2005 Emission Inventory

alessandra
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Pollutants

Emission inventories generally take into account the following atmospheric pollutants:

- sulfur oxides (**SO_x**);
- nitrogen oxides (**NO_x**);
- non-methane volatile organic compounds (**NMVOC**);
- methane (**CH_4**);
- carbon monoxide (**CO**);
- carbon dioxide (**CO_2**).
- ammonia (**NH_3**);
- nitrous oxide (**N_2O**);
- total suspended particulate matter (**TSP**);
- particulate matter with diameter below 10 um (**PM10**);
- particulate matter with diameter below 2.5 um (**PM2.5**).

Elaborations are still in progress in order to assess the emissions of some pollutants whose preliminary data were considered affected by a too high range of uncertainty. These pollutants need detailed studies:

- heavy metals (**As, Cd, Cr, Cu, Hg, Ni, Pb, Se** and **Zn**);
- organic chloride compounds (**dioxins, PCB**, etc.).

Some pollutants, such as non-methane organic volatile compounds (NMVOC), are very wide classes of pollutants, that can contain very diverse compounds (i.e. hydrocarbons or benzene). Emission estimates for these pollutants are more affected by a high range of uncertainty, as census and estimate methodologies followed the ones used for the other pollutants (indicator and total emission factor), remanding then to disaggregation to a single NMVOC component.

As concerns particulate matter, it is not always clear if emission factors used within the Corinair framework are referred to total suspended powders (TSP) or to particulate matter with diameter below 10 um (PM10), and if proposed factors take into account the great development of powder abatement system occurred in the last years in several sectors.

Information needed in order to assess emissions of micro-pollutants (heavy metals or organic chloride compounds) are also poor, as there are few measurements which are available only for few activities such as waste incineration and cement industry.

Kyoto Protocol of December 1997 also paid attention for some halogen compounds responsible for climate change, in particular sulfur hexa fluoride (SF_6), HFCs, PFCs, used in chemical industry, in refrigeration and in air-conditioning. Emission factors for those compounds and activities are not available with completeness.

Another important aspect is qualitative characterization of emissions concerning the definition of the apportionment of the pollutant between gaseous and particulate phase. This information, seldom available in emission inventories, are a key-datum in order to determine the possibility of transporting pollutants in the environment due to a dry and wet deposition phenomena.

The ratio between the amounts of pollutant in the two phases, vapor and particulate, can vary, depending on temperature and vapor pressure, also with daily and seasonal variations.

Particulate phase of a given pollutant is not generally intended as homogeneous particles made of that particular substance, but powders, or fly ashes, which transport the substance adsorbed or contained on/in them. For pollutants in particulate phase, there is still little information about size distributions and enrichment phenomena of small particle distributions that can heavily influence the distribution of the pollutant in the environment, with the same total emission.

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