- in households			3							

Table 3-6. Balance of transport diesel, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	107,712	42,490	56,232	127,985	150,168	156,497	150,528	161,248	136,670	156,249
Biofuel blended				119	1,478	1,600	2,142	2,174	2,383	2,393
Import	8,923	9,475	1,670	2,840	7,882	15,451	19,016	31,433	42,930	68,750
Export	49,416	27,364	28,516	92,877	116,251	128,505	128,727	146,569	129,039	169,375
International marine bunkers			942							
Changes in stocks	-1,997	1,573	-4,819	-2,586	31	178	1,961	-2,156	217	-768
Gross inland consumption	**65,222**	**26,174**	**23,625**	**35,481**	**43,308**	**45,221**	**44,920**	**46,130**	**53,161**	**57,249**
Statistical difference		213	853							
Transformed in power, heat and other plants:	7,521	1,742	36							
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant	7,521	1,615	28							
-in public heat plant		127	8							
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:	128	43	136	194	144	150	133	181	192	174
- in peat extraction enterprises	128	43	60	125	109	107	99	144	156	153
- in crude oil extraction enterprises			22	49	23	27	23	25	21	13
- in refineries			5						4	2
- in electricity, gas, steam and air conditioning enterprises			49	20	12	16	11	12	11	6
Non-energy use			6							
Distribution and transmission losses	297	128	55	122	73	81	70	28	19	22
Final consumption:	**57,276**	**24,474**	**24,245**	**35,165**	**43,091**	**44,990**	**44,717**	**45,921**	**52,950**	**57,053**
- in industry	2,124	1,827	510	499	190	191	174	223	237	248
- in construction	2,507	935	613	589	382	425	472	406	390	320
- in transport	34,289	14,489	21,476	32,515	41,030	42,814	42,412	43,719	50,702	55,021
- in agriculture	14,277	4,207	1,327	1,362	1,444	1,472	1,587	1,503	1,562	1,438
- in fishing				14	5	9	10	10	10	6
- in commercial / public services	2,889	2,804	319	186	40	79	62	60	49	20
- in households	1,190	212								

Table 3-7. Balance of heating and other gasoil, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				2,125	1,130	1,216	4,020	3,397	3,930	4,777
Biofuel blended					2		104	89	98	73
Import		717		915	854	934	874	674	538	701
Export				985		6			90	206
International marine bunkers				770	756	867	850	577	347	1738
Changes in stocks		-717	65	-225	-7	-59	-150	79	-119	-61
Gross inland consumption			**65**	**1,060**	**1,223**	**1,218**	**3,998**	**3,662**	**4,010**	**3,546**
Statistical difference										
Transformed in power, heat and other plants:			22	102	55	40	51	58	38	38
- in public CHP plant					1		9			
- in auto-producer heat plant										
- in auto-producer CHP plant			22	64	52	38	41	56	37	37
-in public heat plant				38	2	2	1	2	1	1
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:					5	3	3	3	3	4
- in peat extraction enterprises					5	3	3	3	3	4
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:			**43**	**958**	**1,163**	**1,175**	**3,944**	**3,601**	**3,969**	**3,504**
- in industry			7	405	220	214	240	200	286	228
- in construction			7	25	47	49	63	60	80	67
- in transport				226	235	179	2,686	2,478	2,588	2,413
- in agriculture			23	137	230	237	287	268	346	264
- in fishing				59	73	65	72	73	78	76
- in commercial / public services			6	55	69	72	87	97	118	48
- in households				51	289	359	509	425	473	408

Table 3-8. Balance of liquefied petroleum gases (LPG), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	12,006	7,636	11,026	21,046	12,720	11,507	10,235	11,742	10,116	12,155
Biofuel blended										
Import	2,208	1,056	3,972	3,110	5,024	5,202	5,208	4,927	5,184	4,882
Export	7,038	4,646	5,793	11,596	8,114	7,526	6,647	8,303	7,256	9,662
International marine bunkers										
Changes in stocks	46	230	-420	163	-111	-27	100	-34	-47	31
Gross inland consumption	**7,222**	**4,276**	**8,785**	**12,723**	**9,519**	**9,156**	**8,896**	**8,332**	**7,997**	**7,406**
Statistical difference										
Transformed in power, heat and other plants:	46		51	90	90	79	80	79	75	81
- in public CHP plant					3			2		
- in auto-producer heat plant										
- in auto-producer CHP plant			21	19	18	30	31	30	27	36
-in public heat plant	46		31	71	69	49	49	47	48	45
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:	552	138	36	4						
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries	552	138	22							
- in electricity, gas, steam and air conditioning enterprises			14	4						
Non-energy use										
Distribution and transmission losses	322	92	103	47	26	15	21	17	16	14
Final consumption:	**6,302**	**4,046**	**8,595**	**12,580**	**9,403**	**9,062**	**8,795**	**8,236**	**7,906**	**7,311**
- in industry			201	229	273	259	320	325	269	326
- in construction	92	46	74	77	122	48	32	35	43	38
- in transport	920	1,058	5,032	9,593	7,275	6,790	6,400	6,147	5,966	5,573
- in agriculture	230	46	19	38	41	63	68	65	105	54
- in fishing										
- in commercial / public services	460	92	62	23	6	25	14	23	26	20
- in households	4,600	2,804	3,207	2,620	1,686	1,877	1,961	1,641	1,497	1,300

Table 3-9. Balance of fuel oil – high sulphur (>1%), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	133,867	33,356	39,422	71,994	65,373	67,961	66,546	72,862	57,935	60,871
Biofuel blended										
Import	293,464	47,887	4,110	5,056	7,883	1,707	813	315	167	1,377
Export	277,769	8,148	16,608	56,627	60,139	64,685	63,173	68,752	56,058	57,774
International marine bunkers	3,894	5,780	2,857	4,712	2,801	1,281	812	46		1255
Changes in stocks	-8,951	-11,159	-4,689	-1,824	-3,450	1,270	5,997	543	1420	926
Gross inland consumption	**136,717**	**56,156**	**19,378**	**13,887**	**6,866**	**4,972**	**9,371**	**4,922**	**3,464**	**4,145**
Statistical difference		40	5,592							
Transformed in power, heat and other plants:	70,406	39,377	14,650	5,536	4,648	1,564	5,811	1,938	857	1,634
- in public CHP plant	44,195	20,511	7,233	3,837	4,157	942	5,284	1,349	346	493
- in auto-producer heat plant	642	201	27			405	279	418	383	1115
- in auto-producer CHP plant	20,190	16,618	6,813	1,659	491	217	248	171	128	26
-in public heat plant	5,379	2,047	577	40						
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:	8,068	3,693	4,899	6,716	2,005	3,255	3,396	2,865	2,512	2,444
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries	8,068	3,693	4,899	6,716	2,005	3,255	3,392	2,865	2,508	2,444
- in electricity, gas, steam and air conditioning enterprises							4		4	
Non-energy use										
Distribution and transmission losses	361			38			3	3	1	
Final consumption:	**57,882**	**13,126**	**5,421**	**1,597**	**213**	**153**	**161**	**116**	**94**	**67**
- in industry	43,993	11,520	5,202	1,486	148	79	155	115	91	67
- in construction	1,044	201	11	17						
- in transport			3	4						
- in agriculture	1,084	201	114	80	41	40				
- in fishing										
- in commercial / public services	11,641	1,204	91	10	24	34	6	1	3	
- in households	120									

Table 3-10. Balance of fuel oil – low sulphur (<1%), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production					4,306	2,413	1,563	382	343	267
Biofuel blended										
Import			1,407	1,191	2,779	4,630	5,339	3,589	333	516
Export				23	40	46	55	15	15	10
International marine bunkers			29	451	2,224	3,735	3,344	3,003	130	203
Changes in stocks			56	-60	-308	-338	-1,515	637	685	196
Gross inland consumption			**1,434**	**657**	**4,513**	**2,924**	**1,988**	**1,590**	**1,216**	**766**
Statistical difference										
Transformed in power, heat and other plants:			755	328	1,232	818	727	1,040	920	436
- in public CHP plant					18		262	819	624	348
- in auto-producer heat plant					1,017	602	181	37		
- in auto-producer CHP plant			713	318	197	213	282	183	296	87
-in public heat plant			42	10		3	2	1	0	1
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:					3,042	1,787	948	280		
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries					3,042	1,787	948	280		
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:			**679**	**329**	**239**	**319**	**313**	**270**	**296**	**330**
- in industry			363	220	147	210	237	213	244	275
- in construction			47	93	75	72	35	37	31	35
- in transport										
- in agriculture			15	2	5	22	19	15	18	17
- in fishing				9						
- in commercial / public services			254	5	12	15	22	5	3	3
- in households										

Table 3-11. Balance of refinery gas (not liquefied), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	11,032	5,318	8,253	15,250	14,127	13,324	13,300	14,875	13,065	14,007
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks										
Gross inland consumption	**11,032**	**5,318**	**8,253**	**15,250**	**14,127**	**13,324**	**13,300**	**14,875**	**13,065**	**14,007**
Statistical difference										
Transformed in power, heat and other plants:					109	101	172	121	99	175
- in public CHP plant										
- in auto-producer heat plant							172	121	99	175
- in auto-producer CHP plant										
-in public heat plant					109	101				
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:	11,032	5,318	8,253	15,250	14,018	13,223	13,128	14,754	12,966	13,832
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries	11,032	5,318	8,253	15,250	14,018	13,223	13,128	14,754	12,966	13,832
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-12. Balance of bitumen, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	9,534	1,108	3,117	6,804	4,938	5,158	4,288	4,904	3,555	5,449
Biofuel blended										
Import	40	791	474	1,150	1,814	2,208	1,623	1,792	1,567	1,812
Export	1,662	356	839	2,587	2,896	3,736	2,757	3,444	2,164	3,506
International marine bunkers										
Changes in stocks	40	39	71	28	-165	162	-286	164	40	-143
Gross inland consumption	**7,952**	**1,582**	**2,823**	**5,395**	**3,691**	**3,792**	**2,868**	**3,416**	**2,998**	**3,612**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use	7,952	1,582	2,823	5,395	3,691	3,792	2,868	3,416	2,998	3,612
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-13. Balance of lubricants, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production			1,226	847	1,504	1,675	1,790	1,755	1,886	1,931
Biofuel blended										
Import	413	620	602	1,121	1,709	2,181	2,891	1,641	1,268	1,655
Export			924	843	2,350	2,950	3,795	2,555	2,358	2,781
International marine bunkers										
Changes in stocks			129	-14	-17	-34	-53	33	11	3
Gross inland consumption	**413**	**620**	**1,033**	**1,111**	**846**	**872**	**833**	**874**	**807**	**808**
Statistical difference			-84							
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use	413	620	949	1,111	846	872	833	874	807	808
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-14. Balance of petroleum coke, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	1,962	1,393	2,740	3,940	3,856	3,883	3,433	3,738	3,528	3,745
Biofuel blended										
Import				1,100	9		13			
Export										
International marine bunkers										
Changes in stocks				-1,054	102					
Gross inland consumption	**1,962**	**1,393**	**2,740**	**3,986**	**3,967**	**3,883**	**3,446**	**3,738**	**3,528**	**3,745**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:	1,962	1,393	2,740	3,940	3,856	3,883	3,433	3,737	3,528	3,745
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries	1,962	1,393	2,740	3,940	3,856	3,883	3,433	3,737	3,528	3,745
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**46**	**111**		**13**	**1**		
- in industry				46	111		13	1		
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-15. Balance of refinery feedstock, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production		8,513	418	1,827				365		640
Biofuel blended										
Import	1,304	17,209	13,934	3,568	12,171	18,931	23,087	25,134	22,010	23,978
Export							9	6	11	33
International marine bunkers										
Changes in stocks	-1,220	-8,470	213	-1,121	614	673	-352	-434	709	-1420
Gross inland consumption	**84**	**17,252**	**14,565**	**4,274**	**12,785**	**19,604**	**22,726**	**25,059**	**22,708**	**23,165**
Statistical difference		-43								
Transformed in power, heat and other plants:	84	17,209	14,565	4,274	12,785	19,604	22,726	25,059	22,708	23,165
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries	84	17,209	14,565	4,274	12,785	19,604	22,726	25,059	22,708	23,165
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-16. Balance of naphtha, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				3,477						
Biofuel blended										
Import										
Export				3,257						
International marine bunkers										
Changes in stocks				-220						
Gross inland consumption										
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-17. Balance of orimulsion, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import		729	1,383	1,681						
Export										
International marine bunkers										
Changes in stocks			-734	700						
Gross inland consumption		**729**	**649**	**2,381**						
Statistical difference										
Transformed in power, heat and other plants:		729	649	2,381						
- in public CHP plant		729	649	2,381						
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-18. Balance of shale oil, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import				73	19					
Export					18					
International marine bunkers										
Changes in stocks				-7	31					
Gross inland consumption				**66**	**32**					
Statistical difference										
Transformed in power, heat and other plants:				9	10					
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant				9	1					
-in public heat plant					9					
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**57**	**22**					
- in industry				13						
- in construction										
- in transport										
- in agriculture				23	4					
- in fishing										
- in commercial / public services				21	18					
- in households										

Table 3-19. Balance of coking coal, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import	31,752	6,506	176	53	4,343	8,929	8,010	10,427	8,326	5,701
Export		50			438	464	575	865	817	
International marine bunkers										
Changes in stocks	980	2,889			-275	-970	-4	-730	178	640
Gross inland consumption	**32,732**	**9,345**	**176**	**53**	**3,630**	**7,495**	**7,431**	**8,832**	**7,687**	**6,341**
Statistical difference										
Transformed in power, heat and other plants:	1,834	452	25	53	55	51	71	81	67	88
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant	904	126	25	53	32	44	71	81	67	88
-in public heat plant	930	326			23	7				
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use		25								
Distribution and transmission losses		25			0	8	9	10	5	10
Final consumption:	**30,898**	**8,843**	**151**		**3,575**	**7,436**	**7,351**	**8,741**	**7,615**	**6,243**
- in industry	1,583	703	137		2,860	3,750	4,353	5,083	4,418	3,602
- in construction	226	25	14		0	11	7	7	4	6
- in transport										
- in agriculture	1,557	50			3	23	16	35	80	86
- in fishing										
- in commercial / public services	12,359	6,632			406	2,105	1,302	1,583	1,352	1,089
- in households	15,173	1,433			305	1,547	1,673	2,033	1,761	1,460

Table 3-20. Balance of anthracite, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			100		90	21	33	62	18	
Export					1	1	5	5	8	
International marine bunkers										
Changes in stocks					-74	71	-4	-15	16	
Gross inland consumption			**100**		**15**	**91**	**24**	**42**	**26**	
Statistical difference										
Transformed in power, heat and other plants:			100							
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant			100							
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:					**15**	**91**	**24**	**42**	**26**	
- in industry					5	91	24	42	22	
- in construction					2					
- in transport										
- in agriculture					3				2	
- in fishing										
- in commercial / public services					4					
- in households					1				2	

Table 3-21. Balance of sub-bituminous coal, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			2,698	6,618	3,248	857	24	58	30	
Export				37	406	127		2	31	
International marine bunkers										
Changes in stocks			11	-168	672	-46	346	10	21	1
Gross inland consumption			**2,709**	**6,413**	**3,514**	**684**	**370**	**66**	**20**	**1**
Statistical difference										
Transformed in power, heat and other plants:			150	207	100	85	49	27	4	1
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant			81	147	66	85	49	27	4	1
-in public heat plant			69	60	34					
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:			4							
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises			4							
Non-energy use			7	3						
Distribution and transmission losses			11	6	8					
Final consumption:			**2,537**	**6,197**	**3,406**	**599**	**321**	**39**	**16**	
- in industry			5	3,059	207	16	19	4	3	
- in construction				18	2	1	1			
- in transport										
- in agriculture			14	36	8	3	2			
- in fishing										
- in commercial / public services			1,867	2,036	1,417	22	6	5	2	
- in households			651	1,048	1,772	557	293	30	11	

Table 3-22. Balance of coke, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			445	440	466	517	543	551	499	391
Export										
International marine bunkers										
Changes in stocks			-52	96	7	5	11	10	-21	8
Gross inland consumption			**393**	**536**	**473**	**522**	**554**	**561**	**478**	**399**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use			47	2						
Distribution and transmission losses										
Final consumption:			**346**	**534**	**473**	**522**	**554**	**561**	**478**	**399**
- in industry			346	534	473	522	554	561	478	399
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-23. Balance of lignite, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import			15	40	14	22		22	13	
Export										
International marine bunkers										
Changes in stocks			1	2	-6	-10	2	1	-7	1
Gross inland consumption			**16**	**42**	**8**	**12**	**2**	**23**	**6**	**1**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:			**16**	**42**	**8**	**12**	**2**	**23**	**6**	**1**
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services			16	25		4		6	5	
- in households				17	8	8	2	17	1	1

Table 3-24. Balance of peat, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	580	600	494	825	364	492	709	985	1,181	872
Biofuel blended										
Import						2				
Export			76	1	104	142	153	137	109	94
International marine bunkers										
Changes in stocks	116	222	51	-235	94	140	-68	-44	-565	-510
Gross inland consumption	**696**	**822**	**469**	**589**	**354**	**492**	**488**	**804**	**507**	**268**
Statistical difference										
Transformed in power, heat and other plants:	445	357	258	299	202	248	188	551	163	67
- in public CHP plant							4		36	
- in auto-producer heat plant										
- in auto-producer CHP plant	67	96	80	128	102	132	99	438	127	67
-in public heat plant	39	10	14			3				
- in geothermal plants										
- in other industries	339	251	163	171	100	113	85	113	96	74
Consumed in energy sector, total:		126	36	11		13	25	6	6	3
- in peat extraction enterprises			20	11				6	6	3
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises		126	15			13	25			
Non-energy use										
Distribution and transmission losses	9	10	5	7						
Final consumption:	**242**	**329**	**170**	**272**	**152**	**231**	**275**	**247**	**242**	**124**
- in industry	155	174	43	7	9	37	40	40	38	33
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services	87	58		21	44	85	112	99	97	51
- in households		97	127	244	99	109	123	108	107	40

Table 3-25. Balance of peat briquettes and peat pellets, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	239	186	138	147	84	101	73	96	81	63
Biofuel blended										
Import		119	2	143	696	899	1,009	1,150	762	604
Export						22	168	116	159	26
International marine bunkers										
Changes in stocks	-53	-13	-1	-35	-44	-160	64	-120	184	9
Gross inland consumption	**186**	**292**	**139**	**255**	**736**	**818**	**978**	**1,010**	**868**	**650**
Statistical difference										
Transformed in power, heat and other plants:				9	3		3	3		
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant				2	1		2	3		
-in public heat plant				7	2		1			
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:			2							
- in peat extraction enterprises			2							
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:	**186**	**293**	**137**	**246**	**733**	**818**	**975**	**1,007**	**868**	**650**
- in industry	13	53		8	27	27	34	28	27	16
- in construction										
- in transport										
- in agriculture				3	16	17	18	21	19	13
- in fishing										
- in commercial / public services	27	53	1	28	193	238	295	325	307	173
- in households	146	186	136	207	497	536	628	633	515	448

Table 3-26. Balance of paraffin and waxes, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import				176	520	857	1,139	1,264	1,328	1,776
Export				106	384	647	906	1,161	1,167	1,427
International marine bunkers										
Changes in stocks					3	-46	-61	38	-13	-202
Gross inland consumption				**70**	**139**	**164**	**172**	**141**	**148**	**147**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use				70	139	164	172	141	148	147
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-27. Balance of natural gas, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production										
Biofuel blended										
Import	201,957	84,929	86,453	104,363	104,017	114,115	111,200	90,670	89,759	89,642
Export	6,102								13	3335
International marine bunkers										
Changes in stocks			-37	-671	304	-298	-68	-62	-3296	255
Gross inland consumption	**195,855**	**84,929**	**86,416**	**103,692**	**104,321**	**113,817**	**111,132**	**90,608**	**86,450**	**86,562**
Statistical difference										
Transformed in power, heat and other plants:	105,124	41,480	47,241	57,134	58,186	48,005	43,280	35,499	27,756	24,104
- in public CHP plant	62,825	17,664	29,650	42,536	45,755	37,219	31,684	26,622	19,871	17,354
- in auto-producer heat plant	1,787	473	324	1,160	1,003	954	1,881	1,045	1,896	1,970
- in auto-producer CHP plant	34,248	21,952	16,272	11,414	10,525	8,994	8,977	7,317	5,473	4,357
-in public heat plant	6,265	1,391	688	667	558	568	470	391	372	327
- in geothermal plants				819	345	270	268	124	144	96
- in other industries			307	538						
Consumed in energy sector, total:			140	130	65	199	130	72	58	1298
- in peat extraction enterprises										
- in crude oil extraction enterprises			3	3	3	3	3	2	3	2
- in refineries			28	28	4	2	19	20	18	15
- in electricity, gas, steam and air conditioning enterprises			109	99	58	194	108	50	37	1281
Non-energy use	26,934	20,167	22,716	21,335	20,139	40,326	41,842	31,938	36,573	39,432
Distribution and transmission losses	1,688	1,935	1,119	420	5	4	3			
Final consumption:	**62,109**	**21,347**	**15,200**	**24,673**	**25,926**	**25,283**	**25,877**	**23,099**	**22,063**	**21,728**
- in industry	36,065	8,916	8,285	14573	13670	14099	14579	12470	12024	11417
- in construction	1,030	219	266	513	501	459	490	509	457	477
- in transport				647	1,028	862	1,330	1,250	1,232	1,250
- in agriculture	2,946	1,197	991	1,192	1,309	1,273	1,156	1,058	869	872
- in fishing										
- in commercial / public services	12,831	3,319	1,302	2,118	2,793	2,520	2,652	2,656	2,452	2,575
- in households	9,237	7,696	4,356	5,630	6,625	6,070	5,670	5,156	5,029	5,137

Table 3-28. Balance of charcoal, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				18	24	19	19	19	28	26
Biofuel blended										
Import				14	61	58	43	58	126	210
Export				15	38	36	34	36	93	163
International marine bunkers										
Changes in stocks				3	1			-3	-17	-7
Gross inland consumption				**20**	**48**	**41**	**28**	**38**	**44**	**66**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**20**	**48**	**41**	**28**	**38**	**44**	**66**
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services				20	48	41	28	38	44	66
- in households										

Table 3-29. Balance of wood and wood waste, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	11,930	19,632	27,324	35,293	41,734	40,955	41,291	43,355	46,292	49,852
Biofuel blended										
Import		61	4	727	2,008	4,603	4,623	4,949	5,185	5,628
Export			255	710	5,102	5,431	4,871	5,427	5,761	5,725
International marine bunkers										
Changes in stocks	-14	-381	-54	-498	444	-2,044	722	-188	-530	457
Gross inland consumption	**11,916**	**19,312**	**27,019**	**34,812**	**39,084**	**38,083**	**41,765**	**42,689**	**45,186**	**50,212**
Statistical difference				457						
Transformed in power, heat and other plants:	527	558	1,640	6,273	10,408	9,792	12,952	14,797	18,690	24,371
- in public CHP plant				191	2,472	2,359	3,785	6,073	6,058	6,365
- in auto-producer heat plant										
- in auto-producer CHP plant	274	156	1,060	4,906	7,121	6,691	7,976	7,679	9,961	16,987
-in public heat plant	253	402	580	1,128	772	706	1,149	1,002	2,627	980
- in geothermal plants										
- in other industries				48	43	36	42	43	44	39
Consumed in energy sector, total:			25	13	19	12	11	6	9	2
- in peat extraction enterprises				13	4	4	6	3	9	
- in crude oil extraction enterprises										
- in refineries					1	2	4	3	0	
- in electricity, gas, steam and air conditioning enterprises			25		14	6	1	0	0	2
Non-energy use										
Distribution and transmission losses			12	4						
Final consumption:	**11,389**	**18,754**	**25,342**	**28,979**	**28,657**	**28,279**	**28,802**	**27,886**	**26,487**	**25,839**
- in industry	453	756	1,218	4,007	2,920	3,027	3,400	3,380	3,313	3,520
- in construction	51	105	100	185	143	145	157	125	99	62
- in transport										
- in agriculture	187	211	272	253	399	463	437	400	436	383
- in fishing										
- in commercial / public services	1,699	1,104	1,703	1,278	1,178	1,276	1,344	1,390	1,358	1,332
- in households	8,999	16,578	22,049	23,256	24,017	23,368	23,464	22,591	21,281	20,542

Table 3-30. Balance of agricultural waste, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				96	228	212	242	238	457	585
Biofuel blended										
Import									8	10
Export									269	386
International marine bunkers										
Changes in stocks				16	11	-9	-34	24	6	-31
Gross inland consumption				**112**	**239**	**203**	**208**	**262**	**202**	**178**
Statistical difference										
Transformed in power, heat and other plants:				64	144	113	112	99	105	68
- in public CHP plant							1	2	2	
- in auto-producer heat plant										
- in auto-producer CHP plant				55	131	100	101	97	103	68
-in public heat plant				9	13	13	10			
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:					3	1				
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises					3	1				
Non-energy use										
Distribution and transmission losses										
Final consumption:				**48**	**92**	**89**	**96**	**163**	**97**	**110**
- in industry				41	11	7	6	13	5	16
- in construction										
- in transport										
- in agriculture				2	56	56	59	88	63	73
- in fishing										
- in commercial / public services					18	25	28	58	29	20
- in households				5	7	1	3	4		1

Table 3-31. Balance of bioethanol, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				195	1,060	565	656	730	407	470
Biofuel blended										
Import					106	234	286	214	32	269
Export				162	649	320	483	562	120	308
International marine bunkers										
Changes in stocks				-7	-3	-14	6	19	41	11
Gross inland consumption				**26**	**514**	**465**	**465**	**401**	**360**	**442**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use					78	68	100	117	128	37
Distribution and transmission losses										
Final consumption:				**26**	**436**	**397**	**365**	**284**	**232**	**405**
- in industry										
- in construction										
- in transport				26	436	397	365	284	232	405
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-32. Balance of biodiesel, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				260	3,299	2,956	3,948	4,340	4429	4353
Biofuel blended										
Import					527	1,273	1,413	1,406	1502	2035
Export				168	2,538	2,726	3,131	3,571	3434	3865
International marine bunkers										
Changes in stocks				27	166	-22	-62	-2	-88	-101
Gross inland consumption				**119**	**1,454**	**1,481**	**2,168**	**2,173**	**2409**	**2422**
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**119**	**1,454**	**1,481**	**2,168**	**2,173**	**2409**	**2422**
- in industry										
- in construction										
- in transport				119	1,454	1,481	2,168	2,173	2409	2422
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-33. Balance of sludge biogas, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				57	125	129	130	150	290	294
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks										
Gross inland consumption				**57**	**125**	**129**	**130**	**150**	**290**	**294**
Statistical difference										
Transformed in power, heat and other plants:				36	55	56	52	67	105	106
- in public CHP plant				17	8	13	10	14	16	21
- in auto-producer heat plant				3	47	43	42	53	89	85
- in auto-producer CHP plant				16						
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**21**	**70**	**73**	**78**	**83**	**185**	**188**
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services				21	70	73	78	83	185	188
- in households										

Table 3-34. Balance of landfill biogas, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production					83	245	257	299	323	343
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks										
Gross inland consumption					**83**	**245**	**257**	**299**	**323**	**343**
Statistical difference										
Transformed in power, heat and other plants:					83	237	256	292	320	338
- in public CHP plant					35	152	124	226	187	266
- in auto-producer heat plant					48	85	132	66	133	72
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:					**0**	**8**	**1**	**7**	**3**	**5**
- in industry								2	1	2
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services					0	8	1	5	2	3
- in households										

Table 3-35. Balance of other biogas from agricultural waste, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production				20	210	89	97	200	263	344
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks										
Gross inland consumption				**20**	**210**	**89**	**97**	**200**	**263**	**344**
Statistical difference										
Transformed in power, heat and other plants:				7	91	42	45	114	178	225
- in public CHP plant										
- in auto-producer heat plant				7	91	42	45	114	178	225
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:				**13**	**119**	**47**	**52**	**86**	**85**	**119**
- in industry					104	41	52	86	85	119
- in construction										
- in transport										
- in agriculture				13	15	6				
- in fishing										
- in commercial / public services										
- in households										

Table 3-36. Balance of emulsified vacuum residue, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production						19		40		
Biofuel blended										
Import										
Export						19		40		
International marine bunkers										
Changes in stocks										
Gross inland consumption										
Statistical difference										
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-37. Balance of sulphur (from oil), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production	960	400	1,228	2,971	2,939	3,068	2,922	3,258	3,064	3,337
Biofuel blended										
Import										2
Export			14	154	49		19		1456	332
International marine bunkers										
Changes in stocks		-280	-101	-75	6	3	-65	87	11	-324
Gross inland consumption	**960**	**120**	**1,113**	**2,742**	**2,896**	**3,071**	**2,838**	**3,345**	**1,619**	**2,683**
Statistical difference		280								
Transformed in power, heat and other plants:										
- in public CHP plant										
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use	960	400	1,113	2,742	2,896	3,071	2,838	3,345	1,619	2,683
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-38. Balance of industrial waste, TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production								155	258	303
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks										-13
Gross inland consumption								**155**	**258**	**290**
Statistical difference										
Transformed in power, heat and other plants:								155	258	290
- in public CHP plant								155	258	290
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-39. Balance of municipal waste (non-biomass fraction), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production								475	495	661
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks								-7	3	-8
Gross inland consumption								**468**	**498**	**653**
Statistical difference										
Transformed in power, heat and other plants:								468	498	653
- in public CHP plant								468	498	653
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

Table 3-40. Balance of municipal waste (biomass fraction), TJ

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Production								468	475	676
Biofuel blended										
Import										
Export										
International marine bunkers										
Changes in stocks								-7	2	-17
Gross inland consumption								**461**	**477**	**659**
Statistical difference										
Transformed in power, heat and other plants:								461	477	659
- in public CHP plant								461	477	659
- in auto-producer heat plant										
- in auto-producer CHP plant										
-in public heat plant										
- in geothermal plants										
- in other industries										
Consumed in energy sector, total:										
- in peat extraction enterprises										
- in crude oil extraction enterprises										
- in refineries										
- in electricity, gas, steam and air conditioning enterprises										
Non-energy use										
Distribution and transmission losses										
Final consumption:										
- in industry										
- in construction										
- in transport										
- in agriculture										
- in fishing										
- in commercial / public services										
- in households										

ANNEX IV. Summary of study "Update of country specific GHG emission factors for energy sector" performed by Lithuanian Energy Institute in 2016

During combustion a great share of carbon is removed immediately as CO_2, therefore conditions of combustion process practically have not influence on CO_2 emission factors. CO_2 emission factors depend on type of fuel, i.e. on the amount of carbon content in this fuel. After the summarization of performed comparative analysis of applied emission factors in other EU countries, summarization of data provided by the operators under the EU ETS system and aggregation of results provided by the accredited research laboratories, the study determined country specific CO_2 emission factors for energy sector (fuel combustion). Updated values of country specific CO_2 emission factors are set considering to the results of analysis performed. Besides, determined values of emission factors assure low as possible uncertainty of emission factors.

CH_4 and N_2O emission factors are influenced by type of technology, operating conditions, age of equipment and other combustion conditions, therefore values of these emission factors significantly differ between the individual technologies. Seeking to precisely set country specific CH_4 and N_2O emission factors of energy technologies used in Lithuania, it is essential to perform comprehensive and multiplex measurements of emissions by differencing in accordance to the group of equipment and fuel type. However, the measurements have to be long-lasting, therefore in this study recommended values of CH_4 and N_2O emission factors are based in accordance to the results of expertual analysis performed and default IPCC (2006) values.

Updated CO_2, CH_4 and N_2O emission factors and previously applied CO_2, CH_4 and N_2O emission factors (presented in the study on "Determination of national GHG emission factors for energy sector", 2012) for energy sector are provided in Tables 4-1.

Table 4-1. GHG emission factors for *energy industries*

1.AA.1 Energy industries	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Liquid fuel						
Motor gasoline	72.77	0.003	0.0006	72.97	0.003	0.0006
Diesel	72.73	0.003	0.0006	72.89	0.003	0.0006
Gasoil	72.73	0.003	0.0006	72.89	0.003	0.0006
Residual fuel oil	78.4	0.003	0.0006	77.6	0.003	0.0006
Petroleum coke	94.06	0.003	0.0006	94.06	0.003	0.0006
Nonliquified petroleum gas	56.9	0.001	0.0001	55.82	0.001	0.0001
Orimulsion	81.74	0.003	0.0006	81.74	0.003	0.0006
Shale oil	76.6	0.003	0.0006	77.4	0.003	0.0006
Liquified petroleum gas	66.34	0.001	0.0001	65.42	0.001	0.0001
Crude oil	77.74	0.003	0.0006	77.74	0.003	0.0006
Solid fuel						
Coking coal	95.1	0.001	0.0015	94.9	0.001	0.0014
Anthracite	106.55	0.001	0.0015	-	-	-
Sub-bituminous coal	96.1	0.001	0.0015	-	-	-

1.AA.1 Energy industries	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Peat	104.34	0.001	0.0015	104.34	0.001	0.0015
Natural gas						
Natural gas	55.14*	0.001	0.0001	55.23	0.001	0.0001
Biomass						
Wood and wood waste	101.34	0.03	0.004	109.9	0.03	0.004
Other solid biomass	103.69	0.03	0.004	-	-	-
Biogas	58.45	0.001	0.0001	58.45	0.001	0.0001
Waste						
Municipality waste (RES)	109.03	0.03	0.004	-	-	-
Municipality waste (non-RES)	111.65	0.03	0.004	-	-	-
Industrial waste	143	0.03	0.004	-	-	-

Remark: * Seeking to ensure higher accuracy of GHG emissions accounting, it is valuable to apply time series of CO_2 emission factor for a period 2004-2014, but an average value of 55,14 t/TJ for a period 1990-2003. Since 2015, country will have to calculate CO_2 emission factor for natural gas considering to the chemical composition of natural gas imported through the pipeline and the liquefied natural gas terminal by applying the method of weighted average.

Updated country specific CO_2 emission factor for natural gas is determined considering to the chemical composition of natural gas during 2004-2014 that was provided by Central Calibration and Test Laboratory of JSC "Lietuvos dujos". Seeking to ensure higher accuracy of GHG inventory, it is valuable to apply time series of CO_2 emission factor for a period 2004-2014, but an average value of 55.14 t/TJ – for a period 1990-2003. Since 2015, country specific CO_2 emission factor for natural gas should be estimated considering chemical composition of natural gas imported through the pipeline and the liquefied natural gas terminal. The CO_2 emission factor for natural gas since 2015 should be calculated applying the method of weighted average and considering to the import structure and chemical composition of natural gas.

Values of country specific CO_2 emission factors for gasoline, diesel, gasoil, jet kerosene, residual fuel oil and liquefied petroleum gas are updated considering the results of measurements of petroleum products that were performed by the accredited Laboratory of Quality Research Centre of JSC „ORLEN Lietuva". When accounting GHG emissions, it is valuable to apply the updated CO_2 emission factors for a specified in this paragraph fuels for a period after 2015 and for a period 1990-2014 to use the emission factors determined in the study of 2012.

Values of country specific CO_2 emission factors for coking coal, petroleum coke, orimulsion, non liquefied petroleum gas and coke are updated on the basis of data provided by the operators under EU ETS and considering to the Tier 3 reliability that ensures the lowest uncertainty of emission factor. Sustaining to data base of EU ETS, in some cases it is possible to apply emission factors set at the plant-specific level. For example, this can be applied for orimulsion or residual fuel oil combusted in CHP of the JSC "ORLEN Lietuva". The application of plant-specific emission factors enables to use higher Tiers in the national GHG inventory.

Value of CO_2 emission factor for shale oil is based on national estonian emission factor considering the fact that shale oil is imported to Lithuania from Estonia. When preparing the inventory of GHG emissions, it is recommended to apply the updated CO_2 emission factor for shale oil after 2015.

Country specific CO_2 emission factors for wood, wood waste, agricultural waste and municipality waste (renewable and non-renewable) are specified by performed measurements in the Laboratory of Heat Equipment Research and Testing (Lithuanian Energy Institute). It is recommended to apply the updated CO_2 emission factors for the specified in this paragraph fuels when recalculating GHG emissions from 1990. This will ensure higher reliability of accounting, considering to the significantly lower uncertainties of the updated CO_2 emission factors.

Value of CO_2 emission factor for biogas and industrial waste is updated in accordance to the results of analysis on applied emission factors in other EU countries and considering the results of long-lasting research analysis performed in other countries. However, seeking to ensure low uncertainty of emission factor for biogas, it is essential to perform long-lasting measurements for different types of biogas in Lithuania.

The reliability of the updated CO_2 emission factors is assessed considering default values given in *2006 IPCC Guidelines* and results of performed comparative analysis, where the updated CO_2 emission factors were compared with the emission factors applied in EU countries. The comparison of updated CO_2 emission factors with default values of *2006 IPCC Guidelines* is presented in Figure 4-1.

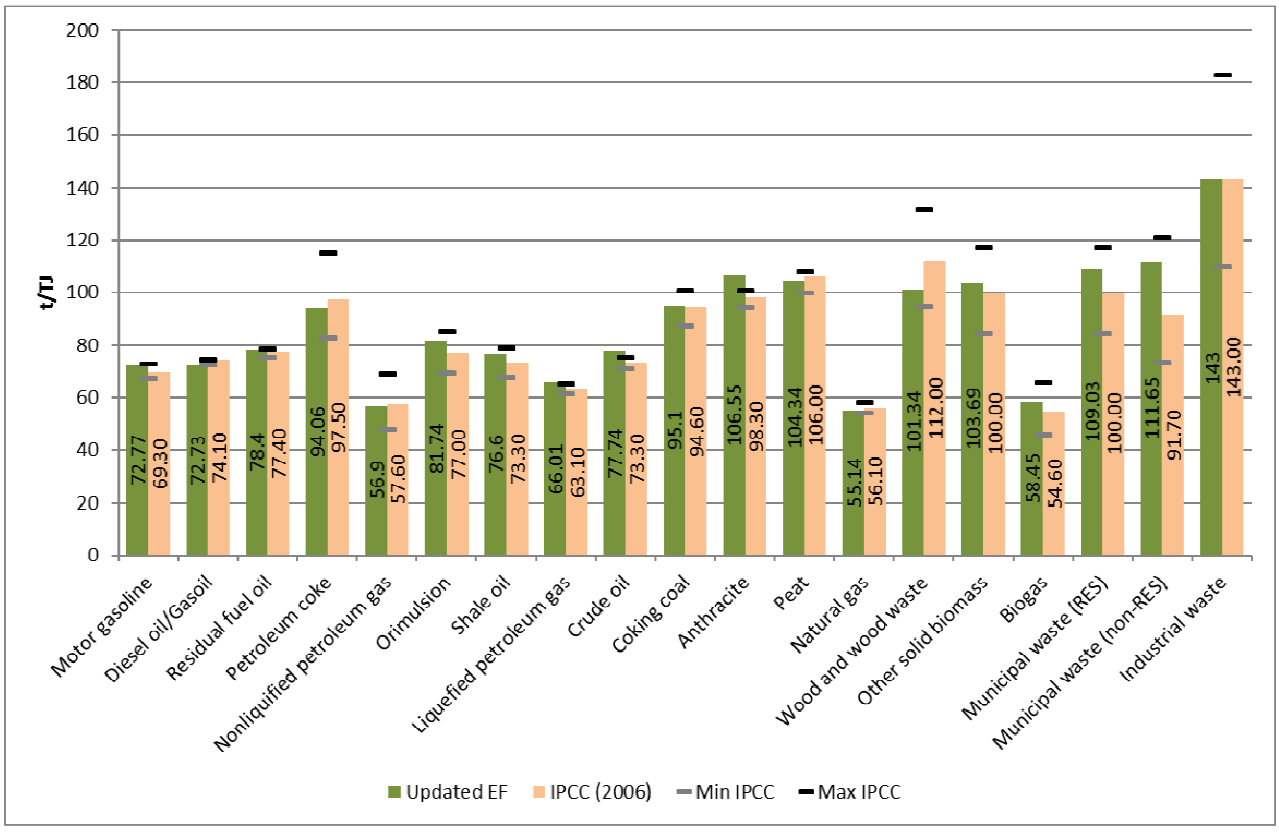

Figure 4-1. Comparison of updated country specific **CO_2** emission factors and default *2006 IPCC Guidelines* emission factors: energy industries

As it is seen from Figure 4-1, the updated values of country specific CO_2 emission factors for fuels fall into the uncertainty ranges of default *2006 IPCC Guidelines* , except for crude oil and anthracite. The updated values of country specific CO_2 emission factors for crude oil and anthracite are by 5.71% and 7.74% higher than default *2006 IPCC Guidelines* values, respectively.

CO_2 emission factors for manufacturing industries and construction are recommended the same as for energy industries sector (Table 4-2). CH_4 and N_2O emission factors are updated considering the results of expertual analysis performed and default *2006 IPCC Guidelines* values.

Table 4-2. GHG emission factors for *manufacturing industries and construction*

1.AA.2 Manufacturing industries and construction	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Liquid fuel						
Gasoil	72.73	0.003	0.0006	72.89	0.002	0.0006
Residual fuel oil	78.4	0.003	0.0006	77.6	0.002	0.0006
Petroleum coke	94.06	0.003	0.0006	94.06	0.002	0.0006
Shale oil	76.6	0.003	0.0006	77.4	0.002	0.0006
Liquified petroleum gas	66.34	0.001	0.0001	65.42	0.002	0.0006
Jet kerosene	71.74	0.003	0.0006	72.24	0.002	0.0006
Solid fuel						
Coaking coal	95.1	0.01	0.0015	94.9	0.01	0.0014
Antracite	106.55	0.01	0.0015	-	-	-
Sub-bituminous coal	96.1	0.01	0.0015	-	-	-
Peat	104.34	0.002	0.0015	104.34	0.002	0.0015
Coke	109.11	0.01	0.0015	109.11	0.01	0.0014
Natural gas						
Natural gas	55.14*	0.001	0.0001	55.23	0.005	0.0001
Biomass						
Biogas	58.45	0.001	0.0001	58.45	0.001	0.0001
Wood and wood waste	101.34	0.03	0.004	109.9	0.03	0.004
Other solid biomass	103.69	0.03	0.004	-	-	-
Waste						
Induastrial waste (used tires)	85.00	0.03	0.004	-	-	-

Remark: * Seeking to ensure higher accuracy of GHG emissions accounting, it is valuable to apply time series of CO_2 emission factor for a period 2004-2014, but an average value of 55,14 t/TJ for a period 1990-2003. Since 2015, country will have to calculate CO_2 emission factor for natural gas considering to the chemical composition of natural gas imported through the pipeline and the liquefied natural gas terminal by applying the method of weighted average.

Updated values of CO_2, CH_4 and N_2O emission factors for transport sector are presented in Table 4-3. CO_2 emission factors of fuels (except aviation gasoline) used in transport sector are updated on the basis of measurement performed by the accredited Laboratory of Quality Research Centre of JSC „ORLEN Lietuva“. Aviation gasoline is not produced in Lithuania. Minor volume of this fuel is imported from Sweden and other EU countries, therefore it is recommended for aviation gasoline to apply average value of emission factors applied in EU countries. CH_4 and N_2O emission factors are significantly impacted by technology type, operational conditions and etc. Table 4-3 provides CH_4 and N_2O emission factors that are updated considering to the recommended values of *2006 IPCC Guidelines*.

Table 4-3. GHG emission factors for transport sector

1.AA.3 Transport	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Aviation gasoline	70.81	0.0005[a]	0.002[a]	71.62	0.0005	0.002
Jet kerosene	71.74	0.0005[a]	0.002[a]	72.24	0.0005	0.002
Motor gasoline	72.77	0.003[b]	0.0006[b]	72.97	0.02	0.0006

1.AA.3 Transport	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Gasoline with bioethanol	72.76	0.003[b]	0.0006[b]	-	-	-
Gasoline with MTBE	72.23	0.003[b]	0.0006[b]	-	-	-
Diesel	72.73	0.0039[b]	0.0016[b]	72.89	0.005	0.0006
Liquefied petroleum gas		0.00415[c]	0.0286[c]			
Residual fuel oil		0.007d	0.002[d]			

Remark: a – civil aviation; b – road transportation; c – railways; d - water-borne navigation.

The comparison of updated country specific CO_2 emission factors with default *2006 IPCC Guidelines* emission factors are presented in Figure 4-2.

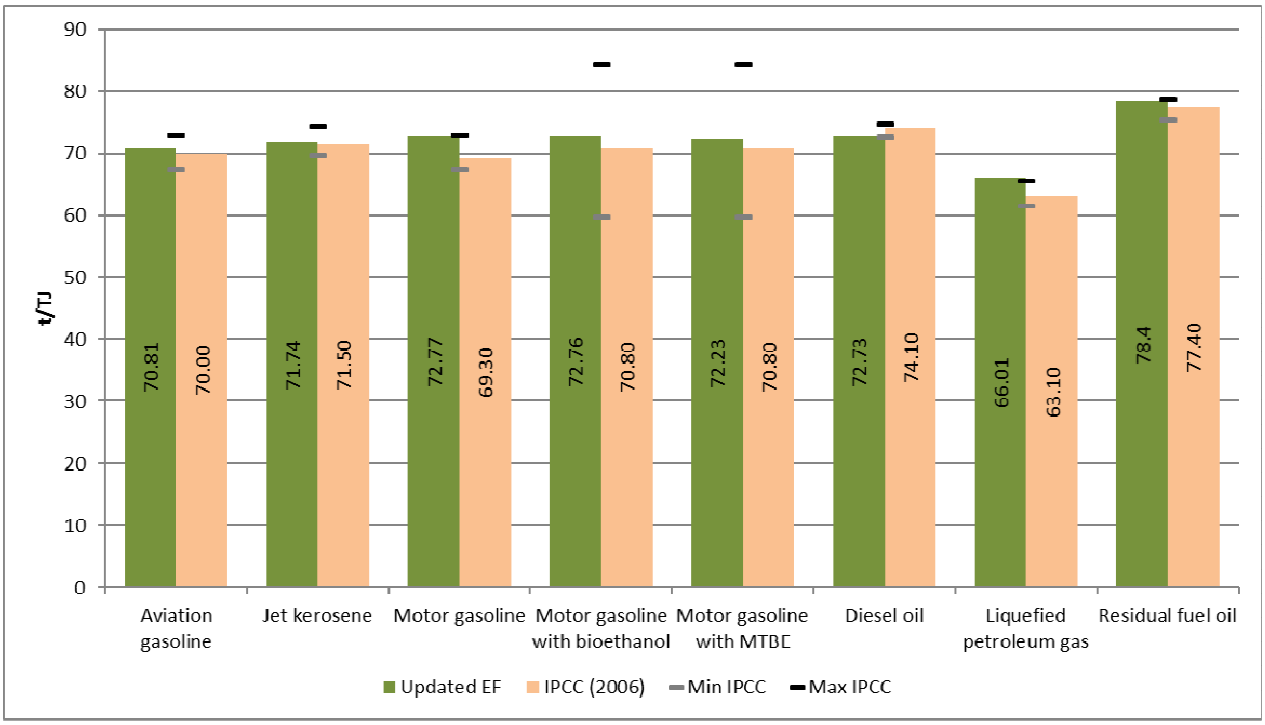

Figure 4-2. Comparison of updated country specific **CO_2** emission factors with default *2006 IPCC Guidelines* emission factors: transport sector

As it is seen from Figure 4-2, updated values of country specific CO_2 emission factors for fuels in transport sector fall into the uncertainty ranges of *2006 IPCC Guidelines* , except for liquefied petroleum gas. The updated value of CO_2 emission factor for liquefied petroleum gas is by 4.41% higher than its dafault value.

Recommended values of CO_2, CH_4 and N_2O emission factors for commercial/institutional, household, agriculture/forestry/fishing sector are presented in Table 4-4.

Table 4-4. GHG emission factors for commercial/institutional, household, agriculture/forestry and fishing sectors

1.AA.4 Other sectors	*Fuel type*	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
		CO_2	CH_4	CO_2	CH_4	CO_2	CH_4
Commercial/ institutional	Coking coal	95.1	0.01	0.0015	94.9	0.01	0.0014
	Anthracite	106.55	0.01	0.0015	-	-	-

1.AA.4 Other sectors	*Fuel type*	*Emission factors in the study of **2016**, t/TJ*			*Emission factors in the study of **2012**, t/TJ*		
		CO_2	CH_4	CO_2	CH_4	CO_2	CH_4
sector	Sub-bituminous coal	96.1	0.01	0.0015	-	-	-
	Biogas	58.45	0.005	0.0001	58.45	0.005	0.0001
	Peat	104.34	0.01	0.0014	104.34	0.01	0.0014
	Natural gas	55.14*	0.005	0.0001	55.23	0.005	0.0001
	Gasoil	72.73	0.01	0.0006	72.89	0.01	0.0006
	Lignite	101	0.01	0.0015	101.2	0.01	0.0014
	Wood and wood waste	101.34	0.25	0.004	109.9	0.3	0.004
	Other solid biomass	103.69	0.25	0.004	-	-	-
	Residual fuel oil	78.4	0.01	0.0006	77.6	0.01	0.0006
	Charcoal	109.9	0.2	0.001	109.9	0.2	0.001
	Shale oil	76.6	0.01	0.0006	77.4	0.01	0.0006
	Liquified petroleum gas	66.34	0.005	0.0001	65.42	0.01	0.0006
Household sector	Coking coal	95.1	0.3	0.0015	94.9	0.3	0.0014
	Anthracite	106.55	0.3	0.0015	-	-	-
	Sub-bituminous coal	96.1	0.3	0.0015	-	-	-
	Peat	104.34	0.3	0.0014	104.34	0.3	0.0014
	Natural gas	55.14*	0.005	0.0001	55.23	0.005	0.0001
	Gasoil	72.73	0.01	0.0006	72.89	0.01	0.0006
	Lignite	101	0.3	0.0015	101.2	0.3	0.0014
	Wood and wood waste	101.34	0.26	0.004	109.9	0.3	0.004
	Other solid biomass	103.69	0.26	0.004	-	-	-
	Residual fuel oil	78.4	0.01	0.0006	77.6	0.01	0.0006
	Liquified petroleum gas	66.34	0.005	0.0001	65.42	0.01	0.0006
Agriculture/ forestry and fishing sector	Coking coal	95.1	0.3	0.0015	94.9	0.3	0.0014
	Anthracite	106.55	0.3	0.0015	-	-	-
	Sub-bituminous coal	96.1	0.3	0.0015	-	-	-
	Biogas	58.45	0.005	0.0001	58.45	0.005	0.0001
	Peat	104.34	0.3	0.0014	104.34	0.3	0.0014
	Natural gas	55.14*	0.005	0.0001	55.23	0.005	0.0001
	Gasoil	72.73	0.01	0.0006	72.89	0.01	0.0006
	Wood and wood waste	101.34	0.25	0.004	109.9	0.3	0.004
	Other solid biomass	103.69	0.25	0.004	-	-	-
	Residual fuel oil	78.4	0.01	0.0006	77.6	0.01	0.0006
	Shale oil	76.6	0.01	0.0006	77.4	0.01	0.0006
	Liquified petroleum gas	66.34	0.005	0.0001	65.42	0.01	0.0006

Remark: * Seeking to ensure higher accuracy of GHG emissions accounting, it is valuable to apply time series of CO_2 emission factor for a period 2004-2014, but an average value of 55.14 t/TJ for a period 1990-2003. Since 2015, country will have to calculate CO_2 emission factor for natural gas considering to the chemical composition of natural gas imported through the pipeline and the liquefied natural gas terminal by applying the method of weighted average.

Preparing the national GHG inventory, it is essential to evaluate the overall inventory uncertainty. For this purpose it is needed to have uncertainty estimates of emission factors, therefore in this study expert valuations of determined national emission factors uncertainties are performed.

Considering international practice, uncertainty assessment of CO_2, CH_4 and N_2O emission factors is performed at aggregated sector-specific and fuel type-specific (liquid, solid, gaseous fuel and biomass) levels. Uncertainty estimations of recommended GHG emission factors are presented in Table 4-5.

Assessment of uncertainty of CO_2 emission factors is performed considering the fact that carbon share of some types of fuels is relatively stable. Emission factors for liquid fuels mainly are identified at the accredited laboratory that satisfies the requirements of LST EN ISO/IEC 17025:2005 standard or are based on data provided by EU ETS applying the Tier 3. Chemical composition of natural gas is determined in the laboratory, which is accredited by the National Accreditation Bureau, too. This has an influence on low uncertainties of emission factors for liquid fuels and natural gas (±2,0%). Uncertainties of emission factors for solid fuels are remarkably higher, because, for example, carbon share in peat is variable, therefore uncertainties of emission factors for solid fuels are estimated considering the recommendations provided in *2006 IPCC Guidelines* . Uncertainty of CO_2 emission factor for biomass is the highest and reaches ±15%.

Table 4-5. Uncertainties of recommended GHG emission factors

IPCC source category	*Fuel type*	CO_2, *%*	CH_4, *%*	N_2O, *%*
1.AA.1 Energy industries	Liquid fuel	± 2.0	± 50	± 50
	Solid fuel	± 5.0	± 50	± 50
	Natural gas	± 2.0	± 50	± 50
	Biomass	± 15.0	± 150	± 150
1.AA.2 Manufacturing industry and construction	Liquid fuel	± 2.0	± 50	± 50
	Solid fuel	± 5.0	± 50	± 50
	Natural gas	± 2.0	± 50	± 50
	Biomass	± 15.0	± 150	± 150
1.AA.3 Transport	Liquid fuel	± 2.0	± 100	± 150
1.AA.4 Other sectors: commercial/institutional, household, agriculture and fishing	Liquid fuel	± 2.0	± 50	± 50
	Solid fuel	± 5.0	± 50	± 50
	Natural gas	± 2.0	± 50	± 50
	Biomass	± 15.0	± 100	± 150

Uncertainties of aggregated CH_4 and N_2O emission factors are very high, since these emission factors highly depend on type of combustion technologies. Assessment of uncertainties of these emission factors are performed considering *2006 IPCC Guidelines* for National GHG inventories (2006).

ANNEX V. CO_2 emissions from the installations registered in the National GHG registry, 2015

Table 5-1. CO_2 emissions from the installations registered in the GHG Emission Allowance Registry, 2015

No	*Company*	*Name of the Installation*	*Allocated EUA*	*Verified Emissions, t CO_2*
1	AB "Akmenės cementas"	Boiler house, cement production furnace	614,726	843,052
	AB "Naujasis kalcitas"	Whitewash production furnace	44,494	47,229
3	UAB "Švenčionėlių keramika"	Furnace for ceramics	5,285	592
4	UAB "Rokų keramika"	Ceramics combustion furnace	8,031	701
5	AB "Palemono keramika"	Ceramics combustion furnace	8,019	3,737
6	AB "Dvarčionių keramika"	Ceramics combustion furnace	0	51
7	UAB "Alytaus keramika"	Ceramics combustion furnace	1,503	617
8	UAB "Kauno stiklas"	Glass melting furnace	5,597	14,030
9	AB "Panevėžio stiklas"	Glass melting furnace	10,726	21,259
10	AB "ORLEN Lietuva"	Oil refining factory	1,359,259	1,755,789
11	AB "Klaipėdos kartonas"	Boiler house	23,785	7,078
12	AB "Grigiškės"	Boiler house	35,060	2,817
13	AB "Simega"	Boiler house	3,102	0
14	AB "Achema"	Boiler house	1,978,283	2,755,145
15	AB "Nordic Sugar Kėdainiai"	Boiler house, oilcake desiccation	28,471	26,015
16	AB "Lifosa"	Boiler house	166,138	784
17	AB "Klaipėdos nafta"	Boiler house	14,820	15,787
18	UAB "Arvi cukrus"	Boiler house	12,624	7,275
19	AB "Įmonių grupė ALITA"	Boiler house, desiccation of apple oilcake	0	1,026
20	UAB "Idavang Pasodėlė"	Boiler house	1,457	0
21	AB "Klaipėdos mediena"	Boiler house	14,516	2,308
22	UAB "Matuizų plytinė"	Boiler house	5,817	0
23	AB "Jonavos šilumos tinklai"	Jonava boiler house	17,680	5,447
24	AB "Jonavos šilumos tinklai"	Girele boiler house	4,155	80
25	UAB "Mažeikių šilumos tinklai"	Mazeikiai boiler house	18,802	277
26	UAB "Raseinių šilumos tinklai"	Raseiniai boiler house No 4	4,627	263

No	*Company*	*Name of the Installation*	*Allocated EUA*	*Verified Emissions, t CO_2*
27	UAB "Molėtų šiluma"	Moletai boiler house	3,282	40
28	UAB "Šilutės šilumos tinklai"	Šilute boiler house	9,020	486
29	UAB "Vilniaus energija"	Vilnius power plant No 2 (E-2)	221,290	196,650
30	UAB "Vilniaus energija"	Vilnius power plant No 3 (E-3)	134,087	193,319
31	UAB "Vilniaus energija"	Vilnius boiler house No 2	10,414	4,358
32	UAB "Vilniaus energija"	Vilnius boiler house No 8	791	863
33	UAB "Širvintų šiluma"	Širvintu boiler house No 3	3,560	0
34	AB "Šiaulių energija"	Šiauliai southern boiler house	59,407	10,010
35	AB "Klaipėdos energija"	Power plant	45,795	16,586
36	UAB "Radviliškio šiluma"	Radviliškis city boiler house	7,376	464
37	UAB "Utenos šilumos tinklai"	Utena boiler house	22,913	1,282
38	UAB "Tauragės šilumos tinklai"	Taurage - Berže boiler house	7,176	207
39	UAB "Šalčininkų šilumos tiklai"	Šalcininkai boiler house	3,058	1
40	Pravieniškių pataisos namai-atviroji kolonija	Varena boiler house	2,291	3,815
41	UAB "Varėnos šiluma"	Panevežys boiler house No 2	6,070	0
42	AB "Panevėžio energija"	Rokiškis region boiler house	25,403	17,076
43	AB "Panevėžio energija"	Panevežys region boiler house	14,872	175
44	AB "Panevėžio energija"	No 1	28,438	10,171
45	AB "Panevėžio energija"	Pasvalys region boiler house	4,259	510
46	AB "Panevėžio energija"	Zarasai boiler house No 4	3,912	77
47	UAB "GEOTERMA"	Klaipeda geothermal PP	16,858	4,966
48	AB "Kauno energija"	Petrašiunai PP	4,232	8
49	AB "Kauno energija"	Pergale boiler house	917	537
50	AB "Kauno energija"	Šilkas boiler house	1,789	1
51	AB "Kauno energija"	Noreikiškes region boiler house	3,338	1,093
52	AB "Kauno energija"	Garliava region boiler house	3,797	582
53	AB "Kauno energija"	Jurbarkas region boiler house	5,531	6,386
54	UAB "Plungės šilumos tinklai"	Plunge boiler house No 1	7,062	393
55	UAB "Birštono šiluma"	Birštonas region boiler house	2,658	644

No	*Company*	*Name of the Installation*	*Allocated EUA*	*Verified Emissions, t CO_2*
56	UAB "Litesko"	Druskininkai industry boiler house	15,892	5,733
57	UAB "Litesko"	Boiler house of Biržai city hall	1,594	478
58	UAB "Litesko"	Vilkaviškis boiler house	4,186	2,082
59	UAB "Litesko"	Luoke boiler house	6,553	918
60	UAB "Litesko"	Mackevicius boiler house	3,004	857
61	UAB "Litesko"	Palanga boiler house	10,282	4,330
62	UAB "Litesko"	Kazlu Ruda boiler house	0	0
63	UAB "Litesko"	Marijampole region boiler house	21,667	8,996
64	UAB "Litesko"	Alytus region boiler house	37,667	5,252
65	AB "Lietuvos energijos gamyba"	Lietuvos PP	21,614	454,806
66	UAB "Kauno termofikacijos elektrinė"	Kaunas PP	198,808	127,681
67	UAB "Kaišiadorių šiluma"	Kaišiadoriai boiler house	4,924	2
68	UAB "Kretingos šilumos tinklai"	Kretinga boiler house No 3	4,560	0
69	AB "Klaipėdos energija"	Klaipeda region boiler house	40,061	2,976
70	AB "Klaipėdos energija"	Lypkiai regiopn boiler house	22,904	9,511
71	AB "Pagirių šiltnamiai"	Boiler house	10,338	7
72	UAB "Pramonės energija"	Boiler house	11,423	0
73	Vį "Ignalinos atominė elektrinė"	Boiler house	4,838	5,157
74	UAB "Trakų energija"	Lentvaris boiler house	1,782	0
75	UAB "Gargždų plytų gamykla"	Boiler house	2,314	0
76	UAB "Akmenės energija"	Zalgiris boiler house	4,355	847
77	AB "Panevėžio energija"	Panevežys thermal PP	22,187	48,240
78	UAB "IKEA Industry Lietuva"	Fuel combustion plants	39,019	17,885
79	UAB "NEO Group"	Boiler house	33,939	15,896
80	AB "Panevėžio energija"	Kėdainiai region boiler house	83	135
81	UAB "Paroc"	Plants producing stone-wool	33,510	53,021
82	UAB "Vilniaus energija"	Boiler house	1	4
83	AB "Vilniaus GKG-3"	Boiler house	801	348
84	UAB "Agro Neveronys"	Boiler house	4,262	0

No	*Company*	*Name of the Installation*	*Allocated EUA*	*Verified Emissions, t CO_2*
85	UAB "Pramonės energija"	Boiler house	15,160	0
86	Vį "Visagino energija"	Thermal boiler house	51,712	26,608
87	AB "Amilina"	Boiler house and driers	0	2,188
88	UAB "Lignoterma"	Boiler house	0	61
89	AB "Amber Grid"	Jauniūnų gas compressor station	0	156
90	UAB "Hoegh DLNG Klaipėda"	LNG ship	0	68,709
		Total	**5,676,013**	**6,844,943**

ANNEX VI. LULUCF area matrices, resulted from studies presented in NIR Chapter 6.1.1

1990

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,054,182	399	3,994	2,396	399	0	**2,061,370**	7,188
Cropland	0	2,403,666	22,367	0	0	0	**2,426,033**	-39,541
Grassland	0	61,110	1,246,568	0	0	0	**1,307,678**	42,339
Wetlands	0	0	0	363,066	0	0	**363,066**	-5,193
Settlements	0	0	0	0	324,323	0	**324,323**	1,198
Other land	0	0	0	0	0	47,530	**47,530**	-5,991
Initial	**2,054,182**	**2,465,574**	**1,265,339**	**368,259**	**323,125**	**53,521**	**6,530,000**	**0**

1991

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,061,370	399	3,994	2,396	399	0	**2,068,559**	7,189
Cropland	0	2,362,926	22,367	0	799	399	**2,386,492**	-39,541
Grassland	0	61,110	1,279,719	3,595	799	4,793	**1,350,015**	42,337
Wetlands	0	399	399	357,075	0	0	**357,874**	-5,192
Settlements	0	1,198	1,198	0	322,326	799	**325,521**	1,198
Other land	0	0	0	0	0	41,539	**41,539**	-5,991
Initial	**2,061,370**	**2,426,033**	**1,307,678**	**363,066**	**324,323**	**47,530**	**6,530,000**	**0**

1992

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,068,559	399	3,195	1,997	0	399	**2,074,550**	5,991
Cropland	0	2,320,189	25,562	0	0	799	**2,346,550**	-39,942
Grassland	0	62,308	1,320,858	2,396	1,598	4,793	**1,391,954**	41,939
Wetlands	0	399	0	353,480	0	2,396	**356,276**	-1,598
Settlements	0	2,396	399	0	323,924	399	**327,119**	1,598
Other land	0	799	0	0	0	32,752	**33,551**	-7,988
Initial	**2,068,559**	**2386492**	**1,350,015**	**357,874**	**325,521**	**41,539**	**6,530,000**	**0**

1993

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,074,550	1,198	3,994	0	0	0	**2,079,742**	5,192
Cropland	0	2,283,842	23,565	1,198	799	1,598	**2,311,003**	-35,547
Grassland	0	59,513	1,363,595	1,598	1,598	5,192	**1,431,496**	39,542
Wetlands	0	399	399	353,480	0	399	**354,679**	-1,597
Settlements	0	799	399	0	324,723	0	**325,921**	-1,198
Other land	0	799	0	0	0	26,361	**27,160**	-6,391
Initial	**2,074,550**	**2,346,550**	**1,391,954**	**356,276**	**327,119**	**33,551**	**6,530,000**	**0**

1994

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,079,343	0	2,396	399	399	0	**2,082,538**	2,796
Cropland	0	2,239,508	29,157	0	0	799	**2,269,464**	-41,539
Grassland	0	67,501	1,398,344	799	799	5,592	**1,473,034**	41,538
Wetlands	0	799	0	353,480	0	399	**354,679**	0
Settlements	0	2,796	1,598	0	324,723	0	**329,116**	3,195
Other land	399	399	0	0	0	20,370	**21,169**	-5,991
Initial	**2,079,742**	**2,311,003**	**1,431,496**	**354,679**	**325,921**	**27,160**	**6,530,000**	**0**

1995

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,082,538	0	1,598	799	0	0	**2,084,935**	2,397
Cropland	0	2,206,756	25,962	0	0	399	**2,233,117**	-36,347
Grassland	0	59,513	1,444,277	2,396	2,796	4,394	**1,513,375**	40,341
Wetlands	0	799	1,198	351,483	0	1,198	**354,679**	0
Settlements	0	1,997	0	0	326,320	399	**328,717**	-399
Other land	0	399	0	0	0	14,778	**15,178**	-5,991
Initial	**2,082,538**	**2,269,464**	**1,473,034**	**354,679**	**329,116**	**21,169**	**6,530,000**	**0**

1996

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,084,935	399	3,195	1,598	0	0	**2,090,127**	5,192
Cropland	0	2,207,555	8,388	0	0	0	**2,215,942**	-17,175
Grassland	0	25,163	1,501,792	399	0	0	**1,527,355**	13,980
Wetlands	0	0	0	352,682	0	0	**352,682**	-1,997
Settlements	0	0	0	0	328,717	0	**328,717**	0
Other land	0	0	0	0	0	15,178	**15,178**	0
Initial	**2,084,935**	**2,233,117**	**1,513,375**	**354,679**	**328,717**	**15,178**	**6,530,000**	**0**

1997

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,090,127	799	2,396	399	0	0	**2,093,722**	3,595
Cropland	0	2,163,619	19,571	0	0	399	**2,183,590**	-32,352
Grassland	0	51,125	1,504,588	0	0	0	**1,555,713**	28,358
Wetlands	0	0	399	352,282	0	0	**352,682**	0
Settlements	0	399	399	0	328,317	0	**329,116**	399
Other land	0	0	0	0	399	14,778	**15,178**	0
Initial	**2,090,127**	**2,215,942**	**1,527,355**	**352,682**	**328,717**	**15,178**	**6,530,000**	**0**

1998

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,093,722	0	3,195	0	0	399	**2,097,317**	3,595
Cropland	0	2,096,518	37,944	0	0	0	**2,134,462**	-49,128
Grassland	0	86,273	1,514,174	0	0	0	**1,600,447**	44,734
Wetlands	0	0	0	352,282	0	0	**352,282**	-400
Settlements	0	399	399	399	32,9116	0	**330,314**	1,198
Other land	0	399	0	0	0	14,778	**15,178**	0
Initial	**2,093,722**	**2,183,590**	**1,555,713**	**352,682**	**32,9116**	**15,178**	**6,530,000**	**0**

1999

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,096,917	399	1,598	1,198	0	0	**2,100,113**	2,796
Cropland	0	2,036,606	51,924	0	0	0	**2,088,530**	-45,932
Grassland	0	97,057	1,546,127	0	0	0	**1,643,184**	42,737
Wetlands	399	0	0	351,084	0	0	**351,483**	-799
Settlements	0	399	799	0	330,314	0	**331,513**	1,199
Other land	0	0	0	0	0	15,178	**15,178**	0
Initial	**2,097,317**	**2,134,462**	**1,600,447**	**352,282**	**330,314**	**15,178**	**6,530,000**	**0**

2000

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,100,113	399	2,396	2,396	0	399	**2,105,704**	5,591
Cropland	0	1,978,292	51,125	0	0	0	**2,029,416**	-59,114
Grassland	0	107,841	1,588,465	399	399	0	**1,697,105**	53,921
Wetlands	0	0	0	348,687	0	0	**348,687**	-2,796
Settlements	0	1,997	1,198	0	331,113	0	**334,309**	2,796
Other land	0	0	0	0	0	14,778	**14,778**	-400
Initial	**2,100,113**	**2,088,530**	**1,643,184**	**351,483**	**331,513**	**15,178**	**6,530,000**	**0**

2001

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,105,704	799	2,396	0	0	0	**2,108,900**	3,196
Cropland	0	1,925,170	42,338	0	0	0	**1,967,507**	-61,909
Grassland	0	103,049	1,651,572	399	399	399	**1,755,819**	58,714
Wetlands	0	0	0	348,288	0	0	**348,288**	-399
Settlements	0	399	399	0	333,909	399	**335,107**	798
Other land	0	0	399	0	0	13,979	**14,379**	-399
Initial	**2,105,704**	**2,029,416**	**1,697,105**	**348,687**	**334,309**	**14,778**	**6,530,000**	**0**

2002

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,108,900	0	3,994	399	0	0	**2,113,293**	4,393
Cropland	0	1,878,438	40,341	0	0	0	**1,918,779**	-48,728
Grassland	0	8,8270	1,711,084	0	0	0	**1,799,355**	43,536
Wetlands	0	0	399	347,889	0	799	**349,087**	799
Settlements	0	799	0	0	335,107	0	**335,906**	799
Other land	0	0	0	0	0	13,580	**13,580**	-799
Initial	**2,108,900**	**1,967,507**	**1,755,819**	**348,288**	**335,107**	**14,379**	**6,530,000**	**0**

2003

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,112,894	799	3,595	1,198	399	0	**2,118,885**	5,592
Cropland	0	1,853,275	23,565	0	0	0	**1,876,841**	-41,938
Grassland	0	64,705	1,771,396	0	0	399	**1,836,500**	37,145
Wetlands	399	0	0	347,889	0	0	**348,288**	-799
Settlements	0	0	399	0	335,507	0	**335,906**	0
Other land	0	0	399	0	0	13,181	**13,580**	0
Initial	**2,113,293**	**1,918,779**	**1,799,355**	**349,087**	**335,906**	**13,580**	**6,530,000**	**0**

2004

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,118,486	399	6391	1598	0	0	**2126873**	7,988
Cropland	0	1,825,716	29,157	0	0	0	**1854873**	-21,968
Grassland	0	50326	1,800,154	399	0	0	**1850879**	14,379
Wetlands	399	0	799	346,291	0	399	**347889**	-399
Settlements	0	399	0	0	335,906	0	**336306**	400
Other land	0	0	0	0	0	13,181	**13181**	-399
Initial	**2,118,885**	**1,876,841**	**1,836,500**	**348,288**	**335,906**	**13,580**	**6,530,000**	**0**

2005

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,126,474	799	5,592	1,598	0	399	**2,134,861**	7,988
Cropland	0	1,815,331	19,971	0	0	0	**1,835,302**	-19,571
Grassland	0	37,545	1,824,917	0	0	0	**1,862,462**	11,583
Wetlands	0	0	399	346,291	0	399	**347,090**	-799
Settlements	399	1,198	0	0	336,306	0	**337,903**	1,597
Other land	0	0	0	0	0	12,382	**12,382**	-799
Initial	**2,126,873**	**1,854,873**	**1,850,879**	**347,889**	**336,306**	**13,181**	**6,530,000**	**0**

2006

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,134,063	799	5,592	1,598	0	0	**2,142,051**	7,190
Cropland	0	1,802,949	90,267	0	0	0	**1,893,217**	57,915
Grassland	0	31,154	1,764,206	799	0	0	**1,796,159**	-66,303
Wetlands	0	399	399	344,693	0	0	**345,492**	-1,598
Settlements	399	0	1,598	0	337,903	0	**339,900**	1,997
Other land	399	0	399	0	0	12,382	**13,181**	799
Initial	**2,134,861**	**1,835,302**	**1,862,462**	**347,090**	**337,903**	**12,382**	**6,530,000**	**0**

2007

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,142,051	2,796	3,195	1,997	0	399	**2,150,439**	8,388
Cropland	0	1,866,057	86,673	0	0	0	**1,952,729**	59,512
Grassland	0	24,364	1,705,093	0	0	0	**1,729,457**	-66,702
Wetlands	0	0	399	343,495	0	0	**343,894**	-1,598
Settlements	0	0	799	0	339,900	0	**340,699**	799
Other land	0	0	0	0	0	12,781	**12,781**	-400
Initial	**2,142,051**	**1,893,217**	**1,796,159**	**345,492**	**339,900**	**13,181**	**6,530,000**	**0**

2008

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,150,439	1,598	4,793	399	0	0	**2,157,229**	6,790
Cropland	0	1,925,969	100,253	0	399	0	**2,026,621**	73,892
Grassland	0	24,764	1,622,015	399	0	0	**1,647,178**	-82,279
Wetlands	0	0	799	343,096	0	0	**343,894**	0
Settlements	0	399	799	0	340,300	0	**341,498**	799
Other land	0	0	799	0	0	12,781	**13,580**	799
Initial	**2,150,439**	**1,952,729**	**1,729,457**	**343,894**	**340,699**	**12,781**	**6,530,000**	**0**

2009

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,156,829	0	3,195	0	0	0	**2,160,024**	2,795
Cropland	0	2,009,046	71,495	0	0	0	**2,080,541**	53,920
Grassland	0	17,175	1,570,891	0	799	399	**1,589,264**	-57,914
Wetlands	399	0	399	343,894	0	0	**344,693**	799
Settlements	0	399	799	0	340,699	0	**341,897**	399
Other land	0	0	399	0	0	13,181	**13,580**	0
Initial	**2,157,229**	**2,026,621**	**1,647,178**	**343,894**	**341,498**	**13,580**	**6,530,000**	**0**

2010

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,160,024	399	5,592	399	0	0	**2,166,415**	6,391
Cropland	0	2,078,944	5,991	0	0	0	**2,084,935**	4,394
Grassland	0	1,198	1,577,681	799	0	0	**1,579,678**	-9,586
Wetlands	0	0	0	343,495	0	0	**343,495**	-1,198
Settlements	0	0	0	0	341,897	0	**341,897**	0
Other land	0	0	0	0	0	13,580	**13,580**	0
Initial	**2,160,024**	**2,080,541**	**1,589,264**	**344,693**	**341,897**	**13,580**	**6,530,000**	**0**

2011

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,166,415	1,997	4,793	0	0	0	2,173,205	6,790
Cropland	0	2,076,547	13,979	0	0	0	2,090,527	5,592
Grassland	0	6,391	1,560,905	399	0	0	1,567,695	-11,983
Wetlands	0	0	0	343,096	0	0	343,096	-399
Settlements	0	0	0	0	341,897	0	341,897	0
Other land	0	0	0	0	0	13,580	13,580	0
Initial	**2,166,415**	**2,084,935**	**1,579,678**	**343,495**	**341,897**	**13,580**	**6,530,000**	**0**

2012

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,173,205	1,997	8,787	799	0	0	2,184,788	11,583
Cropland	0	2,083,337	30,355	0	0	0	2,104,107	23,166
Grassland	0	5,192	1,527,355	0	0	0	1,542,133	-35,148
Wetlands	0	0	0	342,297	0	0	342,297	-799
Settlements	0	0	799	0	341,897	0	342,696	799
Other land	0	0	399	0	0	13,580	13,979	399
Initial	**2,173,205**	**2,090,527**	**1,567,695**	**343,096**	**341,897**	**13,580**	**6,530,000**	**0**

2013

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	218,4788	799	3,595	0	0	0	2,189,182	4,394
Cropland	0	2,073,352	57,915	0	0	0	2,131,267	17,574
Grassland	0	39,142	1,467,043	399	399	0	1,506,985	-25,562
Wetlands	0	0	399	341,897	0	0	342,297	0
Settlements	0	399	3,595	0	342,297	0	346,291	3,595
Other land	0	0	0	0	0	13,979	13,979	0
Initial	**2,184,788**	**2,113,693**	**1,532,547**	**342,297**	**342,696**	**13,979**	**6,530,000**	**0**

2014

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,189,182	1,997	3,595	2,396	0	0	**2,197,170**	7,988
Cropland	0	2,075,349	79,483	0	0	0	**2,154,832**	23,565
Grassland	0	52,723	1,415,918	1,198	399	799	**1,471,037**	-35,948
Wetlands	0	0	2,796	338,702	0	399	**341,897**	-399
Settlements	0	1,198	4,794	0	345,891	0	**351,883**	5,593
Other land	0	0	399	0	0	12,782	**13,185**	-799
Initial	**2,189,182**	**2,131,267**	**1,506,985**	**342,296**	**346,290**	**13,980**	**6,530,000**	**0**

2015

Land category	Forest land	Cropland	Grassland	Wetlands	Settlements	Other land	Final	Net change
Forest land	2,197,170	799	7,189	799	0	0	**2,205,957**	8,787
Cropland	0	2,055,778	83,078	0	0	0	**2,138,856**	-15,976
Grassland	0	98,256	1,377,974	399	0	1,198	**1,477,827**	6,790
Wetlands	0	0	0	340,699	0	399	**341,099**	-798
Settlements	0	0	2,396	0	351,883	0	**354,279**	2,396
Other land	0	0	399	0	0	11,583	**11,982**	-1,199
Initial	**2,197,170**	**2,154,832**	**1,471,037**	**341,897**	**351,883**	**13,181**	**6,530,000**	**0**

ANNEX VII. Additional information of Agriculture sector

Other relavant information

Figure below shows impact of milk yield on GE and EFs.

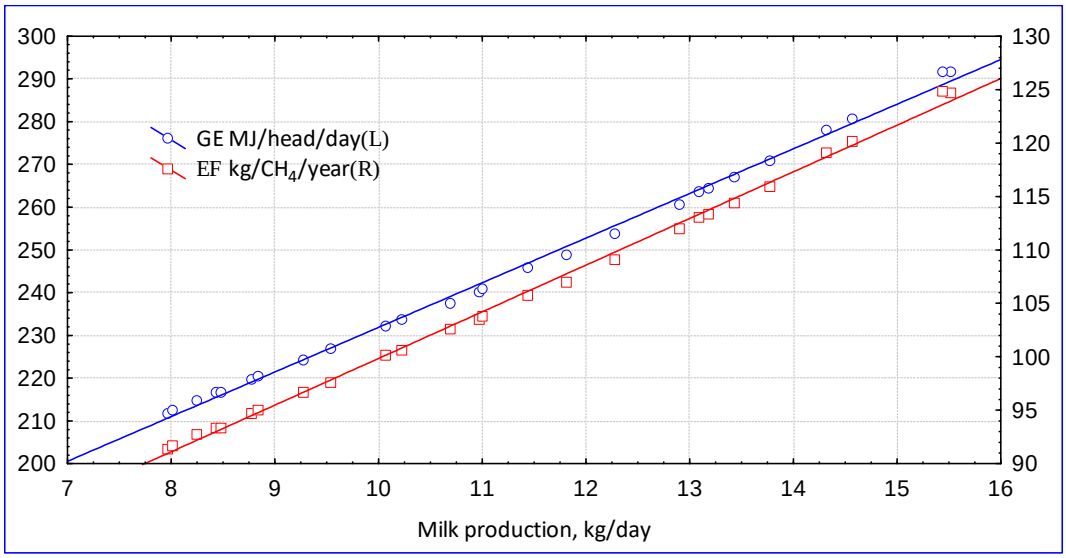

Figure A. 5-1. Impact of milk yeld on GE and EF's

Milk yield, gross energy, and emission factors are closely related. Positive relationships between milk production and gross energy as well as between milk yield and emission factors: Pearson r = 0.999 (P<0,0005) were estimated. There is an estimated positive relationship r = 1.0 (P<0,0005) between gross energy and EF.

Table A. 5-1. Estimated methane conversion factors values,%

Year	Methane conversion factor, %		
	Dairy cattle	Non-dairy cattle	Sheep
1990	6.56	6.44	6.16
1995	6.58	6.44	6.16
2000	6.58	6.43	6.16
2005	6.56	6.45	6.16
2010	6.54	6.50	6.16
2011	6.53	6.51	6.16
2012	6.53	6.52	6.16
2013	6.53	6.54	6.16
2014	6.52	6.57	6.16
2015	6.53	6.59	6.18

TableA. 5-2. Average diet nutrition indicators for dairy cattle, kg/kg DM

Year	Crude protein	Crude fat	Crude fiber	Nitrogen-free extracts
1990	1722	311	3172	6629
1995	1495	271	2998	6161
2000	1703	308	3159	6593
2005	1908	343	3310	7005
2010	2115	380	3422	7510

2011	2155	388	3439	7613
2012	2238	405	3475	7838
2013	2269	410	3488	7913
2014	2391	433	3538	8222
2015	2390	432	3535	8203

Table A. 5 - 3. Composition of diet for Non-dairy cattle to 1 year for slaughter

Feedstuff	**Crude protein**	**Crude fat**	**Crude fibre**	**Nitrogen-free extract**	**DM**	**GE**	**Fooder**
	g/kg DM				**g/kg**	**MJ/kg DM**	**kg/day**
Hay	115.0	23.7	310.7	476.3	851.3	183	0.63
Silage	114.1	32.5	298.4	390.0	279.0	16.8	2.1
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.5	11.2
Milk substitutes	275.0	301.0	0.0	368.8	125.0	25.0	1.02
Concentrates	173.5	152.7	52.6	719.2	866.0	18.8	1.01

Table A. 5 - 4. Composition of diet for Non-dairy cattle to 1 year bulls for breed

Feedstuff	**Crude protein**	**Crude fat**	**Crude fibre**	**Nitrogen-free extract**	**DM**	**GE**	**Fooder**
	g/kg DM				**g/kg**	**MJ/kg DM**	**kg/day**
Hay	115.0	23.7	310.7	476.3	851.3	18.3	1.8
Straw	114.1	32.5	298.4	390.0	279.0	16.8	8.9
Milk substitutes	275.0	301.0	0.0	368.8	125.0	25.0	1.1
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	1.7

Table A. 5 - 5. Composition of diet for Non-dairy cattle to 1 year heifers for breed

Feedstuff	**Crude protein**	**Crude fat**	**Crude fibre**	**Nitrogen-free extract**	**DM**	**GE**	**Fooder**
	g/kg DM				**g/kg**	**MJ/kg DM**	**kg/day**
Hay	115.0	23.7	310.7	476.3	851.3	18.3	0.7
Silage	114.1	32.5	298.4	390.0	279.0	16.8	2.2
Green fodder - grass	1829	37.6	250.1	432.7	213.1	18.5	10.9
Milk substitutes	275.0	301.0	0.0	368.8	125.0	25.0	1.1
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	0.7

Table A. 5 -6. Composition of diet for Non-dairy cattle buls from 1 to 2 years

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	1.8
Silage	114.1	32.5	298.4	390.0	279.0	16.8	13,.6
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.5	15.1
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	1.85

Table A. 5 - 7. Composition of diet for Non-dairy cattle heifers from 1 to 2 years for slaughter

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	105.7	23.5	311.5	478.8	860.0	18.1	0.3
Straw	42.9	16.0	439.0	452.8	829.0	18.4	0.6
Silage	109.3	33.8	297.3	343.8	232.0	15.9	13.2
Green fodder - grass	175.0	40	258.0	422.0	220.0	18.3	18.1
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	1.0

Table A. 5 - 8. Composition of diet for Non-dairy cattle heifers from 1 to 2 years for breed

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	1.8
Straw	50.7	17.9	422.8	456.2	821.3	18.4	1.1
Silage	114.1	32.5	298.4	390.0	279.0	16.8	8.4
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.5	13.6

Table A. 5 - 9. Composition of diet for Non-dairy cattle bulls at 2 years

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	8.25
Silage and other green fodder	109.7	32.8	90.5	700.4	120.0	18.0	3.00
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	2.60

Table A. 5 - 10. Composition of diet for Non-dairy cattle heifers at 2 years for slaughter

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	1.1
Silage	121.8	34.2	324.8	447.2	302.5	18.6	9.9
Green fodder - grass	177.1	38.1	260.1	426.1	216.4	18.4	20.8
Concentrates	170.3	25.7	49.3	726.9	869.9	18.8	0.95

Table A. 5 - 11. Composition of diet for Non-dairy cattle heifers at 2 years for breed

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	2.4
Silage	114.1	32.5	298.4	390.0	279.0	16.8	7.2
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.5	16.7
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	2.1

Table A. 5 - 12. Composition of diet for Dairy cattle for slaughter

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.3	1.2
Straw	42.9	16.0	245.5	452.8	829.0	18.4	1.1
Silage	98.6	29.1	245.5	275.6	279.0	13.3	19.2
Green fodder - grass	175.0	40.0	258.0	422.0	220.0	18.3	24.2
Concentrates	173.5	26.4	52.6	719.2	866.0	18.8	0.45

Table A. 5 - 13. Composition of diet for Suckling cows

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	123.1	21.5	325.8	456.6	835.0	18.3	1.0
Straw	49.4	16.3	434.4	451.5	820.9	18.5	1.7
Silage	111.1	29.5	273.1	379.0	302.5	16.0	13.0
Molasses	132.8	2.0	0.0	767.4	761.2	16.7	0.6
Green fodder - grass	138.0	30.0	303.0	458.3	217.0	18.6	21.9
Succulent and other fodder	102.4	9.0	116.1	683.8	141.4	17.1	2.6

Concentrates	134.8	19.5	42.2	781.9	869.3	18.5	1.0

Table A. 5-14. Changes in dairy cattle population, milk yield, gross energy, methane emission factor per cow and methane emission in the period of 1990-2015, per cent (1990=100%)

Year	Population of dairy cattle	Milk production	Gross energy	Emission Factor	Emission
1990	100	93	100	100	100
1995	71	83	92	92	65
2000	55	105	99	100	55
2005	50	120	106	106	54
2010	43	135	114	114	49
2011	42	140	116	115	48
2012	40	142	119	118	48
2013	38	152	120	119	46
2014	37	151	125	124	46
2015	36	151	125	124	45

Table A. 5-15. Chemical composition of diet for mated Main Sows

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.6	1.0
Oats	123	38.8	108.2	704.8	860	19.0	0.7
Wheat bran	145.1	42.2	82.3	693.3	867.5	18,.9	0.1
Leguminous plants	245	20.4	76	628.4	840	19.2	0.2
Rapeseed cake	313.2	190.6	101.5	335.5	902	23.0	0.1
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.1	0.02
Fish meal	695	102	8	18	910	21.2	0.01
Premix	0	0	0	0	950	0.00	0.07

Table A. 5-16. Chemical composition of diet for mated Replacemen Sows

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.6	0.86
Oats	123	38.8	108.2	704.8	860	19.0	0.81
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.9	0.08
Leguminous plants	245	20.4	76	628.4	840	19.2	0.24
Rapeseed cake	313.2	190.6	101.5	335.5	902	23.0	0.15
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.1	0.04
Fish meal	695	102	8	18	910	21.2	0.02
Premix	0	0	0	0	950	0	0.08

Table A. 5-17. Chemical composition of diet for nursing Main Sows

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.6	2.64
Oats	123	38.8	108.2	704.8	860	19.0	0.81
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.9	0.23
Leguminous plants	245	20.4	76	628.4	840	19.2	0.71
Rapeseed cake	313.2	190.6	101.5	335.5	902	23.0	0.30
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.1	0.42
Fish meal	695	102	8	18	910	21.2	0.16
Oil	0	998	0	0	999	39.7	0.17
Premix	0	0	0	0	950	0	0.16

Table A. 5-18. Chemical composition of diet for nursing Replacement Sows

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.61	3.06
Oats	123.0	38.8	108.2	704.8	860	18.99	0.98
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.93	0.31
Leguminous plants	245.0	20.4	76	628.4	840	19.19	0.79
Rapeseed cake	313.2	190.6	101.5	335.5	902	22.98	0.31
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.08	0.47
Fish meal	695.0	102.0	8.0	18.0	910	21.15	0.19
Oil	0.0	998.0		0.0	999	39.72	020
Premixture	0.0	0.0	0	0.0	950	0.0	0.19

Table A. 5-19. Chemical composition of diet for Piglets

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.61	0.014
Wheat	137.5	19.4	30.8	793.1	850	18.56	0.043
Leguminous plants	245.0	20.4	76	628.4	840	19.19	0.004
Soybean meal	500.3	16.4	78.1	337.3	880,6	20.08	0.011
Milk substitutes	366.0	11.2	0.0	549.3	960	18.81	0.025
Fish meal	695.0	102.0	8.0	18.0	910	21.15	0.004
Oil	0.0	998.0	0.0	0.0	999	39.72	0.004
Premix	0.0	0.0	0.0	0.0	950	0.00	0.004

Table A. 5-20. Chemical composition of diet for Growing pigs

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.61	0.47
Wheat	137.5	19.4	30.8	793.1	850	18.56	0.09
Triticale	135.3	17.0	29.9	797.0	880	18.46	0.59
Leguminous plants	278.1	17.1	83.2	588.8	855	19.19	0.28
Rapeseed cake	334.6	76.6	93.1	404.4	919	22.98	0.12
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.08	0.06
Milk substitutes	366.0	11.2	0.0	549.3	960.0	18.81	0.02
Fish meal	695.0	102.0	8.0	18.0	910.0	21.15	0.01
Oil	0.0	998.0	0.0	0.0	999.0	39.72	0.02
Premix	0.0	0.0	0.0	0.0	950.0	0.00	0.04

Table A. 5-21. Chemical composition of diet for mature Boars

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853.0	18.61	0.74
Oats	123.0	38.8	108.2	704.8	860.0	18.99	0.99
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.93	0.17
Leguminous plants	245	20.4	76.0	628.4	840.0	19.19	0.25
Rapeseed cake	313.2	190.6	101.5	335.5	902.0	22.98	0,1
Soybean meal	500.3	16.4	78.1	337.3	880.6	20.08	0.07
Fish meal	695.0	102.0	8.0	18.0	910.0	21.15	0.07
Premix	0.0	0.0	0.0	0.0	950.0	0.00	0.07

Table A. 5-22. Chemical composition of diet for young Boars for breed

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.61	0.75
Oats	123.0	38.8	108.2	704.8	860	18.99	0.59
Wheat	137.5	19.4	30.8	793.1	850	18.56	0.09
Triticale	135.3	17.0	29.9	797.0	880	18.46	0.14
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.93	0.2
Leguminous plants	245.0	20.4	76.0	335.5	840.0	14.07	0.37
Rapeseed cake	313.2	190.6	101.5	337.3	902.0	23.01	0.19
Soybean meal	500.3	16.4	78.1	628.4	880.6	25.18	0.11

Milk substitutes	366.0	11.2	0.0	549.3	960	18.81	0.02
Fish meal	695.0	102.0	8.0	18.0	910	21.15	0.004
Oil	0.0	998.0	0.0	0.0	999	39.72	0.007
Premix	0.0	0.0	0.0	0.0	950	0.00	0.077

Table A. 5-23. Chemical composition of diet for Gilts for breed

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Barley	129.4	23.3	60.4	764.5	853	18.61	0.74
Oats	123.0	38.8	108.2	704.8	860	18.99	0.45
Wheat	137.5	19.4	30.8	793.1	850	18.56	0.11
Triticale	135.3	17.0	29.9	797.0	880	18.46	0.16
Wheat bran	145.1	42.2	82.3	693.3	867.5	18.93	0.14
Leguminous plants	245.0	20.4	76.0	335.5	840.0	14.07	0.26
Rapeseed cake	313.2	190.6	101.5	337.3	902.0	23.01	0.17
Soybean meal	500.3	16.4	78.1	628.4	880.6	25.18	0.09
Milk substitutes	366.0	11.2	0.0	549.3	960	18.81	0.015
Fish meal	695.0	102.0	8.0	18.0	910	21.15	0.004
Oil	0.0	998.0	0.0	0.0	999	39.72	0.008
Premix	0.0	0.0	0.0	0.0	950	0.00	0.064

Table A. 5-24. Chemical composition of diet for Mature ewes

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.27	0.548
Straw	50.7	17.9	422.8	456.2	821.3	18.41	0.274
Silage	114.1	32.5	298.4	390.0	279.0	16.84	0.767
Root vegetables	99.8	10.4	87.6	706.0	120.0	16.91	0.548
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.47	3.164
Concentrates	123.0	39.1	108.2	704.8	880.0	19.00	0.205

Table A. 5-25. Chemical composition of diet for EWE owe 1 years

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	119.8	23.6	313.9	465	853.8	18,.25	0.582
Straw	50.7	27.2	394	432.4	829.0	18.52	0.240
Silage	121.8	34.2	324.8	447.2	302.5	18.62	0.582

Root vegetables	99.8	10.4	87.6	706.0	120.0	16.91	0.548
Green fodder - grass	138	35.1	280.5	440.2	218.5	18.03	2.712
Concentrates	171.7	29.6	64.3	705.3	869.2	18.92	0.082

Table A. 5-26. Chemical composition of diet for Rams

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.27	0.548
Straw	50.7	17.9	422.8	456.2	821.3	18.41	0.274
Silage	114.1	32.5	298.4	390.0	279.0	16.84	1.644
Root vegetables	99.8	10.4	87.6	706.0	120.0	16.91	0.548
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.47	2.938
Concentrates	171.7	29.6	64.3	705.3	866.0	18.92	0.274

Table A. 5-27. Chemical composition of diet for Lambs 0-4

Feedstuff	Crude protein	Crude fat	Crude fibre	Nitrogen-free extract	DM	GE	Fooder
	g/kg DM				g/kg	MJ/kg DM	kg/day
Hay	115.0	23.7	310.7	476.3	851.3	18.27	0.09
Silage	121.8	34.2	324.8	447.2	302.5	18.62	0.25
Root vegetables	99.8	10.4	87.6	706.0	120.0	16.91	0.40
Green fodder - grass	182.9	37.6	250.1	432.7	213.1	18.47	0.59
Concentrates	171.7	29.6	64.3	705.3	869.2	18.92	0.15

Table A. 5-28. The number of swine and fraction of swine manure managed in liquid MMS during the 1990-2015

MMS	Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Liquid manure	Swine, thous. heads	411.9	443.3	397.0	327.7	354.4	405.7	422.9	448.0	492.0
	Liquid manure, %	16.0	19.2	22.4	25.6	28.9	32.1	35.3	38.5	41.7
	Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
	Swine, thous. heads	470.6	434.1	482.3	565.2	611.9	615.0	667.9	720.5	684.5
	Liquid manure, %	44.9	48.1	51.4	54.6	57.8	57.7	61.1	64.3	66.8
	Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
	Swine, thous. heads	635.7	668.3	710.2	701.2	692.7	677.2	600.1	569.8	
	Liquid manure, %	69.9	73.2	76.5	81.6	86.7	86.7	81.7	81.3	
	Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Anaerobic	Swine, thous.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

digesters	heads									
	Anaerobic digesters, %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
	Swine, thous. heads	0.0	0.0	0.0	0.0	0.0	34.7	34.5	35.2	39.6
	Anaerobic digesters, %	0.0	0.0	0.0	0.0	0.0	3.3	3.2	3.1	3.9
	Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
	Swine, thous. heads	36.3	35.0	35.3	16.6	0.0	0.0	41.9	43.0	
	Anaerobic digesters, %	4.0	3.8	3.8	1.9	0.0	0.0	5.7	6.1	

Table A. 5-29. Swine population distribution between market and breeding animals, %

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Market	9.9	9.6	9.6	9.6	9.6	9.6	9.6	10.2	10.0
Breeding	90.1	90.4	90.4	90.4	90.4	90.4	90.4	89.8	90.0
Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Market	90.7	90.6	90.4	90.3	90.6	90.9	90.9	91.1	91.1
Breeding	9.3	9.4	9.6	9,7	9.4	9.1	9.1	8.9	8.9
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
Market	91.1	91.0	90.9	91.1	91.6	92.0	92.0	92.1	
Breeding	8.9	9.0	9.1	8.9	8.4	8.0	8.0	7.9	

Table A. 5-30. Mature body weight and rate of weight gain of non-dairy cattle, kg[1]

Cattle sub –categories	**Weight, kg**	**Weight gain, kg**
Beef cattle (mature cows)	600	0.0
1) Non-dairy cattle to 1 year for slaughter	189.0	0.82
2) Non-dairy cattle to 1 year bulls for breed	204.3	0.9
3) Non-dairy cattle to 1 year heifers for breed	176.9	0.75
4) Non-dairy cattle buls from 1 to 2 years	420	0.85
5) Non-dairy cattle heifers from 1 to 2 years for slaughter	400	0.775
6) Non-dairy cattle heifers from 1 to 2 years for breed	400	0.525
7) Non-dairy cattle bulls at 2 years	600	0.0
8) Non-dairy cattle heifers at 2 years for slaughter	535	0.2
9) Non-dairy cattle heifers at 2 years for breed	535	0.8
10) Dairy cattle for slaughter	575-622	0.0
11) Non-dairy cattle bulls at 2 years for breed	900	0.0

Distribution of horses by breeds is provided in the Figure below.

[1] Gyvulininkystės žinynas. Baisogala (en. Livestock manual. Institute of Animal Science of LVA), 2007

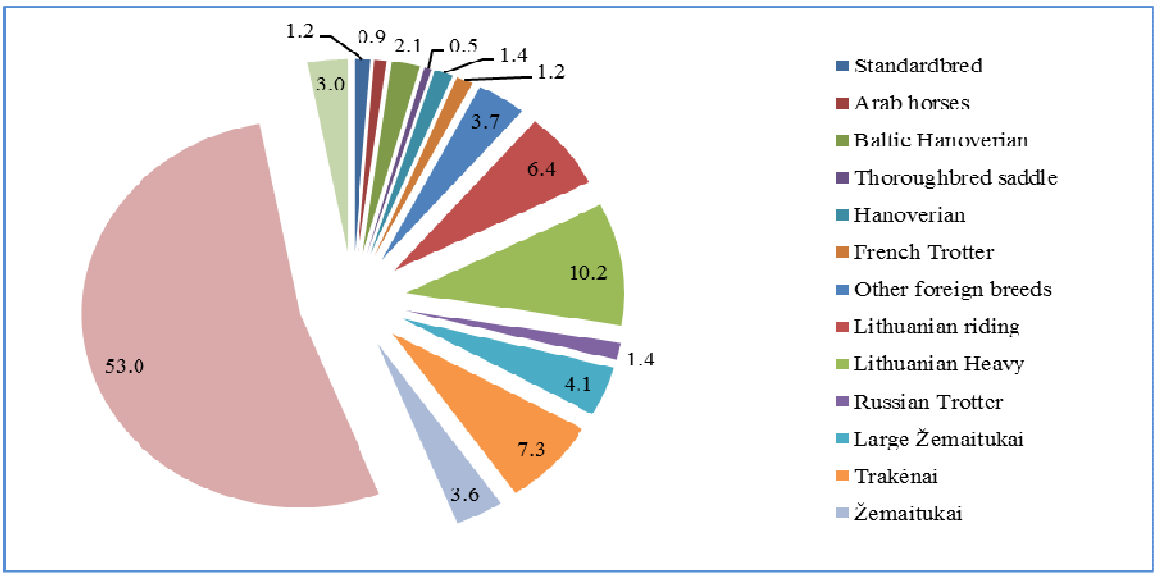

Figure A. 5-2. Distribution by breeds of horses 2015,%

Among the horses raised in the Lithuania the working horses (crossbreeds of various local breeds) constitute the highest share – 53%. However, recently, the decrese of working horses population is observed. Horses used for sports and horses of pony classes are increasing every year.

Recalculations made in Agriculture

Table A. 5-31. Reported in previous submission and recalculated number of livestock population per year, thous. heads

Year	Dairy cattle		Non-dairy cattle		Sheep		Goats	
	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission
1990	842.00	844.85	1479.50	1531.20	56.50	72.17	5.20	4.55
1991	831.90	836.95	1364.70	1431.66	58.10	68.18	6.30	5.75
1992	737.80	784.85	963.20	1182.92	51.70	65.32	8.80	7.55
1993	678.10	707.95	706.16	864.41	45.00	57.53	10.40	9.60
1994	614.87	646.49	537.52	657.27	40.00	50.57	12.40	11.40
1995	586.05	600.46	479.10	545.37	32.30	43.01	14.60	13.50
1996	589.89	587.97	464.20	509.58	28.20	35.99	16.90	15.75
1997	582.82	586.35	433.44	497.13	24.00	31.06	18.50	17.70
1998	537.70	560.26	390.04	456.26	15.80	23.68	23.70	21.10
1999	494.33	516.01	403.48	426.98	13.80	17.61	24.70	24.20
2000	438.35	466.34	309.94	385.94	11.50	15.05	23.00	23.85
2001	441.76	440.06	309.97	339.14	12.30	14.16	23.70	23.35
2002	443.29	442.52	335.79	351.71	13.60	15.41	22.00	22.85
2003	448.08	445.69	363.98	377.68	16.90	18.15	27.20	24.60
2004	433.94	441.01	358.03	387.50	22.15	23.23	26.90	27.05
2005	416.50	425.22	383.79	394.99	29.21	30.55	22.00	24.45
2006	398.97	407.73	439.81	431.98	36.59	39.15	20.80	21.40
2007	404.49	401.73	383.43	432.15	43.30	47.53	19.70	20.25
2008	394.71	399.60	376.21	402.90	47.52	54.03	16.60	18.15
2009	374.65	384.68	384.72	402.20	52.46	59.48	14.72	15.66
2010	359.78	367.21	388.20	406.37	58.55	66.04	16.05	15.38

2011	349.55	354.66	402.81	413.19	60.40	70.77	14.96	15.50
2012	331.04	340.29	398.14	415.82	82.75	85.17	13.60	14.28
2013	315.68	323.36	397.81	412.27	99.64	108.51	13.83	13.72
2014	314.04	314.86	422.57	423.54	123.91	130.03	12.99	13.41

Table A. 5-32. Reported in previous submission and recalculated number of livestock population per year, thous. heads

Year	Horses		Swine		Fur-bearing, rabbits and nutria		Poultry	
	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission
1990	79.90	78.85	2,435.90	2,574.63	248.92	707.67	16,815.0	17,800.6
1991	82.60	81.25	2,179.80	2,307.85	246.71	781.70	16,994.0	17,658.9
1992	79.70	81.15	1,359.80	1,769.80	242.94	749.10	8,2,8.9	9,980.6
1993	81.30	80.50	1,196.11	1,277.95	202.54	629.84	8,728.2	9,089.7
1994	78.20	79.75	1,259.85	1,227.98	192.67	523.22	8,848.8	9,234.8
1995	77.60	77.90	1,269.96	1,264.91	183.16	495.37	8,444.2	8,715.9
1996	81.40	79.50	1,127.63	1,198.79	194.39	490.96	7,775.4	8,145.6
1997	78.50	79.95	1,200.09	1,163.86	214.64	503.27	7,423.2	7,775.8
1998	74.30	76.40	1,159.03	1,179.56	151.61	402.05	6,749.3	7,191.3
1999	74.90	74.60	936.15	1,047.59	129.39	279.08	6,372.6	6,473.3
2000	68.40	71.65	867.58	901.86	129.36	264.72	5,576.5	5,614.3
2001	64.50	66.45	1,010.80	939.19	127.65	279.46	6,576.1	6,706.1
2002	60.70	62.60	1,061.02	1,035.91	136.69	307.59	6,848.1	7,097.3
2003	63.60	62.15	1,057.40	1,059.21	192.14	407.34	8,065.5	8,186.9
2004	63.60	63.60	1,073.35	1,065.37	229.50	558.18	8,419.4	8,584.5
2005	62.60	63.10	1,114.65	1,094.00	273.75	709.94	9,397.1	8,524.4
2006	60.90	61.75	1,127.12	1,120.89	279.05	786.23	9,440.0	9,229.9
2007	55.90	58.40	923.20	1,025.16	264.77	755.16	9,874.8	9,733.8
2008	54.40	55.15	897.11	910.16	280.03	757.82	9,107.5	9,919.5
2009	48.98	51.69	928.19	912.65	228.90	680.08	9,308.7	10,106.7
2010	44.68	46.83	929.40	928.79	280.58	679.83	9,466.3	10,961.1
2011	36.36	40.52	790.34	859.87	291.48	814.99	8,921.2	10,748.7
2012	29.46	32.91	807.48	798.91	405.13	1061.76	9,085.6	10,460.9
2013	22.18	25.82	754.63	781.06	444.81	1350.85	9,761.6	10,212.7
2014	18.19	20.19	714.16	734.40	554,72	1609.41	10,218.4	10,414.2

Table A. 5-33. Reported in previous submission and recalculated CH_4 emissions from enteric fermentation by animal category, kt

Year	Dairy cattle		Non-dairy cattle		Sheep		Goats	
	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission	2016 submission	2017 submission
1990	84.76	85.05	79.30	80.88	0.66	0.75	0.03	0.02
1991	81.20	81.72	73.15	75.52	0.68	0.70	0.03	0.03
1992	68.82	73.23	51.63	62.20	0.61	0.67	0.04	0.04
1993	61.90	64.67	37.85	45.16	0.53	0.59	0.05	0.05
1994	56.35	59.29	28.81	34.10	0.47	0.52	0.06	0.06
1995	54.30	55.69	25.68	28.16	0.38	0.44	0.07	0.07

1996	55.03	54.92	24.88	26.25	0.33	0.37	0.08	0.08
1997	55.14	55.54	23.23	25.58	0.28	0.32	0.09	0.09
1998	51.97	54.20	20.06	23.00	0.19	0.24	0.12	0.11
1999	46.93	49.06	21.01	21.19	0.16	0.18	0.12	0.12
2000	43.87	46.71	15.97	19.19	0.14	0.16	0.12	0.12
2001	45.22	45.11	15.91	16.69	0.14	0.15	0.12	0.12
2002	45.80	45.79	17.26	17.33	016	0.16	0.11	0.11
2003	46.41	46.24	18.67	18.67	0.20	0.19	0.14	0.12
2004	45.81	46.63	18.25	19.11	0.26	0.24	0.13	0.14
2005	44.52	45.52	19.73	19.55	0.34	0.32	0.11	0.12
2006	43.43	44.46	23.02	21.79	0.43	0.40	0.10	0.11
2007	45.24	45.00	20.25	22.09	0.51	0.49	0.10	0.10
2008	44.56	45.19	19.92	20.67	0.56	0.56	0.08	0.09
2009	42.43	43.63	20.50	20.75	0.62	0.61	0.07	0.08
2010	41.14	42.04	20.94	21.21	0.69	0.68	0.08	0.08
2011	40.50	41.13	21.18	21.47	0.71	0.73	0.07	0.08
2012	39.38	40.52	21.20	21.54	0.97	0.88	0.07	0.07
2013	37.91	38.86	21.79	21.82	1.17	1.12	0.07	0.07
2014	39.16	39.29	23.67	23.02	1.43	1.35	0.06	0.07

Table A. 5-34. Reported in previous submission and recalculated CH_4 emissions from enteric fermentation by animal category, kt

Year	**Horses**		**Swine**		**Fur-bearing, rabbits and nutria**	
	2016 submission	**2017 submission**	**2016 submission**	**2017 submission**	**2016 submission**	**2017 submission**
1990	1.44	1.42	2.53	3.06	0.07	0.12
1991	1.49	1.46	2.26	2.74	0.07	0.12
1992	1.43	1.46	1.41	2.10	0.07	0.12
1993	1.46	1.45	1.24	1.51	0.07	0.11
1994	1.41	1.44	1.30	1.45	0.06	0.10
1995	1.40	1.40	1.31	1.50	0.06	0.10
1996	1.47	1.43	1.17	1.42	0.07	0.10
1997	1.41	1.44	1.25	1.38	0.08	0.11
1998	1.34	1.38	1.18	1.39	0.07	0.10
1999	1.35	1.34	0.97	1.23	0.06	0.08
2000	1.23	1.29	0.89	1.07	0.05	0.07
2001	1.16	1.20	1.04	1.11	0.05	0.07
2002	1.09	1.13	1.09	1.22	0.05	0.07
2003	1.14	1.12	1.09	1.25	0.07	0.08
2004	1.14	1.14	1.10	1.25	0.07	0.10
2005	1.13	1.14	1.14	1.28	0.08	0.12
2006	1.10	1.11	1.13	1.30	0.08	0.13
2007	1.01	1.05	0.93	1.18	0.08	0.13
2008	0.98	0.99	0.92	1.06	0.08	0.13
2009	0.88	0.93	0.92	1.05	0.08	0.12
2010	0.80	0,84	0.95	1.07	0.08	0.12
2011	0.65	0.73	0.82	1.01	0.08	0.13
2012	0.53	0.59	0.83	0.94	0.09	0.15

2013	0.40	0.46	0.78	0.92	0.09	0.18
2014	0.33	0.36	0.74	0.86	0.11	0.22

Table A. 5-35. Reported in previous submission and recalculated methane emission factor (kg CH_4/head/year) and methane emission (kt) from manure management for non-dairy cattle

Year	2016 submission		2017 submission		Relative difference, %	
	CH_4 EF (kg CH_4/head/year)	CH_4 emission (kt)	CH_4 EF (kg CH_4/head/year)	CH_4 emission (kt)	CH_4 EF	CH_4 emission
1990	3.29	4.86	3.24	4.96	-1.52	2.06
1991	3.34	4.56	3.29	4.71	-1.50	3.29
1992	3.40	3.28	3.34	3.95	-1.76	20.43
1993	3.46	2.44	3.37	2.91	-2.60	19.26
1994	3.52	1.89	3.41	2.24	-3.13	18.52
1995	3.57	1.71	3.45	1.88	-3.36	9.94
1996	3.63	1.68	3.49	1.78	-3.86	5.95
1997	3.69	1.60	3.55	1.76	-3.79	10.00
1998	3.60	1.41	3.53	1.61	-1.94	14.18
1999	3.73	1.50	3.55	1.52	-4.83	1.33
2000	3.72	1.15	3.61	1.39	-2.96	20.87
2001	3.77	1.17	3.62	1.23	-3.98	5.13
2002	3.81	1.28	3.67	1.29	-3.67	0.78
2003	3.86	1.40	3.73	1.41	-3.37	0.71
2004	3.90	1.40	3.78	1.46	-3.08	4.29
2005	4.08	1.57	3.89	1.54	-4.66	-1.91
2006	4.34	1.91	4.13	1.78	-4.84	-6.81
2007	4.41	1.69	4.28	1.85	-2.95	9.47
2008	4.59	1.73	4.39	1.77	-4.36	2.31
2009	4.72	1.81	4.55	1.83	-3.60	1.10
2010	4.89	1.90	4.70	1.91	-3.89	0.53
2011	4.81	1.94	4.76	1.97	-1.04	1.55
2012	5.02	2.00	4.83	2.01	-3.78	0.50
2013	5.52	2.19	5.18	2.14	-6.16	-2.28
2014	5.85	2.47	5.60	2.37	-4.27	-4.05

Table A. 5-36. Reported in previous submission and recalculated methane emission factor (kg CH_4/head/year) and methane emission (kt) from manure management for swine

Year	2016 submission		2017 submission		Relative difference, %	
	CH_4 EF (kg CH_4/head/year)	CH_4 emission (kt)	CH_4 EF (kg CH_4/head/year)	CH_4 emission (kt)	CH_4 EF	CH_4 emission
1990	3.89	9.47	4.46	11.48	14.65	21.22
1991	3.90	8.50	4.46	10.30	14.36	21.18
1992	3.92	5.33	4.48	7.93	14.29	48.78
1993	3.93	4.70	4.50	5.75	14.50	22.34
1994	3.95	4.97	4.51	5.54	14.18	11.47
1995	3.96	5.03	4.53	5.73	14.39	13.92

1996	3.97	4.48	4.55	5.45	14.61	21.65
1997	4.02	4.83	4.58	5.33	13.93	10.35
1998	3.96	4.59	4.57	5.39	15.40	17.43
1999	4.04	3.78	4.59	4.80	13.61	26.98
2000	4.02	3.49	4.62	4.17	14.93	19.48
2001	4.05	4.09	4.63	4.35	14.32	6.36
2002	4.06	4.31	4.65	4.82	14.53	11.83
2003	4.07	4.30	4.66	4.94	14.50	14.88
2004	3.93	4.22	4.50	4.80	14.50	13.74
2005	3.92	4.37	4.51	4.93	15.05	12.81
2006	3.88	4.37	4.48	5.03	15.46	15.10
2007	3.88	3.58	4.45	4.56	14.69	27.37
2008	3.95	3.54	4.50	4.10	13.92	15.82
2009	3.84	3.57	4.48	4.09	16.67	14.57
2010	3.98	3.70	4.50	4.18	13.07	12.97
2011	4.13	3.26	4.69	4.03	13.56	23.62
2012	4.21	3.40	4.81	3.85	14.25	13.24
2013	4.22	3.19	4.81	3.76	13.98	17.87
2014	3.99	2.85	4.54	3.33	13.78	16.84

Table A. 5-37. Reported in previous submission and recalculated methane emission factor (kg CH_4/head/year) and methane emission (kt) from manure management for poultry

Year	**2016 submission**		**2017 submission**		**Relative difference, %**	
	CH_4 EF (kg CH_4/head/year)	**CH_4 emission (kt)**	**CH_4 EF (kg CH_4/head/year)**	**CH_4 emission (kt)**	**CH_4 EF**	**CH_4 emission**
1990	0.16	2.73	0.16	2.80	0.00	2.56
1991	0.16	2.66	0.15	2.71	6.25	1.88
1992	0.29	2.38	0.25	2.47	13.79	3.78
1993	0.27	2.31	0.26	2.37	3.70	2.60
1994	0.25	2.24	0.25	2.29	0.00	2.23
1995	0.25	2.15	0.25	2.20	0.00	2.33
1996	0.27	2.06	0.26	2.11	3.70	2.43
1997	0.27	1.98	0.26	2.02	3.70	2.02
1998	0.28	1.88	0.27	1.93	3.57	2.66
1999	0.28	1.80	0.28	1.84	0.00	2.22
2000	0.31	1.70	0.31	1.74	0.00	2.35
2001	0.25	1.65	0.25	1.69	0.00	2.42
2002	0.23	1.57	0.23	1.62	0.00	3.18
2003	0.19	1.53	0.19	1.57	0.00	2.61
2004	0.17	1.46	0.17	1.50	0.00	2.74
2005	0.15	1.40	0.17	1.42	-13.33	1.43
2006	0.14	1.32	0.15	1.36	-7.14	3.03
2007	0.13	1.25	0.13	1.29	0.00	3.20
2008	0.13	1.16	0.12	1.21	7.69	4.31
2009	0.12	1.08	0.11	1.14	8.33	5.56
2010	0.11	1.01	0.10	1.08	9.09	6.93

2011	0.10	0.92	0.09	1.00	10.00	8.70
2012	0.09	0.84	0.09	0.91	0.00	8.33
2013	0.08	0.76	0.08	0.81	0.00	6.58
2014	0.07	0.69	0.07	0.74	0.00	7.25

Table A. 5-38. Reported in previous submission and recalculated methane emission factor (kg CH_4/head/year) and methane emission (kt) from manure management for fur-bearing animals, rabbits and nutria

Year	**2016 submission**		**2017 submission**		**Relative difference, %**	
	CH_4 EF (kg CH_4/head/year)	**CH_4 emission (kt)**	**CH_4 EF (kg CH_4/head/year)**	**CH_4 emission (kt)**	**CH_4 EF**	**CH_4 emission**
1990	0.50	0.13	0.62	0.44	24.00	238.46
1991	0.50	0.12	0.62	0.49	24.00	308.33
1992	0.47	0.12	0.62	0.46	31.91	283.33
1993	0.41	0.08	0.60	0.38	46.34	375.00
1994	0.41	0.08	0.58	0.30	41.46	275.00
1995	0.40	0.07	0.58	0.29	45.00	314.29
1996	0.39	0.08	0.57	0.28	46.15	250.00
1997	0.35	0.07	0.55	0.28	57.14	300.00
1998	0.27	0.04	0.51	0.21	88.89	425.00
1999	0.28	0.04	0.48	0.13	71.43	225.00
2000	0.30	0.04	0.49	0.13	63.33	225.00
2001	0.33	0.04	0.51	0.14	54.55	250.00
2002	0.35	0.05	0.53	0.16	51.43	220.00
2003	0.37	0.07	0.55	0.23	48.65	228.57
2004	0.43	0.10	0.58	0.32	34.88	220.00
2005	0.46	0.13	0.60	0.42	30.43	223.08
2006	0.46	0.13	0.60	0.47	30.43	261.54
2007	0.45	0.12	0.60	0.45	33.33	275.00
2008	0.46	0.13	0.60	0.45	30.43	246.15
2009	0.40	0.09	0.59	0.40	47.50	344.44
2010	0.46	0.13	0.59	0.40	28.26	207.69
2011	0.48	0.14	0.61	0.49	27.08	250.00
2012	0.53	0.22	0.62	0.66	16.98	200.00
2013	0.54	0.24	0.64	0.86	18.52	258.33
2014	0.55	0.30	0.64	1.03	16.36	243.33

Table A. 5-39. Reported in previous submission and recalculated N excretion of animal population, kt

Year	**2016 submission**	**2017 submission**	**Absolute difference**	**Relative difference, %**
1990	124.3	131.3	7.0	5.6
1991	115.4	122.7	7.3	6.3
1992	83.2	100.4	17.2	20.7
1993	69.7	78.9	9.2	13.2
1994	62.7	69.0	6.3	10.0
1995	60.0	64.1	4.1	6.8
1996	58.1	61.6	3.5	6.0

1997	58.6	61.4	2.8	4.8
1998	53.5	58.5	5.0	9.3
1999	48.8	51.9	3.1	6.4
2000	43.7	48.0	4.3	9.8
2001	46.6	47.0	0.4	0.9
2002	48.4	49.2	0.8	1.7
2003	50.3	51.5	1.2	2.4
2004	50.4	53.2	2.8	5.6
2005	51.8	54.0	2.2	4.2
2006	53.2	55.6	2.4	4.5
2007	50.6	54.9	4.3	8.5
2008	49.6	53.0	3.4	6.9
2009	49.1	52.0	2.9	5.9
2010	49.1	52.0	2.9	5.9
2011	46.8	51.4	4.6	9.8
2012	47.1	51.4	4.3	9.1
2013	46.5	51.7	5.2	11.2
2014	47.2	53.6	6.4	13.6

ANNEX VIII. Improvements in response to recommendations / encouragements provided in the 2016 ARR

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that the Party use the correct oxidation rate of 1.00 for all fuels in the reference approach. The ERT also recommends that if discrepancies which are more than 2% occur between the CO_2 emissions under the reference and sectoral approaches, the Party investigate and document the reasons for the discrepancies.	E.6	Lithuania used the correct oxidation rate of 1.00 for all fuels in the reference approach. Explanations on the discrepancies are provided in the NIR.	Chapter 3.2.1 Comparison of sectoral approach with the reference approach
The ERT recommends that Lithuania include, in the NIR, transparent information on the choice of EFs for anthracite used in heat plants, particularly when these factors are outside the uncertainty range of the relevant EFs described in the 2006 IPCC Guidelines.	E.7	Information on EF for antracite used in heat plant in provided in the NIR.	Chapter 3.2.6.4 Heat plants (CRF 1.A.1.a.iii) (Table 3-16)
The ERT recommends that Lithuania provide transparent information on the types of municipal waste combusted in public electricity and heat production, including a quantitative disaggregation of the biogenic and non-biogenic waste input in its NIR. The ERT also encourages Lithuania to provide additional information on municipal waste generated before and after 2013, including other possible uses (such as incineration without energy recovery or landfilling), and how different streams of municipal waste are reflected in the GHG inventory.	E.8	Quantitative disaggregation of the biogenic and non-biogenic waste is provided in the NIR (see Annex III).	Annex III. LITHUANIAN ENERGY BALANCE ACCORDING TO THE FUEL TYPE

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that the Party correct the error in the NIR by changing the notation key “CS” (country specific) into “T1” (tier 1) for CH_4 and N_2O EFs for peat, biogas and used tyres in the relevant tables in the NIR and by correcting the information in the text (p. 99 in the NIR 2016)	E.9	The error was corrected by changing the notation key "CS" (country specific) into "D" (default) and "T1" (tier 1) for CH_4 and N_2O for peat, biogas and used tyres in the relevant tables in the NIR.	All relevant tables in the NIR (Chapter "Energy").
The ERT recommends that the Party explain in the NIR that residual fuel oil contains both regular residual fuel oil and “non-tradable oil”, and that the Party provide the CO_2 EFs and information on how they are derived for both types of residual fuel oil	E.10	The information on CO_2 EF of non-tradable residual fuel oil combusted at the refinery is provided in the NIR (see Table 3-20) and added information how this EF is derived.	Chapter 3.2.7 Petroleum Refining (CRF 1.A.1.b)
The ERT recommends that Lithuania explain in its NIR the methodology and data sources used to estimate CO_2 and CH_4 emissions in 1990–2004 from this category, namely by explaining that (i) for 1993–2004 the average observed leakage rate (in per cent) in 2005–2014 is applied, and (ii) for 1990–1992, regression analysis is used	E.11	Explanatory information on the methodology and data sources used to estimate CO_2 and CH_4 emissions in 1990-2004 from this category is included in the NIR.	Chapter 3.7.3 Fugitive emissions from natural gas (CRF 1.B.2.b)

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that Lithuania explain in the NIR that the decrease in N_2O emissions from anesthesia since 2008 is related to decreasing use of inhalational anesthesia (using N_2O) compared with injection anesthesia, which is more widely used in Lithuania recently	I.7	The explanation of decrease in N_2O emissions from anesthesia is included in the NIR.	Chapter 4.8.3 N_2O from Product Uses (CRF 2.G.3)
The ERT recommends that Lithuania include, in the IPPU chapter of the NIR, a reference to the section in the energy chapter where information on CO_2 emissions from limestone used for flue gas desulphurization is included.	I.8	A reference was included in the NIR.	Chapter 4.6.3 Consumption of carbonates use in flue gas desulphurisation (CRF 2.H.3)
The ERT encourages the Party to follow the 2006 IPCC Guidelines (vol. 1, chapter 6) and to document the results of peer reviews or audits in the NIR, for example by using a checklist format that shows the findings and recommendations for improvement. The ERT further encourages Lithuania to report a summary of implemented QA activities and key findings for the agriculture sector categories in the NIR.	A.11	Information on QA activities implemented is included in the NIR.	Chapter 5.6.1.4 Category-specific QA/QC and verification
The ERT recommends that Lithuania include, in the NIR, explanation on how the average annual livestock data are derived for each animal type.	A.12	Explanation on how the average annual livestock data are derived for each animal type is included in the NIR.	Chapter 5.2.2.2 Characterization of livestock population
The ERT encourages the Party to include explanatory information on the drivers behind substantial inter-annual changes of cattle enteric fermentation and manure management CH_4 IEFs in the NIR with supporting charts (e.g. correlation analysis).	A.13	Information about the drivers influencing inter-annual changes in the CH_4 IEFs for cattle enteric fermentation and	Chapter 5.2.2.3 Calculation of CH_4 emission factors for cattle, swine and sheep Chapter 5.3.2.3

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
		manure management was included in the 2017 NIR	Calculation of CH_4 emissions
The ERT encourages Lithuania to include explanatory information regarding the substantial decrease in the live weight of horses in the NIR.	A.14	Lithuania has provided explanationary information regarding decrease in the live weight of horses in the 2017 NIR.	Chapter 5.4.1.2 Methodological issue - Calculation of N_2O emissions NIR Annex VII. Additional information of Agriculture sector – Figure A. 5-2
The ERT encourages Lithuania to conduct an approach 1 uncertainty analysis based on a country-specific uncertainty estimate for each parameter used to derive the country-specific CH_4 EFs for cattle, sheep and swine enteric fermentation and manure management, as opposed to applying default uncertainty values from the 2006 IPCC Guidelines. Alternatively, the ERT encourages Lithuania to use expert judgement to evaluate the applicability of the currently used uncertainty estimates from the 2006 IPCC Guidelines. The ERT further encourages the Party to report on the results in the NIR.	A.15	Analysis of uncertainties was included in the 2017 NIR.	Chapter 5.2.3 Uncertainties and time-series consistency Chapter 5.3.3 Uncertainties and time-series consistency
The ERT recommends that the Party include, in the NIR, tables showing the chemical composition of rations for cattle, sheep and swine per types of feed and the corresponding GE content per kg dm.	A.16	Tables showing composition of ration for cattle, sheep and swine per types of feed and the corresponding GE content per kg d.m. are included.	NIR Annex VII. Additional information of Agriculture sector

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that the Party include the correct Ym values applied for cattle in the NIR, with references to the data sources used.	A.17	Table showing calculated Ym values for cattle and sheep are included.	Chapter 5.2.2.3 Calculation of CH_4 emission factors for cattle, swine and sheep and NIR Annex VII Additional information of Agriculture sector - Table A. 5-1
The ERT recommends that the Party include, in its NIR, tables showing feeding standards depending on dairy cattle milk yields as well as weight and growing rate of non-dairy cattle.	A.18	Tables showing feeding standards depending on dairy cattle milk yields as well as weight and growing rate of non-dairy cattle are provided.	5.2.2.3 Calculation of CH_4 emission factors for cattle, swine and sheep Table 5-14. NIR Annex VII Additional information of Agriculture sector Figure A. 5-1., Tables A. 5-2, a.5-14. Non - dairy Tables A.5-3 - A.5-13
The ERT recommends that the Party include in its NIR the information that cattle growing and forage preparation technology used in Lithuania is close to Western Europe, to justify the use of the default value for non-dairy cattle methane producing capacity for Western Europe instead of the value for Eastern Europe.	A.19	Explanatory information for Bo use for non-dairy cattle is included in the NIR.	Chapter 5.3.2.3 Calculation of CH_4 emissions

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT encourages Lithuania to include in its NIR the explanatory information that the Bo for dairy cattle was obtained using a standardized method and is based on the total as-excreted VS and typical cattle rations as recommended in the 2006 IPCC Guidelines.	A.20	Explanatory information that the Bo for dairy cattle was obtained using a standardized method and is based on the total excreted VS and typical cattle rations is provided.	Chapter 5.3.2.3 Calculation of CH_4 emissions
The ERT recommends that Lithuania provide, in the NIR, mature body weight data in moderate body condition (reference weight) for growing cattle, with supporting references.	A.21	Explanatory information regarding the weight data for non-dairy cattle is included.	Chapter 5.4.1.2 Methodological issues - Calculation of N_2O emissions NIR Annex VII Additional information of Agriculture sector Table A. 5-38.
The ERT recommends that Lithuania include in its NIR the explanation that the differences between default and country-specific VS values are influenced by national nutritional standards because Lithuania's VS calculation formula includes GE value, which is based on sheep nutrition norms and feed nutrition tables provided in the "Livestock manual" (2007). The ERT also recommends that the Party explain in the NIR that lambs are usually weaned at 4 months old in Lithuania, and on this basis more feed is needed for ewes, which leads to a higher GE value.	A.22	Explanationary information regarding differences between default and country-specific VS values for sheep is included.	Chapter 5.3.2.3 Calculation of CH_4 emissions Annex VII Additional information of Agriculture sector Tables A. 5-24 - A.5-27.

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that Lithuania include data about the swine population distribution between market and breeding swine, with reference in the NIR.	A.23	Explanatory information regarding swine population distribution between market and breeding swine is provided.	Chapter 5.3.2.3 Calculation of CH_4 emissions NIR Annex VII Additional information of Agriculture sector Table A.5-33
The ERT encourages the Party to include in its NIR explanatory information regarding the growing trend of the fraction of swine manure managed in liquid systems during the time series.	A.24	Explanatonary information regarding the growing trend of the fraction of swine manure managed in liquid system is included.	Chapter 5.3.2.3 Calculation of CH_4 emissions NIR Annex VII Additional information of Agriculture sector Table A.5-32
The ERT encourages the Party to include in its NIR explanatory information, with supporting charts (e.g. correlation analysis), on the drivers that are behind the substantial inter-annual changes of CH_4 and N_2O IEFs of swine manure management.	A.25	Information about the drivers influencing inter-annual changes in the swine manure management CH_4 and N_2O IEFs was included in the 2017 NIR.	Chapter 5.3.2.3 Calculation of CH_4 emissions Chapter 5.4.1.2 Methodological issues
The ERT recommends that the Party include in the NIR the information that because a CH_4 EF for geese is not available in either the 2006 IPCC Guidelines or in the Revised 1996 IPCC Guidelines, the Party applied the EF for “other poultry” from the Revised 1996 IPCC Guidelines (vol. 3, table B-7, p.4.47) for geese, and that this EF is also used for “other poultry”.	A.26	Explanatory information about CH_4 EFs in manure management for geese and other poultry is included.	Chapter 5.3.2.3 Calculation of CH_4 emissions

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT encourages the Party to include explanations of QA procedures performed for the category agricultural soils in the NIR.	A.28	Explanation on QA procedures performed for the 3.D Agriculture soils category is added in the NIR.	Chapter 5.6.1.4 Category-specific QA/QC and verification
The ERT recommends that the Party explain, in the NIR, how the AD for inorganic fertilizer application has been derived for the last inventory year, in particular if extrapolation instead of actual data is used.	A.29	It is explained how AD for inorganic fertilizer application was derived for the 2015 year in the NIR.	Chapter 5.6.1.2 Methodological issues -Applied inorganic N fertilizers (FSN) (CRF 3.D.1.1)
The ERT recommends that the Party include data on the amount of N in bedding per animal species in the NIR with an appropriate reference to the 2006 IPCC Guidelines.	A.30	Explanation on parameter of amount of N in bedding material per animal species is included.	Chapter 5.6.1.2 Methodological issues -Animal manure applied to soils (FAM) (CRF 3.D.1.2.a)
The ERT recommends that the Party update the description of this category in the NIR by including in NIR tables 5-54 to 5-56 data on all crop types included in the calculation, and by correcting the fraction of pasture renewed in table 5-55 (0.2 instead of 1) with supporting references.	A.31	Description of Crop residues (FCR) (CRF 3.D.1.4) category chapter was updated.	Chapter 5.6.1.2 Methodological issues - Crop residues (FCR) (CRF 3.D.1.4)
ERT recommends that the Party report the correct definitions for above-ground residues (straw and stubble) and below-ground residues (roots) in the NIR, in line with the 2006 IPCC Guidelines.	A.32	Description of Crop residues (FCR) (CRF 3.D.1.4) category chapter was updated.	Chapter 5.6.1.2 Methodological issues - Crop residues (FCR) (CRF 3.D.1.4)

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that the Party to include in the NIR the organic soil definition and data source for the AD.	A.33	Organic soil definition and data source for the AD was added in the NIR.	Chapter 5.6.1.2 Methodological issues - Cultivation of organic soils (FOS) (CRF 3.D.1.6)
The ERT recommends that the Party enforce the implementation of its general QC procedures, which according to NIR page 52 include evaluation of the emission calculation by assessing the correctness of units, to identify any unit errors in the calculation spreadsheets for this category, and report on such improvement in the NIR.	A.34	Lithuania has made QC procedure for the Cultivation of organic soils (FOS) (CRF 3.D.1.6) category.	Chapter 5.6.1.4 Category-specific QA/QC and verification
The ERT recommends that Lithuania report carbon stock change in soils for forest land converted to settlements and other land across the whole 20 year time period or provide a justification for the current assumption about instantaneous oxidation of soil organic matter in the year of conversion.	L.7	Lithuania is using assumption of instantaneous oxidation of soil organic matter also in soils in the year of conversion since forest land conversion (deforestation) could only result in settlements, other land or flooded land, which results in soil destruction and removal. Years subsequent to the conversion, converted area is either paved, flooded or the top	-

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
		layer of soil is removed. However, Lithuania is considering to report carbon stock change in soils for forest land converted to other land uses in 20 years period in the next submission.	
The ERT recommends that Lithuania provide, in the NIR, additional information on the accuracy of AD estimates made using the two methods (NFI sampling method used under the Convention and wall-to-wall method used under the Kyoto Protocol) for forest land converted to other land uses and that the Party consider and report in the NIR how the two datasets may be reconciled for the future submissions.	L.8	Differences between two methods to obtain activity data and accuracy of activity data estimates made using NFI sampling method and wall-to-wall method are presented in the NIR.	Chapter 11 KP-LULUCF (CRF 7) - 11.2 Land related information - 11.2.2 Methodology used to develop the land transition matrix.

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that Lithuania estimate and report carbon stock changes in mineral soils for lands converted to forest land. If this cannot be done, the ERT recommends that the Party use the notation key “NE” instead of “NO”, and provide a justification for the use of the notation key in its NIR and CRF table 9.	L.9	Carbon stock changes in mineral soils in land converted to forest land were reported as NE for entire time series when conversion to forest land actually occurred. Lithuania has no country specific carbon stock values before and after conversion in mineral soils, yet is planning to obtain country specific values after implementation of scientific studies results obtained from GHG inventory partnership project under Norway Grants programme to estimate carbon stock changes in mineral soils after conversion from other land uses to forest land.	CRF Table 4.A.2 Land converted to forest land - Carbon stock change

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT recommends that, instead of using the notation keys "NO" (for CO_2 emissions from drained organic soils on peat extraction lands) and "NE" (for CO_2 emissions from drained organic soils in cropland and grassland), the Party use the notation key "IE", or report CO_2 emissions from drained lands in CRF table 4(II).	L.10	CO_2 emissions from drained organic soils in peat extraction areas are included in CRF Table 4.D.1.1 Peat extraction remaining peat extraction, therefore in Table 4(II) of drained organic soils in Peat extraction lands CO_2 emissions are reported as IE. CO_2 emissions from drained organic soils in cropland and grassland are currently reported in Table 4(II), therefore carbon stock changes in organic soils in cropland and grassland are reported as IE.	CRF Tables 4.B Cropland, 4.C Grassland 4.D Wetlands - Tables 4(II) Emissions and removals from drainage and rewetting and other management of organic and mineral soils - Total Organic soils - Drained organic soils
Lithuania reports CH_4 emissions from drained organic soils on peat extraction lands as "NO" and those in drained organic soils in cropland and grassland as "NE". The ERT noted that the calculation methods are presented in the Wetlands Supplement. During the review, Lithuania explained that it has applied the 2006 IPCC Guidelines for GHG estimations from drained organic soils and peat extraction sites, therefore CH_4 emissions from drained organic soils in peat extraction remaining peat extraction areas were considered as not significant. The ERT encourages the Party to use the Wetlands Supplement for calculating	L.11	CH_4 emissions from drained organic soils on peat extraction lands, cropland and grassland are reported as NE. Lithuania is considering to apply Wetlands Supplement to the Convention	CRF Tables 4.B Cropland, 4.C Grassland 4.D Wetlands - Tables 4(II) Emissions and removals from drainage and rewetting and other management of

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
CH_4 emissions from drained organic soils on peat extraction lands, cropland and grassland in future annual submissions.		reporting in the future submissions.	organic and mineral soils - Total Organic soils - Drained organic soils
The ERT acknowledges the explanation and encourages the Party to report separately emissions from different fire types within forest land in order to improve the transparency of its annual submission.	L.12	More comprehensive explanation of emissions estimations from forest fires (wildfires) is presented in the 2017 NIR submission.	Chapter 6 Land Use, Land Use change and Forestry (CRF 4) - 6.2 Forest land - 6.2.1 Source category description
Lithuania reported CO_2, CH_4 and N_2O emissions from wildfires in wetlands remaining wetlands as "NE" for the entire time series. If AD are available, the ERT encourages the Party to calculate emissions from wildfires on wetlands remaining wetlands using default mass of fuel available for combustion and combustion factors, which are provided in the 2006 IPCC Guidelines (vol. 4, table 2.4) and using EFs from published sources, such as Akagi et al. (2011).	L.13	There is no sufficient activity data on wildfires in wetlands remaining wetlands, therefore CO_2, CH_4 and N_2O emissions were reported as NE for entire time series.	CRF Table 4. D.1 Wetlands remaining wetlands - 4 (V)Biomass burning - Wildfires
The ERT recommends that the Party use the correct notation key ("NO") for CH_4 and N_2O emissions from biomass burning in settlements in CRF table 4(V) for the years when the activity did not occur.	L.14	CH_4 and N_2O emissions from biomass burning in settlements were reported as NO for the entire time series (biomass burning not occurring).	CRF Table 4.E. Settlements - 4 (V) Biomass burning

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT encourages the Party to gather the activity data and to use emission factors from published sources such as from Akagi et al. (2011) d to calculate emissions from wildfires on other lands. In the case of an absence of fires on other land the ERT encourages the Party to use the notation key "NO".	L.15	There is no sufficient activity data on biomass burning in other land, therefore emissions from biomass burning in settlements are reported as NE for the entire time series.	CRF Table 4.F Other land - 4 (V) Biomass burning
The ERT recommends that the Party complete CRF table 4.G and the additional information box on factors used to convert from product units to carbon, noting that Parties can do this by setting a custom node year within the data entry screen for harvested wood products in the CRF Reporter software.	L.16	Lithuania has already included activity data values from the starting year and therefore it covers whole reporting period by now: 1961-2015. Tier 1 method for carbon stock changes in HWP pool accounting in LULUCF sector is used, therefore factors used to convert from product units to carbon are default factors provided in 2006 IPCC Guidelines, p.12.19, Table 12.4.	Chapter 6.8 Harvested wood products (CRF 4.G) - 6.8.2 Methodological issues

Review recommendation	*Review report / paragraph*	*MS response / status of implementation*	*Chapter/section in the NIR*
The ERT encourages the Party to include information in the NIR that anaerobic digestion at biogas facilities of municipal solid waste did not occur in Lithuania between 1990–2014.	W.5	Information included in the NIR.	Chapter 7.3 Biological treatment of waste (CRF 5.B) / 7.3.1 Category description
The ERT recommends that the Party include the information on sewage sludge application, incineration and deposition in the NIR or in the documentation box of CRF table 5.D.	W.6	Information included in the NIR.	Chapter 7.2 Solid waste disposal on land (CRF 5.A) / 7.2.2 Category description/Sewage sludge disposal, Table 7.24.
The ERT acknowledges the explanation and encourages the Party to report separately emissions from different fire types in order to improve transparency.	KL.1	Lithuania has presented more comprehensive explanation of emissions estimations from forest fires (wildfires) in the 2017 NIR submission.	Chapter 6 Land Use, Land Use change and Forestry (CRF 4) - 6.2 Forest land - 6.2.1 Source category description.