

GHG Reporting Programme

National GHG Emission Reporting Regulations



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Legal Framework

- **National Environmental Management: Air Quality Act No.39 of 2004**
 - National Greenhouse Gas (GHG) Emission Reporting Regulations
 - Published on 3 April 2017
 - 1 February 2019 - National Gazette No. 42203
 - Reporting instruction on where to submit information
 - Extension of registration period



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Objectives of the Regs.

- The purpose of these Regulations is to introduce a single national reporting system for the transparent reporting of greenhouse gas emissions, which will be used—
 - (a) to update and maintain a National Greenhouse Gas Inventory;
 - (b) for the Republic of South Africa to meet its reporting obligations under the United Framework Convention on Climate Change (UNFCCC) and instrument treaties to which it is bound; and
 - (c) to inform the formulation and implementation of legislation and policy.



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Application of the Regulations (4)

- **Data Providers** – The Reporting Regulations identify 2 types of data providers (Category A) and (Category B).

Category A

Any person in control of or conducting an activity marked in the Category A column above the capacity given in the threshold

Category B

Any organ of state, research institution or academic institution, which holds GHG or relevant activity data

However, if these institutions conduct listed activities, then they are classified as Category A data providers



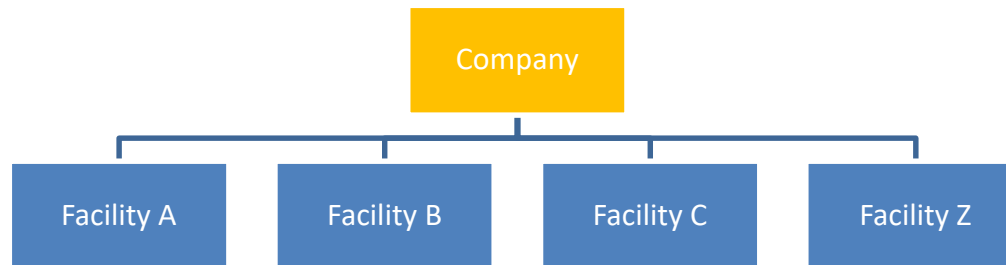
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Registration (5)

- **Registration – Regulation**
 - Company or corporation or legal entity
 - Declare all facilities over which it has operational control and relevant IPCC codes applicable



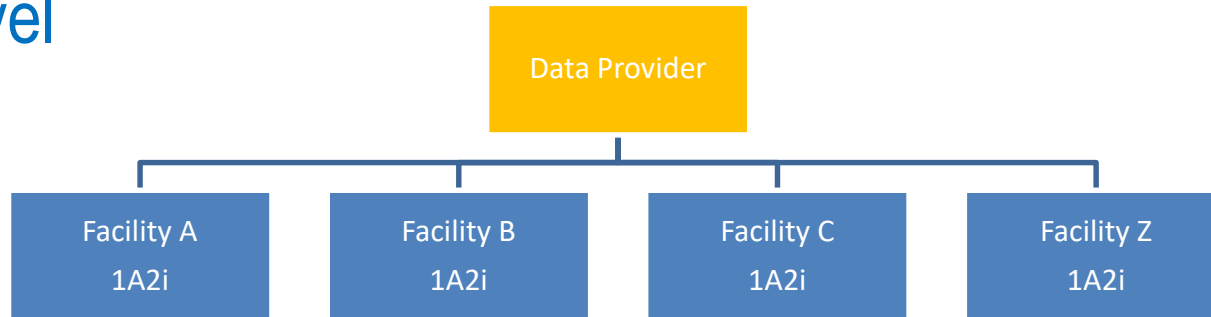
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Reporting (7)

- Company or corporation or legal entity
- Reports on behalf of all its facilities at an aggregated level



1A2i	Coal	Amount of fuel combusted
1A2i	Diesel	Amount of fuel combusted
1A2i	Heavy Fuel Oil	Amount of fuel combusted



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Reporting Requirements

- Data providers need to aggregate emissions at company-level,
- Whilst maintaining IPCC activity disaggregation.
- E.g. using 1A2i as an example, the data provider should sum up all its 1A2i emissions from the different facilities and report this as one aggregated 1A2i emissions from the company.

1A2i	Coal	Amount of fuel combusted
1A2i	Diesel	Amount of fuel combusted
1A2i	Heavy Fuel Oil	Amount of fuel combusted



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Reporting Requirements Cont.

- Category A data provider must report:
 - All greenhouse gas emissions; and
 - activity data as set out in the Technical Guidelines
 - Table 9.1

IPCC Code	Name	Activity data required	Units
1	ENERGY		
1A	Fuel Combustion Activities		
1A1	Energy Industries	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1a	Main Activity Electricity and Heat Production	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1b	Petroleum Refining	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1c	Manufacture of Solid Fuels and Other Energy Industries	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)

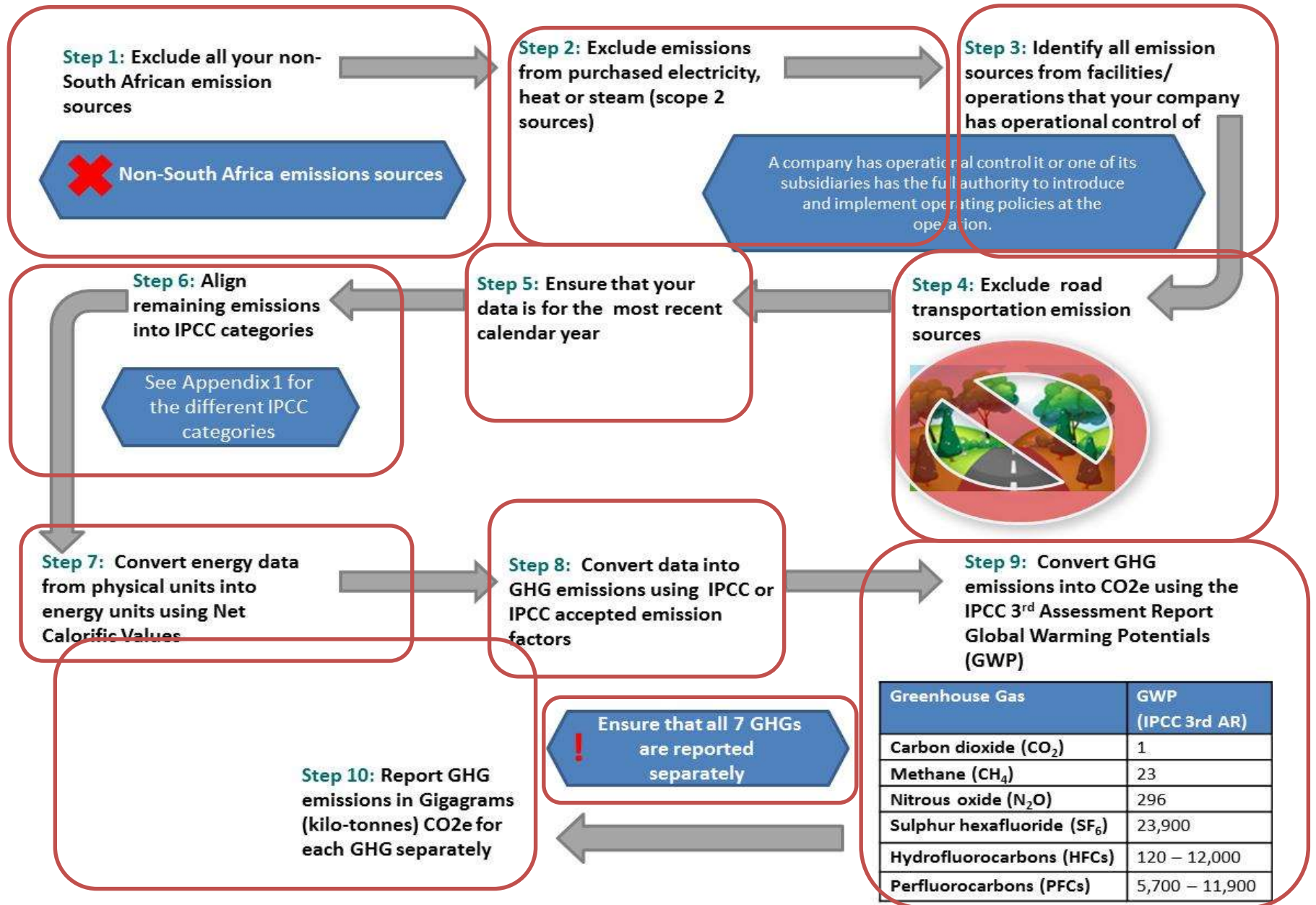


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Figure 3.1: A step-by-step approach to reporting corporate emissions under the IPCC Guidelines



Registration and Reporting

- Currently NAEIS unable to meet registration and reporting requirements of Regulations (Notice No.40762)
- Registration is done using Annexure 2 and submitted by email to GHGReporting@environment.gov.za (Notice No. Notice No. 71 of 2019)
- Even data providers currently registered for reporting on Atmospheric Emission Licenses are required to submit the manual registration in terms of these regulations.

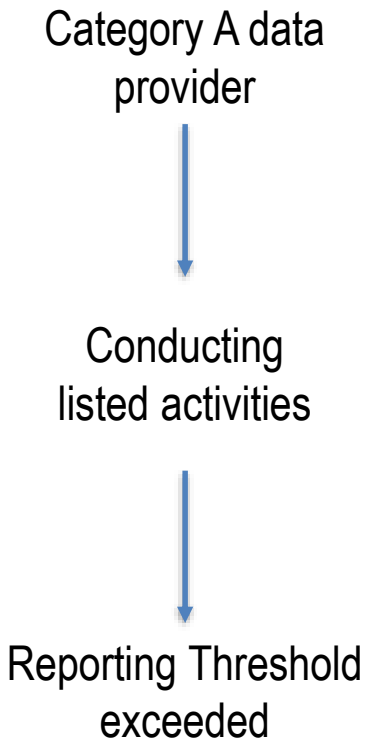


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Application of the Regs.



- **Energy –**
 - Stationary combustion of fuels;
 - Domestic Aviation Industry;
 - Water-borne navigation;
 - Railway transport;
 - Fugitive emissions from coal mining;
 - Fugitive emission from Oil and gas operations.
- **Industrial Processes and Product Use:**
 - Mineral Industry;
 - Chemical Industry;
 - Aviation
 - Metal Industry.
- **AFOLU – Plantations/Natural Forests**
- **Waste**
 - Solid waste disposal;
 - Wastewater treatment;
 - Waste incineration.

Trigger for Registration and Reporting

- Key aspect for data providers to understand requirements:
 1. Throughout data provider value-chain, which activities listed in Annexure 1 are conducted?
 2. Does the data provider meet the reporting threshold for the respective activities?



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Thresholds

- Thresholds are at Data Provider level
 - Not at facility-level
 - Aggregated at data provider-Level
 - Based on installed capacity and not consumption.
 - E.g. A data provider with 2 facilities
 - One at 3MW and the other has 7MW – therefore reporting threshold is met.



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IPCC activities and not Sectors

- E.g. Agriculture - Even though a company operates in the Agricultural sector, it may still have:
 - Stationary combustion activities i.e. from fuels combusted in pumps, grain drying, horticultural greenhouses and other agriculture, forestry or stationary combustion in the fishing industry
 - Waste incineration



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Code	Name	Category A		
		shall report when their total installed capacity for this activity is over the threshold	Threshold	Transitional Arrangement Applicability (Regulation 15)
1	ENERGY			
1A	Fuel Combustion Activities			
1A1	Energy Industries			
1A1a	Main Activity Electricity and Heat Production	Tier 2 or 3	10 MW(th)	YES
1A1b	Petroleum Refining	Tier 2 or 3	none	YES
1A1c	Manufacture of Solid Fuels and Other Energy Industries	Tier 2 or 3	none	YES
1A2	Manufacturing Industries and Construction			
1A2a	Iron and Steel	Tier 2 or 3	10 MW(th)	YES
1A2b	Non-Ferrous Metals	Tier 2 or 3	10 MW(th)	YES
1A2c	Chemicals	Tier 2 or 3	10 MW(th)	YES
1A2d	Pulp, Paper and Print	Tier 2 or 3	10 MW(th)	YES
1A2e	Food Processing, Beverages and Tobacco	Tier 2 or 3	10 MW(th)	NO
1A2f	Non-Metallic Minerals	Tier 2 or 3	10 MW(th)	YES
1A2g	Transport Equipment	Tier 2 or 3	10 MW(th)	NO
1A2h	Machinery	Tier 2 or 3	10 MW(th)	NO
1A2i	Mining and Quarrying	Tier 2 or 3	10 MW(th)	YES
1A2j	Wood and Wood Products	Tier 2 or 3	10 MW(th)	NO
1A2k	Construction	Tier 2 or 3	10 MW(th)	NO
1A2l	Textile and Leather	Tier 2 or 3	10 MW(th)	NO
1A2m	Brick manufacturing:	Tier 2 or 3	10 000 bricks a month	NO
1A3	Transport			
1A3a	Civil Aviation	Tier 2 or 3	100 000 litres/year	Yes

IPCC guidelines vs. GHG Protocol

IPCC Guidelines

Energy

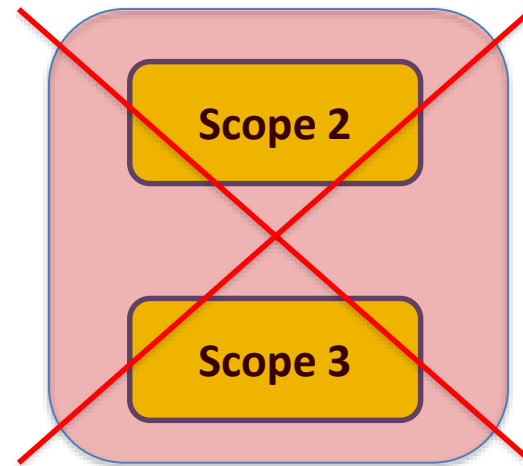
Industrial Processes

AFOLU

Waste

GHG Protocol

Scope 1

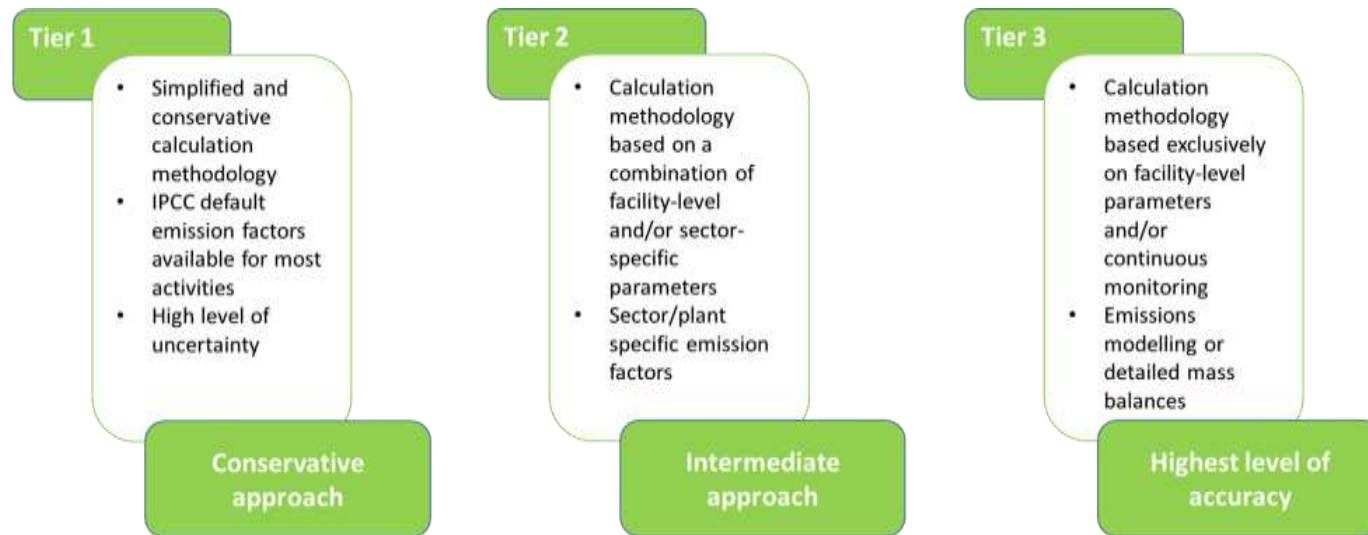


Purchased Electricity

GHG Protocol Approach: Activity Data >> Emission Factor (e.g. DEFRA) >> Emissions in CO₂eq

IPCC Approach: Activity Data >> (NCV) >> Emission Factor per gas >> GWP value = CO₂eq

Methodology Tiers (Levels of Complexity)



1A1a	Main Activity Electricity and Heat Production	Tier 2 or 3	10 MW(th) ²	YES ³
1A1b	Petroleum Refining	Tier 2 or 3	10 MW(th)	YES
1A1c	Manufacture of Solid Fuels and Other Energy Industries	Tier 2 or 3	10 MW(th)	YES
1A2	Manufacturing Industries and Construction			

Key timelines

- 03 April 2017 – Promulgation
- 03 May 2017 – Deadline for Registration
- 31 March 2018 – First round of reports due
- 31 March 2019 – Second round of reports due



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Focus of Verification

- Verification of reported emissions:
 - Activity data
 - Methods and parameters used
 - Completeness against registered IPCC activities and other potential sources



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TECHNICAL GUIDELINES



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Technical Guidance

- Technical Guidelines provide the “*How*” with detailed methodological guidance on how emissions may be calculated in line with IPCC 2006 Guidelines.

Technical Guidelines for Monitoring, Reporting and Verification of Greenhouse Gas Emissions by Industry

A companion to the South African National GHG Emission Reporting Regulations

Version No: TG-2016.1

April 2017



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Technical GLs on the DEA website

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Guidelines and policies

Date published	Description	Doc type
11 April 2017	Technical guidelines for Monitoring, Reporting and Verification of Greenhouse Gas Emissions by Industry	
31 March 2017	National Environmental Management Act, 1998 (Act No. 107 of 1998) Draft National Biodiversity Offset Policy	
14 March 2017	Updated Integrated Environmental Management Guideline - Guideline on Need and Desirability	
19 August 2016	Use of Official Languages Act (12/2012): Department of Environmental Affairs Language Policy (GN40221 - N937)	
1 July 2016	Cultural Heritage Survey Guidelines and Assessment Tools for Protected Areas in South Africa	
30		

Activity data needs for a tier1/2 IPCC methodology

Can be found in

Table 9.1 of the GLs

2	INDUSTRIAL PROCESSES AND PRODUCT USE		
2A	Mineral Industry		
2A1	Cement Production	<ul style="list-style-type: none"> Individual type of cement produced Mass of individual type of cement produced Clinker fraction in cement Imports for consumption of clinker Export of clinker 	tonne tonne tonne tonne
2A2	Lime Production	<ul style="list-style-type: none"> Type of lime produced Mass of lime produced 	tonne
2A3	Glass Production	<ul style="list-style-type: none"> Total glass production Cullet Ratio 	tonne dimensionless
2A4	Other Process Uses of Carbonates		
2A4c	Non Metallurgical Magnesia Production	<ul style="list-style-type: none"> Type of use Mass of carbonate consumed 	Tonne
2A4d	Other (please specify)	<ul style="list-style-type: none"> Type of use Mass of carbonate consumed 	Tonne
2A5	Other (please specify)	Production/Consumption quantity	Tonne
2B	Chemical Industry		
2B1	Ammonia Production	Amount of Ammonia Produced Amount of fuel consumption (e.g. natural gas) as feedstock	tonne Terajoule (TJ)

IPCC Code	Name	Activity data required	Units
1	ENERGY		
1A	Fuel Combustion Activities		
1A1	Energy Industries	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1a	Main Activity Electricity and Heat Production	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1b	Petroleum Refining	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A1c	Manufacture of Solid Fuels and Other Energy Industries	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)
1A2	Manufacturing Industries and Construction	amount of fuel combusted/Consumed (Energy Unit)	Terajoule (TJ)

Annexure A: Stationary Combustion – Emission factors

44. Annexure A: Stationary Combustion – Emission factors

The table below details the default emission factors for energy (Tables 1.4 and 2.2 in Volume 2 Energy Chapters 1&2 of the 2006 IPCC Guidelines.)

Table A.1: Default Emission Factors and Net Calorific Values for Stationary Combustion – (solid, liquid and gaseous fuels)

FUEL TYPE [1]	CO ₂ (KGCO ₂ /TJ)	CH ₄ (KGCH ₄ /TJ)	N ₂ O (KGN ₂ O/TJ)	DEFAULT CALORIFIC VALUE (TJ/TONNE)
ANTHRACITE	<u>98.300</u>	1	<u>1.5</u>	0.0267
AVIATION GASOLINE	<u>70.000</u>	3	<u>0.6</u>	0.0443
BIODIESEL	<u>70.800</u>	3	<u>0.6</u>	0.027
BIOGASOLINE	<u>70.800</u>	3	<u>0.6</u>	0.027
BITUMEN	<u>80.700</u>	3	<u>0.6</u>	0.0402
BLAST FURNACE GAS	<u>260.000</u>	1	<u>0.1</u>	0.00247
DIESEL	<u>74.100</u>	3	<u>0.6</u>	0.043
BROWN COAL BRIQUETTES	<u>97.500</u>	1	<u>1.5</u>	0.0207
CHARCOAL	<u>112.000</u>	<u>200</u>	<u>4</u>	0.0295
COAL TAR	<u>80.700</u>	1	<u>1.5</u>	0.028
COKE OVEN COKE AND LIGNITE COKE	<u>107.000</u>	1	<u>1.5</u>	0.0282
COKE OVEN GAS	<u>44.400</u>	1	<u>0.1</u>	0.0387
COKING COAL	<u>94.600</u>	1	<u>1.5</u>	0.0282
CRUDE OIL	<u>73.300</u>	3	<u>0.6</u>	0.0438
DIESEL	<u>74.100</u>	3	<u>0.6</u>	0.0381
ETHANE	<u>61.600</u>	1	<u>0.1</u>	0.0464

45.1. Solid Fuels

Annexure B: Fugitive Emissions – Emission Factors

Table B.1: Country specific emission factors for fugitive emissions from coal mining (Lloyd and Cook, 2005)

Mining method	Activity	GHG	South African specific Emission Factor (m ³ tonne ⁻¹)
Underground Mining	Coal Mining	CH ₄	0.77
	Post-mining (handling and transport)		0.18
Surface Mining	Coal mining	CO ₂	0
	Post-mining (storage and transport)		0
Underground Mining	Coal mining	CO ₂	0.077
	Post-mining (storage and transport)		0.018
Surface Mining	Coal mining	CO ₂	0
	Post-mining (storage and transport)		0

45.1 Country Specific

45.2. Default emissions factors for fugitive emissions from coal mining, oil and gas operations (IPCC 2006)

IPCC Code	SOURCE CATEGORY ACTIVITY	CO ₂	CH ₄	N ₂ O
1B1	SOLID FUELS (M³ / TONNE)			
1B1a	COAL MINING AND HANDLING			
1B1ai	UNDERGROUND COAL MINING	0.077	0.77	
	UNDERGROUND POST-MINING (HANDLING & TRANSPORT)	0.018	0.18	
1B1aii	SURFACE COAL MINING	N/A	0	
	SURFACE POST-MINING (STORAGE AND TRANSPORT)	N/A	0	
1B1c2	Charcoal production (Fuel wood input) (kgCH ₄ /TJ)	N/A	300	
	Charcoal production (Charcoal produced) (kgCH ₄ /TJ)	N/A	1000	

45.2 provides Default Factors

Annexure C: Default IPCC Emission Factors for IPPU

46. Annexure C: Default IPCC Emission Factors for Industrial Processes and Product Use

Table C1: Default IPCC emissions factors for Industrial Process and Product Use (IPCC 2006)

IPCC Code	SOURCE ACTIVITY / MATERIAL / PRODUCT	CATEGORY / RAW PRODUCT	TONNE CO ₂ /tonne product	TONNE CH ₄ /tonne product	TONNE N ₂ O/tonne product	TONNE C ₂ F ₆ /tonne product	TONNE CF ₄ /tonne product	TONNE SF ₆ /tonne product
2A1	CEMENT PRODUCTION (PER TONNE OF CLINKER)							
	CEMENT		0.52					
2A2	LIME PRODUCTION (PER TONNE OF LIME)							
	QUICKLIME/HIGH CALCIUM LIME		0.75					
	DOLOMITIC LIME		0.77					
	HYDRATED LIME		0.59					
2A3	GLASS PRODUCTION (PER TONNE GLASS)							
	GLASS PRODUCTION		0.2					
2A4	Other Process Uses of Carbonates							
2A4a	CERAMICS (PER TONNE CARBONATE)							
	CALCITE/ARAGONITE (CaCO ₃)		0.43971					
	MAGNESITE (MgCO ₃)		0.52197					

47. Annexure D: Country-specific Net Caloric Values of fuels

The net calorific values for liquid, gaseous and solid fuels are provided in the table below.

Table D1: Net calorific values for liquid, gaseous and solid fuels as provided by the South African Petroleum Industry Association

	Fuel	Net Value	Calorific Unit	Density (kg/l)
Liquid fuels	Paraffin	37.5	MJ/l	0.790
	Diesel	38.1	MJ/l	0.845
	Heavy Fuel Oil	43	MJ/kg	0.958
	Fuel Oil 180	42	MJ/kg	0.99
	Petrol	34.2	MJ/l	0.75
	Avgas (100LL)	33.9	MJ/l	0.71
	Jet Fuel (Jet-A1)	37.5	MJ/l	0.79
Gaseous fuels	LPG	46.1	MJ/kg	0.555
	Sasol Gas (MRG)	33.6	MJ/Nm ³	
	Natural Gas	38.1	MJ/Nm ³	
	Blast furnace gas	3.1	MJ/Nm ³	
	Refinery gas	20	MJ/Nm ³	
	Coke oven gas	17.3	MJ/Nm ³	
Solid fuels	Coal Eskom Average	<u>19.57</u>	MJ/kg	
	Coal General Purpose	24.3	MJ/kg	
	Coal (coking)	30.1	MJ/kg	
	Coke	27.9	MJ/kg	
	Biomass (wood dry typical)	17	MJ/kg	
	Wood Charcoal	31	MJ/kg	16

49. Annexure F: IPCC Source Codes and Definitions (GHG Activities listed in Annexure 1 of the National Greenhouse Gas Emissions Reporting Regulations (DEA 2016))

Annexure F: Definition of Activities

Table F.1: IPCC source codes and definitions

IPCC Source Codes (GHG Activities in terms of Annexure 1 of the Reporting Regulations)	Name	Definition
1	ENERGY	This category includes all GHG emissions arising from combustion and fugitive releases of fuels. Emissions from the non-energy uses of fuels are generally not included here, but reported under Industrial Processes and Product Use Sector.
1 A	Fuel Combustion Activities	Emissions from the intentional oxidation of materials within an apparatus that is designed to raise heat and provide it either as heat or as mechanical work to a process or for use away from the apparatus.
1 A 1	<i>Energy Industries</i>	Comprises emissions from fuels combusted by the fuel extraction or energy-producing industries.
1 A 1 a	Main Activity Electricity and Heat Production	Sum of emissions from main activity producers of electricity generation, combined heat and power generation, and heat plants. Main activity producers (formerly known as public utilities) are defined as those undertakings whose primary activity is to supply the public. They may be in public or private ownership. Emissions from own on-site use of fuel should be included. Emissions from auto producers (undertakings which generate electricity/heat wholly or partly for their own use, as an activity that supports their primary activity) should be assigned to the sector where they were generated and not under 1 A 1 a. Auto producers may be in public or private ownership.
1 A 1 a i	<i>Electricity Generation</i>	Comprises emissions from all fuel use for electricity generation from main activity producers except those from combined heat and power plants.

2002 ISIC Revision 3.1

<http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=17&Lg=1>

1 A 2 a	Iron and Steel	ISIC Group 271 and Class 2731.
1 A 2 b	Non-Ferrous Metals	ISIC Group 272 and Class 2732.
1 A 2 c	Chemicals	ISIC Division 24.
1 A 2 d	Pulp, Paper and Print	ISIC Divisions 21 and 22.
1 A 2 e	Food Processing, Beverages and Tobacco	ISIC Divisions 15 and 16.
1 A 2 f	Non-Metallic Minerals	Includes products such as glass ceramic, cement, etc. ISIC Division 26.
1 A 2 g	Transport Equipment	ISIC Divisions 34 and 35.
1 A 2 h	Machinery	Includes fabricated metal products, machinery and equipment other than transport equipment. ISIC Divisions 28, 29, 30, 31 and 32.

Treatment of biogenic fuels

- CO₂ emissions from the use of biomass, biofuels and biogas for stationary combustion should be reported but excluded from emission totals.

IPCC Code	Fuel	Value of AD	Units	CO ₂	Tier	Ref	CH ₄	Tier	Ref	N ₂ O	Tier	Ref
1A2e	Coal	1896	TJ	772,172544	1	Sec 12	0,0364032	1	Sec 12	0,0546048	1	Sec 12
1A2e	Wood Pallets	129,4	TJ	3454	1	Sec 12	0,0605592	1	Sec 12	0,00605	1	Sec 12
1A2e	Coal	7551,059	TJ	2332,01117	1	Sec 12	0,14498033 3	1	Sec 12	0,2174704 99	1	Sec 12
1A2e	HFO	7,012	TJ	0,00661021 2	1	Sec 12	0,00084985 4	1	Sec 12	0,0001699 71	1	Sec 12

CS factors – Importance of Improvement programmes [Coal-mining case]

Mining method	Activity	Greenhouse Gas	Emission Factor (South Africa specific) – m ³ /Tonne	2006 IPCC default (m ³ /Tonne)	
Underground Mining	Coal Mining	CH ₄	0.77	18	
	Post-mining (handling and transport)		0.18	2.5	
Surface Mining	Coal mining		0	1.2	
	Post-mining (storage and transport)		0	0.1	
Underground Mining	Coal mining		CO ₂	0.077	NA
	Post-mining (storage and transport)			0.018	NA
Surface Mining	Coal mining	0		NA	
	Post-mining (storage and transport)	0		NA	

Questions



Thank You



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