

ANNEX 8A.2

REPORTING TABLES

Year of the Inventory	
Contact Name	
Country	
Organisation	
Address	
Phone	
Fax	
e-mail	

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Table A Summary Table (1 of 6) (Updated)

Categories		Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂	
		(Gg)			CO ₂ equivalents (Gg)						(Gg)	(Gg)			
Total National Emissions and Removals															
1 ENERGY															
1A	Fuel Combustion Activities														
1A1	Energy Industries														
1A2	Manufacturing Industries and Construction														
1A3	Transport														
1A4	Other Sectors														
1A5	Non-Specified														
1B	Fugitive Emissions from Fuels														
1B1	Solid Fuels														
1B2	Oil and Natural Gas														
1B3	Other Emissions from Energy Production														
1C	Carbon Dioxide Transport and Storage														
1C1	Transport of CO ₂														
1C2	Injection and Storage														

Table A Summary Table (2 of 6) (Updated) (Continued)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)					(Gg)	(Gg)			
2 INDUSTRIAL PROCESSES AND PRODUCT USE													
2A Mineral Industry													
2A1 Cement Production													
2A2 Lime Production													
2A3 Glass Production													
2A4 Other Process Uses of Carbonates													
2A5 Other (please specify)													
2B Chemical Industry													
2B1 Ammonia Production													
2B2 Nitric Acid Production													
2B3 Adipic Acid Production													
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production													
2B5 Carbide Production													
2B6 Titanium Dioxide Production													
2B7 Soda Ash Production													
2B8 Petrochemical and Carbon Black Production													
2B9 Fluorochemical Production													
2B10 Hydrogen Production													
2B11 Other (please specify)													

Table A Summary Table (3 of 6) (Updated) (Continued)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)	CO ₂ equivalents (Gg)						(Gg)	(Gg)				
2C Metal Industry													
2C1 Iron and Steel Production													
2C2 Ferroalloys Production													
2C3 Aluminium Production													
2C4 Magnesium Production													
2C5 Lead Production													
2C6 Zinc Production													
2C7 Rare Earths Production													
2C8 Other (please specify)													
2D Non-Energy Products from Fuels and Solvent Use													
2D1 Lubricant Use													
2D2 Paraffin Wax Use													
2D3 Solvent Use													
2D4 Other (please specify)													
2E Electronics Industry													
2E1 Integrated Circuit or Semiconductor													
2E2 Displays													
2E3 Photovoltaics													
2E4 Microelectromechanical systems (MEMS)													
2E5 Other (please specify)													

Table A Summary Table (4 of 6) (Updated) (Continued)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)					(Gg)	(Gg)			
2F Product Uses as Substitutes for Ozone Depleting Substances													
2F1 Refrigeration and Air Conditioning													
2F2 Foam Blowing Agents													
2F3 Fire Protection													
2F4 Aerosols													
2F5 Solvents													
2F6 Other Applications													
2G Other Product Manufacture and Use													
2G1 Electrical Equipment													
2G2 Halogenated Gases from Other Product Uses													
2G3 N ₂ O from Product Uses													
2G4 Other (please specify)													
2H Other (please specify)													
2H1 Pulp and Paper Industry													
2H2 Food and Beverages Industry													
2H3 Other (please specify)													

Table A Summary Table (5 of 6) (Updated) (Continued)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)				(Gg)	(Gg)				
3 AGRICULTURE, FORESTRY AND OTHER LAND USE													
3A Livestock													
3A1 Enteric Fermentation													
3A2 Manure Management													
3B Land													
3B1 Forest Land													
3B2 Cropland													
3B3 Grassland													
3B4 Wetlands													
3B5 Settlements													
3B6 Other Land													
3C Aggregate Sources and Non-CO₂ Emissions Sources on Land													
3C1 Biomass Burning													
3C2 Liming													
3C3 Urea Application													
3C4 Direct N ₂ O Emissions from Managed Soils													
3C5 Indirect N ₂ O Emissions from Managed Soils													
3C6 Indirect N ₂ O Emissions from Manure Management													
3C7 Rice cultivation													
3C8 Other (please specify)													
3D Other													
3D1 Harvested Wood Products													
3D2 Other (please specify)													

Table A Summary Table (6 of 6) (Updated) (Continued)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)	CO ₂ equivalents (Gg)						(Gg)	(Gg)				
4 WASTE													
4A Solid Waste Disposal													
4B Biological Treatment of Solid Waste													
4C Incineration and Open Burning of Waste													
4D Wastewater Treatment and Discharge													
4E Other (please specify)													
5 OTHER													
5A Indirect N₂O Emissions from the Atmospheric Deposition of Nitrogen in NO_x and NH₃													
5B Other (please specify)													
Memo items⁽⁵⁾													
International Bunkers													
International Aviation (International Bunkers)													
International Water-borne Transport (International Bunkers)													
Multilateral Operations													

(1) CO₂ net emissions (emissions minus removals)

(2) Total amount of CO₂ captured for long-term storage is to be reported separately for domestic storage and for export in the documentation box.

(3) The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this column. Such gases should be reported in the column 'Other halogenated gases without CO₂ equivalent conversion factors'.

(4) When this column is used, gases should be listed separately (in IPPU Background Tables and Table 2.11) and the name of the gas should be given in the documentation box.

(5) Emissions that are not included in the national total should be reported as memo items.

* Cells to report emissions of NO_x, CO, NMVOC and SO₂ have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

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Table B Short Summary Table (1 of 2) (Updated)

Categories	Net CO ₂ (1) (2)	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated gases with CO ₂ equivalent conversion factors ⁽³⁾	Other halogenated gases without CO ₂ equivalent conversion factors ⁽⁴⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)					(Gg)	(Gg)			
Total National Emissions and Removals													
1 ENERGY													
1A Fuel Combustion Activities													
1B Fugitive Emissions from Fuels													
1C Carbon Dioxide Transport and Storage													
2 INDUSTRIAL PROCESSES AND PRODUCT USE													
2A Mineral Industry													
2B Chemical Industry													
2C Metal Industry													
2D Non-Energy Products from Fuels and Solvent Use													
2E Electronics Industry													
2F Product Uses as Substitutes for Ozone Depleting Substances													
2G Other Product Manufacture and Use													
2H Other													
3 AGRICULTURE, FORESTRY AND OTHER LAND USE													
3A Livestock													
3B Land													
3C Aggregate Sources and Non-CO ₂ Emissions Sources on Land													
3D Other													
4 WASTE													
4A Solid Waste Disposal													
4B Biological Treatment of Solid Waste													

- (1) CO₂ net emissions (emissions minus removals)
- (2) Total amount of CO₂ captured for long-term storage is to be reported separately for domestic storage and for export in the documentation box.
- (3) The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this column. Such gases should be reported in the column 'Other halogenated gases without CO₂ equivalent conversion factors'.
- (4) When this column is used, gases should be listed separately in IPPU Background Tables and Table 2.11 and the name of the gas should be given in the documentation box.
- (5) Emissions that are not included in the national total should be reported as memo items.

* Cells to report emissions of NO_x, CO, NMVOC and SO₂ have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

Table 1 Energy Sectoral Table (1 of 3) (Updated)

Categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOCs	SO ₂
	(Gg)						
1 ENERGY							
1A Fuel Combustion Activities							
1A1 Energy Industries							
1A1 a Main Activity Electricity and Heat Production							
1A1 ai Electricity Generation							
1A1 aii Combined Heat and Power Generation (CHP)							
1A1 aiii Heat Plants							
1A1 b Petroleum Refining							
1A1 c Manufacture of Solid Fuels and Other Energy Industries							
1A1 ci Manufacture of Solid Fuels							
1A1 cii Other Energy Industries							
1A2 Manufacturing Industries and Construction							
1A2 a Iron and Steel							
1A2 b Non-Ferrous Metals							
1A2 c Chemicals							
1A2 d Pulp, Paper and Print							
1A2 e Food Processing, Beverages and Tobacco							
1A2 f Non-Metallic Minerals							
1A2 g Transport Equipment							
1A2 h Machinery							
1A2 i Mining (excluding fuels) and Quarrying							
1A2 j Wood and Wood Products							
1A2 k Construction							
1A2 l Textile and Leather							
1A2 m Non-specified Industry							
1A3 Transport							
1A3 a Civil Aviation							
1A3 ai International Aviation (International Bunkers) ⁽¹⁾							
1A3 aii Domestic Aviation							
1A3 b Road Transportation							

1A3	bi	Cars							
1A3	bi	Passenger Cars with 3-way Catalysts							
1A3	bi2	Passenger Cars without 3-way Catalysts							
1A3	bii	Light-duty Trucks							
1A3	bii1	Light-duty Trucks with 3-way Catalysts							
1A3	bii2	Light-duty Trucks without 3-way Catalysts							
1A3	biii	Heavy-duty Trucks and Buses							
1A3	biv	Motorcycles							
1A3	bv	Evaporative Emissions from Vehicles							
1A3	bvi	Urea-based Catalysts							
1A3	c	Railways							
1A3	d	Water-borne Navigation							
1A3	di	International Water-borne Navigation (International Bunkers) ⁽¹⁾							
1A3	dii	Domestic Water-borne Navigation							
1A3	e	Other Transportation							
1A3	ei	Pipeline Transport							
1A3	eii	Off-road							
1A4		Other Sectors							
1A4	a	Commercial/Institutional							
1A4	b	Residential							

Table 1 Energy Sectoral Table (2 of 3) (Updated) (Continued)

Categories			CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOCs	SO ₂
			(Gg)						
1A4	c	Agriculture/Forestry/Fishing/Fish Farms							
1A4	ci	Stationary							
1A4	cii	Off-road Vehicles and Other Machinery							
1A4	ciii	Fishing (mobile combustion)							
1A5		Non-Specified							
1A5	a	Stationary							
1A5	b	Mobile							
1A5	bi	Mobile (aviation component)							
1A5	bii	Mobile (water-borne component)							
1A5	biii	Mobile (other)							
1A5	c	Multilateral Operations ^{(1) (2)}							
1B		Fugitive Emissions from Fuels							
1B1		Solid Fuel							
1B1	a	Coal Mining and Handling							
1B1	ai	Underground Mines							
1B1	ai1	Mining							
1B1	ai2	Post-mining Seam Gas Emissions							
1B1	ai3	Abandoned Underground Mines							
1B1	ai4	Flaring of Drained Methane or Conversion of Methane to CO ₂							
1B1	aii	Surface Mines							
1B1	aii1	Mining							
1B1	aii2	Post-mining Seam Gas Emissions							
1B1	aii3	Abandoned Surface Mines							
1B1	aiii	Coal Exploration							
1B1	b	Uncontrolled Combustion, and Burning Coal Dumps							
1B1	c	Fuel Transformation							
1B1	ci	Charcoal and Biochar Production							
1B1	cii	Coke Production							
1B1	ciii	Solid to Solid Fuel Production							
1B1	civ	Gasification Transformation							

1B2	Oil and Natural Gas							
1B2 a	Oil							
1B2 ai	Exploration							
1B2 aii	Production and Upgrading							
1B2 aiii	Transport							
1B2 aiv	Refining							
1B2 av	Distribution of Oil Products							
1B2 avi	Others							
1B2 avii	Abandoned Oil Wells							
1B2 b	Natural Gas							
1B2 bi	Exploration							
1B2 bii	Production and Gathering							
1B2 biii	Processing							
1B2 biv	Transmission and Storage							
1B2 bv	Distribution							
1B2 bvi	Gas Post-Meter							
1B2 bvii	Others							
1B2 bviii	Abandoned Gas Wells							
1B3	Other Emissions from Energy Production							
1C	Carbon Dioxide Transport and Storage							
1C1	Transport of CO₂							
1C1 a	Pipelines							
1C1 b	Ships							
1C1 c	Other (Please specify)							
1C2	Injection and Storage							
1C2 a	Injection							
1C2 b	Storage							

Table 1 Energy Sectoral Table (3 of 3) (Updated) (Continued)

Categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOCs	SO ₂
	(Gg)						
Memo items ⁽³⁾							
International Bunkers							
International Aviation (International Bunkers)							
International Water-borne Transport (International Bunkers)							
Multilateral Operations							
Information items							
CO ₂ from Biomass Combustion for Energy Production							

(1) To be reported as a memo item, and not part of the national inventory.

(2) Multilateral operations pursuant to the Charter of the United Nations: including emissions from fuel delivered to the military in the country and delivered to the military of other countries.

(3) Emissions that are not included in the national total should be reported as memos.

* Cells to report emissions of NO_x, CO, NMVOC and SO₂ have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

Table 1.1 Energy Background Table: 1A1-1A2 (1 of 2)

Categories	Activity (TJ)						Emissions (Gg)																		Information item ⁽²⁾ (Gg)		
							Solid			Liquid			Gas			Other fossil fuel			Peat ⁽¹⁾			Biomass			Total		
	Solid	Liquid	Gas	Other fossil fuel	Peat	Bio-mass	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CO ₂ emitted	
1A Fuel Combustion Activities																											
1A1 Energy Industries																											
1A1a Main Activity Electricity and Heat Production																											
1A1ai Electricity Generation																											
1A1aii Combined Heat and Power Generation (CHP)																											
1A1aiii Heat Plants																											
1A1b Petroleum Refining																											
1A1c Manufacture of Solid Fuels and Other Energy Industries																											
1A1ci Manufacture of Solid Fuels																											
1A1cii Other Energy Industries																											
1A2 Manufacturing Industries and Construction																											
1A2a Iron and Steel																											
1A2b Non-Ferrous Metals																											
1A2c Chemicals																											
1A2d Pulp, Paper and Print																											
1A2e Food Processing, Beverages and Tobacco																											
1A2f Non-Metallic Minerals																											
1A2g Transport Equipment																											

Table 1.1 Energy Background Table: 1A1-1A2 (2 of 2) (Continued)

Categories	Activity (TJ)						Emissions (Gg)																					Information item ⁽²⁾ (Gg)	
							Solid			Liquid			Gas			Other fossil fuel			Peat ⁽¹⁾			Biomass			Total			CO ₂ Amount captured ⁽³⁾	Biomass
	Solid	Liquid	Gas	Other fossil fuel	Peat	Bio-mass	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CO ₂ emitted			
1A2h Machinery																													
1A2i Mining and Quarrying																													
1A2j Wood and Wood Products																													
1A2k Construction																													
1A2l Textile and Leather																													
1A2m Non-specified Industry																													

- (1) Although peat is not strictly speaking a fossil fuel, the CO₂ emissions from combustion of peat are included in the national emissions as for fossil fuels. See Chapter 1 of Energy Volume, page 1.15.
- (2) Information items that are not themselves emissions, therefore not included in the national total. The carbon should be converted to carbon dioxide. It is subtracted in the CO₂ emission columns (net emissions). Only CO₂ captured for permanent storage in geological reservoirs should be subtracted.
- (3) Enter the amount of CO₂ captured as a negative number since this amount is subtracted from total CO₂ produced.

Documentation box:

Table 1.2 Energy Background Table: 1A3-1A5 (1 of 2)

Category	Activity (TJ)						Emissions (Gg)															Total emissions (Gg)					
							Solid			Liquid			Gas			Other fossil fuel			Peat ⁽¹⁾						Biomass		
	Solid	Liquid	Gas	Other fossil fuel	Peat	Bio-mass	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O			
1A3 Transport																											
1A3a Civil Aviation																											
1A3ai International Aviation (International Bunkers) ⁽²⁾																											
1A3aai Domestic Aviation																											
1A3b Road Transportation																											
1A3bi Cars																											
1A3bi1 Passenger Cars with 3-way catalysts																											
1A3bi2 Passenger Cars without 3-way Catalysts																											
1A3bii Light-duty Trucks																											
1A3bii1 Light-duty Trucks with 3-way Catalysts																											
1A3bii2 Light-duty Trucks without 3-way Catalysts																											
1A3biii Heavy-duty Trucks and Buses																											
1A3biv Motorcycles																											
1A3bv Evaporative Emissions from Vehicles																											
1A3bvi Urea based Catalyst ⁽³⁾																											
1A3c Railways																											
1A3d Water-borne Navigation																											
1A3di International Water-borne Navigation (International Bunkers) ⁽²⁾																											
1A3dii Domestic Water-borne Transport																											
1A3e Other Transportation																											
1A3ei Pipeline Transport																											
1A3eii Off-road																											
1A4 Other Sectors																											
1A4a Commercial/Institutional																											
1A4b Residential																											
1A4c Agriculture/Forestry/Fishing/Fish Farms																											
1A4ci Stationary																											
1A4cii Off-road Vehicles and Other Machinery																											
1A4ciii Fishing (mobile combustion)																											

Table 1.2 Energy Background Table: 1A3-1A5 (2 of 2) (Continued)

Category	Activity (TJ)						Emissions (Gg)															Total emissions (Gg)					
							Solid			Liquid			Gas			Other fossil fuel			Peat ⁽¹⁾						Biomass		
	Solid	Liquid	Gas	Other fossil fuel	Peat	Bio-mass	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O			
1A5 Non-Specified																											
1A5a Stationary																											
1A5b Mobile																											
1A5bi Mobile (aviation component)																											
1A5bii Mobile (water-borne component)																											
1A5biii Mobile (other)																											
1A5c Multilateral Operation																											
Memo items ⁽⁴⁾																											
International Bunkers																											
International Aviation (International Bunkers)																											
International Water-borne Transport (International Bunkers)																											
Multilateral Operations ⁽⁵⁾																											

- (1) Although peat is not strictly speaking a fossil fuel, the CO₂ emissions from combustion of peat are included in the national emissions as for fossil fuels. See Chapter 1 of Energy Volume, page 1.15.
- (2) To be reported as a memo item, and not part of the national inventory.
- (3) Report the amount of urea-based additive used and its purity in the documentation box.
- (4) Emissions that are not included in the national total should be reported as memo items.
- (5) Multilateral operations pursuant to the Charter of the United Nations: including emissions from fuel delivered to the military in the country and delivered to the military of other countries.

Documentation box:

Table 1.3 Energy Background Table: 1B (Updated)

Category	Activity Data			Emissions (Gg)			Information item: Amount captured ⁽²⁾ (Gg)
	Description	Unit ⁽¹⁾	Value	CO ₂	CH ₄	N ₂ O	
1B Fugitive Emissions from Fuels							
1B1 Solid Fuel							
1B1a Coal Mining and Handling							
1B1ai Underground Mines	Coal produced	ktonnes					
1B1ai1 Mining	Coal produced	ktonnes					
1B1ai2 Post mining Seam Gas Emissions	Coal produced	ktonnes					
1B1ai3 Abandoned Underground Mines	Number of mines	number					
1B1ai4 Flaring of Drained Methane or Conversion of CH ₄ to CO ₂	Gas flared	10 ⁶ Sm ³					
1B1aii Surface Mines							
1B1aii1 Mining	Coal produced	ktonnes					
1B1aii2 Post-mining Seam Gas Emissions	Coal produced	ktonnes					
1B1aii3 Abandoned Surface Mines	Surface area mined	m ²					
1B1aiii Coal Exploration	Augmentation of coal resource	ktonnes					
1B1b Uncontrolled Combustion, and Burning Coal Dumps	Solid fuel combusted	ktonnes					
1B1c Fuel Transformation	Solid fuel transformed	ktonnes					
1B1ci Charcoal and Biochar Production	Charcoal and biochar produced	tonnes of dry matter					
1B1cii Coke Production	Coke produced	kg					
1B1ciii Solid to Solid Fuel Production	Wood pellets produced	MJ					
1B1civ Gasification Transformation	Feedstock	TJ					
1B2 Oil and Natural Gas							
1B2a Oil							
1B2ai Exploration	Oil wells drilled or oil well count, or oil produced	Number, number, 10 ³ m ³					
1B2aii Production and Upgrading	Oil produced or oil wells	10 ³ m ³ , number					
1B2aiii Transport	Crude oil transported	10 ³ m ³					
1B2aiv Refining	Refinery crude oil throughput	10 ³ m ³					
1B2av Distribution of Oil Products	Amount distributed	10 ³ m ³					
1B2avi Others							
1B2avii Abandoned oil wells	Number of abandoned oil wells	number					
1B2b Natural Gas							
1B2bi Exploration	Gas wells drilled or gas well count, or gas produced number wells drilled	Number, number, 10 ⁶ m ³					
1B2bii Production and Gathering	Gas produced or gas wells	10 ⁶ m ³ , number					
1B2biii Processing	Amount of gas processed at facilities	10 ⁶ m ³					
1B2biv Transmission and Storage	Amount of gas consumed	10 ⁶ m ³					
1B2bv Distribution	Amount of gas distributed or length of pipeline	10 ⁶ m ³ , kilometres					
1B2bvi Gas Post-Meter	Natural gas vehicles, appliances, and/or non-residential or commercial gas consumed	Number, number, 10 ⁶ m ³					
1B2bvii Other							
1B2bviii Abandoned gas wells	Number of abandoned gas wells	number					
1B3 Other Emissions from Energy Production							

(1) The units given here are the most commonly used for respective activity data. For convenience and/or consistency, they can be converted into appropriate energy units.

(2) The amount of CO₂ captured is given for information purposes; it is subtracted in the CO₂ emission columns (net emissions).

Table 1.4a Energy Background Table: 1C CO₂ Transport, Injection and Storage

Category	Activity (Gg)		Annual mass of fugitive CO ₂ emissions to the atmosphere or sea bed (Gg) ⁽²⁾
	Annual mass of CO ₂ transported	Annual mass of CO ₂ injected ⁽¹⁾	
1C1 Transport of CO₂			
1C1a Pipelines			
1C1b Ships			
1C1c Other (please specify)			
1C2 Injection and Storage ⁽³⁾			
1C2a Injection			
1C2b Storage			
1C3 Other			

(1) Excluding recycled CO₂ for enhanced recovery.

(2) Corrected for baseline background fluxes.

(3) Fugitive emissions during above ground operations such as processing and CO₂ recycling during enhanced oil and gas recovery operations should be reported as fugitive emissions from oil and natural gas and reported under the appropriate categories for that sector.

Documentation box:

Table 1.4b Energy Background Table: 1C CO₂ Transport, Injection and Storage – Overview

Category ⁽¹⁾	CO ₂ (Gg)
Total amount captured for storage (A)	
Total amount of import for storage (B)	
Total amount of export for storage (C)	
Total amount of CO ₂ injected at storage sites (D)	
Total amount of leakage during transport (E1) category 1C1	
Total amount of leakage during injection (E2) category 1C2a	
Total amount of leakage from storage sites (E3) category 1C2b	
Total leakage (E4 = E1 + E2 + E3))	
Capture + imports (F = A + B)	
Injection + leakage + exports (G = D + E4 + C)	
Discrepancy (F – G)	

(1) Once captured, there is no differentiated treatment between biogenic carbon and fossil carbon. Emissions and storage of both biogenic and fossil carbons will be estimated and reported.

Documentation box:

Table 1.5 Energy Background Table: Reference Approach (1 of 1)

Fuel Types			Production	Import	Export	Inter-national bunkers	Stock change	Apparent consumption	Conversion factor	Apparent consumption	Carbon emission factor	Carbon content	Carbon content	Excluded carbon	Net carbon emission	Fraction of carbon oxidised	Actual carbon emission	CO ₂ emission			
			(Unit)	(Unit)	(Unit)	(Unit)	(Unit)	(Unit)	(TJ/Unit)	(TJ)	(tC/TJ)	(t C)	(Gg C)	(Gg C)	(Gg C)	(Gg C)		(Gg C)	(Gg CO ₂)		
Liquid Fossil	Primary Fuels	Crude Oil																			
		Orimulsion																			
		Natural Gas Liquids																			
	Secondary Fuels	Gasoline																			
		Jet Kerosene																			
		Other Kerosene																			
		Shale Oil																			
		Gas / Diesel Oil																			
		Residual Fuel Oil																			
		LPG																			
		Ethane																			
		Naphtha																			
		Bitumen																			
		Lubricants																			
		Petroleum Coke																			
		Refinery Feedstocks																			
		Other Oil																			
Liquid Fossil Totals																					
Solid Fossil	Primary Fuels	Anthracite ⁽¹⁾																			
		Coking Coal																			
		Other Bit. Coal																			
		Sub-bit. Coal																			
		Lignite																			
	Oil Shale and Tar Sands																				
	Secondary Fuels	BKB & Patent Fuel																			
		Coke Oven/Gas Coke																			
Coal Tar																					
Solid Fossil Totals																					
Gaseous Fossil	Natural Gas (Dry)																				
Other Fossil Fuels																					
Peat ⁽²⁾																					
Total																					

-
- (1) If anthracite is not separately available, include with Other Bituminous Coal.
- (2) Although peat is not strictly speaking a fossil fuel, the CO₂ emissions from combustion of peat are included in the national emissions as for fossil fuels. See Chapter 1 of Energy Volume, page 1.15.

Documentation box:

Table 2 IPPU Sectoral Table (1 of 2) (See Volume 3, Chapter 1, Table 1.1) (Updated)

Category	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated compounds with CO ₂ equivalent conversion factors ⁽¹⁾	Other halogenated compounds without CO ₂ equivalent conversion factors ⁽²⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)					(Gg)				
2 INDUSTRIAL PROCESSES AND PRODUCT USE													
2A Mineral Industry													
2A1 Cement Production													
2A2 Lime Production													
2A3 Glass Production													
2A4 Other Process Uses of Carbonates													
2A4a Ceramics													
2A4b Other Uses of Soda Ash													
2A4c Non Metallurgical Magnesia Production													
2A4d Other (please specify) ⁽³⁾													
2A5 Other (please specify) ⁽³⁾													
2B Chemical Industry													
2B1 Ammonia Production													
2B2 Nitric Acid Production													
2B3 Adipic Acid Production													
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production													
2B5 Carbide Production													
2B6 Titanium Dioxide Production													
2B7 Soda Ash Production													
2B8 Petrochemical and Carbon Black Production													
2B8a Methanol													
2B8b Ethylene													
2B8c Ethylene Dichloride and Vinyl Chloride Monomer													
2B8d Ethylene Oxide													
2B8e Acrylonitrile													
2B8f Carbon Black													
2B9 Fluorochemical Production													
2B9a HCFC-22 Production													
2B9b HFC Production (specify HFC(s) produced)													
2B9c PFC Production (specify PFC(s) produced)													
2B9d SF ₆ Production													
2B9e NF ₃ Production													
2B9f Fluoropolymer Production (specify fluoropolymer produced)													
2B9g Other Fluorochemical Production (specify other fluorochemical produced)													
2B10 Hydrogen Production													
2B11 Other (please specify) ⁽³⁾													
2C Metal Industry													
2C1 Iron and Steel Production													
2C2 Ferroalloys Production													
2C3 Aluminium Production													
2C4 Magnesium Production ⁽⁴⁾													
2C5 Lead Production													
2C6 Zinc Production													
2C7 Rare Earths Production													
2C8 Other (please specify) ⁽³⁾													
2D Non-Energy Products from Fuels and Solvent Use ⁽⁵⁾													
2D1 Lubricant Use													
2D2 Paraffin Wax Use													

2D3	Solvent Use ⁽⁶⁾																			
2D4	Other (please specify) ^{(3), (7)}																			
2E	Electronics Industry																			
2E1	Integrated Circuit or Semiconductor ⁽⁸⁾																			
2E2	Displays ⁽⁸⁾																			
2E3	Photovoltaics ⁽⁸⁾																			
2E4	Microelectromechanical systems (MEMS)																			
2E5	Other (please specify) ⁽³⁾																			
2F	Product Uses as Substitutes for Ozone Depleting Substances																			
2F1	Refrigeration and Air Conditioning																			
2F1a	Refrigeration and Stationary Air Conditioning																			

Table 2 IPPU Sectoral Table (2 of 2) (Updated) (Continued)

Category	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Other halogenated compounds with CO ₂ equivalent conversion factors ⁽¹⁾	Other halogenated compounds without CO ₂ equivalent conversion factors ⁽²⁾	NO _x	CO	NMVOCs	SO ₂
	(Gg)			CO ₂ equivalents (Gg)					(Gg)				
2F1b Mobile Air Conditioning													
2F2 Foam Blowing Agents													
2F3 Fire Protection													
2F4 Aerosols													
2F5 Solvents													
2F6 Other Applications ⁽³⁾													
2G Other Product Manufacture and Use													
2G1 Electrical Equipment													
2G1a Manufacture of Electrical Equipment													
2G1b Use of Electrical Equipment													
2G1c Disposal of Electrical Equipment													
2G2 SF ₆ and PFCs from Other Product Uses													
2G2a Military Applications													
2G2b Accelerators													
2G2c Waterproofing of Electronic Circuits													
2G2d Other (please specify) ⁽³⁾													
2G3 N ₂ O from Product Uses													
2G3a Medical Applications													
2G3b Propellant for Pressure and Aerosol Products													
2G3c Other (please specify) ⁽³⁾													
2G4 Other (please specify) ⁽³⁾													
2H Other													
2H1 Pulp and Paper Industry													
2H2 Food and Beverages Industry													
2H3 Other (please specify) ⁽³⁾													

- (1) This column includes other halogenated compounds for which CO₂ equivalent conversion factors are available, including, for example, hydrofluoroethers (HFEs) and perfluoropolyethers (PFPEs) used for temperature control, device testing, cleaning substrate surfaces and other parts, and soldering during electronics manufacturing and other processes. Halogenated gases for which a CO₂ equivalent conversion factor is not available should not be included in this column. Such gases should be reported in the column "Other halogenated gases without CO₂ equivalent conversion factors".
- (2) This column includes other halogenated compounds for which CO₂ equivalent conversion factors are NOT available, including, for example, perfluoroamines and perfluoroalkyl morpholines used for temperature control, device testing, cleaning substrate surfaces and other parts, and soldering during electronics manufacturing and other processes. When this column is used, gases should be listed separately (in IPPU background tables and Table 2.11) and the name of the gas should be given in the documentation box. Insert additional columns if necessary.
- (3) Insert additional rows if needed.
- (4) Small amounts of CO₂ used as a diluent for SF₆ and emitted during magnesium processing is considered insignificant and is usually counted elsewhere. The "Other halogenated gases" here mainly comprise fluorinated ketones.
- (5) Emissions from feedstock uses in petrochemical industry should be addressed in 2B8 (Petrochemical and Carbon Black Production). Emissions from some product uses should be allocated to each industry source category (e.g., CO₂ from carbon anodes and electrodes → 2C (Metal Industry)).
- (6) Only NMVOC emissions and no direct GHGs are relevant to this category.
- (7) Emissions from asphalt production, and paving of roads and roofing are included here.
- (8) "Other halogenated compounds" may include, for example, c-C₄F₈O and the HFEs, PFPEs, perfluoroamines and perfluoroalkyl morpholines discussed in notes (1) and (2). Specific compounds to be reported here include (but are not limited to) those listed with and without GWPs in Table 6.5 of Volume 3 and throughout Chapter 6 of Volume 3.

* Cells to report emissions of NO_x, CO, NMVOC and SO₂ have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

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Table 2.1 IPPU Background Table: 2A Mineral Industry, 2B (2B1-2B8, 2B10-2B11) Chemical Industry - CO₂, CH₄ and N₂O (Updated)

Categories	Activity data			Emissions						
	Production/Consumption quantity			CO ₂ (Gg)			CH ₄ (Gg)		N ₂ O (Gg)	
	Description ⁽¹⁾	Quantity	Unit ⁽²⁾	Emissions ⁽³⁾	Information item Captured and Stored ⁽⁴⁾	(memo) Other Reduction ⁽⁵⁾	Emissions ⁽³⁾	Information item Reduction ⁽⁶⁾	Emissions ⁽³⁾	Information item Reduction ⁽⁶⁾
2A Mineral Industry										
2A1 Cement production										
2A2 Lime production										
2A3 Glass Production										
2A4 Other Process Uses of Carbonates ⁽⁷⁾										
2A4a Ceramics										
2A4b Other Uses of Soda Ash										
2A4c Non Metallurgical Magnesia Production										
2A4d Other										
2A5 Other (please specify) ⁽⁸⁾										
2B Chemical Industry										
2B1 Ammonia Production										
2B2 Nitric Acid Production										
2B3 Adipic Acid Production										
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production										
2B5 Carbide Production										
2B6 Titanium Dioxide Production										
2B7 Soda Ash Production										
2B8 Petrochemical and Carbon Black Production										
2B8a Methanol										
2B8b Ethylene										
2B8c Ethylene Dichloride and Vinyl Chloride Monomer										
2B8d Ethylene Oxide										
2B8e Acrylonitrile										
2B8f Carbon Black										
2B10 Hydrogen Production										
2B11 Other (please specify) ⁽⁸⁾										

(1) Where the options for activity data, e.g., cement or clinker or carbonates for estimating the emissions from Cement Production, specify the activity data used in order to make the choice of emission factor more transparent.

(2) Unit of activity data should be specified.

(3) Enter the reported emissions (adjusted with captured and/or reduced amount).

(4) Where generated CO₂ is captured for injection into a storage, the captured amount should be reported here. These data are provided as the additional information. They are not emissions, therefore should not be included in the national total.

(5) Where reduction of generated CO₂ except for capture and storage occurs (e.g., re-conversion to carbonates) and its amount is available, it should be reported here.

(6) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.)

(7) Report here only the emissions from carbonate uses not covered in other categories.

(8) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide notation key "C" but there should be a note indicating this in the documentation box below. Also, more specific information could be provided in the documentation box.

Documentation box:

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Table 2.2 IPPU Background Table: 2B (2B9, 2B11) Chemical Industry HFCs, PFCs, SF₆, NF₃ and other halogenated gases (Updated)

Categories	HFC-23	HFC-32	HFC-41	HFC-125	HFC-134	HFC-134a	HFC-143	HFC-143a	HFC-152	HFC-152a	HFC-161	HFC-227ea	HFC-236cb	HFC-236ea	HFC-236fa	HFC-245ca	HFC-245fa	HFC-365mfc	HFC-43-10mee	Other HFCs ⁽²⁾ (please specify)	Total HFCs	CF ₄	C ₂ F ₆	C ₃ F ₈	C ₄ F ₁₀	c-C ₄ F ₈ perfluorocyclobutane)	C ₄ F ₈ (perfluoromethyl cyclopropane)	C ₅ F ₁₂	C ₆ F ₁₄	Other PFCs ⁽²⁾ (please specify)	Total PFCs	SF ₆	NF ₃	Other halogenated gases ⁽²⁾ (please specify)																					
	CO ₂ equivalent conversion factors ⁽¹⁾ [Source of the factor:]																																																						
Emissions in original mass unit (tonne)																																																							
2B9	Fluorochemical Production																																																						
2B9a	HCFC-22 Production																																																						
2B9b	HFC Production (specify HFC(s) produced)																																																						
2B9c	PFC Production (specify PFC(s) produced)																																																						
2B9d	SF ₆ Production																																																						
2B9e	NF ₃ Production																																																						
2B9f	Fluoropolymer Production (specify fluoropolymer produced)																																																						
2B9g	Other Fluorochemical Production (specify other fluorochemical produced)																																																						
2B11	Other (please specify)																																																						
Emissions in CO ₂ equivalent unit (Gg-CO ₂)																																																							
2B9	Fluorochemical Production																																																						
2B9a	HCFC-22 Production																																																						
2B9b	HFC Production (specify HFC(s) produced)																																																						
2B9c	PFC Production (specify PFC(s) produced)																																																						
2B9d	SF ₆ Production																																																						
2B9e	NF ₃ Production																																																						
2B9f	Fluoropolymer Production (specify fluoropolymer produced)																																																						
2B9g	Other Fluorochemical Production (specify other fluorochemical produced)																																																						
2B11	Other (please specify)																																																						

-
- (1) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. The source of the factors must be specified in the bracket.
- (2) Insert additional columns if necessary. The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this table. Such gases should be reported in Table 2.11 IPPU background table: Greenhouse Gases without CO₂ equivalent conversion factors.

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

Documentation box:

Table 2.3 IPPU Background Table: 2C Metal Industry CO₂, CH₄ and N₂O (Updated)

Categories	Activity Data			Emissions						
	Production/Consumption quantity			CO ₂ (Gg)			CH ₄ (Gg)		N ₂ O (Gg)	
	Description ⁽¹⁾	Quantity	Unit ⁽²⁾	Emissions ⁽³⁾	(information) Captured and Stored ⁽⁴⁾	(information) Other Reduction ⁽⁵⁾	Emissions ⁽³⁾	(information) Reduction ⁽⁶⁾	Emissions ⁽³⁾	(information) Reduction ⁽⁶⁾
2C Metal Industry										
2C1 Iron and Steel Production										
2C2 Ferroalloys Production										
2C3 Aluminium Production										
2C4 Magnesium Production										
2C5 Lead Production										
2C6 Zinc Production										
2C7 Rare Earths Production										
2C8 Other (please specify) ⁽⁷⁾										

- (1) Where the options for activity data, e.g. steel production or process materials consumption for estimating the emissions from Iron and Steel Production, specify the activity data used in order to make the choice of emission factor more transparent.
- (2) Unit of activity data should be specified.
- (3) Enter the reported emissions (adjusted with captured and/or reduced amount).
- (4) Where generated CO₂ is captured for injection into a storage, the captured amount should be reported here. These data are provided as the additional information. They are not emissions, therefore should not be included in the national total.
- (5) Where reduction of generated CO₂ except for capture and storage occurs and its amount is available, it should be reported here.
- (6) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.).
- (7) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide notation key “C” but there should be a note indicating this in the documentation box below. Also, More specific information (e.g. data on virgin and recycled steel production) could be provided in the documentation box.

Documentation box:

**Table 2.4 IPPU Background Table: 2C (2C3, 2C4, 2C7, 2C8) Metal Industry
HFCs, PFCs, SF₆ and other halogenated gases (Updated)**

Categories	HFC-134a	Other HFCs ⁽²⁾ (please specify)	Total HFCs	CF ₄	C ₂ F ₆	C ₃ F ₈	C ₄ F ₁₀	c-C ₄ F ₈	C ₅ F ₁₂	C ₆ F ₁₄	Other PFCs ⁽²⁾ (please specify)	Total PFCs	SF ₆	Other halogenated gases ⁽²⁾ (please specify)
CO₂ equivalent conversion factors⁽¹⁾ [Source of the factor:]														
Emissions in original mass unit (tonne)														
2C3 Aluminium Production ⁽³⁾														
(information) Reduced amount ⁽⁴⁾														
2C4 Magnesium Production ⁽³⁾														
(information) Reduced amount ⁽⁴⁾														
2C7 Rare Earths Production														
(information) Reduced amount ⁽⁴⁾														
2C8 Other Metals (please specify) ⁽⁵⁾														
(information) Reduced amount ⁽⁴⁾														
Emissions in CO₂ equivalent unit (Gg-CO₂)														
2C3 Aluminium Production														
2C4 Magnesium Production														
2C7 Rare Earths Production														
2C8 Other (please specify) ⁽⁵⁾														

- (1) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. The source of the factors must be specified in the bracket.
- (2) Insert additional columns if necessary. The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this table. Such gases should be reported in Table 2.11 IPPU background table: Greenhouse Gases without CO₂ equivalent conversion factors.
- (3) Enter the reported emissions (adjusted with captured and/or reduced amount).
- (4) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.).
- (5) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

Documentation box:

Table 2.5 IPPU Background Table: 2D Non-Energy Products from Fuels and Solvent Use CO₂, CH₄ and N₂O

Categories	Activity Data			Emissions		
	Production/Consumption quantity			CO ₂	CH ₄	N ₂ O
	Description	Quantity	Unit	(Gg)	(Gg)	(Gg)
2D Non-Energy Products from Fuels and Solvent Use						
2D1 Lubricant Use	Lubricant consumption		tonne			
2D2 Paraffin Wax Use	Wax consumption		tonne			
2D3 Solvent Use						
2D4 Other						
Product (please specify)						
Product (please specify)						
Product (please specify) ⁽¹⁾						

(1) Insert additional rows if necessary.

Documentation box:

Table 2.6 IPPU Background Table: 2E Electronics Industry HFCs, PFCs, SF₆, NF₃ and other halogenated gases (Updated)

Categories	CO ₂ ⁽²⁾	N ₂ O ⁽²⁾	HFC-23	HFC-32	Other HFCs ⁽³⁾ (please specify)	Total HFCs	CF ₄	C ₂ F ₆	C ₃ F ₈	c-C ₄ F ₈	Other PFCs ⁽³⁾ (please specify)	Total PFCs	SF ₆	NF ₃	Other halogenated gases ⁽³⁾ (please specify)	
CO ₂ equivalent conversion factors ⁽¹⁾ [Source of the factor:]																
Emissions in original mass unit (tonne)																
2E Electronics Industry																
2E1 Integrated Circuit or Semiconductor																
2E2 Displays																
2E3 Photovoltaics																
2E4 Microelectromechanical systems (MEMS)																
2E5 Other (please specify) ⁽⁴⁾																
Emissions in CO₂ equivalent unit (Gg-CO₂)																
2E Electronics Industry																
2E1 Integrated Circuit or Semiconductor																
2E2 Displays																
2E3 Photovoltaics																
2E4 Microelectromechanical systems (MEMS)																
2E5 Other (please specify) ⁽³⁾																

- (1) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. The source of the factors must be specified in the bracket.
- (2) Emissions may occur but no methodological guidance is provided in these Guidelines.
- (3) Insert additional columns if necessary. The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this table. Such gases should be reported in Table 2.11 IPPU background table: Greenhouse gases without CO₂ equivalent conversion factors.
- (4) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

Documentation box:

Table 2.7 IPPU Background Table: 2F Product Uses as Substitutes for Ozone Depleting Substances HFCs, PFCs and other halogenated gases (Updated)

Categories	CO ₂ ⁽²⁾	HFC-23	HFC-32	HFC-125	HFC-134a	HFC-143a	HFC-152a	HFC-227ea	HFC-236fa	HFC-245fa	HFC-365mfc	HFC-43-10mee	Other HFCs ⁽³⁾ (please specify)	Total HFCs	CF ₄	C ₂ F ₆	C ₃ F ₈	C ₄ F ₁₀	Other PFCs ⁽³⁾ (please specify)	Total PFCs	Other halogenated gases ⁽³⁾ (please specify)	
CO₂ equivalent conversion factors⁽¹⁾ [Source of the factor:]																						
Emissions in original mass unit (tonne)																						
2F Product Uses as Substitutes for Ozone Depleting Substances																						
2F1 Refrigeration and Air Conditioning																						
2F1a Refrigeration and Stationary Air Conditioning																						
2F1b Mobile Air Conditioning																						
2F2 Foam Blowing Agents																						
2F3 Fire Protection																						
2F4 Aerosols																						
2F5 Solvents																						
2F6 Other Applications ⁽⁴⁾																						
Emissions in CO₂ equivalent unit (Gg-CO₂)																						
2F Product Uses as Substitutes for Ozone Depleting Substances																						
2F1 Refrigeration and Air Conditioning																						
2F1a Refrigeration and Stationary Air Conditioning																						
2F1b Mobile Air Conditioning																						
2F2 Foam Blowing Agents																						
2F3 Fire Protection																						
2F4 Aerosol																						
2F5 Solvents																						
2F6 Other Applications ⁽⁴⁾																						

(1) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. The source of the factors must be specified in the bracket.

(2) Emissions may occur but no methodological guidance is provided in these Guidelines.

(3) Insert additional columns if necessary. For example, additional halogenated compounds with GWPs include HFC-1234yf, HFC-1234ze(E), and HCFC-1233zd(E). The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this table. Such gases should be reported in Table 2.11 IPPU background table: Greenhouse gases without CO₂ equivalent conversion factors.

(4) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

Documentation box:

Table 2.8 IPPU Background Table: 2G (2G1, 2G2, 2G4) Other Product Manufacture and Use – PFCs, SF₆ and other halogenated gases (Updated)

Categories	CF ₄	C ₂ F ₆	C ₃ F ₈	C ₄ F ₁₀	c-C ₄ F ₈	C ₆ F ₁₂	C ₆ F ₁₄	Other PFCs ⁽²⁾ (please specify)	Total PFCs	HFC-23	SF ₆	Other halogenated gases ⁽²⁾ (please specify)
CO₂ equivalent conversion factors⁽¹⁾ [Source of the factor:]												
Emissions in original mass unit (tonne)												
2G Other Product Manufacture and Use												
2G1 Electrical Equipment												
2G1a Manufacture of Electrical Equipment ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
2G1b Use of Electrical Equipment ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
2G1c Disposal of Electrical Equipment ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
2G2 SF ₆ and PFCs from Other Product Uses												
2G2a Military Applications ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
2G2b Accelerators ⁽³⁾												
University and Research Particle Accelerators ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
Industrial and Medical Particle Accelerators ⁽³⁾												
(information) Reduced amount ⁽⁴⁾												
2G2c Waterproofing of Electronic Circuits												
(information) Reduced amount ⁽⁴⁾												
2G2d Other (please specify) ^{(3), (5)}												
(information) Reduced amount ^{(4), (5)}												
2G4 Other (please specify) ^{(3), (5), (6)}												
(information) Reduced amount ^{(4), (5), (6)}												
Emissions in CO₂ equivalent unit (Gg-CO₂)												
2G Other Product Manufacture and Use												
2G1 Electrical Equipment												
2G1a Manufacture of Electrical Equipment												
2G1b Use of Electrical Equipment												
2G1c Disposal of Electrical Equipment												
2G2 SF ₆ and PFCs from Other Product Uses												
2G2a Military Applications (AWACS)												
2G2b Accelerators												
University and Research Particle Accelerators												
Industrial and Medical Particle Accelerators												
2G2c Waterproofing of Electronic Circuits												
2G2d Other (please specify) ⁽⁵⁾												
2G4 Other (please specify) ^{(5), (6)}												

(1) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. The source of the factors must be specified in the bracket.

(2) Insert additional columns if necessary. The other halogenated gases for which the CO₂ equivalent conversion factor is not available should not be included in this table. Such gases should be reported in Table 2.11 IPPU background table: Greenhouse gases without CO₂ equivalent conversion factors.

(3) Enter the reported emissions (adjusted with captured and/or reduced amount).

(4) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.)

(5) Insert additional rows if necessary.

(6) If HFCs with CO₂ equivalent conversion factor are estimated, include them in the column for "Other halogenated gases".

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

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Table 2.9 IPPU Background Table: 2G (2G3, 2G4) Other Product Manufacture and Use - N₂O, CO₂, CH₄

Categories	Activity Data			Emissions					
				N ₂ O (Gg)		CO ₂ (Gg)		CH ₄ (Gg)	
	Description	Quantity	Unit	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾
2G3 N₂O from Product Uses									
2G3a Medical Applications	N ₂ O supplied		tonne						
2G3b Propellant for Pressure and Aerosol Products	N ₂ O supplied		tonne						
2G3c Other (please specify) ⁽³⁾	N ₂ O supplied		tonne						
2G4 Other (please specify) ⁽³⁾									

- (1) Enter the reported emissions (adjusted with captured and/or reduced amount).
- (2) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.)
- (3) Insert additional rows if necessary.

Documentation box:

Table 2.10 IPPU Background Table: 2H Other

Categories	Activity Data		Emissions						
			CO ₂ (Gg)		CH ₄ (Gg)		N ₂ O (Gg)		
	Quantity	Unit	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾	Emissions ⁽¹⁾	(information) Reduction ⁽²⁾	
2H Other									
2H1 Pulp and Paper Industry									
2H2 Food and Beverages Industry									
2H3 Other (please specify) ⁽³⁾									

- (1) Enter the reported emissions (adjusted with captured and/or reduced amount).
(2) Enter the quantities of reduction of generated gas (emission recovery, destruction, etc.).
(3) Insert additional rows if necessary.

Documentation box:

Table 2.11 IPPU Background Table: Greenhouse gases without CO₂ equivalent conversion factors (Updated)

Categories	(please specify)	(please specify)	(please specify)	(please specify)	(please specify) ⁽¹⁾
Emissions in original mass unit (tonne)					
Total					
2B Chemical Industry					
2B9 Fluorochemical Production					
2B11 Other (please specify) ⁽²⁾					
2C Metal Industry					
2C4 Magnesium Production					
2C7 Other (please specify) ⁽²⁾					
2E Electronics Industry					
2E1 Integrated Circuit or Semiconductor					
2E2 Displays					
2E3 Photovoltaics					
2E4 Microelectromechanical systems (MEMS)					
2E5 Other (please specify) ⁽²⁾					
2F Product Uses as Substitutes for Ozone Depleting Substances					
2F1 Refrigeration and Air Conditioning					
2F1a Refrigeration and Stationary Air Conditioning					
2F1b Mobile Air Conditioning					
2F2 Foam Blowing Agents					
2F3 Fire Protection					
2F4 Aerosols					
2F5 Solvents					
2F6 Other Applications (please specify) ⁽²⁾					
2G. Other Product Uses					
2G1 Electrical Equipment					
2G1a Manufacture of Electrical Equipment					
2G1b Use of Electrical Equipment					
2G1c Disposal of Electrical Equipment					
2G2 SF ₆ and PFCs from Other Product Uses					
2G2a Military Applications (AWACS)					
2G2b Accelerators					
2G2c Waterproofing of electronic circuits					
2G2d Other (please specify) ⁽²⁾					
2G4 Other (please specify) ⁽²⁾					

(1) Insert additional columns if necessary. The gases for which the CO₂ equivalent conversion factor is available should not be included in this table. Such gases should be reported in the respective sectoral background tables and included in national totals.

(2) Insert additional rows if necessary.

Note: Where information is confidential the entries should provide aggregate figures but there should be a note indicating this in the documentation box below.

Documentation box:

Documentation box:

Table 2.12 IPPU Background Table: Allocation of CO₂ emissions from Non-Energy Use of fossil fuels: IPPU and other sectors [See also section 1.4 of Volume 3] (Updated)

Category	Reported in year:				Notes
	Primary NEU fuel ⁽¹⁾	Other NEU fuel(s) ⁽¹⁾	Emissions Amount Reported in IPPU Sector CO ₂ ⁽²⁾ (Gg)	In case reported elsewhere: Sub-category in 1A where these emissions are (partly) reported	
2 Industrial Processes and Product Use					
2A Mineral Industry					
(Please specify the sub-category)	(Coal, ..)				4
2B Chemical Industry					
2B1 Ammonia Production	Natural gas	Oil, coal			
2B5 Carbide Production	Pet coke	Oil			
2B6 Titanium Dioxide Production	Coal				
2B8 Petrochemical and Carbon Black Production					
2B8a Methanol	Natural gas	Coal, oil			5
2B8b Ethylene	Naphtha	Gas oil; butane, ethane, propane, LPG			5
2B8f Carbon Black	Natural gas	Oil, coke oven gas			
2B10 Hydrogen Production	Natural gas	LPG, naphtha, coal, methanol, biomass and waste			
2B11 Other					
2C Metal Industry					
2C1 Iron and Steel Production	Coke	Coal, pet coke (carbon electrode)			6
2C2 Ferroalloys Production	(Carbon electrode)	Coke, coal			7
2C3 Aluminium Production	(Carbon electrode)	Coke, coal			7
2C5 Lead Production	Coke				
2C6 Zinc Production	Coke				
2C7 Other	(Carbon electrode)	Coke, coal			
2D Non-Energy Products from Fuels and Solvent Use					
2D1 Lubricant Use	Lubricants	Greases			
2D2 Paraffin Wax Use	Waxes				
2D3 Solvent Use	(Mineral turpentine)	Coal tars and oils			8
2D4 Other					9
2H Other					
2H1 Pulp and Paper Industry					
2H2 Food and Beverages Industry	Coke				
2H3 Other					
1 ENERGY					
1A Fuel Combustion Activities			Reported in Sector 1A ⁽³⁾		
1A1a Main Activity Electricity and Heat Production	(BF gas)	(Chemical off-gases)			10
1A1b Petroleum Refining					
1A1c Manufacture of Solid Fuels and Other Energy Industries	BF gas				
1A2 Manufacturing Industries and Construction	(BF gas)	(Lubricants, chemical off-gases))			

- (1) The columns 'Primary NEU fuel' and 'Other NEU fuel' should be completed with the actual fuel types used.
- (2) These are the same emissions reported in the sectoral background table (also the same emissions notation keys NE, NO, IE, where applicable). If (partly) reported elsewhere, a reference to that other source category should be added in the next column.
- (3) Report here only the CO₂ emissions from combustion of waste gases produced from industrial processes but used for fuel combustion in other economic sectors and reported in the Energy sector (e.g. from combustion of blast furnace gas or chemical off-gases transferred offsite to another source category).
- (4) For example, powdered anthracite coal may be used in Glass Production (2A3).
- (5) In cases where the production of off-gases (i.e. byproduct gases) is fully accounted for in the energy statistics, the combustion of these gases may be used to calculate and report CO₂ emissions from the feedstock losses. Part of these off-gases may be combusted off-site (i.e. in a sector other than the petrochemical industry) and should thus be accounted for separately as fuel combustion in the Energy Sector.
- (6) Part of the blast furnace gas produced from coke used in blast furnaces may be combusted off-site (i.e. in a sector other than the iron and steel industry) and should thus be accounted for separately as fuel combustion in the Energy Sector.
- (7) Carbon electrodes are generally manufactured from coke, coal or tar either on-site by the users themselves or separately by anode production plants and then sold to users domestically and/or exported. If anodes are also imported and/or exported, there is no direct correspondence between fuels used for anode production and the amounts of anodes used in the country.

- (8) Mineral turpentine are often used as solvent, possibly blended with other liquids. Aromatics derived from coal oils may also be used as solvents.
- (9) Emissions from asphalt production, paving of roads and roofing should be reported under 2D4. However, bitumen - and other oil as diluent or 'road oil' - used for this activity does not result in CO₂ emissions.
- (10) CO₂ from blast furnace gas and chemical off-gases should be reported here only when utilised in public power or heat production.

Documentation box:

Table 3 AFOLU Sectoral Table (1 of 2) (Updated)

Categories	Net CO ₂ emissions/ removals	Emissions				
		CH ₄	N ₂ O	NO _x	CO	NMVOCs
(Gg)						
3 AFOLU						
3A Livestock						
3A1 Enteric Fermentation						
3A1a Cattle						
3A1ai Dairy Cows						
3A1aia Other Cattle						
3A1b Buffalo						
3A1c Sheep						
3A1d Goats						
3A1e Camels						
3A1f Horses						
3A1g Mules and Asses						
3A1h Swine						
3A1j Other (please specify)						
3A2 Manure Management ⁽¹⁾						
3A2a Cattle						
3A2ai Dairy Cows						
3A2aia Other Cattle						
3A2b Buffalo						
3A2c Sheep						
3A2d Goats						
3A2e Camels						
3A2f Horses						
3A2g Mules and Asses						
3A2h Swine						
3A2i Poultry						
3A2j Other (please specify)						
3A2k Co-digestates (on-farm)						
3A2ki Crop residues						
3A2kii Energy crops						
3A2kiii Other						
3B Land						
3B1 Forest Land						
3B1a Forest Land Remaining Forest Land						
3B1b Land Converted to Forest Land						
3B1bi Cropland Converted to Forest Land						
3B1bii Grassland Converted to Forest Land						
3B1biii Wetlands Converted to Forest Land						
3B1biv Settlements Converted to Forest Land						
3B1bv Other Land Converted to Forest Land						
3B2 Cropland						
3B2a Cropland Remaining Cropland						
3B2b Land Converted to Cropland						
3B2bi Forest Land Converted to Cropland						
3B2bii Grassland Converted to Cropland						
3B2biii Wetlands Converted to Cropland						
3B2biv Settlements Converted to Cropland						
3B2bv Other Land Converted to Cropland						
3B3 Grassland						
3B3a Grassland Remaining Grassland						
3B3b Land Converted to Grassland						
3B3bi Forest Land Converted to Grassland						
3B3bii Cropland Converted to Grassland						
3B3biii Wetlands Converted to Grassland						
3B3biv Settlements Converted to Grassland						
3B3bv Other Land Converted to Grassland						

Table 3 AFOLU Sectoral Table (2 of 2) (Updated) (Continued)

Categories	Net CO ₂ emissions/removals	Emissions				
		CH ₄	N ₂ O	NO _x	CO	NMVOCs
(Gg)						
3B4 Wetlands						
3B4a Wetlands Remaining Wetlands						
3B4ai Peatlands Remaining Peatlands						
3B4aii Flooded Land Remaining Flooded Land						
3B4b Land Converted to Wetlands						
3B4bi Land Converted for Peat Extraction						
3B4bii Land Converted to Flooded Land						
3B4biii Land Converted to Other Wetlands						
3B5 Settlements						
3B5a Settlements Remaining Settlements						
3B5b Land Converted to Settlements						
3B5bi Forest Land Converted to Settlements						
3B5bii Cropland Converted to Settlements						
3B5biii Grassland Converted to Settlements						
3B5biv Wetlands Converted to Settlements						
3B5bv Other Land Converted to Settlements						
3B6 Other Land						
3B6a Other Land Remaining Other Land						
3B6b Land Converted to Other Land						
3B6bi Forest Land Converted to Other Land						
3B6bii Cropland Converted to Other Land						
3B6biii Grassland Converted to Other Land						
3B6biv Wetlands Converted to Other Land						
3B6bv Settlements Converted to Other Land						
3C Aggregate Sources and Non-CO₂ Emissions Sources on Land ⁽²⁾						
3C1 Biomass Burning						
3C1a Biomass Burning in Forest Land						
3C1b Biomass Burning in Cropland						
3C1c Biomass Burnings in Grassland						
3C1d Biomass Burnings in All Other Land						
3C2 Liming						
3C3 Urea Fertilization						
3C4 Direct N₂O Emissions from Managed Soils ⁽³⁾						
3C5 Indirect N₂O Emissions from Managed Soils						
3C6 Indirect N₂O Emissions from Manure Management						
3C7 Rice cultivation						
3C8 Other (please specify)						
3D Other						
3D1 Harvested Wood Products						
3D2 Other (please specify)						

(1) Indirect N₂O emissions are not included here (see category 3C6).

(2) If CO₂ emissions from Biomass Burning are not already included in Table 3.2 (Carbon stock changes background table), they should be reported here.

(3) Countries may report by land categories if they have the information.

* Cells to report emissions of NO_x, CO, and NMVOC have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

Table 3.1 AFOLU Background Table: 3A1 - 3A2 Agriculture/Livestock

Categories	Activity data		Emissions	
			CH ₄	N ₂ O
	(number of animals)		(Gg)	
3A Livestock				
3A1 Enteric Fermentation				
3A1a Cattle				
3A1ai Dairy Cows				
3A1aii Other Cattle				
3A1b Buffalo				
3A1c Sheep				
3A1d Goats				
3A1e Camels				
3A1f Horses				
3A1g Mules and Asses				
3A1h Swine				
3A1j Other (please specify)				
3A2 Manure Management ^(1,2)				
3A2a Cattle				
3A2ai Dairy Cows				
3A2aii Other Cattle				
3A2b Buffalo				
3A2c Sheep				
3A2d Goats				
3A2e Camels				
3A2f Horses				
3A2g Mules and Asses				
3A2h Swine				
3A2i Poultry				
3A2j Other (please specify)				
	Total dry mass (kg/year)	Total N (kg N/yr)		
3A2k Co-digestates (on-farm)				
3A2ki Crop residues				
3A2kii Energy crops				
3A2kiii Other				

(1) Indirect N₂O emissions are not included here.

(2) Includes inputs from co-digestion of residues and crops used in the production of biogas.

Documentation box:

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Table 3.2 AFOLU Background Table: 3B Carbon stock changes in FOLU (1 of 2)

Categories	Activity data		Net carbon stock change and CO ₂ emissions									Net CO ₂ emissions (Gg CO ₂)
	Total area	Thereof: Area of organic soils	Biomass				Dead organic matter			Soils		
			Increase	Decrease	Carbon emitted as CH ₄ and CO from fires ⁽¹⁾	Net carbon stock change	Net carbon stock change	Carbon emitted as CH ₄ and CO from fires ⁽¹⁾	Net carbon stock change	Net carbon stock change in mineral soils ⁽²⁾	Carbon loss from drained organic soils	
	(ha)		(Gg C)									
3B Land												
3B1 Forest Land												
3B1a Forest Land Remaining Forest Land												
3B1b Land Converted to Forest Land												
3B1bi Cropland Converted to Forest Land												
3B1bii Grassland Converted to Forest Land												
3B1biii Wetlands Converted to Forest Land												
3B1biv Settlements Converted to Forest Land												
3B1bv Other Land Converted to Forest Land												
3B2 Cropland												
3B2a Cropland Remaining Cropland												
3B2b Land Converted to Cropland												
3B2bi Forest Land Converted to Cropland												
3B2bii Grassland Converted to Cropland												
3B2biii Wetlands Converted to Cropland												
3B2biv Settlements Converted to Cropland												
3B2bv Other Land Converted to Cropland												
3B3 Grassland												
3B3a Grassland Remaining Grassland												
3B3b Land Converted to Grassland												
3B3bi Forest Land Converted to Grassland												
3B3bii Cropland Converted to Grassland												
3B3biii Wetlands Converted to Grassland												
3B3biv Settlements Converted to Grassland												
3B3bv Other Land Converted to Grassland												
3B4 Wetlands ⁽³⁾												
3B5 Settlements												

Table 3.2 AFOLU Background Table: 3B Carbon stock changes in FOLU (2 of 2) (Continued)

Categories	Activity data		Net carbon stock change and CO ₂ emissions									Net CO ₂ emissions (Gg CO ₂)	
	Total area	Thereof: Area of organic soils	Biomass				Dead organic matter			Soils			
			Increase	Decrease	Carbon emitted as CH ₄ and CO from fires ⁽¹⁾	Net carbon stock change	Net carbon stock change	Carbon emitted as CH ₄ and CO from fires ⁽¹⁾	Net carbon stock change	Net carbon stock change in mineral soils ⁽²⁾	Carbon loss from drained organic soils		
	(ha)		(Gg C)										(Gg CO ₂)
3B5a	Settlements Remaining	Settlements											
3B5b	Land Converted to	Settlements											
3B5bi	Forest Land Converted to	Settlements											
3B5bii	Cropland Converted to	Settlements											
3B5biii	Grassland Converted to	Settlements											
3B5biv	Wetlands Converted to	Settlements											
3B5bv	Other Land Converted to	Settlements											
3B6	Other Land												
3B6a	Other Land Remaining	Other Land											
3B6b	Land Converted to	Other Land											
3B6bi	Forest Land Converted to	Other Land											
3B6bii	Cropland Converted to	Other Land											
3B6biii	Grassland Converted to	Other Land											
3B6biv	Wetlands Converted to	Other Land											
3B6bv	Settlements Converted to	Other Land											

- (1) Where the carbon contained in the emissions of CH₄ and CO is significant part of the sectoral emissions, this should be copied from the corresponding columns in the Sectoral Background Table 3.4. This amount of carbon emitted as CH₄ and CO is then subtracted from carbon stock change to avoid double counting (see Volume 4, Section 2.2.3).
- (2) The activity data used for this column correspond to the difference between the column Area and the Area of organic soils.
- (3) CO₂ Emissions from Wetlands are reported in a separate background table (Table 3.3) that includes all gases emitted from Wetlands.

Documentation box:

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Table 3.3 AFOLU Background Table: Emissions in Wetlands (3B4) (Updated)

Categories	Activity data	Emissions		
	Area	CO ₂	CH ₄	N ₂ O
	(ha)	(Gg)		
3B4 Wetlands				
3B4a Wetlands Remaining Wetlands				
3B4ai Peatlands Remaining Peatlands				
3B4aii Flooded Land Remaining Flooded Land				
3B4b Land Converted to Wetlands				
3B4bi Land Converted for Peat Extraction				
3B4bii Land Converted to Flooded Land				
3B4biii Land Converted to Other Wetlands				

Documentation box:

Table 3.4 AFOLU Background Table: Biomass Burning (3C1) (1 of 2)

Categories ⁽¹⁾	Activity data			Emissions							Information item: Carbon emitted as CH ₄ and CO ⁽⁵⁾	
	Description ⁽²⁾	Unit	Values	CO ₂ ⁽³⁾	CH ₄ ⁽⁴⁾		N ₂ O	CO ⁽⁴⁾		NO _x	Biomass	DOM
		(ha or kg dm)			Biomass	DOM		Biomass	DOM			
3C1 Biomass Burning												
3C1a Biomass Burning in Forest Land												
Controlled Burning												
Wildfires												
3C1b Biomass Burning in Cropland												
Biomass Burning in Cropland Remaining Cropland												
Controlled Burning												
Wildfires												
Biomass burning in Forest Land Converted to Cropland												
Controlled Burning												
Wildfires												
Biomass Burning in Non Forest Land Converted to Cropland												
Controlled Burning												
Wildfires												
3C1c Biomass Burning in Grassland												
Burning in Grassland Remaining Grassland												
Controlled Burning												
Wildfires												
Burning in Forest Land Converted to Grassland												
Controlled Burning												
Wildfires												
Burning in Non Forest Land Converted to Grassland												
Controlled Burning												
Wildfires												
3C1d Biomass Burning in All Other Land												
Biomass Burning in Other Land Remaining All Other Land												
Controlled Burning												
Wildfires												

Table 3.4 AFOLU Background Table: Biomass Burning (3C1) (2 of 2) (Continued)

Categories ⁽¹⁾	Activity data			Emissions							Information item: Carbon emitted as CH ₄ and CO ⁽⁵⁾	
	Description ⁽²⁾	Unit	Values	CO ₂ ⁽³⁾	CH ₄ ⁽⁴⁾		N ₂ O	CO ⁽⁴⁾		NO _x	Biomass	DOM
		(ha or kg dm)			Biomass	DOM		Biomass	DOM			
Biomass Burning in Forest Land Converted to All Other Land												
Controlled Burning												
Wildfires												
Biomass Burning in Non Forest Land Converted to All Other Land												
Controlled Burning												
Wildfires												

- (1) Parties should report both Controlled/Prescribed Burning and Wildfires emissions, where appropriate, in a separate manner.
- (2) For each land type data should be selected between area burned or biomass burned. Units for area will be in hectare (ha) and for biomass burned in kilogram dry matter (kg dm).
- (3) If CO₂ emissions from biomass burning are not already included in Table 3.2 (Carbon stock changes background table), they should be reported here. Carbon stock changes associated with biomass burning should not also be reported in Table 3.2 to avoid double counting.
- (4) CH₄ and CO emissions from biomass burning and DOM are reported separately.
- (5) Where the carbon contained in the emissions of CH₄ and CO is a significant part of the sectoral emissions this should be transferred to the corresponding columns in the Sectoral Background Table 3.2. This amount of carbon emitted as CH₄ and CO is then subtracted from carbon stock change to avoid double counting. The conversion factors to convert CH₄ and CO to C (as input to Table 3.2) are 12/16 for CH₄ and 12/28 for CO. (see Volume 4, Section 2.2.3).

Documentation box:

Table 3.5 AFOLU Background Table: CO₂ emissions from Liming (3C2)

Categories	Activity data			Emissions
	Limestone CaCO ₃	Dolomite CaMg(CO ₃) ₂	Total amount of lime applied ⁽²⁾	CO ₂
	(Mg/yr)		(Mg/yr)	(Gg)
3C2 Liming ⁽¹⁾				
Forest Land				
Cropland				
Grassland				
Wetland				
Other Land				
Other				

(1) If countries are not able to separate liming application for different land use categories, they should use the main category "Liming". Also, if a country has data broken down to limestone and dolomite at national level, it can be reported under this category.

(2) A country may report aggregate estimates for total lime applications when data are not available for limestone and dolomite.

Documentation box:

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Table 3.6 AFOLU Background Table: CO₂ emissions from Urea Fertilization (3C3)

Categories	Activity data	Emissions
	Total amount of urea applied	CO ₂
	(Mg/yr)	(Gg)
3C3 Urea applied ⁽¹⁾		
Forest Land		
Cropland		
Grassland		
Settlements		
Other Land		

(1) If countries are not able to separate urea application for different land use categories, they should use the main category "Urea applied".

Documentation box:

Table 3.7 AFOLU Background Table: Direct N₂O emissions from Managed Soils (3C4)

Categories ⁽¹⁾	Activity data	Emissions
	Total amount of nitrogen applied	N ₂ O
	(Gg N/yr)	(Gg)
3C4 Direct N₂O Emissions from Managed Soils		
Inorganic N fertilizer application		
Forest Land		
Cropland		
Grassland		
Settlements		
Other Land		
Organic N applied as fertilizer (manure and organic wastes)		
Forest Land		
Cropland		
Grassland		
Settlements		
Other Land		
Urine and dung N deposited on pasture, range and paddock by grazing animals ⁽²⁾		
N in crop residues ⁽³⁾		
	Area	
	(ha)	
N mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils ⁽³⁾		
Drainage/management of organic soils (i.e., Histosols)		

(1) Countries will report at the aggregation level if their activity data allows them within each category. If country has disaggregated data by land use, reporting is also possible using this table.

(2) Only for Grassland.

(3) Only for Cropland.

Documentation box:

Table 3.8 AFOLU Background Table: Indirect N₂O emissions from Managed Soils and Manure Management (3C5 and 3C6)

Categories ⁽¹⁾	Activity data	Emissions
	Total amount of nitrogen applied / excreted	N ₂ O
	(Gg N/yr)	(Gg)
3C5 Indirect N₂O emissions from Managed Soils		
From atmospheric deposition of N volatilized from managed soils from agricultural inputs of N (synthetic N fertilizers; organic N applied as fertilizer; urine and dung N deposited on pasture, range and paddock by grazing animals ⁽²⁾)		
Forest Land		
Cropland		
Grasslands		
Settlements		
Other Land		
From N leaching/runoff from managed soils (i.e. from synthetic N fertilizers; organic N applied as fertilizer; urine and dung N deposited on pasture, range and paddock by grazing animals ⁽²⁾ ; N in crop residues ⁽³⁾ ; and N mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils ⁽³⁾)		
Forest Land		
Cropland		
Grasslands		
Settlements		
Other Land		
3C6 Indirect N₂O emissions from Manure Management		

- (1) Countries will report at the aggregation level if their activity data allows them within each category. If country has disaggregated data by land use, reporting is also possible using this table.
- (2) Only for Grassland.
- (3) Only for Cropland.

Documentation box:

Table 3.9 AFOLU Background Table: Non-CO₂ GHG emissions not included elsewhere (3C7 and 3C8)

Categories	Activity data	Emissions	
		CH ₄	N ₂ O
	(ha)	(Gg)	
3C7 Rice cultivation ⁽¹⁾			
3C8 Other (please specify)			

(1) If a country wishes to report direct N₂O emissions from N fertilizer application to rice field, it should be reported here. Otherwise, in Table 3.7.

Documentation box:

Table 3.10 AFOLU Background Table: Harvested Wood Products (3D1) - Annual carbon HWP contribution to total AFOLU CO₂ removals and emissions and background information

Inventory year	Variable number										
	1A	1B	2A	2B	3	4	5	6	7	8	9
	Annual Change in stock of HWP in use from consumption	Annual Change in stock of HWP in SWDS from consumption	Annual Change in stock of HWP in use produced from domestic harvest	Annual Change in stock of HWP in SWDS produced from domestic harvest	Annual Imports of wood, and paper products + wood fuel, pulp, recovered paper, roundwood/ chips	Annual Exports of wood, and paper products + wood fuel, pulp, recovered paper, roundwood/ chips	Annual Domestic Harvest	Annual release of carbon to the atmosphere from HWP consumption (from fuelwood & products in use and products in SWDS)	Annual release of carbon to the atmosphere from HWP (including fuelwood) where wood came from domestic harvest (from products in use and products in SWDS)	HWP Contribution to AFOLU CO ₂ emissions/ removals	Approach used to estimate HWP Contribution
	$\Delta C_{HWP\ IU\ DC}$	$\Delta C_{HWP\ SWDS\ DC}$	$\Delta C_{HWP\ IU\ DH}$	$\Delta C_{HWP\ SWDS\ DH}$	P_{IM}	P_{EX}	H	$\uparrow C_{HWP\ DC}$	$\uparrow C_{HWP\ DH}$		
	Gg C /yr									Gg CO ₂ /yr	
1990											
.....											
<p>Report Col 6 or 7 as needed for the approach used. Col 6 or 7 may be computed using Cols 1 through 5 or by a Tier 3 method. Always report Cols 3, 4, and 5. Report Cols 1A, 1B, 2A, 2B if they are used.</p> <p>The HWP contribution and approach should be reported in Columns 8 and 9 together with a description of the approach chosen and main assumptions in the Documentation Box</p> <p>Additional Variables calculated and used should be reported to enhance the transparency of the results. (e.g., CH₄ from SWDS if this was used) Add additional columns if needed.</p> <p>Note: $\uparrow C_{HWP\ DC} = H + P_{IM} - P_{EX} - \Delta C_{HWP\ IU\ DC} - \Delta C_{HWP\ SWDS\ DC}$ AND $\uparrow C_{HWP\ DH} = H - \Delta C_{HWP\ IU\ DH} - \Delta C_{HWP\ SWDS\ DH}$</p>											

Documentation box:

Table 4 Waste Sectoral Table

Categories	CO ₂	CH ₄	N ₂ O	NO _x	CO	NM VOC ⁽¹⁾	SO ₂
	(Gg)						
4 WASTE							
4A Solid Waste Disposal							
4A1 Managed Waste Disposal Sites							
4A2 Unmanaged Waste Disposal Sites							
4A3 Uncategorised Waste Disposal Sites							
4B Biological Treatment of Solid Waste							
4C Incineration and Open Burning of Waste							
4C1 Waste Incineration							
4C2 Open Burning of Waste							
4D Wastewater Treatment and Discharge							
4D1 Domestic Wastewater Treatment and Discharge							
4D2 Industrial Wastewater Treatment and Discharge							
4E Other (please specify) ⁽²⁾							

(1) Countries may wish to report emissions of NMVOCs from waste disposal sites and wastewater treatment.

(2) Insert additional rows if necessary.

* Cells to report emissions of NO_x, CO, NMVOC and SO₂ have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box:

Table 4.1 Waste Background Table: CO₂, CH₄, N₂O emissions (Updated)

Categories	Type of activity data	Unit	Emission factor			Emissions		
			CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O
			(Gg/unit activity data)			(Gg)		
4A Solid Waste Disposal ⁽¹⁾								
4A1 Managed Waste Disposal Sites								
4A2 Unmanaged Waste Disposal Sites								
4A3 Uncategorised Waste Disposal Sites								
4B Biological Treatment of Solid Waste								
4C Incineration and Open Burning of Waste ⁽²⁾								
4C1 Waste Incineration								
4C2 Open Burning of Waste								
4D Wastewater Treatment and Discharge								
4D1 Domestic Wastewater Treatment and Discharge								
CH ₄ emissions ⁽³⁾								
N ₂ O emissions ⁽⁴⁾								
4D2 Industrial Wastewater Treatment and Discharge								
CH ₄ emissions ⁽³⁾								
N ₂ O emissions ⁽⁴⁾								
4E Other (please specify) ⁽⁵⁾								

- (1) Amount of waste deposited in the SWDS in the inventory year. [mil. tonnes of wet waste/yr] Specification by waste type is encouraged. Emission factor data (parameters used in the calculations) should be reported in FOD parameter sheet or reported separately, when other methods are used.
- (2) Waste burned for energy is reported in the Energy Sector under 1A. Information on reporting of waste combustion in the Energy Sector should be given in the documentation box.
- (3) Activity data for estimation of CH₄ emissions is total amount of organically degradable material in the wastewater (TOW) [Gg BOD/yr or Gg COD/yr].
- (4) Activity data for estimation of N₂O emissions is total amount of nitrogen in wastewater (TN) [Gg N/yr] and total amount of nitrogen in effluent (N_{EFFLUENT}) [Gg N/yr]
- (5) Insert additional rows if necessary.

Documentation box:

Table 4.2 Waste Background Table: CH₄ recovery ^{(1) (2)}

Categories	Unit	CH ₄	
	Gg CH ₄	Flared ⁽³⁾	Energy recovery ⁽⁴⁾
4A Solid Waste Disposal			
4B Biological Treatment of Solid Waste			
4D Wastewater Treatment and Discharge			
4D1 Domestic Wastewater Treatment and Discharge			
4D2 Industrial Wastewater Treatment and Discharge			
4E Other (please specify) ⁽⁵⁾			

- (1) The amount of CH₄ recovery should be reported in this table even if the gas is used for energy.
- (2) Flaring and energy recovery should be reported separately, if possible.
- (3) Default EF for CH₄ and N₂O from flaring is zero. The CO₂ emissions are not reported as the gas is of biogenic origin.
- (4) When CH₄ recovered is used for energy, the emissions from the combustion of the gas should be reported in the Energy sector (under 1A).
Default EF for CH₄ and N₂O from the combustion of the gas is zero.
- (5) Insert additional rows if necessary.

Documentation box:

Table 4.3 Waste Background Table: Long-term storage of carbon Information items

Categories	C ⁽¹⁾
	(Gg)
Information items⁽²⁾	
Long-term storage of carbon in waste disposal sites	
Annual change in total long-term storage of carbon stored	
Annual change in long-term storage of carbon in HWP waste ⁽³⁾	

- (1) Report in mass carbon.
- (2) These items are listed for information only and will not be added to the totals. The carbon should be converted to carbon dioxide.
- (3) Carbon stored in wood, paper, cardboard, garden (yard) and park (equal to the annual change in stock of HWP in SWDS from consumption, reported in Table 3.10, Column 1B).

Documentation box:

Table 5A Cross-sectoral Table: Indirect emissions of N₂O ⁽¹⁾⁽²⁾

Categories	Activity data / source emissions		Emissions
	Emissions NH ₃	Emissions NO _x	N ₂ O
	(Gg NH ₃)	(Gg NO ₂ -equivalents)	(Gg N ₂ O)
1 Energy			
2 Industrial Processes and Product Use			
3 Agriculture, Forestry and Other Land Use			
3C5 Indirect N ₂ O Emissions from managed soils			
3C6 Indirect N ₂ O Emissions from manure management			
Other ⁽³⁾ (Please specify)			
4 Waste			
5 Other (Please specify) ⁽⁴⁾			

(1) 90 to 99 percent of ammonia emissions originate in the Agriculture Sector. Other emission sources for ammonia are in the Energy Sector (such as combustion, petroleum refining, catalyst cars in the transport sector), in the Industrial Processes and Product Use Sector in particular from production of ammonia, nitric acid, ammonium nitrate and phosphate, urea, and fertilizers), and from metal industry (coke ovens battery operations), and also in the Waste Sector (solid waste disposal and waste incineration).

(2) Indirect N₂O emissions from nitrogen leaching /runoff from managed soils in AFOLU categories are included in Table 3.8.

(3) Any other sources not included in 3C5 and 3C6.

(4) Insert additional rows if necessary.

Documentation box:

Table 6A Trends of CO₂ (1 of 3) (Updated) (Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
1 ENERGY																					
1A Fuel Combustion Activities																					
1A1 Energy Industries																					
1A2 Manufacturing Industries and Construction																					
1A3 Transport																					
1A4 Other Sectors																					
1A5 Non-Specified																					
1B Fugitive Emissions from Fuels																					
1B1 Solid Fuels																					
1B2 Oil and Natural Gas																					
1B3 Other Emissions from Energy Production																					
1C Carbon Dioxide Transport and Storage																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E1 Integrated Circuit or Semiconductor																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					

Table 6A Trends of CO₂ (2 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					
2H2 Food and Beverages Industry																					
2H3 Other (please specify)																					
3 AGRICULTURE, FORESTRY AND OTHER LAND USE																					
3A Livestock																					
3A1 Enteric Fermentation																					
3A2 Manure Management																					
3B Land																					
3B1 Forest Land																					
3B2 Cropland																					
3B3 Grassland																					
3B4 Wetlands																					
3B5 Settlements																					
3B6 Other Land																					
3C Aggregate Sources and Non-CO₂ Emissions Sources on Land																					
3C1 Biomass Burning																					
3C2 Liming																					
3C3 Urea Application																					
3C4 Direct N ₂ O Emissions from Managed Soils																					
3C5 Indirect N ₂ O Emissions from Managed Soils																					
3C6 Indirect N ₂ O Emissions from Manure Management																					
3C7 Rice cultivation																					
3C8 Other (please specify)																					
3D Other																					
3D1 Harvested Wood Products																					
3D2 Other (please specify)																					
4 WASTE																					
4A Solid Waste Disposal																					
4A1 Managed Waste Disposal Sites																					
4A2 Unmanaged Waste Disposal Sites																					
4A3 Uncategorised Waste Disposal Sites																					
4B Biological Treatment of Solid Waste																					
4C Incineration and Open Burning of Waste																					
4C1 Waste Incineration																					
4C2 Open Burning of Waste																					

Table 6A Trends of CO₂ (3 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
4D Wastewater Treatment and Discharge																					
4D1 Domestic Wastewater Treatment and Discharge																					
4D2 Industrial Wastewater Treatment and Discharge																					
4E Other (please specify)																					
5 OTHER																					
5A Indirect N₂O emissions from the Atmospheric Deposition of Nitrogen in NO_x and NH₃																					
5B Other (please specify)																					
Memo items																					
International Bunkers																					
International Aviation (International Bunkers)																					
International Water-borne Transport (International Bunkers)																					
Multilateral Operations																					
Information items ⁽¹⁾																					
CO ₂ from Biomass Burning for Energy Production																					
CO ₂ captured																					
For domestic storage																					
For storage in other countries																					
Long-term storage of carbon in waste disposal sites																					
Annual change in total long-term storage of carbon stored																					
Annual change in long-term storage of carbon in HWP waste																					
Other (please specify)																					

(1) Here, both emissions and removals can be listed.

Table 6B Trends of CH₄ (1 of 3) (Updated) (Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
1 ENERGY																					
1A Fuel Combustion Activities																					
1A1 Energy Industries																					
1A2 Manufacturing Industries and Construction																					
1A3 Transport																					
1A4 Other Sectors																					
1A5 Non-Specified																					
1B Fugitive Emissions from Fuels																					
1B1 Solid Fuels																					
1B2 Oil and Natural Gas																					
1B3 Other Emissions from Energy Production																					
1C Carbon Dioxide Transport and Storage																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E1 Integrated Circuit or Semiconductor																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					

Table 6B Trends of CH₄ (2 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					
2H2 Food and Beverages Industry																					
2H3 Other (please specify)																					
3 AGRICULTURE, FORESTRY AND OTHER LAND USE																					
3A Livestock																					
3A1 Enteric Fermentation																					
3A2 Manure Management																					
3B Land																					
3B1 Forest Land																					
3B2 Cropland																					
3B3 Grassland																					
3B4 Wetlands																					
3B5 Settlements																					
3B6 Other Land																					
3C Aggregate Sources and Non-CO₂ Emissions Sources on Land																					
3C1 Biomass Burning																					
3C2 Liming																					
3C3 Urea Application																					
3C4 Direct N ₂ O Emissions from Managed Soils																					
3C5 Indirect N ₂ O Emissions from Managed Soils																					
3C6 Indirect N ₂ O Emissions from Manure Management																					
3C7 Rice cultivation																					
3C8 Other (please specify)																					
3D Other																					
3D1 Harvested Wood Products																					
3D2 Other (please specify)																					
4 WASTE																					
4A Solid Waste Disposal																					
4A1 Managed Waste Disposal Sites																					
4A2 Unmanaged Waste Disposal Sites																					
4A3 Uncategorised Waste Disposal Sites																					
4B Biological Treatment of Solid Waste																					
4C Incineration and Open Burning of Waste																					
4C1 Waste Incineration																					
4C2 Open Burning of Waste																					

Table 6B Trends of CH₄ (3 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
4D Wastewater Treatment and Discharge																					
4D1 Domestic Wastewater Treatment and Discharge																					
4D2 Industrial Wastewater Treatment and Discharge																					
4E Other (please specify)																					
5 OTHER																					
5A Indirect N₂O emissions from the Atmospheric Deposition of Nitrogen in NO_x and NH₃																					
5B Other (please specify)																					
Memo items																					
International Bunkers																					
International Aviation (International Bunkers)																					
International Water-borne Transport (International Bunkers)																					
Multilateral Operations																					
Information items ⁽¹⁾																					
CO ₂ from Biomass Burning for Energy Production																					
CO ₂ captured																					
For domestic storage																					
For storage in other countries																					
Long-term storage carbon in waste disposal sites																					
Annual change in total long-term storage of carbon stored																					
Annual change in long-term storage of carbon in HWP waste																					
Other (please specify)																					

(1) Here, both emissions and removals can be listed.

Table 6C Trends of N₂O (1 of 3) (Updated) (Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
1 ENERGY																					
1A Fuel Combustion Activities																					
1A1 Energy Industries																					
1A2 Manufacturing Industries and Construction																					
1A3 Transport																					
1A4 Other Sectors																					
1A5 Non-Specified																					
1B Fugitive Emissions from Fuels																					
1B1 Solid Fuels																					
1B2 Oil and Natural Gas																					
1B3 Other Emissions from Energy Production																					
1C Carbon Dioxide Transport and Storage																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E1 Integrated Circuit or Semiconductor																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					

Table 6C Trends of N₂O (2 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					
2H2 Food and Beverage Industry																					
2H3 Other (please specify)																					
3 AGRICULTURE, FORESTRY AND OTHER LAND USE																					
3A Livestock																					
3A1 Enteric Fermentation																					
3A2 Manure Management																					
3B Land																					
3B1 Forest land																					
3B2 Cropland																					
3B3 Grassland																					
3B4 Wetlands																					
3B5 Settlements																					
3B6 Other land																					
3C Aggregate Sources and non-CO₂ Emissions Sources on Land																					
3C1 Biomass Burning																					
3C2 Liming																					
3C3 Urea Application																					
3C4 Direct N ₂ O Emissions from Managed Soils																					
3C5 Indirect N ₂ O Emissions from Managed Soils																					
3C6 Indirect N ₂ O Emissions from Manure Management																					
3C7 Rice cultivation																					
3C8 Other (please specify)																					
3D Other																					
3D1 Harvested Wood Products																					
3D2 Other (please specify)																					
4 WASTE																					
4A Solid Waste Disposal																					
4A1 Managed Waste Disposal Sites																					
4A2 Unmanaged Waste Disposal Sites																					
4A3 Uncategorised Waste Disposal Sites																					
4B Biological Treatment of Solid Waste																					
4C Incineration and Open Burning of Waste																					
4C1 Waste Incineration																					
4C2 Open Burning of Waste																					

Table 6C Trends of N₂O (3 of 3) (Updated) (Continued)

(Gg)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
4D Wastewater Treatment and Discharge																					
4D1 Domestic Wastewater Treatment and Discharge																					
4D2 Industrial Wastewater Treatment and Discharge																					
4E Other (please specify)																					
5 OTHER																					
5A Indirect N₂O emissions from the Atmospheric Deposition of Nitrogen in NO_x and NH₃																					
5B Other (please specify)																					
Memo items																					
International Bunkers																					
International Aviation (International Bunkers)																					
International Water-borne Transport (International Bunkers)																					
Multilateral Operations																					
Information items ⁽¹⁾																					
CO ₂ from Biomass Burning for Energy Production																					
CO ₂ captured																					
For domestic storage																					
For storage in other countries																					
Long-term storage of carbon in waste disposal sites																					
Annual change in total long-term storage of carbon stored																					
Annual change in long-term storage of carbon in HWP waste																					
Other (please specify)																					

(1) Here, both emissions and removals can be listed.

Table 6D Trends of HFCs (CO₂ equivalents (Gg)) (Updated)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvents Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E1 Integrated Circuit or Semiconductor																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					

2H1	Pulp and Paper Industry																						
2H2	Food and Beverages Industry																						
2H3	Other (please specify)																						

Table 6E Trends of PFCs (CO₂ equivalents (Gg)) (Updated)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					

2H2 Food and Beverages Industry																			
2H3 Other (please specify)																			

Table 6F Trends of SF₆ (CO₂ equivalents (Gg)) (Updated)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					

2H2 Food and Beverages Industry																				
2H3 2H3 Other (please specify)																				

Table 6G Trends of other gases ⁽¹⁾ (Gg) (Updated)

Categories	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	...	
Total National Emissions and Removals																					
2 INDUSTRIAL PROCESSES AND PRODUCT USE																					
2A Mineral Industry																					
2A1 Cement Production																					
2A2 Lime Production																					
2A3 Glass Production																					
2A4 Other Process Uses of Carbonates																					
2A5 Other (please specify)																					
2B Chemical Industry																					
2B1 Ammonia Production																					
2B2 Nitric Acid Production																					
2B3 Adipic Acid Production																					
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production																					
2B5 Carbide Production																					
2B6 Titanium Dioxide Production																					
2B7 Soda Ash Production																					
2B8 Petrochemical and Carbon Black Production																					
2B9 Fluorochemical Production																					
2B10 Hydrogen Production																					
2B11 Other (please specify)																					
2C Metal Industry																					
2C1 Iron and Steel Production																					
2C2 Ferroalloys Production																					
2C3 Aluminium Production																					
2C4 Magnesium Production																					
2C5 Lead Production																					
2C6 Zinc Production																					
2C7 Rare Earths Production																					
2C8 Other (please specify)																					
2D Non-Energy Products from Fuels and Solvent Use																					
2D1 Lubricant Use																					
2D2 Paraffin Wax Use																					
2D3 Solvent Use																					
2D4 Other (please specify)																					
2E Electronics Industry																					
2E1 Integrated Circuit or Semiconductor																					
2E2 Displays																					
2E3 Photovoltaics																					
2E4 Microelectromechanical systems (MEMS)																					
2E5 Other (please specify)																					
2F Product Uses as Substitutes for Ozone Depleting Substances																					
2F1 Refrigeration and Air Conditioning																					
2F2 Foam Blowing Agents																					
2F3 Fire Protection																					
2F4 Aerosols																					
2F5 Solvents																					
2F6 Other Applications (please specify)																					
2G Other Product Manufacture and Use																					
2G1 Electrical Equipment																					
2G2 SF ₆ and PFCs from Other Product Uses																					
2G3 N ₂ O from Other Product Uses																					
2G4 Other (please specify)																					
2H Other																					
2H1 Pulp and Paper Industry																					
2H2 Food and Beverages Industry																					
2H3 Other (please specify)																					

(1) This includes all other GHGs including fluorinated gases.

Table 7A Uncertainties

IPCC category	Gas	Base year emissions /removals	Year t emissions /removals	Activity data uncertainty		Emission factor /estimation parameter uncertainty (combined if more than one estimation parameter is used)		Combined uncertainty		Contribution to variance in Year t	Inventory trend in national emissions for year t increase with respect to base year	Uncertainty introduced into the trend in total national emissions with respect to Base Year		Approach and Comments
				(-) %	(+) %	(-) %	(+) %	(-) %	(+) %			(fraction)	(% of base year)	
E.g. 1.A.1. Energy Industries Fuel 1	CO ₂	Gg CO ₂ equivalent	Gg CO ₂ equivalent											
E.g. 1.A.1. Energy Industries Fuel 2	CO ₂													
Etc...	...													
Total														

Table 7B Summary of Key Category analysis

Quantitative method used: Approach 1/Approach 1 and Approach 2

IPCC Category Code	IPCC Category	Greenhouse Gas	Identification criteria ⁽¹⁾	Comments ⁽²⁾

(1) The notation keys to be used for this column:

- L1 = key category according to Approach 1 Level Assessment
- L2 = key category according to Approach 2 Level Assessment
- T1 = key category according to Approach 1 Trend Assessment
- T2 = key category according to Approach 2 Trend Assessment
- Q = key category according to qualitative criteria

(2) In the column for comments, reasons for a qualitative assessment can be provided.