Main Contents of 2006 IPCC Guideline - Vol.2 (Energy)

The 7th Greenhouse Gas Inventory system training workshop

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2006 IPCC Guidelines for National Greenhouse Gas Inventories

Guideline Details:	**Mandatory use for ETF**	**MPGs Clarifications**:	**Precedence of MPGs**:

• General **principles and methods for compiling GHG inventories**.
• Good practice for reporting and QA/QC procedures.
	• **Each Party shall use the 2006 IPCC Guidelines** and any subsequent versions or refinements agreed upon by the CMA.	• Provide information on the **use of the 2006 IPCC Guidelines**.
		• Clarify provisions and offer guidance on approaches like key category analysis and uncertainty analysis.
			• On the rare occasion that information in the MPGs differs from that in the 2006 IPCC Guidelines
			  • Example: MPGs separate agriculture and LULUCF sectors, unlike the 2006 IPCC Guidelines.
			  • **MPGs take precedence over the 2006 IPCC Guidelines.**

2019 Refinement to the 2006 IPCC Guidelines

Purpose:	**Updates**:	**Voluntary Use**:
• Provides **supplementary methodologies** for GHG sources and sinks with identified gaps, new technologies, and under-covered areas.	• Includes **updated default values for emission factors (EFs)** and other parameters based on the latest science.	• Parties **may use the 2019 Refinement voluntarily** (decision 5/CMA.3).

2006 IPCC Guidelines for National Greenhouse Gas Inventories

CBIT-GSP
CLIMATE TRANSPARENCY

Volume 1 General Guidance and Reporting

Volume 2 Energy

Volume 3 Industrial Processes and Product

Volume 4 Agriculture, Forestry and Other Land Use

Volume 5 Waste

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Volume 2 Energy

Volume 2 – Energy

1. Introduction
2. Stationary Combustion
3. Mobile Combustion
4. Fugitive emissions
5. Carbon Dioxide Transport, Injection and Geological Storage
6. Reference approach

Annex 1. Worksheets

General structure of sectoral guidance chapters

Methodological Issues

- Choice of Method, including decision trees and definition of tiers.
- Choice of Emission Factor
- Choice of Activity Data
- Completeness
- Developing a Consistent Time Series

Uncertainty Assessment

- Activity Data Uncertainties
- Emission Factor Uncertainties

Quality Assurance/Quality Control, Reporting and Documentation

Worksheets

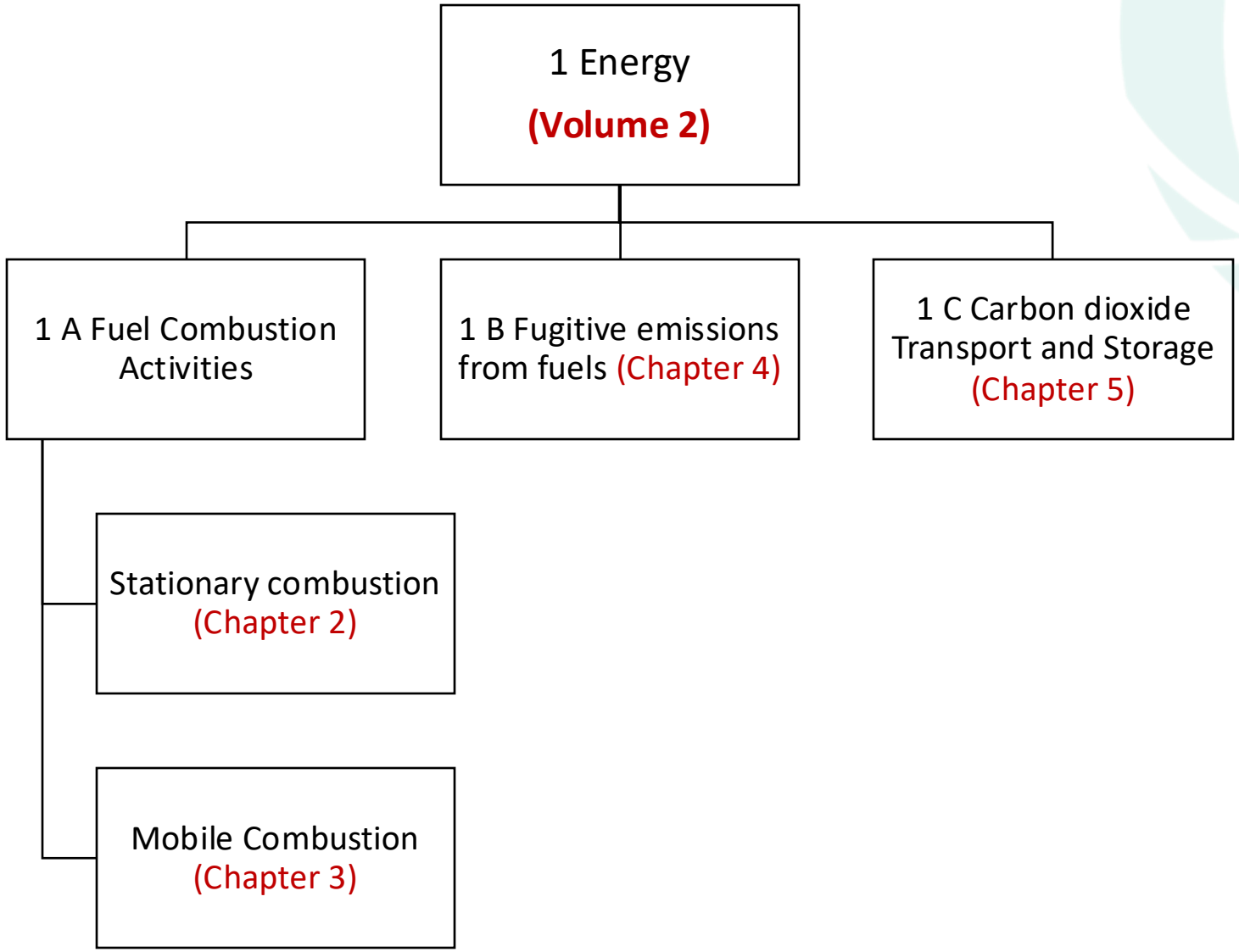
Chapter 1. Introduction

Source categories

Emissions arise from these activities by **combustion** and **as fugitive emissions**, or escape without combustion

- Exploration and exploitation of primary energy sources,
- Conversion of primary energy sources into more useable energy forms in refineries and power plants
- Transmission and distribution of fuels
- Use of fuels in stationary and mobile applications.

Source categories for Energy sector



Source categories

Methodologies for estimating fugitive emissions from the Energy Sector are very different from those used for fossil fuel combustion.

Fuel combustion

- Definition: **intentional oxidation of materials within an apparatus that is designed to provide heat or mechanical work to a process**

Fugitive emissions

- Fugitive emissions from extraction, transformation and transportation of primary energy carriers.
  - **Leakage of natural gas and the emissions of methane during coal mining and flaring during oil/gas extraction and refining**
  - Typically, only a few percent of the emissions in the energy sector arise as fugitive emissions
  - In some cases where countries produce or transport significant quantities of fossil fuels, fugitive emissions can make a much larger contribution to the national total.

Three tiers for fuel combustion

Tier 1

- Fuel combustion from national energy statistics and **default emission factors**;

Tier 2

- Fuel combustion from national energy statistics, together with **country-specific emission factors**, where possible, derived from national fuel characteristics;

Tier 3

- Fuel statistics and data on combustion technologies applied together with **technology-specific emission factors**; this includes the use of models and facility level emission data where available.

Selecting tiers: A general decision tree

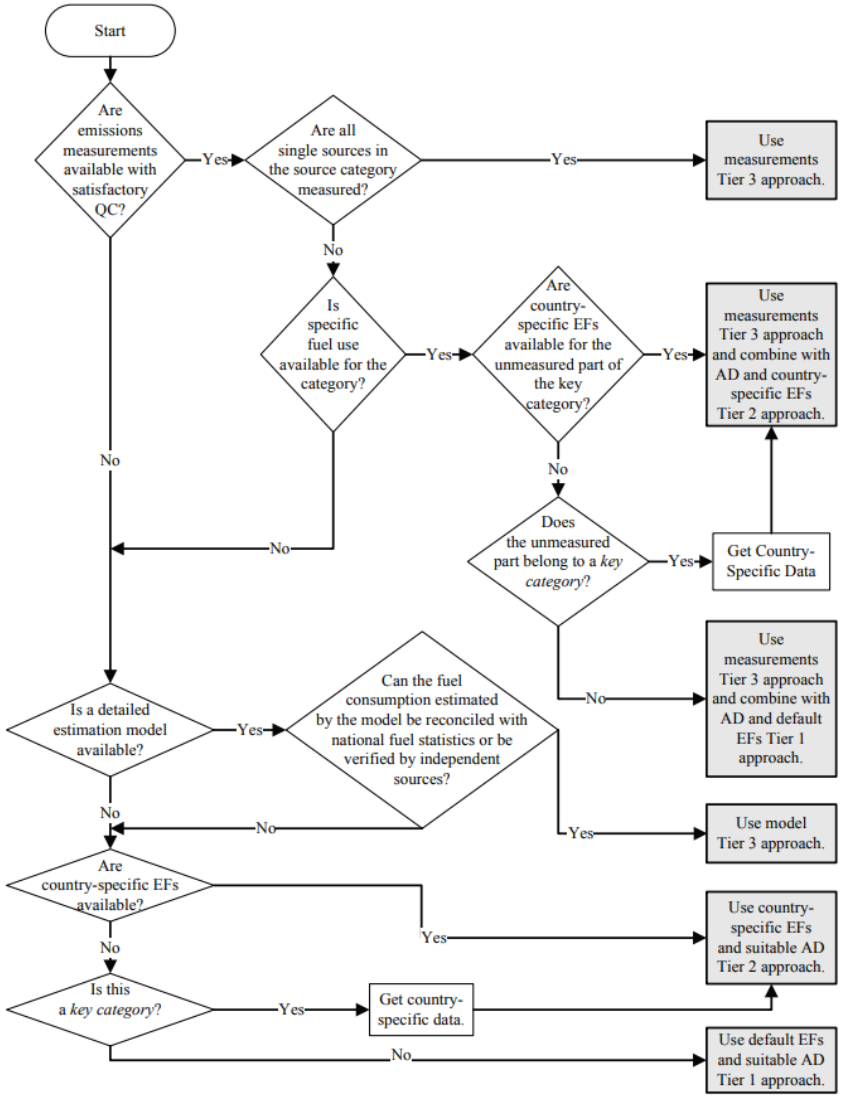
For each source category and greenhouse gas, the inventory compiler has a **choice of applying different methods**

Could use different tiers for different source categories depending on:

- **importance of the source category within the national total** (key categories Chapter 4 of Volume 1)
- **availability of resources** in terms of time, work force, sophisticated models, and budget

Decision tree to select Tier Approach

Figure 2.1 **Generalised decision tree for estimating emissions from stationary combustion**



- **If a category is key, *it is good practice* to estimate emissions using a Tier 2 or Tier 3 approach.**

- The decision tree will help in selecting which tier should be used to estimate emissions from sources of stationary combustion.

Emissions from biomass fuels

Emissions of **CO2 from biomass fuels are estimated and reported in the AFOLU sector** as part of the AFOLU methodology.

- These emissions are reported as information items in the reporting tables but are **not included in the sectoral or national totals to avoid double counting.**
- For biomass, only the portion combusted **for energy purposes should be included as an information item in the Energy sector.**

Emissions of CH4 and N2O from biomass combustion are estimated and included in energy the sector and national totals

Potential double counting between sectors
Non-Energy use of Fuels

For a number of applications, mainly in larger industrial processes, **fossil hydrocarbons are not only used as energy sources, but also have other uses** e.g. feedstocks, lubricants, solvents, etc.

- In some types of non-energy use of fossil hydrocarbons, **emissions of fossil carbon containing substances might occur**.
- Reported under the IPPU sector where they occur.
- Volume 3, Industrial Processes and Product Use.

The **use of fuel combustion statistics** rather than fuel delivery statistics is key to avoid double counting in emission estimates.

- When activity data are not quantities of fuel combusted but are instead deliveries to enterprises or main subcategories, **there is a risk of double counting emissions from the IPPU or Waste Sectors.**

Potential double counting between sectors

Incineration of waste

Energy Recovery from Waste

- Emissions from waste combustion with energy recovery are reported in the Energy sector under stationary combustion.
- It is recommended to **differentiate between fossil carbon materials and biogenic parts in waste**.

Waste incineration without energy recovery

- Reported in the Waste source category.

CO_2 emissions from fossil carbon

- included in the "Other fuels" category

CO_2 emissions from biomass

- reported as an information item (Chapter 5 of the Waste Volume)

Chapter 2. Stationary Combustion

Detailed sector split for stationary combustion

Energy Industries (1A1)	• Electricity and heat production (1A1a) • Petroleum refining (1A1b) • Manufacture of solid fuels and other energy industries (1A1c)
Manufacturing Industries and Construction (1A2)	• Iron and steel (1A2a) • Non-ferrous metals (1A2b) • Chemicals (1A2c) • Pulp, paper, and print (1A2d) • Food processing, beverages, and tobacco (1A2e) • Non-metallic minerals (1A2f) • Transport equipment (1A2g) • Machinery (1A2h) • Mining (excluding fuels) and Quarrying (1A2i) • Wood and Wood Products (1A2j) • Construction (1A2k) • Textile and Leather (1A2l) • Non-specified Industry (1A2m)
Other Sectors (1A4)	• Commercial and institutional (1A4a) • Residential (1A4b) • Agriculture, forestry, and fishing (1A4c)
Non-specified (1A5)	• Stationary (1A5a) • Mobile (1A5b)

Activity data (stationary combustion)

The activity data - **amounts and types of fuel combusted.**

Most fuels consumers normally pay for the solid, liquid and gaseous fuels they consume.

Masses or volumes of fuels they consume are **measured or metered**.

Sources of activity data (fuel combustion)

National energy statistics agencies	• National energy statistics agencies may collect data on the amount and types of fuel combusted from individual enterprises that consume fuels)
Reports provided by enterprises to national energy statistics agencies	• These reports are most likely to be produced by the operators or owners of large combustion plants
Reports provided by enterprises to regulatory agencies	• For example, reports produced to demonstrate how enterprises are complying with emission control regulations
Individuals within the enterprise responsible for the combustion equipment	• Periodic surveys, by statistical agencies, of the types and quantities of fuels consumed by a sample of enterprises
Suppliers of fuels	• Who may record the quantities of fuels delivered to their customers, and may also record the identity of their customers usually as an economic activity code)

Tier 1 (Stationary Combustion)

$$Emissions_{GHG,fuel} = Fuel\ consumption_{fuel} \times Emission\ factor_{GHG,fuel}$$

For each source category and fuel:

- Data on the amount of fuel combusted in the source category
- **A default emission factor**

Total emissions by gas from the source category:

- $Emissions_{GHG} = \sum_{fuels} Emissions_{GHG,fuel}$

Tier 1 (Stationary Combustion)
CO_2 emissions

$$CO_2\ emissions = Fuel\ consumption_{fuel} \times CO_2\ Emission\ factor_{fuel}$$

$$CO_2\ emission\ factor_{fuel} = Carbon\ content_{fuel} \times \text{Oxidation fraction} \times 44/12$$

OXIDATION FRACTION

- measure the percentage of carbon that is actually oxidized when combustion occurs.
- Default CO2 emission factors: the fraction of carbon oxidised is assumed to be 1
- is used to calculate the amount of the fuel that is contributing to GHG emissions.
- Efficient fuel combustion ensures oxidation of the maximum amount of carbon available the fuel.

Tier 2 (Stationary Combustion)

$$Emissions_{GHG,fuel} = Fuel\ consumption_{fuel} \times Emission\ factor_{GHG,fuel}$$

For each source category and fuel:

- Data on the amount of fuel combusted in the source category
- **A country-specific emission factor** for the source category and fuel for each gas.

Country-specific emission factors can be developed by taking into account country-specific data:

- Carbon contents of the fuels
- Carbon oxidation factors
- Fuel quality
- The state of technological development (for non-CO2 gases in particular)

Tier 3 (Stationary Combustion)

$$Emissions_{GHG,fuel,technology} = Fuel\ consumption_{fuel,technology} \times Emission\ factor_{GHG,fuel.technology}$$

Data requirements

- Data on the amount of fuel combusted in the source category for each relevant technology (**fuel type used, combustion technology, operating conditions, control technology, and maintenance and age of the equipment**).
- **A specific emission factor for each technology** (fuel type used, combustion technology, operating conditions, control technology, oxidation factor, and maintenance and age of the equipment).
- Facility level measurements can also be used when available

When the amount of fuel combusted for a certain technology is not directly known, it can be estimated by means of models.

- For example, a simple model for this is based on the penetration of the technology into the source category:
- $Fuel\ consumption_{fuel,technology} = Fuel\ consumption_{fuel} \times Penetration_{technology}$

To calculate the emissions of a gas for a source category, emissions per technology must be summed over all technologies applied in the source category.

- $Fuel\ consumption_{fuel,technology} = \sum_{technologies} Fuel\ consumption_{fuel,technology} \times Emission\ Factor_{GHG,fuel,technology}$

Default Emission Factors for stationary combustion

kg of greenhouse gas per TJ on a Net Calorific Basis

Table 2.2
- Default emission factors for stationary combustion in the **energy industries**

Table 2.3
- Default emission factors for stationary combustion in the **manufacturing industries and construction**

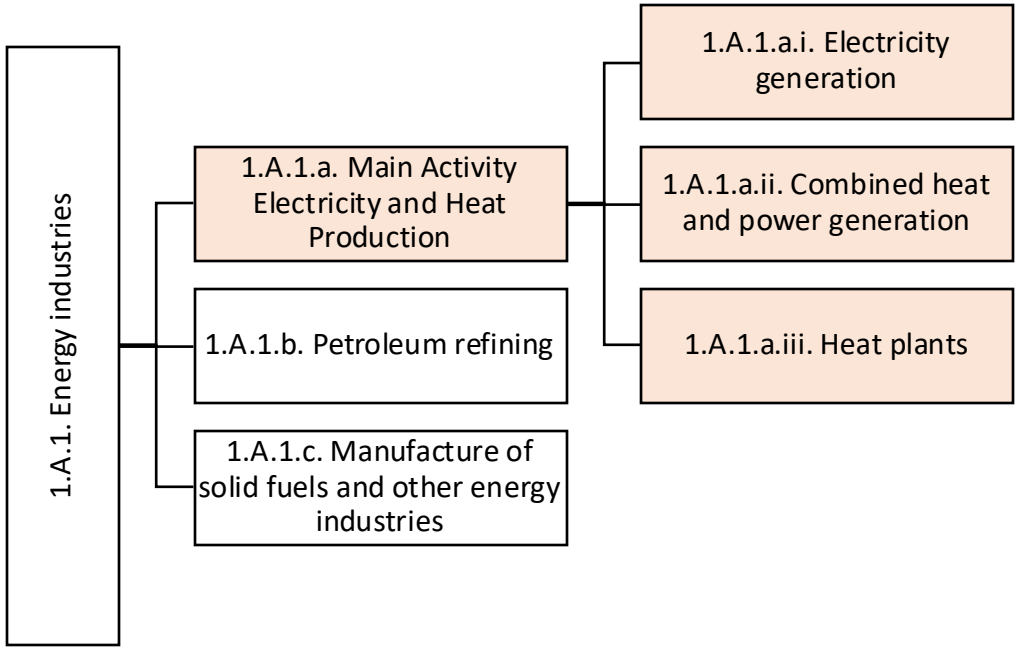
Table 2.4
- Default emission factors for stationary combustion in the **commercial/institutional category**

Table 2.5
- Default emission factors for stationary combustion in the **residential and agriculture/forestry/fishing/fishing**

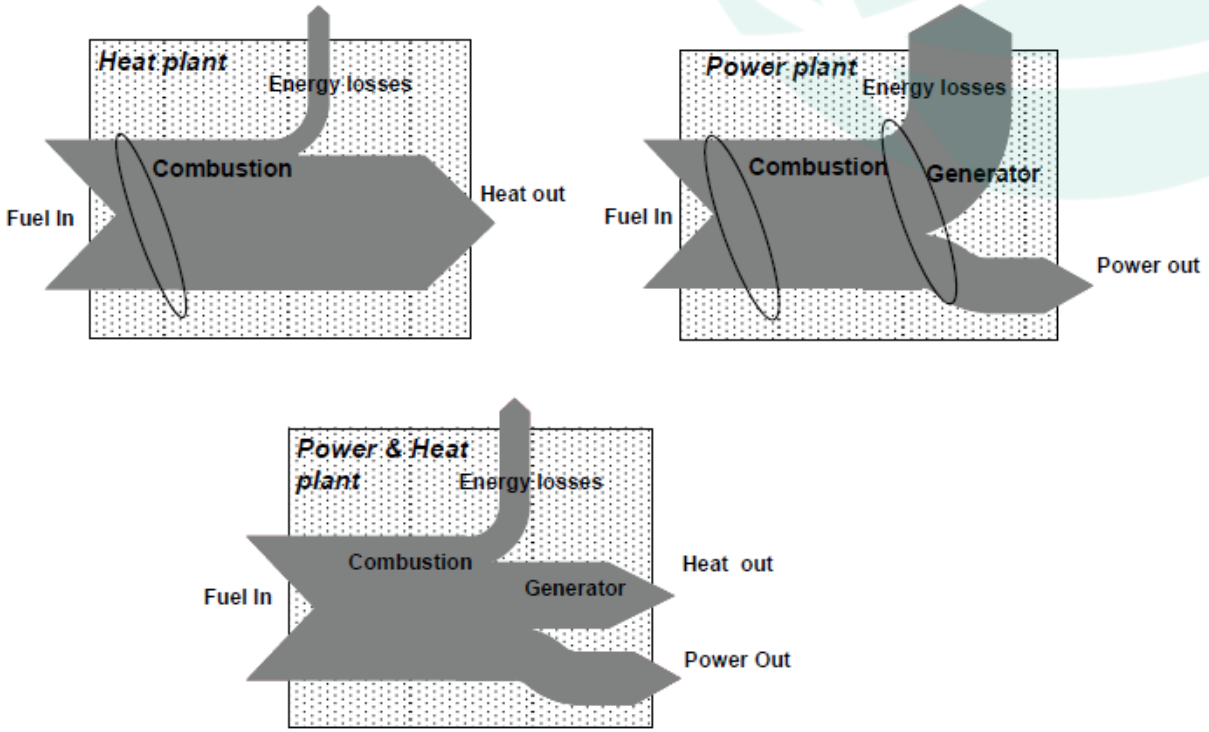
TABLE 2.2
DEFAULT EMISSION FACTORS FOR STATIONARY COMBUSTION IN THE ENERGY INDUSTRIES
(kg of greenhouse gas per TJ on a Net Calorific Basis)

Fuel		CO_2			CH_4			N_2O		
		Default Emission Factor	Lower	Upper	Default Emission Factor	Lower	Upper	Default Emission Factor	Lower	Upper
Crude Oil		73 300	71 100	75 500	r 3	1	10	0.6	0.2	2
Orimulsion		r 77 000	69 300	85 400	r 3	1	10	0.6	0.2	2
Natural Gas Liquids		r 64 200	58 300	70 400	r 3	1	10	0.6	0.2	2
Gasoline	Motor Gasoline	r 69 300	67 500	73 000	r 3	1	10	0.6	0.2	2
	Aviation Gasoline	r 70 000	67 500	73 000	r 3	1	10	0.6	0.2	2
	Jet Gasoline	r 70 000	67 500	73 000	r 3	1	10	0.6	0.2	2
Jet Kerosene		r 71 500	69 700	74 400	r 3	1	10	0.6	0.2	2
Other Kerosene		71 900	70 800	73 700	r 3	1	10	0.6	0.2	2
Shale Oil		73 300	67 800	79 200	r 3	1	10	0.6	0.2	2
Gas/Diesel Oil		74 100	72 600	74 800	r 3	1	10	0.6	0.2	2
Residual Fuel Oil		77 400	75 500	78 800	r 3	1	10	0.6	0.2	2
Liquefied Petroleum Gases		63 100	61 600	65 600	r 1	0.3	3	0.1	0.03	0.3
Ethane		61 600	56 500	68 600	r 1	0.3	3	0.1	0.03	0.3
Naphtha		73 300	69 300	76 300	r 3	1	10	0.6	0.2	2
Bitumen		80 700	73 000	89 900	r 3	1	10	0.6	0.2	2
Lubricants		73 300	71 900	75 200	r 3	1	10	0.6	0.2	2
Petroleum Coke		r 97 500	82 900	115 000	r 3	1	10	0.6	0.2	2
Refinery Feedstocks		73 300	68 900	76 600	r 3	1	10	0.6	0.2	2
Other Oil	Refinery Gas	n 57 600	48 200	69 000	r 1	0.3	3	0.1	0.03	0.3
	Paraffin Waxes	73 300	72 200	74 400	r 3	1	10	0.6	0.2	2
	White Spirit and SBP	73 300	72 200	74 400	r 3	1	10	0.6	0.2	2
	Other Petroleum Products	73 300	72 200	74 400	r 3	1	10	0.6	0.2	2
Anthracite		98 300	94 600	101 000	1	0.3	3	r 1.5	0.5	5
Coking Coal		94 600	87 300	101 000	1	0.3	3	r 1.5	0.5	5
Other Bituminous Coal		94 600	89 500	99 700	1	0.3	3	r 1.5	0.5	5
Sub-Bituminous Coal		96 100	92 800	100 000	1	0.3	3	r 1.5	0.5	5
Lignite		101 000	90 900	115 000	1	0.3	3	r 1.5	0.5	5
Oil Shale and Tar Sands		107 000	90 200	125 000	1	0.3	3	r 1.5	0.5	5
Brown Coal Briquettes		97 500	87 300	109 000	n 1	0.3	3	r 1.5	0.5	5
Patent Fuel		97 500	87 300	109 000	1	0.3	3	n 1.5	0.5	5
Coke	Coke Oven Coke and Lignite Coke	r 107 000	95 700	119 000	1	0.3	3	r 1.5	0.5	5
	Gas Coke	r 107 000	95 700	119 000	r 1	0.3	3	0.1	0.03	0.3
Coal Tar		n 80 700	68 200	95 300	n 1	0.3	3	r 1.5	0.5	5
Derived Gases	Gas Works Gas	n 44 400	37 300	54 100	n 1	0.3	3	0.1	0.03	0.3
	Coke Oven Gas	n 44 400	37 300	54 100	r 1	0.3	3	0.1	0.03	0.3
	Blast Furnace Gas	n 260 000	219 000	308 000	r 1	0.3	3	0.1	0.03	0.3
	Oxygen Steel Furnace Gas	n 182 000	145 000	202 000	r 1	0.3	3	0.1	0.03	0.3
Natural Gas		56 100	54 300	58 300	1	0.3	3	0.1	0.03	0.3

1.A.1.a Main Activity Electricity and Heat Production



- Power and heat plants use fuels to produce electric power and/or useful heat.
- Primary activity is to produce electricity and/or heat

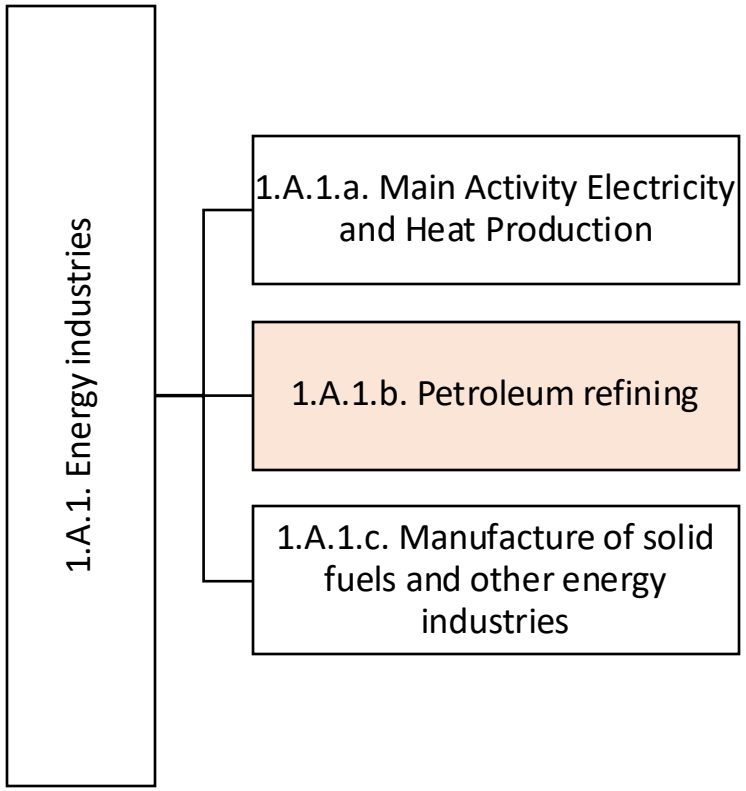


[2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2 Stationary Combusiton]

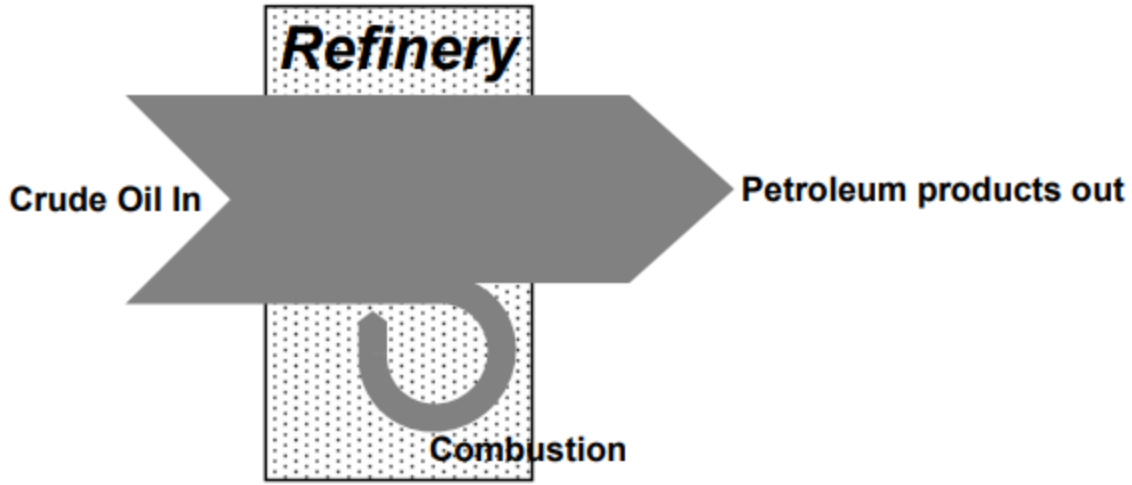
Difference between main activity producers and autoproducers

Main activity producers	Autoproducers
• **Primary activity is to supply the public** • Public or private ownership • Emissions from own on-site use of fuel included	• An enterprise that, in support of its primary activity, generates electricity and/or heat for its own use or for sale, **but not as its main business** • Emissions from autoproducers should be assigned to the sector where they were generated and not under 1 A 1 a.

1.A.1.b Petroleum refining



- Crude oil is transformed into various products in a refinery
- A refinery uses energy to transform crude oil into petroleum products.
- Typically, 6-10% of the total fuel input is combusted within refineries, varying by technology and complexity.
- *Best Practice: Consult the refinery industry for accurate fuel consumption data to verify energy statistics.*

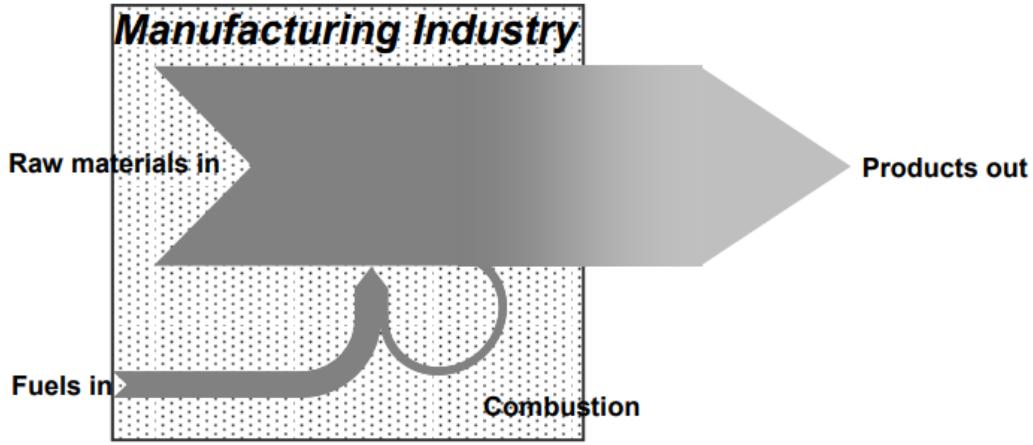


2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2 Stationary Combusiton

1.A.2. Manufacturing industries and construction		
	a. Iron and steel	ISIC Group 271 and Class 2731
	b. Non-ferrous metals	ISIC Group 272 and Class 2732
	c. Chemicals	ISIC Division 24
	d. Pulp, paper and print	ISIC Divisions 21 and 22
	e. Food processing, beverages and tobacco	ISIC Divisions 15 and 16
	f. Non-metallic minerals	ISIC Division 26
	g. Transport Equipment	ISIC Divisions 34 and 35
	h. Machinery	ISIC Divisions 28, 29, 30, 31 and 32.
	i. Mining (excluding fuels) and Quarrying	ISIC Divisions 13 and 14
	j. Wood and Wood Products	ISIC Division 20
	k. Construction	ISIC Division 45
	l. Textile and Leather	ISIC Divisions 17, 18 and 19
	m. Non-specified Industry	ISIC Divisions 25, 33, 36 and 37

1.A.2. Manufacturing industries and construction

- The category has been subdivided using the **International Standard Industrial Classification (ISIC)**.
- Fuels are used as an energy source in manufacturing industries to convert raw materials into products.



2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2 Stationary Combusiton

1.A.2. Manufacturing industries and construction

Reported in 1.A.2

- Emissions from combustion of fuels in industry.
- Also includes combustion for the generation of electricity and heat for own use in these industries.

Not reported in 1.A.2

- Emissions from fuel combustion in coke ovens within the iron and steel industry, reported under 1 A 1 c
- Energy used for transport by industry, reported under Transport (1 A 3).

1.A.4. Other sectors

1.A.4.a. Commercial/institutional

- Emissions from fuel combustion in commercial and institutional buildings; all activities included in ISIC Divisions 41, 50, 51, 52, 55, 63-67, 70-75, 80, 85, 90-93 and 99.

1.A.4.b. Residential

- All emissions from fuel combustion in households.

1.A.4.c. Agriculture/forestry/fishing

- Emissions from fuel combustion in agriculture, forestry, fishing and fishing industries such as fish farms.

  Activities included in ISIC Divisions 01, 02 and 05.

  Highway agricultural transportation is excluded.

Chapter 3. Mobile Combustion

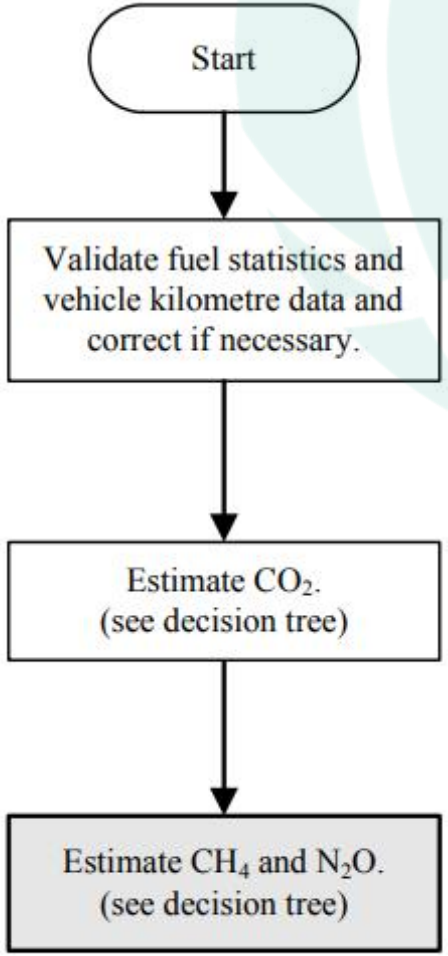
Detailed sector split for the transport sector

Civil aviation (1A3a)	• i. International Aviation (International Bunkers) • ii. Domestic Aviation
Road Transportation (1A3b)	• i. Cars • ii Light Duty trucks • iii. Heavy duty trucks and buses • iv. Motorcycles • v. Evaporative emissions from vehicles • vi. Urea-based catalysts
Railways(1A3c)	• Emissions from railway transport for both freight and passenger traffic routes.
Water-borne Navigation (1A3d)	• i. International water-borne navigation (International bunkers) • ii. Domestic water-borne Navigation
Other Transportation (1A3e)	• i. Pipeline Transport • ii. Off-road • iii. Fishing (mobile combustion)

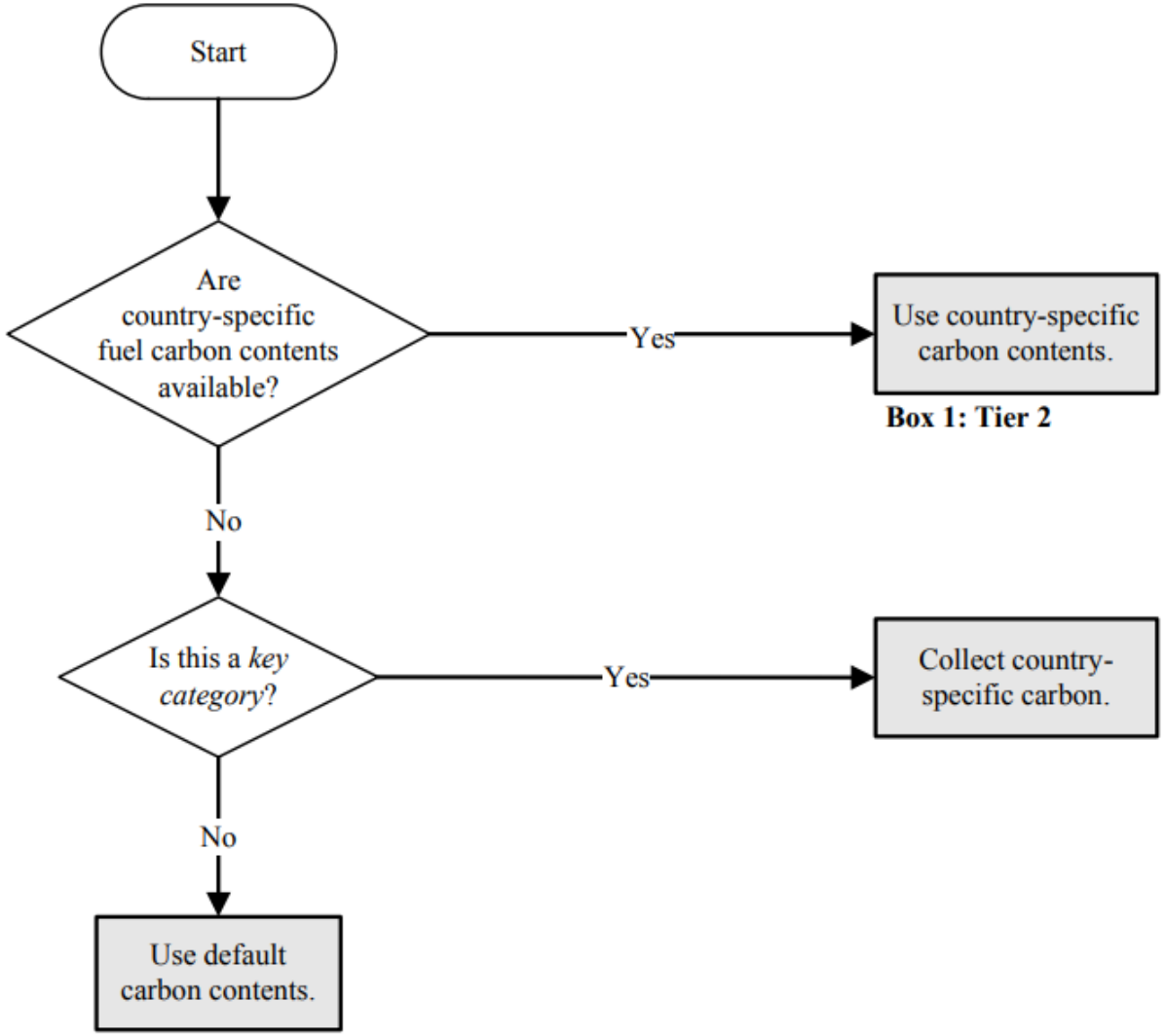
1.A.3.b Road transportation

Emissions can be estimated using fuel sold or vehicle kilometres.

Validation step - consistency between fuel sold and vehicle kilometre data.



Decision tree for CO2 emissions from fuel combustion in road vehicles



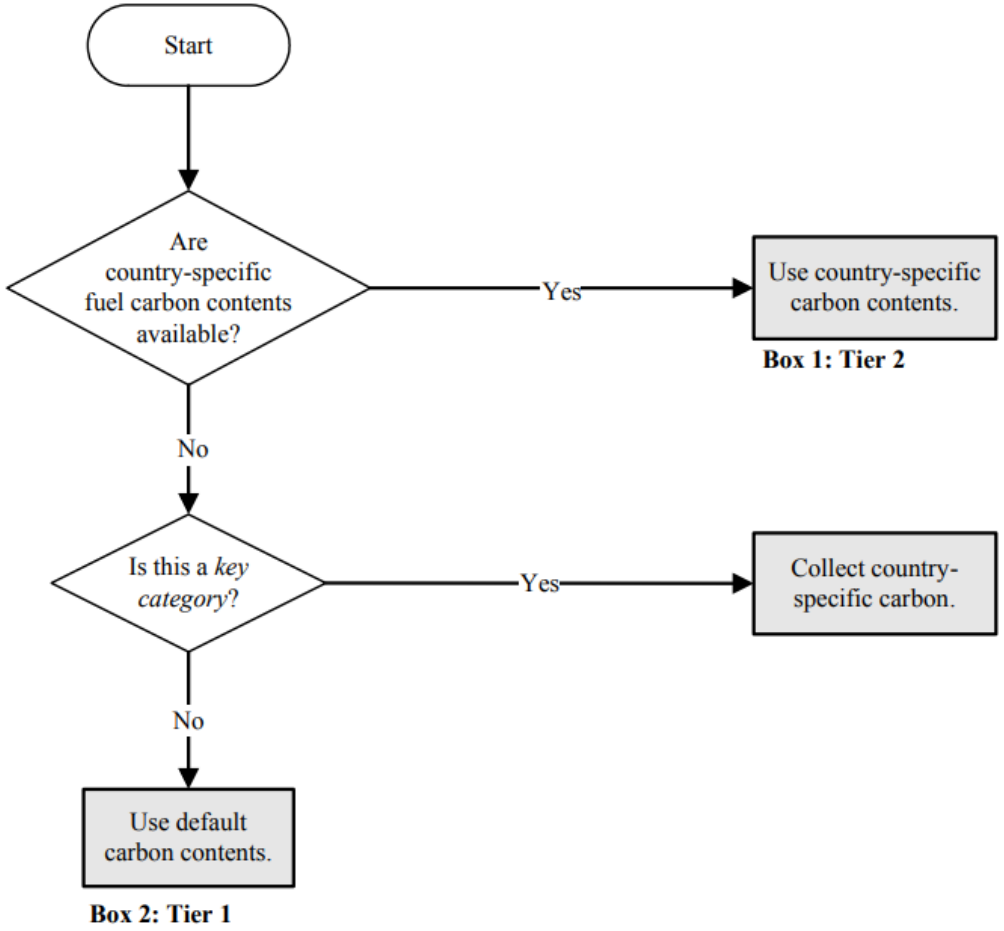
CO_2 from road transport

$$Emision = \sum_{a} [Fuel_a \times EF_a]$$

a = type of fuel (e.g. petrol, diesel, natural gas, LPG etc.)

The Tier 2 approach is the same as Tier 1 except that country-specific carbon contents of the fuel sold in road transport are used.

Decision tree for CO2 emissions from fuel combustion in road vehicles



CO_2 from road transport

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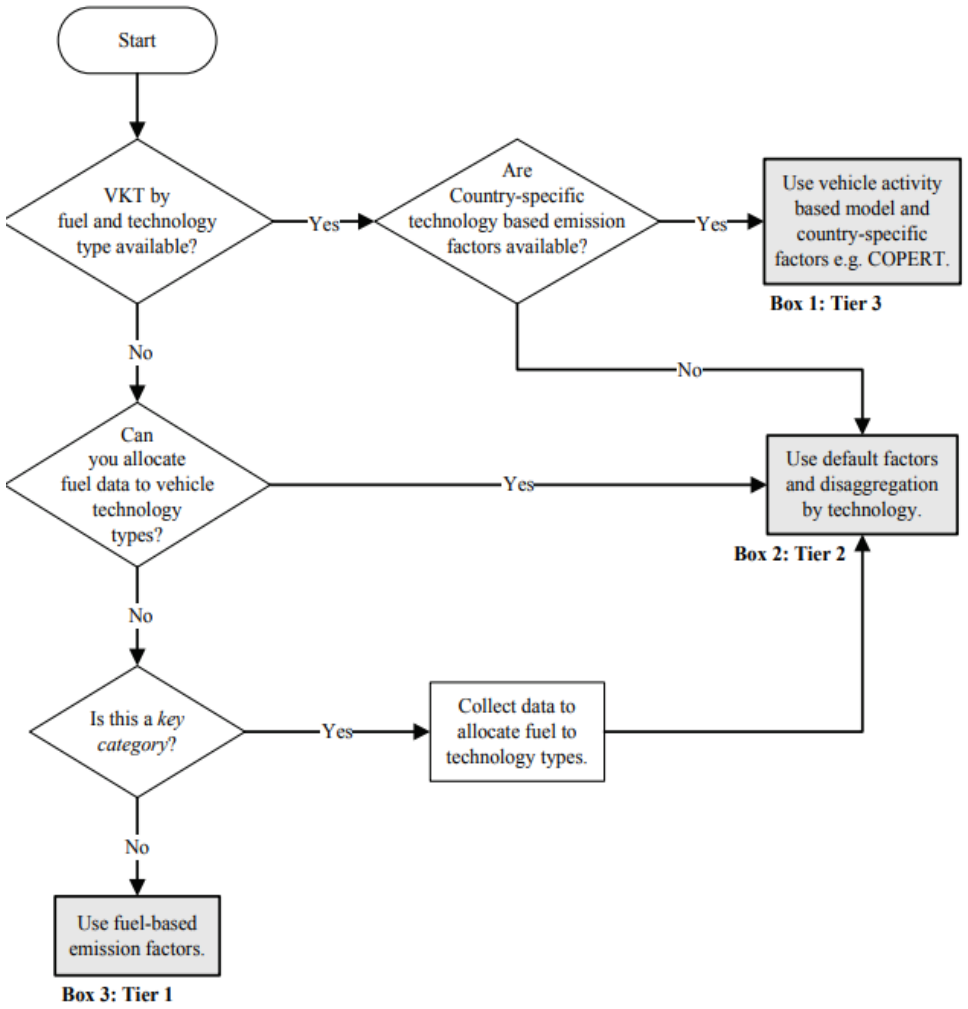
The Tier 2 approach is the same as Tier 1 except that country-specific carbon contents of the fuel sold in road transport are used.

Decision tree for CH4 and N2O emissions from road vehicles



Tier 1

- Uses fuel-based emission factors; suitable if fuel consumption by vehicle type cannot be estimated.

Tier 2

- Uses fuel-based emission factors specific to vehicle subcategories.

Tier 3

- Requires detailed, country-specific data; calculates emissions based on vehicle activity levels (e.g., VKT) for each vehicle subcategory and road type.

Emission factors for CH4 and N2O depend on vehicle technology, fuel, and operating characteristics.

Validation of fuel consumption with Vehicle Kilometres Travelled (VKT) data

$$Estimated\ Fuel = \sum_{i,j,t} [Vehicles_{i,j,t} \times Distance_{i,j,t} \times Consumption_{i,j,t}]$$

- *Estimated Fuel =total estimated fuel use estimated from distance travelled (VKT) data*
- *$Vehicles_{i,j,t}$ = number of vehicles of type i and using fuel j on road type t*
- *$Distance_{i,j,t}$ = annual kilometres travelled per vehicle of type i and using fuel j on road type t (km)*
- *$Consumption_{i,j,t}$ = average fuel consumption (l/km) by vehicles of type i and using fuel j on road type t*
- *i = vehicle type (e.g., car, bus)*
- *j = fuel type (e.g. motor gasoline, diesel, natural gas, LPG)*
- *t = type of road (e.g., urban, rural)*

- If data on different road types are unavailable, simplify the equation by removing the road type variable.
- It is ***good practice*** to compare the fuel sold statistics used in the Tier 1 approach with the result of equation
- It is ***good practice*** to consider any differences and determine which data is of higher quality.

Activity data for Tier 2 and Tier 3 (CH4 and N2O)

If CH_4 or N_2O emissions from road transportation are a *key category*, it is *good practice* to obtain more information:	The **amount of fuel consumed** (in terajoules) by fuel type (all tiers);
	for each fuel type, **the amount of fuel (or VKT driven) that is consumed by each representative vehicle type** preferably with age categories (Tiers 2 and 3);
	the emission control technology (e.g., three-way catalysts) (Tiers 2 and 3).
	It may also be possible to collect **VKT data by type of road** (e.g. urban, rural, highway)

International aviation and international navigation (international bunkers)

1.A.3.a.i International Aviation (International Bunkers)

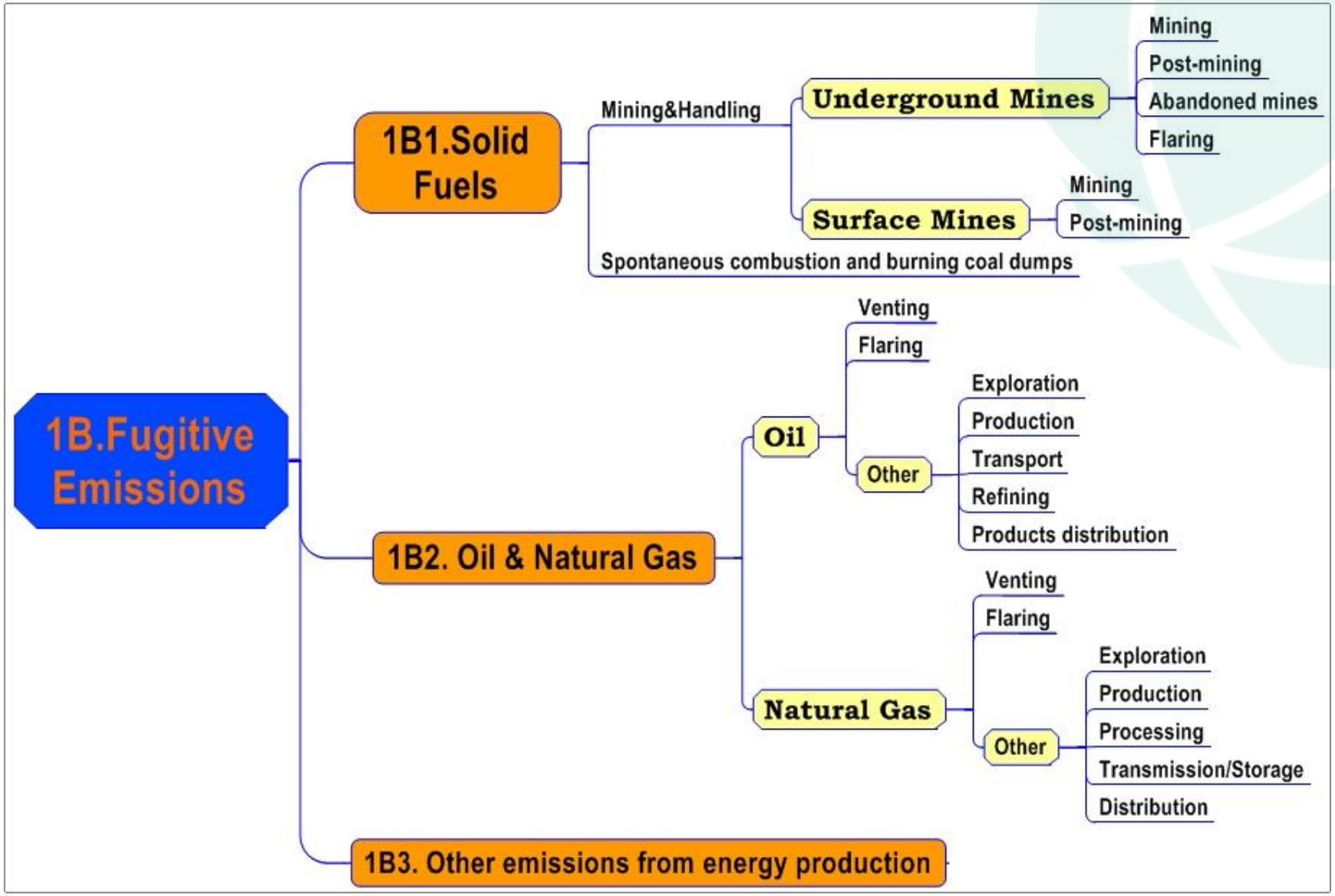
- Emissions from flights that depart **in one country and arrive in a different country.**
- Include take-offs and landings for these flight stages.

1.A.3.d.i International waterborne Navigation (International bunkers)

- The international navigation may take place at sea, on inland lakes and waterways and in coastal waters.
- Includes emissions from journeys **that depart in one country and arrive in a different country.**

Chapter 4 Fugitive emissions

1B. Fugitive Emissions



1B. Fugitive Emissions

Fugitive emissions are emissions of gases or vapour from equipment due to leaks and other unintended or irregular releases of gases, mostly from activities associated with the production and distribution of fossil fuels.

It includes leaks form pressurised equipment, evaporation and displacement of vapour, and accidental releases

- Significant CH_4 emissions from:
  - Coal mines
  - Refinery leaks
  - Gas distribution pipelines

- Simple Emission Factor methods at Tier 1. Higher Tiers need more details on technologies and age of plant/mines etc.

Coal Mines

CH_4 is the major GHG emitted from coal mining and handling.

CO_2 may also be present in some coal seams.

The major stages for the GHG emissions for both underground and surface coal mines are

Mining emissions	Post-mining emissions	Low temperature oxidation	Uncontrolled combustion
• gas liberated by fracturing coal during mining. This may be collected (for safety) and flared or used for energy. Emission can continue after mine closure	• emissions during processing, handling and distribution	• coal slowly oxidises to CO_2 when exposed to the air	• oxidation may lead to an active fire in coal storage or exposed coal seams with a rapid CO2 formation. This can occur naturally

Oil and Gas

- Oil & Gas fugitive emissions include all emissions from oil and gas systems except those for the use of oil and gas for energy purpose or as a feedstock

- It covers everything from an oil well to a consumer:
  - Exploration and Production
  - Processing and Refining
  - Distribution and Delivery

- Includes equipment leaks, evaporation loses, venting, flaring and accidental releases

Chapter 5. Carbon Dioxide Transport, Injection and Geological Storage

Four systems of CCS chain (Guidelines)

1. Capture and Compression System:

1. Includes capture, compression, and conditioning for transport.

2. Transport System:

- Involves pipelines and ships for large-scale CO2 transport. Boundaries are from the compression/conditioning plant to the end of the transport pipeline or ship offloading facility.

3. Injection System:

- Comprises surface facilities at the injection site, including storage facilities, distribution pipelines, additional compression facilities, measurement and control systems, wellheads, and injection wells. Boundaries are from the end of the transport pipeline or ship offloading facility to the geological storage reservoir.

4. Storage System:

- Consists of the geological storage reservoir.

Chapter 2
Stationary Combustion

Chapter 5 Carbon Dioxide Transport, Injection and Geological Storage

Thank you for your attention!

For further information please visit us on The Climate Transparency Platform.

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