

# **2005 Emission Inventory**

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# Table of Contents

2005 Emission Inventory .....	3
Uncertainty in estimates .....	3

## 2005 Emission Inventory

- [Methodology](#)
- [Typologies of atmospheric pollutant sources](#)
- [Pollutants](#)
- [Aggregated pollution indicators](#)
- [Classification of activities \(SNAP 97\)](#)
- ["Top-Down" and "Bottom-Up"](#)
- [Spatial disaggregation of emissions](#)
- [Temporal modulation of emissions](#)
- [Data sources](#)
- [Emission factors](#)
- Uncertainty
- [Work in progress](#)

### Uncertainty in estimates

Atmospheric emission estimates are typically subject to uncertainties, due to several causes distributed all along the data processing.

The term "uncertainty" refers to a lack of knowledge in statistics, or else to the not accuracy or imprecision in estimates.

The uncertainty connected to an emission data varies considerably as the type of pollutant, the activity and the level of spatial disaggregation. For instance emission data of an energy power unit, obtained from the point sources survey, are surely more reliable than those estimated for a plant through medium emission factors. In the same way the municipality data of an area source has a bigger uncertainty than the county level data from whom it derives.

Emission estimates from industrial sources and, in most cases, from non-combustion sources are often less reliable than emission estimates from combustion; both the choice and quantification of indicators used for evaluation and its emission factors are affected by a great range of uncertainty due to the heterogeneity of processes existing in the industrial sector.

As other example, the estimation of volatile organic compounds emissions (VOC), that it is always critical, becomes problematic for evaporative losses (solvent evaporation, vehicles losses, tank losses, even during refueling or loading); more uncertainties are also in the estimation of emission produced by agricultural activities and from biological activity of natural cycle of plants.

The possibility of "accidental" emissions (known also "off-normal" emissions) due to probabilistic events as mistakes, transitory, process overloads, it is usually not taken into account in estimations done for emission inventories, that in general refer to annual average emissions related to normal working conditions, and not to accidental situations.

After all these considerations, it is therefore important in an emission inventory to manage a summarizing picture of all emissions.

The methodology usually employed for evaluation of emission data is for "successive approximations": collection criteria of databases (indicators, emission factors) of emission inventory are revised and improved, on the basis of available resources and results obtained in the first steps.

It cannot be missed that precision required to an emission inventory depends on the uses its data are expected to.

Surely local inventories, specific for a limited territory (for instance a municipality) can be more reliable than the estimate from the regional inventory, that for its nature can not consider all local specificity.

Also for local inventories, the regional inventory is however a useful basis, to provide a first estimate that can address efforts to further studies.

Per tornare ai dati rilasciati al pubblico cliccare su:

[Dati al pubblico](#)

Per tornare alla pagina inventari delle emissioni cliccare su:

[Inventario delle emissioni](#)

per tornare alla gestione dei risultati:

[Gestione dei risultati](#)

oppure tornare alla pagina iniziale cliccare su:

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