"Capacity Building and Strengthening Institutional Arrangement"

Analysis and sampling of air and air pollution

Identification of the sources of pollutant substances emissions

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AIR POLLUTION AND ENVIRONMENTAL IMPACTS

Key source categories

■The IPCC Good Practice Guidance (IPCC, 2000) recommends as good practice the identification of key source categories in national GHG inventories

■A key source category is an emission source that has a significant influence on a country's GHG inventory in terms either of the absolute relative level of emissions or the trend in emissions, or both

■Key source categories are those found in the accumulative 95% of the total annual emissions in the last reported year or belonging to the total trend, when ranked in descending order of magnitude

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Tier 1 and Tier 2 approaches

- Tier 1: key sources categories are identified by means of a pre-determined cumulative emissions threshold, usually fixed at 95% of the total
- Tier 2: the results of Tier 1 are multiplied by the relative uncertainty of each source category.

Key source categories are those that represent 95% of the uncertainty contribution. So the factors which make a source a key source are a high contribution to the total, a high contribution to the trend and a high uncertainty.

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Key sources identification

National emissions have been disaggregated into 60 sources
Both level and trend analysis have been carried out

Source Category Level Assessment =
Source Category Estimate/Total Estimate

Source Category Trend Assessment =
Source Category Level Assessment · |(Source Category Trend – Total Trend)|

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Key sources identification (cnt)

where the source category trend is the change in the source category emissions over time, computed by subtracting the base year estimate for a generic source category from the current year estimate and dividing by the current year estimate

the total trend is the change in the total inventory emissions over time, computed by subtracting the base year estimate for the total inventory from the current year estimate and dividing by the current year estimate

the results of the trend difference is multiplied by the results of the level assessment to provide appropriate weighting

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Results of the key sources analysis for Italy- Tier 1

TIER 1						
CATEGORIES	2003 Gg CO2eq	Level assess.	Cum. Perc	CATEGORIES	% Contr. to trend	Cum. Perc.
CO2 stationary combustion gaseous fuels	143,988	0.25	0.25	CO2 stationary combustion gaseous fuels	0.35	0.35
CO2 stationary combustion liquid fuels	124,462	0.22	0.47	CO2 stationary combustion liquid fuels	0.33	0.68
CO2 Mobile combustion: Road Vehicles	116,346	0.20	0.68	CO2 Mobile combustion: Road Vehicles	0.08	0.77
CO2 stationary combustion solid fuels	61,629	0.11	0.78	HFC, PFC substitutes for ODS	0.03	0.79
CO2 Cement production	17,322	0.03	0.81	CO2 stationary combustion solid fuels	0.02	0.82
CH4 Enteric Fermentation in Domestic Liv	10,933	0.02	0.83	CH4 Enteric Fermentation in Domestic Live	0.02	0.84
CH4 from Solid waste Disposal Sites	9,690	0.02	0.85	CH4 Fugitive emissions from Oil and Gas C	0.02	0.85
Direct N2O Agricultural Soils	8,771	0.02	0.87	N2O Mobile combustion: Road Vehicles	0.01	0.87
Indirect N2O from Nitrogen used in agricu	7,991	0.01	0.88	CH4 from Solid waste Disposal Sites	0.01	0.88
N2O stationary combustion	7,025	0.01	0.89	N2O Nitric Acid	0.01	0.89
N2O Adipic Acid	6,417	0.01	0.90	CO2 Other industrial processes	0.01	0.91
CO2 Mobile combustion: Waterborne Nav	6,148	0.01	0.91	Direct N2O Agricultural Soils	0.01	0.92
CH4 Fugitive emissions from Oil and Gas	4,993	0.01	0.92	N2O Adipic Acid	0.01	0.93
HFC, PFC substitutes for ODS	4,544	0.01	0.93	CO2 Mobile combustion: Aircraft	0.01	0.93
N2O Manure Management	3,972	0.01	0.94	CO2 Fugitive emissions from Oil and Gas C	0.01	0.94
CH4 Manure Management	3,821	0.01	0.94	Indirect N2O from Nitrogen used in agricul	0.01	0.94
N2O Mobile combustion: Road Vehicles	3,670	0.01	0.95	CO2 Mobile combustion: Other	0.00	0.95
CO2 Limestone and Dolomite Use	3,303	0.01	0.96	CH4 Manure Management	0.00	0.95
CO2 Mobile combustion: Aircraft	2,771	0.00	0.96	CO2 Cement production	0.00	0.96
CO2 Fugitive emissions from Oil and Gas	2,499	0.00	0.97	CO2 Emissions from solvent use	0.00	0.96
CO2 Other industrial processes	2,435	0.00	0.97	CO2 Limestone and Dolomite Use	0.00	0.97
CO2 Lime production	2,092	0.00	0.97	N2O stationary combustion	0.00	0.97
N2O from animal production	1,682	0.00	0.98	HFC-23 from HCFC-22 Manufacture and H	0.00	0.97
CH4 from Rice production	1,562	0.00	0.98	N2O from animal production	0.00	0.98
CH4 Emissions from Wastewater Handling	1,432	0.00	0.98	CO2 Emissions from Waste Incineration	0.00	0.98
CO2 Mobile combustion: Other	1,410	0.00	0.98	N2O Manure Management	0.00	0.98
CO2 Iron and Steel production	1,384	0.00	0.99	CH4 Mobile combustion: Road Vehicles	0.00	0.98
CO2 Emissions from solvent use	1,324	0.00	0.99	SF6 Electrical Equipment	0.00	0.99
CH4 stationary combustion	1,096	0.00	0.99	CH4 stationary combustion	0.00	0.99
N2O Emissions from Wastewater Handling	1,062	0.00	0.99	PFC, HFC, SF6 Semiconductor manufactur	0.00	0.99

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Key sources analysis - Tier 2

The Tier 2 method for the identification of key sources implies the assessment of the uncertainty analysis to an emission inventory

Quantitative uncertainty estimates for the Italian GHG inventory are calculated using a Tier 1 approach, which provides a simplified calculation based on the error propagation equations

The Tier 2 approach, by means both of Monte Carlo and bootstrap, has been applied in Italy only to some sources to make comparison and to evaluate the added value