Emission Inventory

Emission Inventory

- An **emission inventory** is an accounting of the amount of pollutants discharged into the atmosphere.
- An emission inventory usually contains the total emissions for one or more specific greenhouse gases or air pollutants, originating from all source categories in a certain geographical area and within a specified time span, usually a specific year.

An emission inventory is generally characterized by the following aspects:

- **Why**: The types of activities that cause emissions,
- **What**: The chemical or physical identity of the pollutants included,
- **Where**: The geographic area covered,
- **When**: The time period over which emissions are estimated,
- **How**: The methodology to use.

Purposes of an Emissions Inventory

- *Pollutant Identification*
- *Effect Studies*
- *Emission Reactivity*
- *Compliance*
- *Policy Development*
- *Ambient Air Monitoring*
- *Agency Requirements*

Application

- Useful to control agencies as well as planning and zoning agencies.
- They can be used with appropriate mathematical models to determine the degree of overall control necessary to meet ambient air quality standards.
- They can be used to indicate the type of sampling network and the locations of individual sampling stations
- Can be used for publicity and political purposes

The method used to develop the emission inventory

- to monitor continually every major source in the area.
- to monitor continually the pollutants in the ambient air at many points and apply appropriate diffusion equations to calculate the emissions.

Emission Inventory Elements

- *Geographical Area*
- *Spatial and Temporal*
- *Characteristics*
- *Source Specific Data*
- *Pre-existing Inventory Data*
- *Data Handling*

Emissions Inventory Process

- *Identify Emissions Goals*
- *Gather Source Specific Data*
- *Review and Revise Data*

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- the area.
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the emissions.

The U.S. Clean Air Act Amendments of 1990 state

INVENTORY.—Such plan provisions shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements of this part are met.

IDENTIFICATION AND QUANTIFICATION

- "Such plan provisions shall expressly identify and quantify the emissions, if any, of any such pollutant or pollutants which will be allowed, from the construction and operation of major new or modified stationary sources in each such area.
- The plan shall demonstrate to the satisfaction of the Administrator that the emissions quantified for this purpose will be consistent with the achievement of reasonable further progress and will not interfere with the attainment of the applicable national ambient air quality standard by the applicable attainment date.

Emissions Inventory Activities include

- *Planning*
- *Identification of Inventory*
- *Objectives*
- *Define Point/Area Categories*
- *Needs Analysis*
- *Data Collection*
- *Calculate Emissions*
- *Report Emissions*
- *QA / QC*

Methods of estimating source emissions include

- *Continuous Emission Monitors*
- *Source Testing*
- *Material Balance*
- *Emission Factors*
- *Fuel Analysis*
- *Emission Estimation Models*
- *Surveys and Questionnaires*
- *Engineering Judgment*

1. Inventory Techniques

- To develop an emission inventory for an area
  1. List the types of sources for the area, such as automobiles, and home fireplaces;
  2. Determine the type of air pollutant emission from each of the listed sources, such as particulates and SO2
  3. Examine the literature to find valid emission factors for each of the pollutants of concern
  4. Through an actual count, or by means of some estimating technique, determine the number and size of specific sources in the area
  5. Multiply the appropriate numbers from (3) and (4) to obtain the total emissions and then sum the similar emissions to obtain the total for the area.

2. Emission Factors

- Actual emission data are available from many handbooks, government
- Publications, and literature searches of appropriate research papers and journals.

3. Data Gathering

- Sources of information for an emission inventory include

1. City, county, and state planning commissions;
2. City, county, and state chambers of commerce;
3. City, county, and state industrial development commissions;
4. Census bureaus;
5. National associations such as coal associations;
6. Local Associations such as the County Coal Dealers Association;

7. Individual dealers or distributors of oil, gasoline, coal, etc.
8. Local utility companies;
9. Local fire and building departments;
10. Data gathered by air pollution control agencies through surveys, sampling, etc.;
11. Traffic maps; and
12. Insurance maps.

4. Data Reduction and Compilation