



EMISSION INVENTORIES

Executive Summary

5TH SEMINAR ON AIR QUALITY IN SPAIN

Santander, October 16, 17 and 18, 2006

TABLE OF CONTENTS

1. Introduction	1
2. Current Situation of Air Emission Inventories in Spain.....	1
2.1. Objectives	1
2.2. Main conclusions	2
3. Bases for the Production of Air Emission Inventories in Spain	3
3.1. Objectives	3
3.2. Objective 1: Horizontal issues	3
3.2.1. Principles	4
3.2.2. Pollutants that should be included in AEIs	4
3.2.3. Structure of the inventory. Classification of activities	4
3.2.4. Acceptance criteria of point measurements as a way of calculating air emissions.....	5
3.2.5. EPER – AEI register	6
3.3. Objective 2: Calculation methodologies for emissions from activity sectors.....	6

1. Introduction

“Group 4: Emissions Inventories” was created within the framework of the 5th Air Quality Seminar with the following aims:

- To determine the current situation in Spain.
- To standardize the performance of emission inventories (Ministry of Environment and Autonomous Communities), by minimizing or eliminating existing methodological differences in order to make Air Emission Inventories (hereinafter, AEIs) comparable.
- To determine the validation tools for other emission registers (EPER)

In order to achieve these objectives, two documents have been drawn up:

1. Current Situation of Air Emission Inventories in Spain
2. Bases for the Production of Air Emission Inventories in Spain

The group has held a series of meetings in which it has become clear that it needs to become a permanent group, with a horizon beyond the 5th Seminar. Thus more consensus-based methodological guidelines will be produced that will be proposed as national references for the performance of inventories.

The following sections provide a very brief summary of the content of the documents produced by this working group.

2. Current Situation of Air Emission Inventories in Spain.

2.1. Objectives

The first objective of this document was to identify the agencies and institutions that perform Air Emission Inventories in Spain and analyse the methodology used by each of these working groups to produce them. For this purpose a survey was drawn up and delivered to City Councils, the

environmental authorities in each Autonomous Community, the Ministry of Environment, and any other agency, whether public or private, that might produce these AEIs.

Although the information received may not be entirely complete at a nationwide level, a response was obtained from a large number of agencies and authorities, enough to provide a highly representative view of the work being performed by an important percentage of the institutions responsible for AEIs in Spain.

The second objective of the chapter is to provide guidance on the various “horizontal issues” of the methodology to be followed in the production of AEIs in Spain, once the methods of the existing AEI producers have been studied.

2.2. Main conclusions

After analysing the survey responses from the various agencies and authorities the following conclusions have been reached.

In Spain there are several public authorities and agencies which perform air emission inventories. The performance criteria of these inventories are not standard, which means that any analysis of the results must be limited to the geographic area in which they are performed.

In this respect, national inventories may give greater importance to the study of activity sectors as area sources, since treating them as point sources may mean having to manage a huge quantity of data, which would be unviable in the time available for the production of the inventory. Meanwhile, regional or municipal inventories could treat most of the emissions generating activities as point sources, allowing for a more finely tuned study if enough data is made available (something which is not always possible).

However, comparisons of the final results obtained from the mere observation of two different regional or municipal inventories cannot serve as a basis for the drawing of definitive conclusions regarding emission levels of two different geographic entities, due to the different criteria used in the production of the information.

It is therefore essential to establish a set of general references allowing inventories to be produced following procedures that all air quality managers are familiar with.

3. Bases for the Production of Air Emission Inventories in Spain

As the production of AEIs has become more widespread, we are beginning to see a need for guidance on the way they should be performed and, more especially, on the way in which emissions should be accounted for and inventoried.

The document “Bases for the Production of Air Emission Inventories in Spain” is the result of the exhaustive work of various members of this working group. We have recognized the need for guidance with regard to the performance methodology of emissions inventories and accounting, and we have joined forces to help meet this need so as to create a nationwide reference guide establishing *Guidelines* for the performance of Air Emissions Inventories in Spain.

3.1. Objectives

This document has been produced to meet the needs of administrations and institutions performing AEIs of any geographic area of Spain. Its purpose is to serve as a reference guide at a national level. The ultimate goal of these *Guidelines* is to facilitate agreement between administrations and institutions as to the way emissions are accounted for and inventoried in Spain.

In order to achieve this ultimate goal the following objectives should be pursued:

1. The standardization of horizontal issues affecting AEIs, by minimizing or eliminating current methodological differences between the various Autonomous Communities and the Ministry of Environment.
2. The establishment of standardized criteria and methodologies for calculating emissions from each and every activity sector.

3.2. Objective 1: Horizontal issues

Air Emission Inventories in Spain should be developed in accordance with EMEP/CORINAIR-IPCC methodology in order to meet the reporting requirements that Spain has committed to in the matter of emissions.

3.2.1. Principles

As far as possible the process for producing an AEI should comply with the following good practices in the performance of emission inventories:

- **Reliability:** accuracy and precision ensured by the use of the best scientific-technical knowledge base for emission generating processes.
- **Completeness:** maximum coverage of the significant correlations between activities and pollutants included in the SNAP (Selected Nomenclature for sources of Air Pollution) and IPCC (Intergovernmental Panel on Climate Change) nomenclatures.
- **Coherence:** alignment of the process for the performance and presentation of the inventory with the relevant definitions and nomenclatures of the methodologies EMEP/CORINAIR and IPCC.
- **Temporal homogeneity:** uniformly defined and estimated time series.
- **Transparency:** reproducibility of inventory estimates by external analysts.
- **Comparability:** possibility of establishing comparisons between countries by using standardized nomenclatures and definitions.

3.2.2. Pollutants that should be included in AEIs

In order to meet the aforementioned principle of completeness and to comply with reporting requirements derived from the various agreements and forums that Spain take part in, the Inventories Group of the 5th Air Quality Seminar has approved a list of pollutants that should be included in AEIs performed in Spain.

3.2.3. Structure of the inventory. Classification of activities

As far as possible, the process of producing an AEI under the EMEP/CORINAIR approach should comply with the good practices of completion and coherence in the performance of emission inventories.

AEIs should therefore be produced within the most extensive cross referencing structure between activities and pollutants, in accordance with EMEP/CORINAIR's nomenclature, SNAP, such that inventory projections can conform to the required presentation formats for certain results presentation specifications. Also, where appropriate, these format specifications may in turn impose certain conventions for definitions and emission computation methods which are based on the more general basic structure in which the AEI is performed, by applying the particular specification requirements of each format.

Another reason for basing the structure of AEIs on the SNAP classification of activities is that the SNAP nomenclature is, at the moment, the most extensive classification of potentially air polluting activities available.

As well as these reporting formats (but not excluding these classifications of activities) inventories can be structured by addressing the most important activity sectors of the geographic area covered by the AEI in order to meet the sectoral information requirements of a certain administration or institution.

3.2.4. Acceptance criteria of point measurements as a way of calculating air emissions

This group is of the opinion that for a point measurement of a pollutant taken at an emission source to be considered acceptable for calculating the annual emission from that source, the following requirements must be met:

1. The Collaborating Government Agency (CGA) that took the measurement must be accredited by the ENAC (Spanish National Accreditation Agency).
2. The measurement must be taken under the normal operating conditions of the productive process so as to obtain representative data of that process throughout the entire year. The representativeness of the sample is especially important, as it is taken as the average emission of the parameter in question during the entire time the emission source is operating.
3. At least the following data must be available at the time of the measurement: pollutant concentrations, measured flows, and annual operating hours.

4. In addition to all the above requirements, it was commented in the meetings held by the Inventories Group of the 5th Air Quality Seminar that it would be advisable to corroborate the representativeness of the point measurement. The following complementary information should therefore also be available when taking measurement: specifications of fuels burned and their feed flow rate (quantity/time). Using this complementary data, the annual quantity of fuel burned at the emission source could be calculated and compared with the annual consumption data provided by the facility. In this way the usefulness of the measurement for calculating annual emissions could be validated or not, as the case may be.
5. Certain members of the Inventories Group consider that the use of point measurements as a means of calculating emissions is dependent on the periodicity (frequency) of the measurements taken and the result that the introduction of the measurements has on the temporal variability of the implicit factor so derived. However, this latter requirement is not widely accepted among all the members of the group and its detractors argue that any point measurement meeting requirements 1, 2 and 3 is sufficient to allow us to consider point measurements as an acceptable method of calculating emissions and that the results so obtained are much more representative of the conditions at the facility than those obtained by using emission factors.

This issue will continue to be a matter for some debate in future meetings of the Inventories Group.

3.2.5. EPER – AEI register

There should be a close collaboration between the working groups producing the EPER register and the AEI respectively for a given Autonomous Community under the EMEP-CORINAIR approach, so as to combine their efforts and coordinate the work:

- By comparing information from the facilities.
- By comparing and standardizing emission calculation criteria and methodologies.
- By comparing the emissions results obtained.

3.3. Objective 2: Calculation methodologies for emissions from activity sectors.

The goals we are pursuing are tremendously ambitious and the timeframe is short, and so in this edition of the Air Quality Seminar in Spain it has not been possible to address all potentially air polluting activities. We have studied only a few activity sectors, leaving the rest for future editions of the Air Quality Seminar.

The document has been structured in a series of chapters which together form our “Sectoral Air Emission Estimation Guidelines” and which contain *Guidelines* for accounting and inventorying emissions of each of the activity sectors analysed.

The members of the Inventories Group that produced these guidelines are experts in the performance of air emission inventories with experience at an institutional level guidelines. The guidelines were drawn up after an exhaustive and in-depth review of all the emissions calculation methodologies available of the activity sector in question. However, these guidelines are yet to receive the consensus of all the members of the group (due to time constraints), so they should be considered as *Guidelines* for the performance of AEIs in Spain rather than *Standards*. They are subject to modifications and extensions in future editions of the Air Quality Seminar or in meetings of the Inventories Working Group .

Guidelines that refer to more complex sectors that are more important contributors to pollution will require more time to be studied by all the Working Group’s members. The opinion of companies from these activity sectors also needs to be polled in order to implement the recommendations included in this document and ultimately establish some guidelines that are more standardized, more reliable, and more widely accepted. In any event, we propose these **“Bases for the Production of Air Emission Inventories in Spain”** as guidelines to be used in preference to any others.