Enviroment and Climate Regional Accession Network ECRAN

ECRAN Regional Training Seminar on the Assessment of
GHG Inventories in the Energy and Industrial Processes Sectors
Activity 3.2: MMR - Task 3.2.2.A
Zagreb, Croatia, 21 November 2014

Good practice in selecting AD, EFs and other parameters in Industrial processes sector
Part I - 2A, 2B, 2C

Andrea Hublin

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Outline

- various industrial activities - categories according to the 2006 IPCC Guidelines
- different greenhouse gases are produced or used (depending on the category) - carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), F-gases
  - ✓ methodologies for emissions estimation - decision trees - 2006 IPCC Guidelines
- emissions of precursors - NO_x, NMVOC, CO, SO_2, NH_3
  - ✓ methodologies for emissions estimation - EMEP/CORINAIR Emission Inventory Guidebook (EEA, 2005)

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Methodological issues (1)

- **choice of method**
  - ✓ *good practice* - choose the most appropriate method based on national circumstances
  - ✓ decision trees - Tier 1, Tier 2, Tier 3 - depending on available data and information
- **choice of emission factors**
  - ✓ *good practice* - default EF for Tier 1
    - country/plant specific EF for higher Tier methods
- **choice of activity data**
  - ✓ *good practice* - national-level data (or plant-level where available) and default values for Tier 1
    - disaggregated data, country/plant specific data for higher Tier methods

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Methodological issues (2)

- **completeness**
  - ✓ compete activity data are needed for *good practice* - account all emissions from all sources
  - ✓ important issue to consider where plant specific data are used to estimate national emissions by higher Tier method
  - ✓ only process-related emissions should be included
  - ✓ double counting should be avoided
- **developing a consistent time series**
  - ✓ use the same method for every year in the time series
  - ✓ recalculations due to methodological changes and refinements
  - ✓ resolving data gaps

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Specific procedures

- **uncertainty assessment**
  - ✓ emission factor uncertainties
  - ✓ activity data uncertainties
- **quality assurance/quality control (QA/QC)**
  - ✓ comparison of emission estimates using different approaches
  - ✓ review of emission factors
  - ✓ activity data check
  - ✓ revision of direct emission measurements
- **reporting and documentation**
  - ✓ *good practice* - document and archive all information required to produce emission estimates

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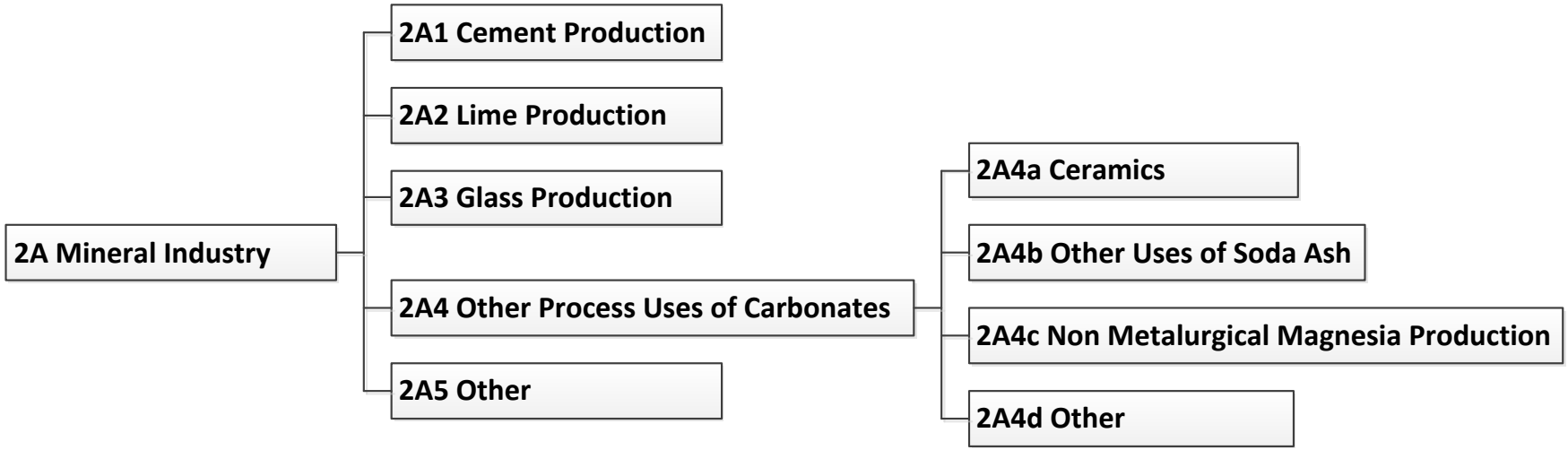
2A Mineral Industry



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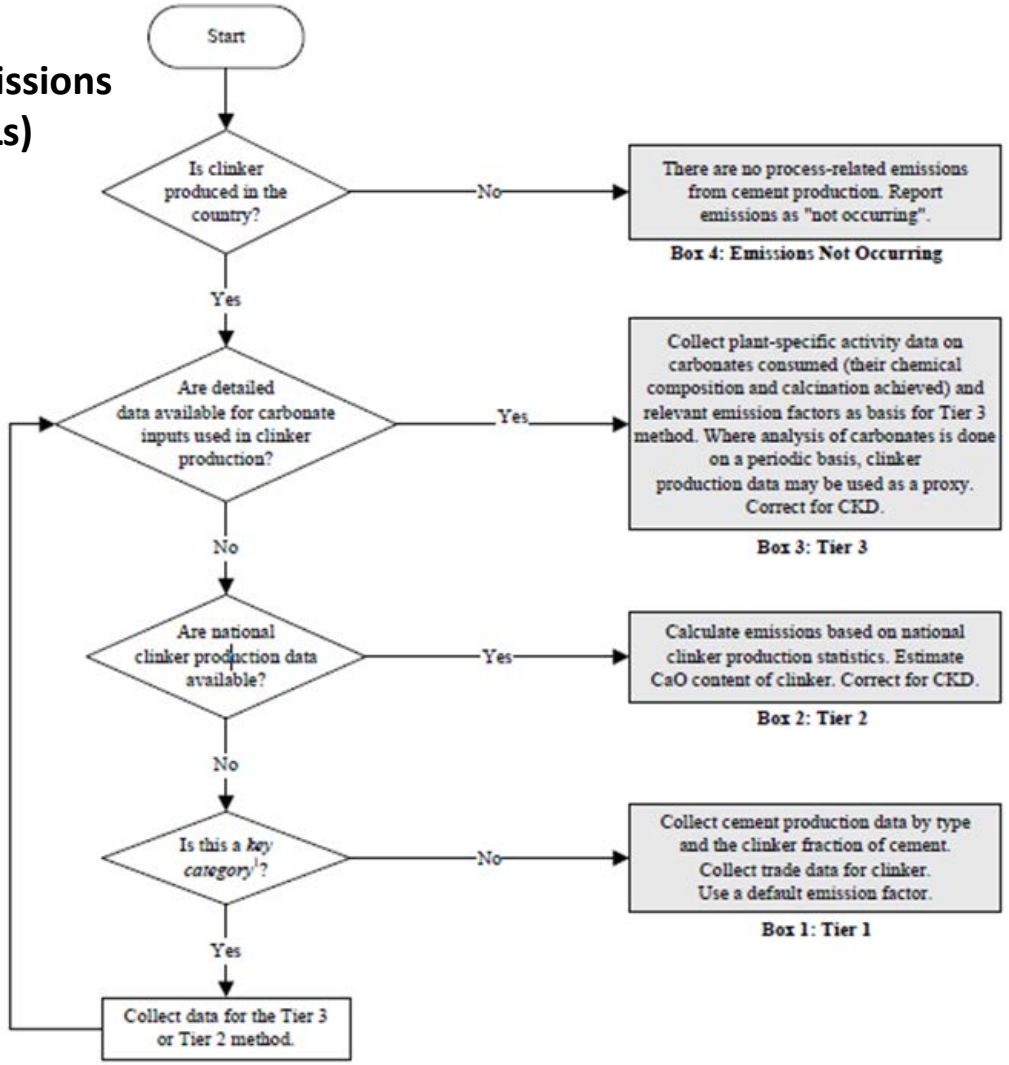
2A1 Cement production - decision tree

Decision tree for estimation of CO_2 emissions from cement production (2006 IPCC GLs)

Box 1: Tier 1
Box 2: Tier 2
Box 3: Tier 3

depending on data availability



Note:
[1] a *key category* is one that is prioritised within the national inventory system because its estimate has a significant influence on a country's total inventory of GHGs in terms of the absolute level, the trend, or the uncertainty in emissions (2006 IPCC GLs, Volume 1, Chapter 4)

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2A1 Cement production - CRF

TABLE 2(I).A-H SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES AND PRODUCT USE
Emissions of CO_2, CH_4 and N_2O
(Sheet 1 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS[2]				
	Production/Consumption quantity		CO_2	CH_4	N_2O	CO_2	
						Emissions[3]	Recovery[4]
	Description[1]	(kt)	(t/t)				
A. Mineral industry							
1. Cement production	(e.g. cement or clinker production)						
2. Lime production							
3. Glass production							
4. Other process uses of carbonates							
a. Ceramics							
b. Other uses of soda ash							
c. Non-metallurgical magnesium production							
d. Other							

activity data
(description and checking of unit)

emission estimate

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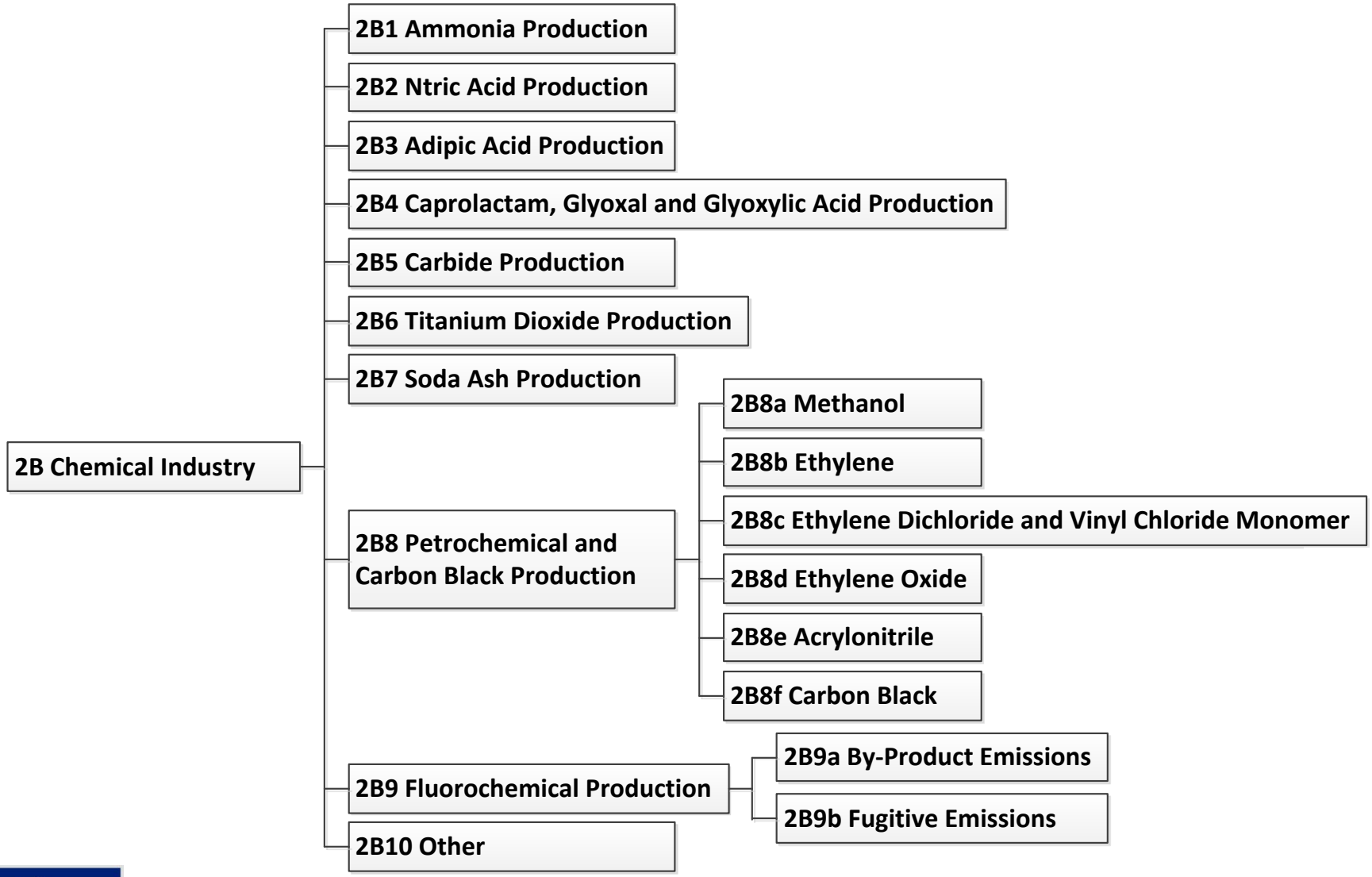
2B Chemical Industry



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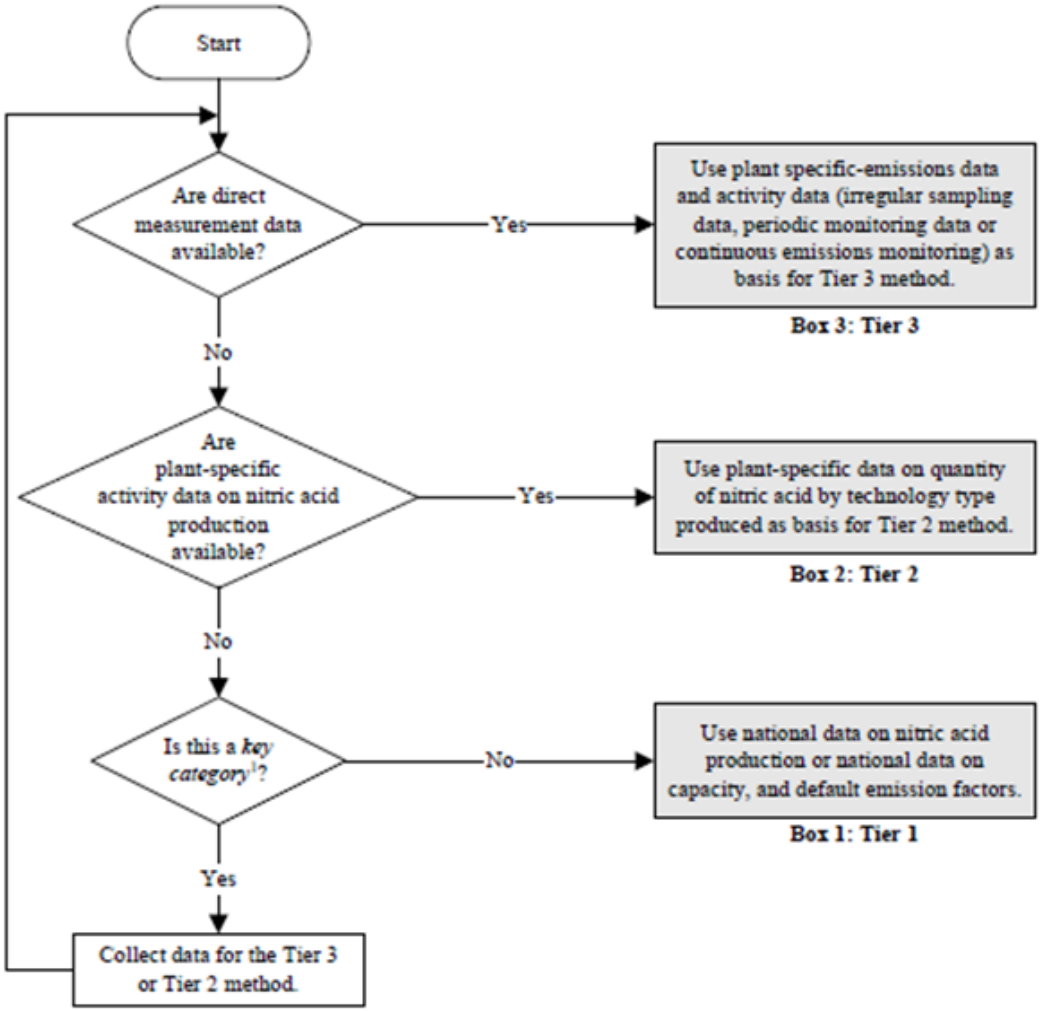
2B2 Nitric acid production - decision tree

Decision tree for estimation of N_2O emissions from nitric acid production (2006 IPCC GLs)



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2B2 Nitric acid production - CRF

activity data

emission estimate

TABLE 2(I).A-H SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES AND PRODUCT USE
Emissions of CO_2, CH_4 and N_2O
(Sheet 1 of 2)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]			EMISSIONS	
	Production/Consumption quantity		CO_2	CH_4	N_2O	N_2O	
	Description [1]	(kt)	(t/t)			Emissions [3]	Recovery [4] (kt)
B. Chemical industry							
1. Ammonia production [5]							
2. Nitric acid production							
3. Adipic acid production							
4. Caprolactam, glyoxal and glyoxylic acid							
a. Caprolactam							
b. Glyoxal							
c. Glyoxylic acid							
5. Carbide production							
a. Silicon carbide							
b. Calcium carbide							
6. Titanium dioxide production							
7. Soda ash production							
8. Petrochemical and carbon black production							
a. Methanol							
b. Ethylene							
c. Ethylene dichloride and vinyl chloride monomer							
d. Ethylene oxide							
e. Acrylonitrile							
f. Carbon black							
g. Other [6]							
Drop-down list							
Styrene							
Other *(please specify)*							
10. Other *(please specify)*							

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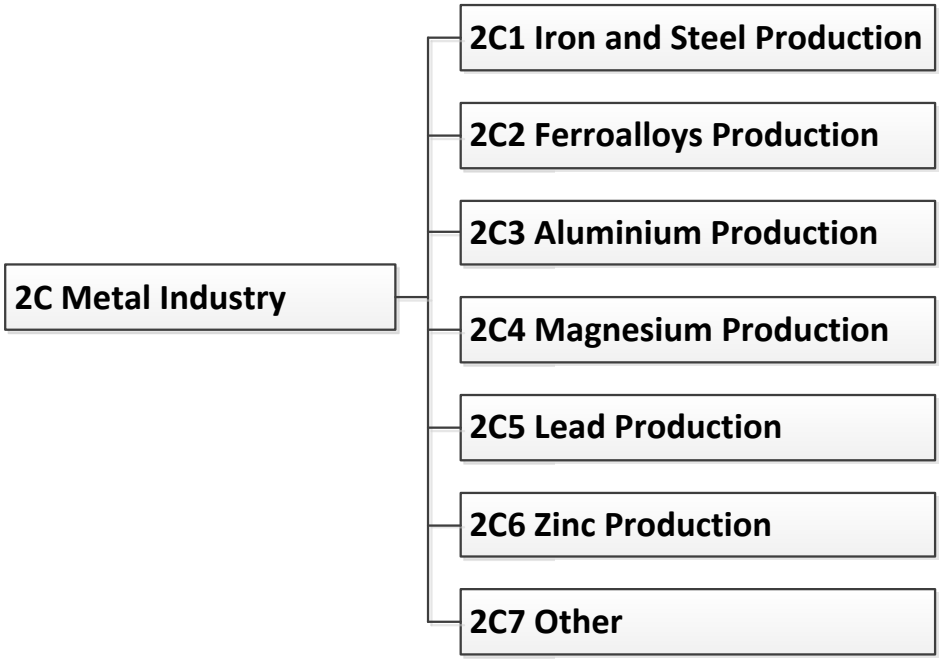
2C Metal Industry



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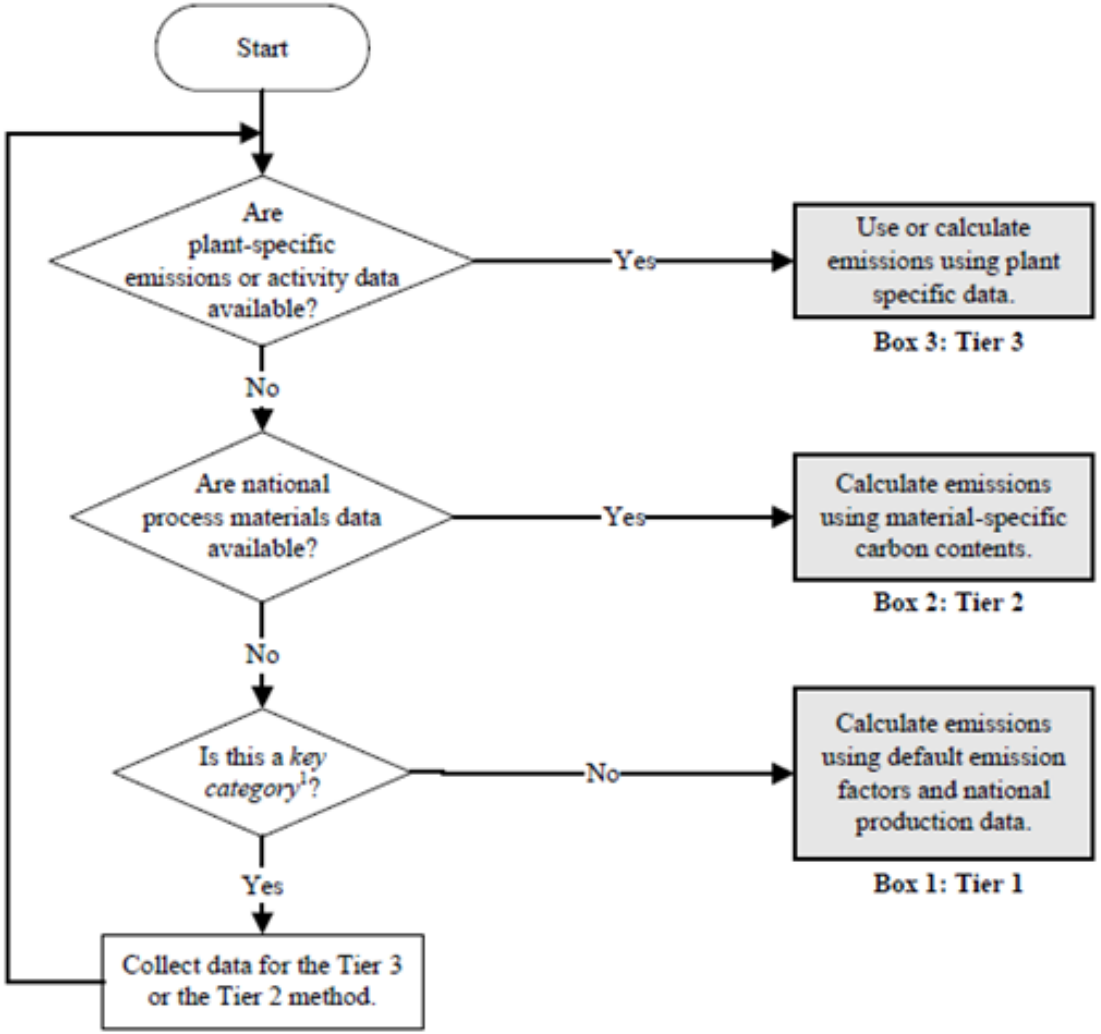
2C1 Iron and steel production - decision trees

Decision tree for estimation of CO_2 emissions from iron and steel production (2006 IPCC GLs)



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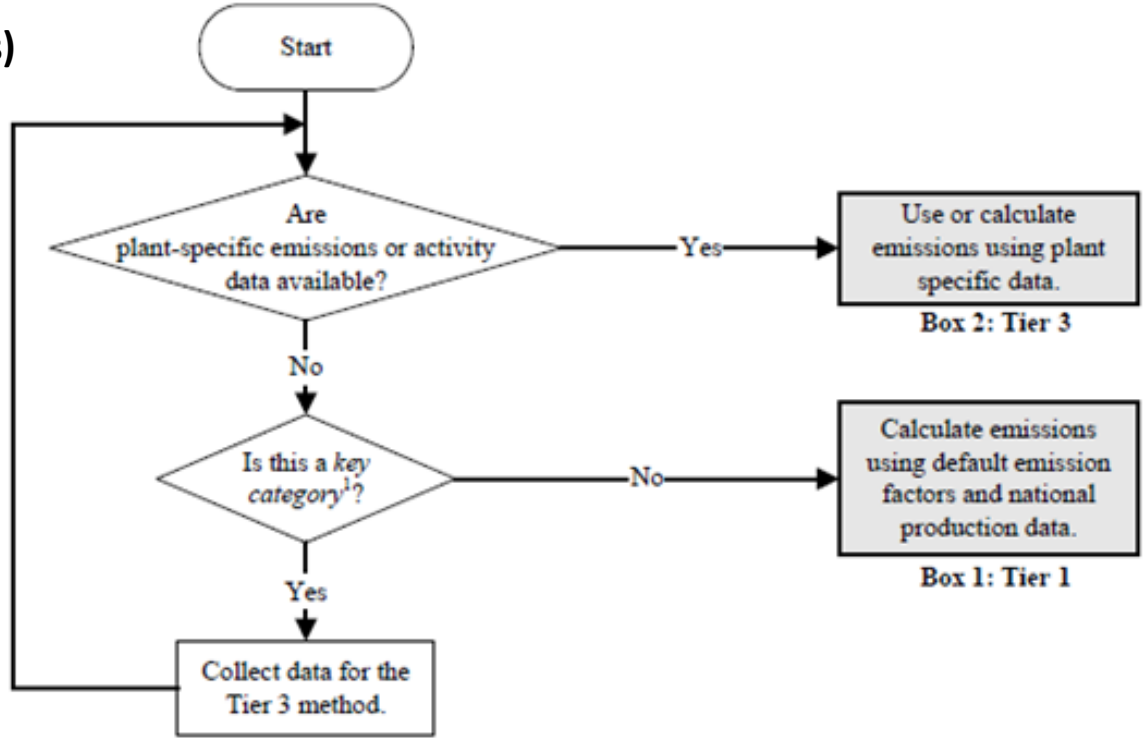
2C1 Iron and steel production - decision trees

Decision tree for estimation of CH_4 emissions from iron and steel production (2006 IPCC GLs)



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2C1a Steel production - CRF

TABLE 2(I).A-H SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES AND PRODUCT USE
Emissions of CO_2, CH_4 and N_2O
(Sheet 2 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]			EMISSIONS			
	Production/Consumption quantity		CO_2	CH_4	N_2O	CO_2		CH_4	
	Description [1]	(kt)	(t/t)			Emissions [1]	Recovery [1]	Emissions [1]	Recovery [1]
						(kt)			
C. Metal industry									
1. Iron and steel production									
a. Steel									
b. Pig iron									
c. Direct reduced iron									
d. Sinter									
e. Pellet									
f. Other *(please specify)*									
2. Ferroalloys production									
3. Aluminium production									
4. Magnesium production									
5. Lead production									
6. Zinc production									
7. Other *(please specify)*									

activity data

emission estimate

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Contact & Information

Andrea Hublin
EKONERG - Energy and Environmental Protection Institute
Phone +385 1 6000 134
andrea.hublin@ekonerg.hr
www.ekonerg.hr

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