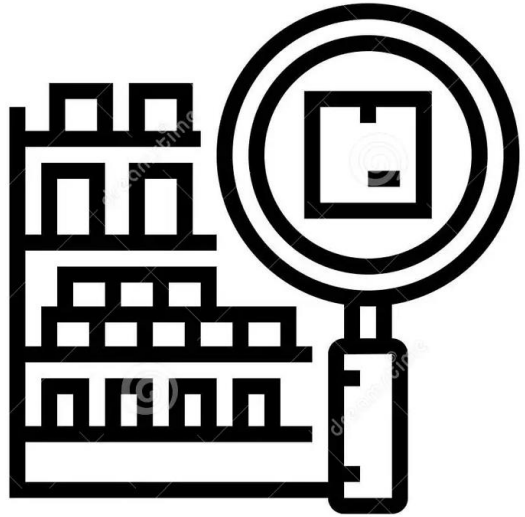
Training on 2006 IPCC Guidelines for preparing National GHG Inventory: Energy and Waste Sector



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Data requirement in moving towards Tier 2 and Tier 3 in transport sector

Organized by the Capacity Building Initiative for Transparency
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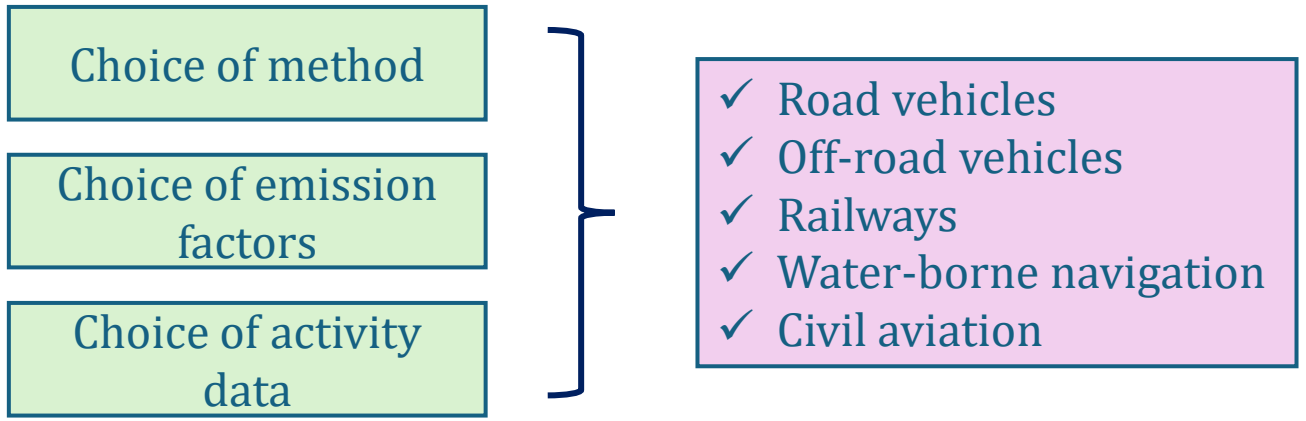
- **Tier represent a level of methodological complexity. There are 3 tiers .**

Tier 1	Basic method
Tier 2	Intermediate method
Tier 3	Most demanding method in terms of complexity and data requirements

- **Tiers selection is applicable for,**



- **Decision trees are used to identify the which tier is most appropriate to calculate emissions**

- In energy sector, where transport is a category, the following table describe best about tiers

Tier	Description

Tier 1	• Method is fuel based. Because emissions from all sources of combustion can be estimated basis of
	  • the quantities of fuel combusted and,
	  • average emission factors
	• Quality of these emission factors differs among gases (CO_2, N_2O, and CH_4)
	  • CO_2 emissions can be estimated fairly accurately
	  • For CH_4 and N_2O, will have large uncertainties

Tier 2	• Emissions from fuel combustion are estimated from fuel statistics (as in Tier 1 method). But country-specific emission factors are used (instead of defaults in tier 1)
Tier 3	• Use either detailed emission models or measurements and data at individual plant level • Provide better estimates for non-CO_2 GHGs.

Civil aviation

Gas	Tier 1	Tier 2	Tier 3
CO_2	▪ Aggregate quantity of fuel consumption (LTO and Cruise) ▪ Default emission factors ▪ Amount of CO_2 captured	▪ LTO fuel consumption of individual aircraft for domestic and international operations ▪ cruise fuel consumption for domestic and international aviation ▪ LTO emission factor ▪ Tier 1 CO_2, CH_4, N_2O emission factors	▪ Movement data of individual aircraft. ▪ Movement data refers to information on the origin and destination, aircraft type, and date of individual flights
CH_4			
N_2O			

Road transportation

Gas	Tier 1	Tier 2	Tier 3
CO_2	▪ Fuel consumption ▪ Default emission factors by fuel type ▪ Amount of CO_2 captured	▪ Country-specific carbon contents of fuels ▪ Fuel consumption by fuel type ▪ Amount of CO_2 captured	▪ N/A
CH_4		▪ Fuel consumption data by technology type ▪ Technology-specific emission factors	▪ VKT by fuel and technology type ▪ Country-specific technology-based emission factors ▪ Emissions during warm-up phase
N_2O			

Railways

Gas	Tier 1	Tier 2	Tier 3
CO_2	- Fuel consumption by fuel type - Default emission factors for fuels - Amount of CO_2 captured	- Fuel consumed by locomotive type - Country-specific and fuel-specific emission factors specific to locomotive type - Amount of CO_2 captured	N/A
CH_4			- The following parameters should be specific to locomotive type and journey type - Number of locomotives - Annual hours of use of locomotives - Average rated power of locomotive - Typical load factor of locomotive - Average emission factor for use in locomotive
N_2O			

Water-borne navigation

Gas	Tier 1	Tier 2
CO_2	▪ Fuel consumption by fuel type ▪ Default emission factors by fuel type ▪ Amount of CO_2 captured	▪ Fuel consumption by fuel type ▪ Country-specific emission factors with greater specificity in the classification of modes (e.g. ocean-going ships and boats), fuel type (e.g. fuel oil), and even engine type (e.g. diesel) ▪ Amount of CO_2 captured
CH_4		
N_2O		

Off-road vehicles

Gas	Tier 1	Tier 2	Tier 3
CO_2	▪ Fuel consumption data fuel-specific default emission factors ▪ Amount of CO_2 captured	▪ Technology-level fuel consumption data ▪ Country-specific emission factors ▪ Amount of CO_2 captured	▪ Source population ▪ Equipment-level data, ➢ Annual hours of equipment use ➢ rated power ➢ load factor ➢ emission factors based on power usage
CH_4			
N_2O			

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