

ANNEX 2

Uncertainty

Sources for uncertainties

EJ – expert judgement, taking into account the instructions from the IPCC 2006 GL

IPCC – uncertainties are available in the IPCC 2006 GL

ETS – the allowed uncertainties from the EU-ETS permits

VER – calculated emission uncertainties from reports prepared by EU-ETS verifiers

M – measurements or other sources (e.g. Copert model)

Table 1: Uncertainties for AD and EF in 2022 inventory.

IPCC Category	AD	CO ₂ EF	CH ₄ EF	N ₂ O EF	F-gases	AD	EF
	%	%	%	%	%	Source	Source
1. ENERGY							
1.A FUEL COMBUSTION							
1.A.1 Energy Industries							
Liquid Fuels	1	2	150	150		EJ	IPCC
Solid Fuels	1	2,5	135	150		ETS	ETS
Gaseous Fuels	1	0.5	135	135		EJ	M, IPCC
Other Fuels	7.7	5	150	170		ETS	ETS
Biomass	10	NA	150	170		EJ	IPCC
1.A.2 Manufacturing Industries and Constr.							
Liquid Fuels	3	2	150	150		EJ	IPCC
Solid Fuels	2	2.5	135	150		ETS	ETS
Gaseous Fuels	2	0.5	135	135		EJ	M, IPCC
Other Fuels	7.7	5	150	170		ETS	ETS
Biomass	10	NA	150	170		EJ	IPCC
1.A.3 Transport							
a. Civil Aviation							
Av. gasoline and Jet	5	2	150	150		EJ	IPCC
b. Road Transportation							
Gasoline	5	4	75	75		EJ	M
Diesel Oil	5	1.5	75	75		EJ	M
LPG	5	2	75	75		EJ	M
Lubricants	20	2				M	M
CNG	5	2	75	75		EJ	M
Biomass in other	5		75	75		EJ	M
c. Railways							
Liquid Fuels	5	1.5	150	150		EJ	IPCC
Solid Fuels	5	2	150	150		EJ	IPCC
e. Other transportation							
Gaseous Fuels	1	0.5	135	135		EJ	M
1.A.4 Other Sectors							
Liquid Fuels	5	2	150	150		EJ	IPCC
Solid Fuels	5	2.5	135	150		EJ	IPCC
Gaseous Fuels	3	0.5	135	135		EJ	M, IPCC
Biomass	20	NA	48	170		EJ	EJ, IPCC
1.A.5 Other Mobile							
Liquid Fuels	10	3	150	150		EJ	IPCC

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IPCC Category	AD	CO ₂ EF	CH ₄ EF	N ₂ O EF	F-gases	AD	EF
	%	%	%	%	%	Source	Source
1.B FUGITIVE EMISSIONS FROM FUELS							
1.B.1 Solid Fuels							
a. Coal Mining and Handling	10	150	30			EJ	IPCC
c. Other (SO ₂ scrubbing)	5	2				ETS	ETS
1.B.2 Oil and Natural Gas							
a. Oil	5	100				EJ	IPCC
b. Natural Gas	2	200	200			EJ	IPCC
c. Venting and Flaring	3,5	50	50	50		EJ	IPCC
2. INDUSTRIAL PROCESSES							
2.A Mineral Products							
1. Cement Production		1.39					VER
2. Lime Production		1.74					VER, IPCC
3. Glass production		3					VER, IPCC
4. Other process uses of carbonates		2.05					VER, IPCC
2.B Chemical Industry							
6. Titanium dioxide production	5	1				EJ	EJ
10. Other	2	0.5				EJ	M
2.C Metal Production							
1. Iron and Steel Production	5	5				ETS, IPCC	ETS, IPCC
3. Aluminium Production	1	5				EJ	EJ
3. Aluminium Production	2				7	EJ	EJ
5. Lead production	10	50				IPCC	IPCC
6. Zinc production	10	50				IPCC	IPCC
2.D Non-energy products from fuels and solvent use							
1. Lubricant use	10	50				IPCC	IPCC
2. Paraffin wax use	10	100				IPCC	IPCC
3. Other	20	2				M	M
2.F Consumption of Halocarbons and SF₆							
1. Refrigeration and AC equipment	20				30	EJ	EJ
2. Foam Blowing agents	10				50	EJ	EJ
3. Fire Protection	10				20	EJ	EJ
4. Aerosols	50				0	EJ	EJ
2.G Other product manufacture and use							
1. Electrical Equipment	20				10	EJ	EJ
3. N ₂ O from product use	20					EJ	
3. AGRICULTURE							
3.A Enteric Fermentation	10		20			EJ	EJ, IPCC
3.B Manure Management	10		30			EJ	EJ, IPCC
3.B Manure Management	50			100		EJ	EJ, IPCC
3.D Agricultural Soils							
1. Direct Soil Emissions	10			250		EJ	EJ, IPCC
2. Indirect Emissions	10			250		EJ	EJ, IPCC
3.G Liming	50	0				EJ	
3.H Urea application	10	50				EJ	EJ
3.I Other C fertilizers	10	50				EJ	EJ

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	%	%	%	%	%	Source	Source
4. LULUCF							
4.A Forest Land							
1. Forest Land remaining Forest Land	1.2	22				EJ	EJ
1. Forest Land remaining Forest Land	30		70	70		EJ	EJ
2. Land converted to Forest Land	36.4	39,6				EJ	EJ
4.B Cropland							
1. Cropland remaining Cropland	4	90				EJ	EJ
2. Land converted to Cropland	20.2	101.5		101.5		EJ	EJ
4.C Grassland							
1. Grassland remaining Grassland	3	70.5				EJ	EJ
2. Land converted to Grassland	14	1074.3		1074.3		EJ	EJ
4.D Wetlands	17	75				EJ	EJ
4.E Settlements							
1. Settlements remaining settlements	6	75				EJ	IPCC
2. Land converted to settlements	57.8	75		75		EJ	IPCC
4.F Other Land	11	75		75		EJ	IPCC
4.G Harvested wood products	25	50				EJ	EJ
4. LULUCF, N₂O from managed soils	75			0		EJ	IPCC
5. WASTE							
5.A Solid waste disposal							
1. Managed waste disposal sites		67					IPCC
5.B Biological treatment of solid waste							
1. Composting	10		100	150		EJ	EJ
5.C Incineration and open burning of waste							
1. Waste incineration	50	27.4	100	100		IPCC	IPCC
5.D Wastewater treatment and discharge							
1. Domestic and Commercial WW	30		70			EJ	IPCC
1. Domestic and Commercial WW	15.5			750		EJ	IPCC
2. Industrial WW	100		42			EJ	IPCC

Uncertainty estimates for 2022 are in the excel file *SVN NID 2024 – Annex 2_Uncertainty calculation*