ANNEX 1

WORKSHEETS

Contents

Annex 1 Worksheets
2A Mineral Industry A1.4
2A1 Cement Production A1.4
2A2 Lime Production A1.4
2A3 Glass Production A1.5
2A4 Other Process Uses of Carbonates A1.5
2B Chemical Industry A1.6
2B1 Ammonia Production A1.6
2B2 Nitric Acid Production A1.6
2B3 Adipic Acid Production A1.7
2B4 Caprolactam, Glyoxal and Glyoxylic Acid Production A1.7
2B5 Carbide Production A1.7
2B6 Titanium Dioxide Production A1.9
2B7 Soda Ash Production A1.10
2B8 Petrochemical and Carbon Black Production A1.10
2B9 Fluorochemical Production A1.15
2C Metal Industry A1.17
2C1 Iron and Steel Production A1.17
2C2 Ferroalloys Production A1.18
2C3 Aluminium Production A1.19
2C4 Magnesium Production A1.20
2C5 Lead Production A1.21
2C6 Zinc Production A1.21
2D Non-Energy Products from Fuels and Solvent Use A1.22
2D1 Lubricant Use A1.22
2D2 Paraffin Wax Use A1.22
2E Electronics Industry A1.23
2E1 Integrated Circuit or Semiconductor A1.23
2E2 TFT Flat Panel Display A1.24
2E3 Photovoltaics A1.24
2E4 Heat Transfer Fluid A1.25
2F Product Uses as Substitutes for Ozone Depleting Substances A1.26
2F1 Refrigeration and Air Conditioning A1.26
2F2 Foam Blowing Agents A1.26
2F3 Fire Protection A1.27
2F4 Aerosols A1.27

2F5 Solvents A1.28
2F6 Other Applications A1.28
2G Other Product Manufacture and Use A1.29
2G1 Electrical Equipment A1.29
2G2 SF_6 and PFCs from Other Product Uses A1.31
2G3 N_2O from Product Uses A1.34

The worksheets in this annex are designed to enable users to perform at least the Tier 1 (and in some cases Tier 2) emission estimation for each category under IPPU Sector.

Sector	Industrial Processes and Product Use
Category	Mineral Industry - Cement Production
Category Code	2A1
Sheet	1 of 2

Individual Type of Cement Produced[1)]	A Mass of Individual Type of Cement Produced	B Clinker Fraction in Cement	C Mass of Clinker in the Individual Type of Cement Produced
	(tonne)	(fraction)	(tonne)
			C = A * B
Total			

1) Insert additional rows if more than two types of cement are produced.

Sector	Industrial Processes and Product Use
Category	Mineral Industry - Cement Production
Category Code	2A1
Sheet	2 of 2

D Imports for Consumption of Clinker	E Exports of Clinker	F Mass of Clinker Produced in the Country	G Emission Factor for the Clinker in the Particular Cement	H CO_2 Emissions	I CO_2 Emissions
(tonne)	(tonne)	(tonne)	(tonne CO_2/ tonne clinker)	(tonne CO_2)	(Gg CO_2)
		F = C – D + E		H = F * G	$I = H/10^3$

Sector	Industrial Processes and Product Use
Category	Mineral Industry - Lime Production
Category Code	2A2
Sheet	1 of 1

Type of Lime Produced[1), 2)]	A Mass of Lime Produced	B Emission Factor for Lime Production	C CO_2 Emissions	D CO_2 Emissions
	(tonne)	(tonne CO_2/ tonne lime)	(tonne CO_2)	(Gg CO_2)
			C = A * B	$D = C/10^3$
Total				

1) Insert additional rows if more than two types of lime are produced.

2) When country-specific information on lime production by type is not available, apply the default emission factor to national level lime production data. (See Equation 2.8 in Chapter 2 of this volume.)

Sector	Industrial Processes and Product Use
Category	Mineral Industry - Glass Production
Category Code	2A3
Sheet	1 of 1

A	B	C	D	E
Total Glass Production	Emission Factor for Glass Production	Average Annual Cullet Ratio	CO_2 Emissions	CO_2 Emissions
(tonne)	(tonne CO_2/ tonne glass)	(fraction)	(tonne CO_2)	(Gg CO_2)
			D = A * B * (1 – C)	$E = D/10^3$

Sector	Industrial Processes and Product Use
Category	Mineral Industry - Other Process Uses of Carbonates[1)]
Category Code	2A4
Sheet	1 of 1

Type of Use	A	B	C	D
	Mass of Carbonate Consumed	Emission Factor for Carbonate Consumption[3), 4)]	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/ tonne carbonate)	(tonne CO_2)	(Gg CO_2)
			C = A * B	$D = C/10^3$
Ceramics				
Other Uses of Soda Ash				
Non Metallurgical Magnesia Production				
Other[2)]				

1) Limestone and other carbonate materials also are consumed in a variety of other industries not covered in Chapter 2 of Volume 3. Examples include carbonates used as fluxes and slagging agents in metals smelting and refining (e.g., iron and steel production and base metals such as copper), and as inputs to the chemical industry (e.g., fertiliser). The methods outlined here for estimating emissions from the use of carbonates are applicable to these other industries as well. It is *good practice* to allocate emissions from the use of limestone, dolomite and other carbonates to the industrial source category where they are emitted (e.g., iron and steel production).

2) This row should contain estimates of emissions that do not fit into any of the major sources presented in Table 2.7 in Chapter 2 of Volume 3. Insert additional rows, if necessary.

3) For the Tier 1 method, it is consistent with *good practice* for inventory compilers to assume that 85 percent of carbonates consumed are limestone and 15 percent of carbonates consumed are dolomite. For the Tier 1 method for soda ash use (Other Uses of Soda Ash), this default fraction (0.85:0.15) should not be applied, and the default value for sodium carbonate should be used. (For default emission factors for various carbonates, see Table 2.1 in Chapter 2 of Volume 3.

4) It is suggested that inventory compilers ensure that data on carbonates reflect pure carbonates and not carbonate rock. If data are only available on carbonate rock, a default purity of 95% can be assumed. For clays a default carbonate content of 10% can be assumed, if no other information is available.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Ammonia Production
Category Code	2B1
Sheet	1 of 2

A	B	C	D	E
Amount of Ammonia Produced	Fuel Requirement for Ammonia Production	Carbon Content of Fuel	Carbon Oxidation Factor of Fuel	CO_2 Generated
(tonne)	(GJ/ tonne ammonia produced)	(kg C/GJ)	(fraction)	(kg CO_2)
				E = (A * B * C * D) * 44/12

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Ammonia Production
Category Code	2B1
Sheet	2 of 2

F	G	H	I
Amount of Urea Produced	CO_2 Recovered for Urea Production	CO_2 Emissions	CO_2 Emissions
(kg)	(kg CO_2)	(kg CO_2)	(Gg CO_2)
	G = F * 44/60	H = E – G	$I = H/10^6$

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Nitric Acid Production
Category Code	2B2
Sheet	1 of 1

A	B	C	D
Amount of Nitric Acid Production	Emission Factor	N_2O Emissions	N_2O Emissions
(tonne)	(kg N_2O/tonne nitric acid produced)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Adipic Acid Production
Category Code	2B3
Sheet	1 of 1

A	B	C	D
Amount of Adipic Acid Production	Emission Factor	N_2O Emissions	N_2O Emissions
(tonne)	(kg N_2O/tonne adipic acid produced)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Caprolactam, Glyoxal and Glyoxylic Acid Production
Category Code	2B4
Sheet	1 of 1

Chemical	A	B	C	D
	Amount of Chemical Production	Emission Factor	N_2O Emissions	N_2O Emissions
	(tonne)	(kg N_2O/tonne chemical produced)	(kg)	(Gg)
			C = A * B	$D = C/10^6$
Caprolactam				
Glyoxal				
Glyoxylic Acid				
Total				

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Carbide Production
Category Code	2B5
Sheet	1 of 6 CO_2 Emissions (calculation based on raw material used)

Type of Carbide Produced/	A	B	C	D
	Raw Material (Petroleum Coke) Consumption	Emission Factor[1)]	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/tonne raw material used)	(tonne CO_2)	(Gg CO_2)
			C = A * B	$D = C/10^3$
Silicon Carbide (SiC)				
Calcium Carbide (CaC_2)				

1) The emission factor needs to be adjusted to account for the carbon contained in the product. See Section 3.6.2.1 of Volume 3.

Note: Inventory compilers should use either this sheet (1 of 6) or the next sheet (2 of 6), not both.

Sector	**Industrial Processes and Product Use**
Category	**Chemical Industry - Carbide Production**
Category Code	**2B5**
Sheet	**2 of 6 CO_2 Emissions (calculation based on carbide produced)**

Type of Carbide Produced	A	B	C	D
	Carbide Produced	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/tonne carbide produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Silicon Carbide (SiC)				
Calcium Carbide (CaC_2)				

Note: Inventory compilers should use either this sheet (2 of 6) or the previous sheet (1 of 6), not both.

Sector	**Industrial Processes and Product Use**
Category	**Chemical Industry - Carbide Production**
Category Code	**2B5**
Sheet	**3 of 6 CO_2 Emissions from Use of CaC_2 in Acetylene Production**

A	B	C	D
Calcium Carbide Used in Acetylene Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
(tonne)	(tonne CO_2/tonne carbide used)	(tonne CO_2)	(Gg CO_2)
		C = A * B	D = C/10^3

Sector	**Industrial Processes and Product Use**
Category	**Chemical Industry - Carbide Production**
Category Code	**2B5**
Sheet	**4 of 6 CO_2 Emission (Total)**

A	B	C	D
CO_2 Emissions from Silicon Carbide (SiC) Production	CO_2 Emissions from Calcium Carbide (CaC_2) Production	CO_2 Emissions from Use of CaC_2 in Acetylene Production	Total CO_2 Emissions
(Gg CO_2)	(Gg CO_2)	(Gg CO_2)	(Gg CO_2)
From D in Sheet 1 of 6 or D in Sheet 2 of 6	From D in Sheet 1 of 6 or D in Sheet 2 of 6	From D in Sheet 3 of 6	D = A + B+ C

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Carbide Production
Category Code	2B5
Sheet	5 of 6 CH_4 Emissions from Silicon Carbide (SiC) Production (calculation based on raw material used)

A	B	C	D
Raw Material (Petroleum Coke) Consumption	Emission Factor	CH_4 Emissions	CH_4 Emissions
(tonne)	(kg CH_4/tonne raw material used)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Note: Inventory compilers should use either this sheet (5 of 6) or the next sheet (6 of 6), not both.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Carbide Production
Category Code	2B5
Sheet	6 of 6 CH_4 Emissions from Silicon Carbide (SiC) Production (calculation based on carbide produced)

A	B	C	D
Carbide Produced	Emission Factor	CH_4 Emissions	CH_4 Emissions
(tonne)	(kg CH_4/tonne carbide produced)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Note: Inventory compilers should use either this sheet (6 of 6) or the previous sheet (5 of 6), not both.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Titanium Dioxide Production
Category Code	2B6
Sheet	1 of 1

Type of production	A	B	C	D
	Amount of Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/tonne produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	$D = C/10^3$
Titanium Slag				
Synthetic Rutile				
Rutile TiO_2				
Total				

Sector	Industrial Processes and Product Use		
Category	Chemical Industry - Soda Ash Production		
Category Code	2B7		
Sheet	1 of 2 Natural Soda Ash (calculation based on trona used)		
A	B	C	D
Amount of Trona Utilised	Emission Factor	CO_2 Emissions	CO_2 Emissions
(tonne)	(tonne CO_2/tonne trona utilized)	(tonne CO_2)	(Gg CO_2)
		C = A * B	D = C/10^3
Note: Inventory compilers should use either this sheet (1 of 2) or the next sheet (2 of 2), not both.			

Sector	Industrial Processes and Product Use		
Category	Chemical Industry -Soda Ash Production		
Category Code	2B7		
Sheet	2 of 2 Natural Soda Ash (calculation based on production)		
A	B	C	D
Amount of Natural Soda Ash Produced	Emission Factor	CO_2 Emissions	CO_2 Emissions
(tonne)	(tonne CO_2/tonne natural soda ash produced)	(tonne CO_2)	(Gg CO_2)
		C = A * B	D = C/10^3
Note: Inventory compilers should use either this sheet (2 of 2) or the previous sheet (1 of 2), not both.			

Sector	Industrial Processes and Product Use			
Category	Chemical Industry - Petrochemical and Carbon Black Production			
Category Code	2B8			
Sheet	1 of 12 CO_2 Emissions from Methanol Production			
Type of Process/Type of Feedstock[1), 2)]	A	B	C	D
	Amount of Methanol Produced	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/tonne methanol produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Type of Process = [ ] (please specify)				
Feedstock = [ ] (Please specify)				
Type of Process = [ ] (please specify)				
Feedstock = [ ] (Please specify)				
Total				

1) For details of process types and feedstock types, see Table 3.12 in Chapter 3 of Volume 3. For the default process type and the default feedstock, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	2 of 12 CH_4 Emissions from Methanol Production

A	B	C	D
Amount of Methanol Produced	Emission Factor	CH_4 Emission	CH_4 Emission
(tonne)	(kg CH_4/tonne methanol produced)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	3 of 12 CO_2 Emissions from Ethylene Production

Type of Feedstock[1), 2)] (please specify)	A	B	C	D	E
	Amount of Ethylene Produced	Emission Factor	Geographic Adjustment Factor[3)]	CO_2 Emissions	CO_2 Emissions
	(tonne)	(tonne CO_2/tonne ethylene produced)	(%)	(tonne CO_2)	(Gg CO_2)
				D = A * B * C/100	$E = D/10^3$
Total					

1) For details of feedstock types, see Table 3.14 in Chapter 3 of Volume 3. For the default feedstock, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

3) For geographic adjustment factors, see Table 3.15 in Volume 3.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	4 of 12 CH_4 Emissions from Ethylene Production

Type of Feedstock[1), 2)] (please specify)	A	B	C	D
	Amount of Ethylene Produced	Emission Factor	CH_4 Emissions	CH_4 Emissions
	(tonne)	(kg CH_4/tonne ethylene produced)	(kg)	(Gg)
			C = A * B	$D = C/10^6$
Total				

1) For details of feedstock types, see Table 3.14 in Chapter 3 of Volume 3. For the default feedstock, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use			
Category	Chemical Industry - Petrochemical and Carbon Black Production			
Category Code	2B8			
Sheet	5 of 12 CO_2 Emissions from Ethylene Dichloride/Vinyl Chloride Monomer Production			
Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Ethylene Dichloride (EDC) or Vinyl Chloride Monomer (VCM) Produced[3)]	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne EDC produced) or (tonne VCM produced)	(tonne CO_2/tonne EDC produced) or (tonne CO_2/tonne VCM produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Total				

1) For details of process types, see Table 3.17 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

3) Inventory compilers should use either EDC production or VCM production (not both) as activity data.

Sector	Industrial Processes and Product Use			
Category	Chemical Industry - Petrochemical and Carbon Black Production			
Category Code	2B8			
Sheet	6 of 12 CH_4 Emissions from Ethylene Dichloride / Vinyl Chloride Monomer Production			
Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Ethylene Dichloride (EDC) or Vinyl Chloride Monomer (VCM) Produced[3)]	Emission Factor	CH_4 Emission	CH_4 Emission
	(tonne EDC produced) or (tonne VCM produced)	(kg CH_4/tonne EDC produced) or (kg CH_4/tonne VCM produced)	(kg)	(Gg)
			C = A * B	D = C/10^6
Total				

1) For details of process types, see Tables 3.11 and 3.19 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

3) Inventory compilers should use either EDC production or VCM production (not both) as activity data.

Sector	Industrial Processes and Product Use			
Category	Chemical Industry - Petrochemical and Carbon Black Production			
Category Code	2B8			
Sheet	7 of 12 CO_2 Emissions from Ethylene Oxide Production			
Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Ethylene Oxide Produced	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne ethylene oxide produced)	(tonne CO_2/tonne ethylene oxide produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	$D = C/10^3$
Total				

1) For details of process types, see Table 3.20 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use			
Category	Chemical Industry - Petrochemical and Carbon Black Production			
Category Code	2B8			
Sheet	8 of 12 CH_4 Emissions from Ethylene Oxide Production			
Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Ethylene Oxide Produced	Emission Factor	CH_4 Emissions	CH_4 Emissions
	(tonne ethylene oxide produced)	(kg CH_4/tonne ethylene oxide produced)	(kg)	(Gg)
			C = A * B	$D = C/10^6$
Total				

1) For details of process types, see Table 3.21 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	9 of 12 CO_2 Emissions from Acrylonitrile Production

Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Acrylonitrile Produced	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne acrylonitrile produced)	(tonne CO_2/tonne acrylonitrile produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Total				

1) For details of process types, see Table 3.22 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	10 of 12 CH_4 Emissions from Acrylonitrile Production

Type of Process[1), 2)] (please specify)	A	B	C	D
	Amount of Acrylonitrile Produced	Emission Factor	CH_4 Emissions	CH_4 Emissions
	(tonne acrylonitrile produced)	(kg CH_4/tonne acrylonitrile produced)	(kg)	(Gg)
			C = A * B	D = C/10^6
Total				

1) For details of process types, see Table 3.22 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	11 of 12 CO_2 Emissions from Carbon Black Production

Type of Process[1), 2)] (please specify)	A Amount of Carbon Black Produced (tonne carbon black produced)	B Emission Factor (tonne CO_2/tonne carbon black produced)	C CO_2 Emissions (tonne CO_2) C = A * B	D CO_2 Emissions (Gg CO_2) D = C/10^3
Total				

1) For details of process types, see Table 3.23 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Petrochemical and Carbon Black Production
Category Code	2B8
Sheet	12 of 12 CH_4 Emissions from Carbon Black Production

Type of Process[1), 2)] (please specify)	A Amount of Carbon Black Produced (tonne carbon black produced)	B Emission Factor (kg CH_4/tonne carbon black produced)	C CH_4 Emissions (kg) C = A * B	D CH_4 Emissions (Gg) D = C/10^6
Total				

1) For details of process types, see Table 3.24 in Chapter 3 of Volume 3. For the default process type, see Table 3.11 in Chapter 3 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Fluorochemical Production
Category Code	2B9
Sheet	1 of 3 HFC-23 Emissions from HCFC-22 Production

A Amount of HCFC-22 Produced (kg)	B Emission Factor (kg HFC-23/kg HCFC-22 produced)	C HFC-23 Emissions (kg) C = A * B	D HFC-23 Emissions (Gg) D = C/10^6

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Fluorochemical Production
Category Code	2B9
Sheet	2 of 3 By-product Emissions from Production of Other Fluorinated Compounds

Fluorinated Compound Emitted as By-product and Principal Fluorinated Compound Produced (Please specify such as "xxx from yyy production") [1)]	A	B	C	D
	Amount of Principal Fluorinated Compound Produced	Byproduct Emission Factor [2)]	Emissions	Emissions
	(kg)	(kg by-product gas emitted/kg F-compound produced)	(kg)	(Gg)
			C = A * B	D = C/10^6

1) Insert additional rows if necessary.

2) For sources that are not *key categories*, fugitive and by-product emissions are considered the same and those emissions are calculated using the next sheet (3 of 3).

Sector	Industrial Processes and Product Use
Category	Chemical Industry - Fluorochemical Production
Category Code	2B9
Sheet	3 of 3 Fugitive Emissions from Production of Other Fluorinated Compounds

Fluorinated Compound Produced (Please specify) [1)]	A	B	C	D
	Amount of Fluorinated Compound Produced	Fugitive Emission Factor [2)]	Emissions	Emissions
	(kg)	(kg fugitive gas emitted/kg F-compound produced)	(kg)	(Gg)
			C = A * B	D = C/10^6

1) Insert additional rows if necessary.

2) For sources that are not *key categories*, fugitive and by-product emissions are considered the same. For Tier 1, in the absence of abatement measures, a default emission factor of 0.5 percent of production, not counting losses in transport and transfer of materials, is suggested for HFCs and PFCs,

Sector	Industrial Processes and Product Use
Category	Metal Industry - Iron and Steel Production
Category Code	2C1
Sheet	1 of 2 CO_2 Emissions

Type of Steelmaking Method, etc	A	B	C	D
	Amount of Steel or Iron Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne crude steel produced, pig iron, DRI, sinter or pellet)	(tonne CO_2/tonne production)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Basic Oxygen Furnace				
Electric Arc Furnace				
Open Hearth Furnace				
Pig Iron Production (not converted into steel)				
Direct Reduced Iron (DRI) Production				
Sinter Production				
Pellet Production				
TOTAL				

Sector	Industrial Processes and Product Use
Category	Metal Industry - Iron and Steel Production
Category Code	2C1
Sheet	2 of 2 CH_4 Emissions

Type of Production	A	B	C	D
	Amount of Production	Emission Factor	CH_4 Emissions	CH_4 Emissions
	(tonne sinter, DRI or pig iron)	(kg CH_4/tonne production)	(kg)	(Gg)
			C = A * B	D = C/10^6
Sinter Production				
Direct Reduced Iron (DRI) Production				
Pig Iron Production				
TOTAL				

Sector	Industrial Processes and Product Use
Category	Metal Industry - Ferroalloys Production
Category Code	2C2
Sheet	1 of 2 CO_2 Emissions

Type of Ferroalloy[1), 2)] (please specify)	A	B	C	D
	Amount of Ferroalloy Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne ferroalloy produced)	(tonne CO_2/tonne ferroalloy produced)	(tonne CO_2)	(Gg CO_2)
			C = A * B	D = C/10^3
Total				

1) For details of ferroalloy types, see Table 4.5 in Chapter 4 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Metal Industry - Ferroalloys Production
Category Code	2C2
Sheet	2 of 2 CH_4 Emissions

Type of Ferroalloy[1), 2)] (please specify)	A	B	C	D
	Amount of Ferroalloy Production	Emission Factor	CH_4 Emissions	CH_4 Emissions
	(tonne ferroalloy produced)	(kg CH_4/tonne ferroalloy produced)	(kg)	(Gg)
			C = A * B	D = C/10^6
Total				

1) For details of ferroalloy types, see Table 4.7 in Chapter 4 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use			
Category	Metal Industry - Aluminium Production			
Category Code	2C3			
Sheet	1 of 3 CO_2 Emissions			
Type of Technology	A	B	C	D
	Amount of Aluminium Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne aluminium produced)	(tonne CO_2/tonne aluminium produced)	(tonne)	(Gg)
			C = A * B	$D = C/10^3$
Prebake				
Soderberg				
Total				

Sector	Industrial Processes and Product Use			
Category	Metal Industry - Aluminium Production			
Category Code	2C3			
Sheet	2 of 3 CF_4 Emissions			
Type of Technology	A	B	C	D
	Amount of Aluminium Production	Emission Factor	CF_4 Emissions	CF_4 Emissions
	(tonne aluminium produced)	(kg CF_4/tonne aluminium produced)	(kg)	(Gg)
			C = A * B	$D = C/10^6$
CWPB				
SWPB				
VSS				
HSS				
Total				

Sector	Industrial Processes and Product Use			
Category	Metal Industry - Aluminium Production			
Category Code	2C3			
Sheet	3 of 3 C_2F_6 Emissions			
Type of Technology	A	B	C	D
	Amount of Aluminium Production	Emission Factor	C_2F_6 Emissions	C_2F_6 Emissions
	(tonne aluminium produced)	(kg C_2F_6/tonne aluminium produced)	(kg)	(Gg)
			C = A * B	$D = C/10^6$
CWPB				
SWPB				
VSS				
HSS				
Total				

Sector	**Industrial Processes and Product Use**
Category	**Metal Industry - Magnesium Production**
Category Code	**2C4**
Sheet	**1 of 2 CO_2 Emissions from Primary Production**

Raw Material Source	A	B	C	D
	Amount of Primary Magnesium Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
	(tonne primary magnesium produced)	(tonne CO_2/tonne primary magnesium produced)	(tonne)	(Gg)
			C = A * B	$D = C/10^3$
Dolomite				
Magnesite				
Total				

Sector	**Industrial Processes and Product Use**
Category	**Metal Industry - Magnesium Production**
Category Code	**2C4**
Sheet	**2 of 2 SF_6 Emissions from Magnesium Casting Processes**

A	B	C	D
Amount of Magnesium Casting	Emission Factor	SF_6 Emissions	SF_6 Emissions
(tonne magnesium casting)	(kg SF_6/tonne magnesium casting)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Note: As regards HFC 134-a, FK 5-1-12 and their decomposition products (e.g., PFCs), no Tier 1 method is provided because the industrial experience in using these compounds (HFC 134-a and FK 5-1-12) for magnesium protection purposes is yet very limited. However, if the greenhouse gas emission from the use of magnesium cover gases is a national *key category*, it is *good practice*, for inventory preparation purposes, to collect direct measurements of these greenhouse gas emissions.

Sector	Metal Industry			
Category	Metal Industry - Lead Production			
Category Code	2C5			
Sheet	1 of 1			
Source and Furnace Type[1), 2)]	A	B	C	D
	Amount of Lead Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
(please specify)	(tonne lead produced)	(tonne CO_2/tonne lead produced)	(tonne)	(Gg)
			C = A * B	D = C/10^3
Total				

1) For details of source and furnace types, see Table 4.21 in Chapter 4 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use			
Category	Metal Industry - Zinc Production			
Category Code	2C6			
Sheet	1 of 1			
Type of Process[1), 2)]	A	B	C	D
	Amount of Zinc Production	Emission Factor	CO_2 Emissions	CO_2 Emissions
(please specify)	(tonne zinc produced)	(tonne CO_2/tonne zinc produced)	(tonne)	(Gg)
			C = A * B	D = C/10^3
Total				

1) For details of process types, see Table 4.24 in Chapter 4 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use			
Category	**Non-Energy Products from Fuels and Solvent Use - Lubricant Use**			
Category Code	**2D1**			
Sheet	**1 of 1**			
A	B	C	D	E
Amount of Lubricant Consumed	Lubricant Carbon Content	Fraction Oxidized During Use (ODU factor)	CO_2 Emissions	CO_2 Emissions
(TJ)	(tonne-C/TJ)	(fraction)	(tonne CO_2)	(Gg CO_2)
			D = A * B * C * 44/12	$E = D/10^3$

Sector	Industrial Processes and Product Use			
Category	**Non-Energy Products from Fuels and Solvent Use – Paraffin Wax Use**			
Category Code	**2D2**			
Sheet	**1 of 1**			
A	B	C	D	E
Amount of Paraffin Waxes Consumed	Paraffin Waxes Carbon Content	Fraction Oxidized During Use (ODU factor)	CO_2 Emissions	CO_2 Emissions
(TJ)	(tonne-C/TJ)	(fraction)	(tonne CO_2)	(Gg CO_2)
			D = A * B * C * 44/12	$E = D/10^3$

Sector	Industrial Processes and Product Use
Category	Electronics Industry - Integrated Circuit or Semiconductor
Category Code	2E1
Sheet	1 of 1

Fluorinated Compounds (FCs)	A	B	C	D	E
	Fraction of Annual Plant Production Capacity Utilization[1)]	Annual Manufacturing Design Capacity[1)]	Tier 1 Default FC Emission Factor[2)]	CO_2 Equivalent Conversion Factor[3)]	FC Emissions[4)]
	(fraction)	(Gm^2 of silicon processed)	(kg FC/m^2 of silicon processed)	(tonne CO_2 /tonne FC)	(Gg CO_2 equivalent)
					$E = A * B * C * D * 10^3$
CF_4			0.9		
C_2F_6			1		
CHF_3			0.04		
C_3F_8			0.05		
NF_3			0.04		
SF_6			0.2		
Total					

1) The same value should be entered in each row.

2) In using Tier 1, inventory compilers should not modify, in any way, the set of the FCs assumed here. Inventory compilers should not combine emissions estimated using Tier 1 method with emissions estimated using the Tier 2 or 3 methods. Neither may inventory compilers change the values of any factors in this column.

3) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. These factors should be the same as those used for other sectors/categories to ensure that they are all internally consistent in the inventory.

4) The Tier 1 method, unlike the Tier 3 or 2 methods, is designed to give an aggregated estimate of FC emissions although its methodology appears to produce gas-specific emissions.

Sector	Industrial Processes and Product Use				
Category	**Electronics Industry - TFT Flat Panel Display**				
Category Code	**2E2**				
Sheet	**1 of 1**				
Fluorinated Compounds (FCs)	A	B	C	D	E
	Fraction of Annual Plant Production Capacity Utilization[1)]	Annual Manufacturing Design Capacity[1)]	Tier 1 Default FC Emission Factor[2)]	CO_2 Equivalent Conversion Factor[3)]	FC Emissions[4)]
	(fraction)	(Gm^2 of glass processed)	(g FC/m^2 of glass processed)	(tonne CO_2 /tonne FC)	(Gg CO_2 equivalent)
					E = A * B * C * D
CF_4			0.5		
NF_3			0.9		
SF_6			4		
Total					

1) The same value should be entered in each row.

2) In using Tier 1, inventory compilers should not modify, in any way, the set of the FCs assumed here. Inventory compilers should not combine emissions estimated using Tier 1 method with emissions estimated using the Tier 2 or 3 methods. Neither may inventory compilers change the values of any factors in this column.

3) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. These factors should be the same as those used for other sectors/categories to ensure that they are all internally consistent in the inventory.

4) The Tier 1 method, unlike the Tier 3 or 2 methods, is designed to give an aggregated estimate of FC emissions although its methodology appears to produce gas-specific emissions.

Sector	Industrial Processes and Product Use		
Category	**Electronics Industry - Photovoltaics**		
Category Code	**2E3**		
Sheet	**1 of 2**		
Fluorinated Compounds (FCs)	A	B	C
	Fraction of Annual Plant Production Capacity Utilization[1)]	Annual Manufacturing Design Capacity[1)]	Fraction of PV manufacture that uses fluorinated compounds
	(fraction)	(Mm^2 of substrate processed)	(fraction)
CF_4			
C_2F_6			
Total			

1) The same value should be entered in each row.

Sector	Industrial Processes and Product Use
Category	Electronics Industry - Photovoltaics
Category Code	2E3
Sheet	2 of 2

Fluorinated Compounds (FCs)	D	E	F
	Tier 1 Default FC Emission Factor[1]	CO_2 Equivalent Conversion Factor[2]	FC Emissions[3]
	(g FC/m^2 of substrate processed)	(tonne CO_2 /tonne FC)	(Gg CO_2 equivalent)
			F = A * B * C * D * E / 10^3
CF_4	5		
C_2F_6	0.2		
Total			

1) In using Tier 1, inventory compilers should not modify, in any way, the set of the FCs assumed here. Inventory compilers should not combine emissions estimated using Tier 1 method with emissions estimated using the Tier 2 or 3 methods. Neither may inventory compilers change the values of any factors in this column.

2) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. These factors should be the same as those used for other sectors/categories to ensure that they are all internally consistent in the inventory.

3) The Tier 1 method, unlike the Tier 3 or 2 methods, is designed to give an aggregated estimate of FC emissions although its methodology appears to produce gas-specific emissions.

Sector	Industrial Processes and Product Use
Category	Electronics Industry - Heat Transfer Fluid
Category Code	2E4
Sheet	1 of 1

Fluorinated Compounds (FCs)	A	B	C	D	E
	Fraction of Annual Plant Production Capacity Utilization	Annual Manufacturing Design Capacity	Tier 1 Default FC Emission Factor[1]	CO_2 Equivalent Conversion Factor[2]	FC Emissions[3]
	(fraction)	(Gm^2 of silicon consumed)	(kg C_6F_{14}/m^2 of silicon consumed)	(tonne CO_2 /tonne C_6F_{14})	(Gg CO_2 equivalent)
					E = A * B * C * D * 10^3
C_6F_{14}			0.3		

1) Tier 1 default emission factor assumes heat transfer fluids have the same GWP and C_6F_{14} represents a suitable proxy. Inventory compilers should not change this value in using Tier 1 method.

2) Typically, global warming potential (100 year time horizon) identified in the IPCC Assessment Report can be used. These factors should be the same as those used for other sectors/categories to ensure that they are all internally consistent in the inventory.

3) The Tier 1 method, unlike the Tier 3 or 2 methods, is designed to give an aggregated estimate of FC emissions although its methodology appears to produce gas-specific emissions.

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances – Refrigeration and Air Conditioning
Category Code	2F1
Sheet	1 of 1

HFCs/PFCs (please specify)	A	B	C	D
	Bank in Inventory Year[1)]	Average Emission Factor from installed base	Agent in Retired Equipment in Inventory Year	Emissions in Inventory Year
	(tonne)	(%)	(tonne)	(tonne)
				D = A * B/100 + C
HFC-23				
…				

1) In reality, it is necessary in the refrigeration and air conditioning application to deal with the development and tracking of banks. This means that an historical time series of country-specific or globally or regionally derived activity data is required dating back to the introduction of any new HFC or PFC. In order to do this, inventory compilers will need to implement spreadsheet calculations. A typical example, which is workable and inventory compilers could use, can be found in the *2006 Guidelines* CDROM. (V3_An1_Calculation_example_for_2F1.xls)

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances – Foam Blowing Agents
Category Code	2F2
Sheet	1 of 1

HFCs/PFCs (please specify)	A	B	C	D
	Original Charge in Each of Previous Years[1)]	Annual Losses Emission Factor	First Year Loss in Inventory Year[2)]	Emissions in Inventory Year
	(tonne)	(%)	(tonne)	(tonne)
				D = A * B/100 + C
HFC-245fa				
…				

1) In reality, it is necessary in the foam application to deal with the historical time series of country-specific or globally or regionally derived activity data dating back to the introduction of any new HFC or PFC. In order to do this, inventory compilers will need to implement spreadsheet calculations. A typical example, which is workable and inventory compilers could use, can be found in the *2006 Guidelines* CDROM. (V3_An1_Calculation_example_for_2F2.xls)

2) For details on the first year loss emission factor, see Table 7.5 in Chapter 7 of this volume. In the case of open-cell foams, the first year loss emission factor is typically 100 %.

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances – Fire Protection
Category Code	2F3
Sheet	1 of 1

HFCs/PFCs (please specify)	A	B	C	D	E
	Bank in Inventory Year[1)]	Average Emission Factor from installed base	Agent in Retired Equipment in Inventory Year	Rate of Recovery of the Agent in Retired Equipment	Emissions in Inventory Year
	(tonne)	(%)	(tonne)	(%)	(tonne)
					E = A * B/100 + C * (1 – D/100)
HFC-23					
…					

1) In reality, it is necessary in the fire protection application to deal with the development and tracking of banks. This means that an historical time series of country-specific or globally or regionally derived activity data is required dating back to the introduction of any new HFC or PFC. In order to do this, inventory compilers will need to implement spreadsheet calculations. A typical example, which is workable and inventory compilers could use, can be found in the *2006 Guidelines* CDROM. (V3_An1_Calculation_example_for_2F3.xls)

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances - Aerosols
Category Code	2F4
Sheet	1 of 1

A		B	C	D	E
Quantity of HFCs/PFCs Contained in Aerosol Products Sold in Inventory Year		Quantity of HFCs/PFCs Contained in Aerosol Products Sold in Prior Year	Emission Factor (Loss of Current Year's Use)	Emissions of HFCs/PFCs from Aerosol Products	Emissions of HFCs/PFCs from Aerosol Products
Chemical[1), 2)]	(tonne)	(tonne)	(fraction)	(tonne)	(Gg)
(please specify)				D = A * C + B * (1 – C)	E = D/10^3

1) For chemicals that are used for this application, see Table 7.1 in Chapter 7 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances - Solvents
Category Code	2F5
Sheet	1 of 1

A		B	C	D	E
Quantity of Solvents (HFCs/PFCs) Sold in Inventory Year		Quantity of Solvents (HFCs/PFCs) Sold in Prior Year	Emission Factor (Loss of Current Year's Use)	Emission of HFCs/PFCs from Solvents	Emission of HFCs/PFCs from Solvents
Chemical[1), 2)] (please specify)	(tonne)	(tonne)	(fraction)	(tonne)	(Gg)
				D = A * C + B * (1 – C)	E = D/10^3

1) For chemicals that are used for this application, see Table 7.1 in Chapter 7 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Product Uses as Substitutes for Ozone Depleting Substances – Other Applications
Category Code	2F6
Sheet	1 of 1

A		B	C	D	E
Quantity of HFCs/PFCs Sold in Inventory Year		Quantity of HFCs/PFCs Sold in Prior Year	Emission Factor (Loss of Current Year's Use)	Emission of HFCs/PFCs from Other Applications	Emission of HFCs/PFCs from Other Applications
Chemical[1), 2)] (please specify)	(tonne)	(tonne)	(fraction)	(tonne)	(Gg)
				D = A * C + B * (1 – C)	E = D/10^3

1) For chemicals that are used for this application, see Table 7.1 in Chapter 7 of Volume 3.

2) Insert additional rows if necessary.

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - Electrical Equipment
Category Code	2G1
Sheet	1 of 5 Manufacturing Emissions of SF_6 [1)]

Type of Equipment	A	B	C
	Total SF_6 Consumption by Equipment Manufacturers	Manufacturing Emission Factor [2)]	Manufacturing Emissions
	(tonne SF_6)	(fraction)	(tonne SF_6)
			C = A * B
Sealed-Pressure			
Closed-Pressure			
Gas-Insulated Transformers			
Total			

1) Emissions of PFCs can be estimated by the same calculation procedure.

2) Default emission factors depend on region for which emissions are being estimated. See Tables 8.2 through 8.4 in Chapter 8 of this volume.

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - Electrical Equipment
Category Code	2G1
Sheet	2 of 5 Equipment Installation Emissions of SF_6 [1)]

Type of Equipment	D	E	F
	Total Nameplate Capacity of New Equipment Filled on Site (not at the factory)	Installation Emission Factor [2)]	Equipment Installation Emissions
	(tonne SF_6)	(fraction)	(tonne SF_6)
			F = D * E
Sealed-Pressure			
Closed-Pressure			
Gas-Insulated Transformers			
Total			

1) Emissions of PFCs can be estimated by the same calculation procedure.

2) Default emission factors depend on region for which emissions are being estimated. See Tables 8.2 through 8.4 in Chapter 8 of this volume.

Sector	Industrial Processes and Product Use		
Category	Other Product Manufacture and Use - Electrical Equipment		
Category Code	2G1		
Sheet	3 of 5 Equipment Use Emissions of SF_6 [1)]		
Type of Equipment	G	H	I
	Total Nameplate Capacity of Installed Equipment	Use Emission Factor [2), 3)]	Equipment Use Emissions
	(tonne SF_6)	(fraction)	(tonne SF_6)
			I = G * H
Sealed-Pressure			
Closed-Pressure			
Gas-Insulated Transformers			
Total			

1) Emissions of PFCs can be estimated by the same calculation procedure.

2) Default emission factors depend on region for which emissions are being estimated. See Tables 8.2 through 8.4 in Chapter 8 of this volume.

3) The 'use emission factor' includes emissions due to leakage, servicing, maintenance, and equipment failures.

Sector	Industrial Processes and Product Use		
Category	Other Product Manufacture and Use - Electrical Equipment		
Category Code	2G1		
Sheet	4 of 5 Equipment Disposal Emissions of SF_6 [1)]		
Type of Equipment	J	K	L
	Total Nameplate Capacity of Retiring Equipment	Fraction of SF_6 Remaining at Retirement [2)]	Equipment Disposal Emissions
	(tonne SF_6)	(fraction)	(tonne SF_6)
			L = J * K
Sealed-Pressure			
Closed-Pressure			
Gas-Insulated Transformers			
Total			

1) Emissions of PFCs can be estimated by the same calculation procedure.

2) Default emission factors depend on region for which emissions are being estimated. See Tables 8.2 through 8.4 in Chapter 8 of this volume.

Sector	**Industrial Processes and Product Use**
Category	**Other Product Manufacture and Use - Electrical Equipment**
Category Code	**2G1**
Sheet	**5 of 5 Total Emissions of SF_6 [1)]**

Type of Equipment	M	N
	Total Emissions	Total Emissions
	(tonne SF_6)	(Gg SF_6)
	M = C + F + I + L	$N = M/10^3$
Sealed-Pressure		
Closed-Pressure		
Gas-Insulated Transformers		
Total		

1) Emissions of PFCs can be estimated by the same calculation procedure.

Sector	**Industrial Processes and Product Use**
Category	**Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses**
Category Code	**2G2**
Sheet	**1 of 7 SF_6 Emissions from Military Applications (AWACS)**

A	B	C	D
National AWACS Fleet	Emission Factor	SF_6 Emissions	SF_6 Emissions
(number of AWACS)	(kg SF_6/plane)	(kg)	(Gg)
		C = A * B	$D = C/10^6$

Sector	**Industrial Processes and Product Use**
Category	**Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses**
Category Code	**2G2**
Sheet	**2 of 7 SF_6 Emissions from University and Research Particle Accelerators**

A	B	C	D	E	F
Number of University and Research Particle Accelerators in the Country	SF_6 Use Factor	SF_6 Charge Factor	SF_6 Emission Factor	SF_6 Emissions	SF_6 Emissions
(number)	(fraction)	(kg SF_6/particle accelerator)	(fraction)	(kg)	(Gg)
				E = A * B * C * D	$F = E/10^6$

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses
Category Code	2G2
Sheet	3 of 7 SF_6 Emissions from Industrial and Medical Particle Accelerators

Process Description	A	B	C	D	E
	Number of Particle Accelerators that use SF_6 by Process Description in the Country	SF_6 Charge Factor	SF_6 Emission Factor	SF_6 Emissions	SF_6 Emissions
	(number)	(kg SF_6/particle accelerator)	(fraction)	(kg)	(Gg)
				D = A * B * C	$E = D/10^6$
Industrial Accelerator (High Voltage: 0.3-23 MV)					
Industrial Accelerator (Low Voltage: <0.3 MV)					
Medical					
Total					

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses
Category Code	2G2
Sheet	4 of 7 SF_6 Emissions[1)] from Adiabatic Uses

Type of Applications[2), 3)] (please specify)	A	B	C
	Sales into application in year t-3	SF_6 Emissions in year t	SF_6 Emissions in year t
	(tonne)	(tonne)	(Gg)
		B = A	$C = B/10^3$
Total			

1) Emissions of PFCs can be estimated by the same calculation procedure.

2) For example, car tires, sport shoe soles and tennis balls.

3) Insert additional rows, if necessary.

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses
Category Code	2G2
Sheet	5 of 7 SF_6 Emissions from Sound-Proof Glazing

A	B	C	D	E	F
SF_6 Purchased to Fill Windows Assembled in Inventory Year	Assembly Emission Factor	Assembly Emissions	Capacity of Existing Windows in Inventory Year	Leakage Emission Factor	Leakage Emissions
(tonne SF_6)	(fraction)	(tonne SF_6)	(tonne SF_6)	(fraction)	(tonne SF_6)
		C = A * B			F = D * E

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses
Category Code	2G2
Sheet	6 of 7 SF_6 Emissions from Sound-Proof Glazing

G	H	I	J	K
Amount Left in Windows at End of Lifetime (Disposed of in Inventory Year)	Recovery Factor[1)]	Disposal Emissions	Total Emissions	Total Emissions
(tonne SF_6)	(fraction)	(tonne SF_6)	(tonne SF_6)	(Gg SF_6)
		I = G * (1 – H)	J = C + F + I	$K = J/10^3$

1) Recovery factor is assumed to be zero unless country-specific information is available.

Sector	Industrial Processes and Product Use
Category	Other Product Manufacture and Use - SF_6 and PFCs from Other Product Uses
Category Code	2G2
Sheet	7 of 7 Emissions of SF_6 and PFCs from Other Prompt Emissive Applications

Type of Applications [1), 2)] (please specify)	A	B	C	D
	Sales into application in year t	Sales into application in year t-1	Emissions in year t	Emissions in year t
	(tonne)	(tonne)	(tonne)	(Gg)
			C = 0.5 * (A + B)	$D = C/10^3$
Total				

1) For example, tracers and use in production of optical cables.

2) Insert additional rows, if necessary.

Sector	Industrial Processes and Product Use		
Category	Other Product Manufacture and Use - N_2O from Product Uses		
Category Code	2G3		
Sheet	1 of 2		
Type of Applications	A	B	C
	Quantity of N_2O Supplied in this Application Type in Year t	Quantity of N_2O Supplied in this Application Type in Year t-1	Emission Factor
	(tonne)	(tonne)	(fraction)
Medical Applications			
Propellant in Aerosol Products			
Other (please specify) [1)]			
Total			
1) Insert additional rows, if necessary.			

Sector	Industrial Processes and Product Use	
Category	Other Product Manufacture and Use - N_2O from Product Uses	
Category Code	2G3	
Sheet	2 of 2	
Type of Applications	D	E
	N_2O Emission	N_2O Emission
	(tonne)	(Gg)
	D = (0.5 * A + 0.5 * B) * C	$E = D/10^3$
Medical Applications		
Propellant in Aerosol Products		
Other (please specify) [1)]		
Total		
1) Insert additional rows, if necessary.		