

Annex 5. Assessment of completeness and sources and sinks of greenhouse gas emissions and removals excluded

Completeness of the Estonia's inventory submissions is evaluated here by sectors in tables below. The completeness has been estimated by gases (CO₂, N₂O, CH₄, F-gases and also NO_x, CO, NMVOC and SO₂) and emission sources according to the detailed CRF Reporter classification. The CRF Reporter tool *Completeness* under the menu Submission has been used.

Abbreviations used in tables:

X - Included in to the inventory
 NO - Not occurring in Estonia
 NA - Not available
 NE - Not estimated
 IE - Included elsewhere.

*Notes,

- if category reporting includes some national specific emission source, which is not required in IPCC guidelines
- other relevant issues.

Energy, Fuel combustion (CRF Reporter 1.A)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂	Notes*
1. A. Fuel combustion activities								
1.A.A. Sectoral Approach								
1.AA.1.A. Energy industries								
1.AA.1.A. Public Electricity and Heat Production	X	X	X	X	X	X	X	
1.AA.1.B. Petroleum Refining*	NO	NO	NO	NO	NO	NO	NO	
1.AA.1.C. Manufacture of Solid Fuels and Other Energy Industries*	X	X	X	X	X	X	X	
1.AA.2. Manufacturing Industries and Construction								
1.AA.2.A. Iron and Steel*	X	X	X	X	X	X	X	There were no production of iron and steel products in 1991, 1992 and 1993.
1.AA.2.B. Non-Ferrous Metals*	X	X	X	X	X	X	X	There was no production of non-ferrous metals products in 1990-1999 and 2001.
1.AA.2.C. Chemicals	X	X	X	X	X	X	X	
1.AA.2.D. Pulp, Paper and Print*	X	X	X	X	X	X	X	There was no production of pulp and paper in 1990, 1991 and 1996 and SO ₂ in 1997 was NA.
1.AA.2.E. Food Processing, Beverages and Tobacco	X	X	X	X	X	X	X	
1.AA.2.F. Other (please specify) Other manufacturing sectors and construction	X	X	X	X	X	X	X	
1.AA.3. Transport								
1.AA.3.A. Civil Aviation	X	X	X	X	X	X	X	

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂	Notes*
1.AA.3.B. Road Transportation	X	X	X	X	X	X	X	
1.AA.3.C. Railways	X	X	X	X	X	X	X	
1.AA.3.D. Navigation	X	X	X	X	X	X	X	
1.AA.3.E. Other Transportation (please specify - other fuels from the Civil Aviation sub-sector)	NO	NO	NO	NO	NO	NO	NO	
1.AA.4. Other Sectors								
1.AA.4.A. Commercial/ Institutional	X	X	X	X	X	X	X	
1.AA.4.B. Residential	X	X	X	X	X	X	X	
1.AA.4.C. Agriculture/Forestry/ Fisheries	X	X	X	X	X	X	X	
1.AA.5. Other (please specify)								
1.AA.5. A. Stationary	NO	NO	NO	NO	NO	NO	NO	
B. Mobile	X	X	X	X	X	X	X	Military Fuels

Energy, Fugitive emissions (CRF Reporter 1.B)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂	Notes*
1.B Fugitive emissions from fuels								
1.B.1. Solid fuels								
1.B.1.A. Coal Mining	NO	NO	NO	NO	NO	NO	NO	
1.B.1.B. Solid Fuel Transformation	NO	NO	NO	NO	NO	NO	NO	
1.B.1.C. Other (please specify)	NO	NO	NO	NO	NO	NO	NO	
1.B.2. Oil and Natural Gas								
1.B.2.A. Oil	NO	X	NO	NO	NO	X	NO	
1.B.2.B.4 Natural Gas/Distribution	NO	X	NO	NO	NO	NO	NO	
1.B.2.B.5 Other Leakage	NO	IE, NO	NO	NO	NO	NO	NO	CH ₄ emissions from natural gas distribution cover emissions of other leakage at residential and commercial sectors and in industrial plants and power stations.
1.B.2.C. Venting and Flaring	NO	IE, NO	NO	NO	NO	NO	NO	Emissions of CH ₄ are included in 1.A.1.c.
1.B.2.D. Other (please specify)	NO	NO	NO	NO	NO	NO	NO	

Industrial Processes (CRF Reporter 2)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂	Notes*
2. Industrial processes								
2. A. Mineral products								
2.A.1. Cement Production	X	NO	NO	NO	NO	NO	X	
2.A.2. Lime Production	X	NO	NO	NO	NO	NO	NO	

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NM VOC	SO ₂	Notes*
2.A.3. Limestone and Dolomite Use	IE	IE	IE	IE	IE	IE	IE	Included elsewhere. The emissions are reported in 2.A.1, 2.A.2 and 2.A.7.
2.A.4. Soda Ash Production and Use	X	NO	NO	NO	NO	NO	NO	
2.A.5. Asphalt Roofing	NO	NO	NO	NO	NO	NO	NO	
2.A.6. Road Paving with Asphalt	NO	NO	NO	NO	NO	X	NO	
2.A.7.1. Glass production	X	NO	NO	NO	NO	NO	NE	SO ₂ emissions are under investigation.
2.A.7.2a. Bricks and Tiles	X	NO	NO	NE	NE	NE	NE	There is no method available in IPCC Guidelines for NO _x , CO, NM VOC and SO ₂ emissions estimates.
2.A.7.2b. Lightweight gravel	X	NO	NO	NE	NE	NE	NE	There is no method available in IPCC Guidelines for NO _x , CO, NM VOC and SO ₂ emissions estimates. There was no production of lightweight gravel in 2010.
2. B. Chemical Industry								
2.B.1. Ammonia Production	X	NO	NO	NO	X	X	X	There was no production of ammonia in 2010.
2.B.2. Nitric Acid Production	NO	NO	NO	NO	NO	NO	NO	
2.B.3. Adipic Acid Production	NO	NO	NO	NO	NO	NO	NO	
2.B.4. Carbide Production	NO	NO	NO	NO	NO	NO	NO	
2.B.5. Other Production	NO	NO	NO	NA	NA	NA	NA	
2.C. Metal Production								
2.C.1. Iron and Steel Production	NA, NO	NA, NO	NO	NO	NO	NO	NO	There is only iron and steel casting in Estonia. Energy related emissions are reported in 1.AA.2.A.
2.C.2. Ferroalloys Production	NO	NO	NO	NO	NO	NO	NO	
2.C.3. Aluminium Production	NO	NO	NO	NO	NO	NO	NO	
2.C.4. SF ₆ Used in Aluminium and Magnesium Foundries	NO	NO	NO	NO	NO	NO	NO	
2.C.5. Other (please specify)	NA	NA	NA	NA	NA	NA	NA	
2.D. Other Production								
2.D.1. Pulp and Paper	NO	NO	NO	X	X	X	X	There was no production of pulp in 1993 and 1994.
2.D.2. Food and Drink	NO	NO	NO	NO	NO	X	NO	
2.G. Other (please specify)								
	NO	NO	NO	NO	NO	NO	NO	

F-gases (CRF Reporter 2.F)

Greenhouse gas source and sink categories	HFC _s	PFC _s	SF ₆	Explanation notes
2. Industrial processes				
2.E. Production of Halocarbons and SF₆				
2.E.1. By-product Emissions	NA, NO	NA, NO	NO	There is no production of Halocarbons and SF ₆ in Estonia.
2.E.1.1. Production of HCFC-22	NO	NO	NO	
2.E.1.2. Other	NA, NO	NA, NO	NO	
2.F. Consumption of Halocarbons and SF₆				
2.F.1. Refrigeration and Air Conditioning Equipment	X	NO	NO	

Greenhouse gas source and sink categories	HFC _s	PFC _s	SF ₆	Explanation notes
2.F.2. Foam Blowing	X	NO	NO	
2.F.3. Fire Extinguishers	X	NO	NO	
2.F.4. Aerosols/ Metered Dose Inhalers	X	NO	NO	
2.F.5. Solvents	NO	NO	NO	
2.F.6. Other applications using ODS substitutes	NO	NO	NO	
2.F.7. Semiconductor Manufacture	NO	NO	NO	
2.F.8. Electrical Equipment	NO	NO	X	
2.F.9. Other Electrical Equipment	NO	NO	X	
2.F.9. Other (sport shoe soles)	NO	NO	NO	PFC emissions from sport shoes with gas cushion occurred in Estonia from 2006 to 2008 and SF ₆ emissions from 1995 to 2006.

Solvent and other product use (CRF Reporter 3)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	SO ₂	Notes*
3. Solvent and Other Product Use								
3.A. Paint Application	X	NO	NO	NO	NO	X	NO	
3.B. Degreasing and Dry Cleaning	X	NO	NO	NO	NO	X	NO	
3.C. Chemical Products, Manufacture and Processing	X	NO	NO	NO	NO	X	NO	
3.D. Other								
3.D.1. Use of N ₂ O for Anaesthesia	NO	NO	X	NO	NO	NO	NO	
3.D.2. N ₂ O from Fire Extinguishers	NO	NO	NO	NO	NO	NO	NO	No use of N ₂ O in Fire Extinguishers.
3.D.3. N ₂ O from Aerosol Cans	NO	NO	X	NO	NO	NO	NO	
3.D.4. Other Use of N ₂ O	NO	NO	IE	NO	NO	NO	NO	Included in Use of N ₂ O for Anaesthesia.
3.D.5. Other	X	NO	NO	NO	NO	X	NO	
Printing Industry	X	NO	NO	NO	NO	X	NO	
Domestic solvent use	X	NO	NO	NO	NO	X	NO	
Other product use	X	NO	NO	NO	NO	X	NO	

Agriculture (CRF Reporter 4)

Greenhouse gas source and sink categories	CH ₄	N ₂ O	NO	CO	NMVOC	SO ₂	Notes*
4.A. Enteric Fermentation	X	NO	NO	NO	NO	NO	
4.B. Manure Management	X	X	NO	NO	NE	NO	
4.C. Rice Cultivation	NO	NO	NO	NO	NO	NO	
4.D. Agricultural soils							
4.D.1. Direct Soil Emissions							
4.D.1.1. Synthetic Fertilizers	NO	X	NO	NO	NO	NO	

Greenhouse gas source and sink categories	CH ₄	N ₂ O	NO	CO	NMVOC	SO ₂	Notes*
4.D.1.2. Animal Manure Applied to Soils	NO	X	NO	NO	NO	NO	
4.D.1.3. N-fixing Crops	NO	X	NO	NO	NO	NO	
4.D.1.4. Crop Residue	NO	X	NO	NO	NO	NO	
4.D.1.5. Cultivation of Histosols	NO	X	NO	NO	NO	NO	
4.D.1.6. Other emissions (Sewage sludge applied on soils)	NO	X	NO	NO	NO	NO	
4.D.2. Pasture, Range and Paddock Manure	NO	X	NO	NO	NO	NO	
4.D.3. Indirect Emissions							
4.D.3.1. Atmospheric Deposition	NO	X	NO	NO	NO	NO	
4.D.3.2. Nitrogen Leaching and Run-off	NO	X	NO	NO	NO	NO	
4.D.4. Other	NO	NO	NO	NO	NO	NO	
4.E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	
4.F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO	NO	

LULUCF (CRF Reporter 5)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	Notes*
5.A. Forest Land							
Carbon stock change	X	NO	NO	NO	NO	NO	
5(I) Direct N ₂ O emissions from N fertilization	NO	NO	NO	NO	NO	NO	
5(II) Non-CO ₂ emissions from drainage of soils and wetlands	NE	NE	NE	NO	NO	NO	
5(V) Biomass burning	IE, NO	X	X	NO	NO	NO	CO ₂ emission estimates are included in FL remaining FL living biomass figures due to <i>Stock Change method</i> used for calculations.
5.A.1. Forest Land remaining Forest Land							
Carbon stock change	X	NO	NO	NO	NO	NO	
5(I) Direct N ₂ O emissions from N fertilization	NO	NO	NO	NO	NO	NO	
5(II) Non-CO ₂ emissions from drainage of soils and wetlands	NE	NE	NE	NO	NO	NO	
5(V) Biomass burning	IE, NO	X	X	NO	NO	NO	
5.A.2. Land converted to Forest Land							
5.A.2.1. Cropland converted to Forest Land	X	NO	NO	NO	NO	NO	
5.A.2.2. Grassland converted to Forest Land	X	NO	NO	NO	NO	NO	
5.A.2.3. Wetlands converted to Forest Land	X	NO	NO	NO	NO	NO	
5.A.2.4. Settlements converted to Forest Land	X	NO	NO	NO	NO	NO	
5.A.2.5. Other Land converted to Forest Land	X	NO	NO	NO	NO	NO	

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	Notes*
5.B. Cropland							
Carbon stock change	X	NO	NO	NO	NO	NO	
5(III) N ₂ O emissions from disturbances associated with land-use conversion to cropland	NO	NO	NO	NO	NO	NO	
5(IV) CO ₂ emissions from agricultural lime application	X	NO	NO	NO	NO	NO	
5(V) Biomass burning	NO	NO	NO	NO	NO	NO	
5.B.1. Cropland remaining Cropland							
Carbon Stock Change	X	NO	NO	NO	NO	NO	
5(V) Biomass Burning	NO	NO	NO	NO	NO	NO	
5(IV) CO ₂ emissions from agricultural lime application	X	NO	NO	NO	NO	NO	
5.B.2. Land converted to Cropland							
5.B.2.1. Forest Land Converted to Cropland	NO	NO	NO	NO	NO	NO	
5.B.2.2. Grassland converted to Cropland	X, NE	NO	NO	NO	NO	NO	Only emissions related to organic soils are estimated.
5.B.2.3. Wetlands converted to Cropland	NO	NO	NO	NO	NO	NO	
5.B.2.4. Settlements converted to Cropland	NO	NO	NO	NO	NO	NO	
5.B.2.5. Other land converted to Cropland	NO	NO	NO	NO	NO	NO	
5(III) N ₂ O emissions from disturbances associated with land-use conversion to cropland	NO	NO	NO	NO	NO	NO	
5(V) Biomass Burning	NO	NO	NO	NO	NO	NO	
5.C. Grassland							
Carbon Stock Change	X	NO	NO	NO	NO	NO	
5(IV) Carbon emissions from agricultural lime application	NO	NO	NO	NO	NO	NO	
5(V) Biomass Burning	IE, NO	X	X	NO	NO	NO	CO ₂ emission estimates are included in GL remaining GL living biomass figures due to <i>Stock Change method</i> used for calculations.
5.C.1. Grassland remaining Grassland							
Carbon stock change	X	NO	NO	NO	NO	NO	
5(IV) CO ₂ emissions from agricultural lime application	NO	NO	NO	NO	NO	NO	
5 (V) Biomass Burning	IE, NO	X	X	NO	NO	NO	
5.C.2. Land converted to Grassland							
5.C.2.1. Forest Land Converted to Grassland	X	NO	NO	NO	NO	NO	
5.C.2.2. Cropland converted to Grassland	X	NO	NO	NO	NO	NO	
5.C.2.3. Wetlands converted to Grassland	X	NO	NO	NO	NO	NO	
5.C.2.4. Settlements converted to Grassland	X	NO	NO	NO	NO	NO	
5.C.2.5. Other land converted to Grassland	NE,NO	NO	NO	NO	NO	NO	
5(V) Biomass Burning	IE, NO	IE, NO	IE, NO	NO	NO	NO	

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NM VOC	Notes*
5.D. Wetlands							
Carbon Stock Change	X, NE	NO	NO	NO	NO	NO	
5(II) N ₂ O emissions from drainage of soils and wetlands	NO	NE, NO	X	NO	NO	NO	IPCC GPG 2003 does not provide default method for estimation of CH ₄ emissions, therefore calculations have not been carried out.
5(V) Biomass Burning	IE, NO	IE, NO	IE, NO	NO	NO	NO	Reported under category 5.C.1 Grassland remaining Grassland 5(V) Biomass Burning due to combined statistical data.
5.D.1. Wetlands remaining Wetlands							
Carbon Stock Change	X, NE	NO	NO	NO	NO	NO	Due to lack of data about living biomass under WL remaining WL, full estimation of GHG emissions is not reported.
5(V) Biomass Burning	IE, NO	IE, NO	IE, NO	NO	NO	NO	Reported under category 5.C.1 Grassland remaining Grassland 5(V) Biomass Burning due to combined statistical data.
5.D.2. Land converted to Wetlands							
5.D.2.1. Forest Land Converted to Wetlands	X	NO	NO	NO	NO	NO	
5.D.2.2. Cropland converted to Wetlands	NO	NO	NO	NO	NO	NO	
5.D.2.3. Grassland converted to Wetlands	NO	NO	NO	NO	NO	NO	
5.D.2.4. Settlements converted to Wetlands	NO	NO	NO	NO	NO	NO	
5.D.2.5. Other land converted to Wetlands	NO	NO	NO	NO	NO	NO	
5(II) Non-CO ₂ emissions from drainage of soils and wetlands	NO	NE, NO	X	NO	NO	NO	
5.E. Settlements							
5.E.1. Settlements remaining Settlements	NE	NE	NE	NO	NO	NO	According to the IPCC good practice guidance for LULUC, it is not mandatory for Parties to prepare estimates for the category contained in appendix 3a.4 Settlements Remaining Settlements.
5.E.2. Land converted to Settlements	X, NO	NO	NO	NO	NO	NO	
5.E.2.1. Forest Land Converted to Settlements	X	NO	NO	NO	NO	NO	
5.E.2.2. Cropland converted to Settlements	NO, NE	NO	NO	NO	NO	NO	
5.E.2.3. Grassland converted to Settlements	X, NO, NE	NO	NO	NO	NO	NO	Grassland has not been converted to Settlements every year (thus NO), only emissions from carbon stock changes in living biomass and dead wood pools have been reported.
5.E.2.4. Wetlands converted to Settlements	NO	NO	NO	NO	NO	NO	

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	Notes*
5.E.2.5. Other land converted to Settlements	NO, NE	NO	NO	NO	NO	NO	According to IPCC GPG-LULUCF (2003), it is not mandatory for Parties to report carbon stock changes in soils under current subcategory (NE).
5.F. Other Land							
5.F.2.1. Forest Land converted to Other Land	X	NO	NO	NO	NO	NO	
5.F.2.2. Cropland converted to Other Land	NE, NO	NO	NO	NO	NO	NO	
5.F.2.3. Grassland converted to Other Land	NO	NO	NO	NO	NO	NO	
5.F.2.4. Wetlands converted to Other Land	NO	NO	NO	NO	NO	NO	
5.F.2.5. Settlements converted to Other Land	NO	NO	NO	NO	NO	NO	
5.G. Other Land (please specify)							
Harvested Wood Products	IE	IE	NE	NO	NO	NO	Estonian inventory on LULUCF considers the total biomass associated with the volume of the extracted roundwood as an immediate emission. Emissions from Harvested Wood Products were added to the total amount of CH ₄ emissions from waste transferred to landfill.

Waste (CRF Reporter 6)

Greenhouse gas source and sink categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOC	Notes*
6.A. Solid Waste Disposal on Land							
6.A.1. Managed Waste Disposal on Land	NE	X	NO	NE	NE	NE	CO ₂ – Decomposition of organic material derived from biomass sources, which are regrown on an annual basis is the primary source of CO ₂ realised from waste. Hence, these CO ₂ emissions aren't treated as as net emissions from waste in the IPCC Methodology. NMVOC,NO _x ,CO – emerged emissions are not significant to estimate (emerged emissions value is minimum).
6.A.2. Unmanaged Waste Disposal Sites							
6.A.2.1. deep (>5 m)	NO	NO	NO	NO	NO	NO	
6.A.2.2. shallow (< 5m)	NO	NO	NO	NO	NO	NO	
6.A.3. Other	NA	NA	NO	NA	NA	NA	
6.B. Wastewater handing							
6.B.1. Industrial Wastewater							
Wastewater	NO	X	NO	NO	NO	NO	

Sludge	NO	IE	NE	NO	NO	NO	The emission of CH ₄ from sludge was not carried out as the amount of sludge was added to the total amount of waste transferred to landfill. N ₂ O - due to lack of activity data, the estimation has not been carried out.
6.B.2. Domestic and Commercial Wastewater							
6.B.2.1. Domestic and Commercial Wastewater							
Wastewater	NO	X	X	NO	NO	NO	
Sludge	NO	IE	NE	NO	NO	NO	The emission of CH ₄ from sludge was not carried out as the amount of sludge was added to the total amount of waste transferred to landfill. N ₂ O - due to lack of activity data, the estimation has not been carried out.
6.B.2.2. Human Sewage	NO	NO	X	NO	NO	NO	
6.C. Waste Incineration							
6.C.1. Biogenic	X	NE	X	NO	NO	NO	CH ₄ - due to lack of activity data, the estimation has not been carried out.
6.C.2. Other	NA	NA	NA	NO	NO	NO	
6.D. Other (Biological Treatment)	NE	X	X	NE	NE	NE	CO ₂ – For being biogenic origin, CO ₂ emission has not been carried out. NO _x , CO, NMVOC – emerged emissions are not significant to estimate (emerged emissions value is minimum).
6.D Other (Biogas burnt in a flare)	NE	X	X	NE	NE	NE	CH ₄ and N ₂ O emission have been estimated since 2009 for the first time in 2012 Submission CO ₂ - For being biogenic origin, CO ₂ emission has not been carried out. NO _x , CO, NMVOC – emerged emissions are not significant to estimate (emerged emissions value is minimum).