



*Ministero dell'Ambiente e della Tutela del Territorio*

DIREZIONE GENERALE PER LA SALVAGUARDIA AMBIENTALE



AGENZIA PER LA PROTEZIONE DELL'AMBIENTE  
E PER I SERVIZI TECNICI

# **AIR QUALITY ASSESSMENT AND MANAGEMENT IN ITALY**

## **Improving Air Quality in the enlarged EU: Workshop on Plans and Programmes of Air Quality and National Emission Ceilings Directives**

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## EC DIRECTIVES IMPLEMENTATION

Directive 96/62/EC

D.Lgs. 351/1999

Dir. 99/30/EC  
Dir. 2000/69/EC

D.M. 60/2002

Directive 2002/03/EC

D.Lgs. 183/2004

## COMPETENT AUTHORITIES for Air Quality Assessment and Management

<b>Region/AutProvince</b>	<b>inhabitants</b>	<b>nr. Provinces</b>
Abruzzo	1.244.226	4
Basilicata	595.727	2
Bolzano	460.665	1
Calabria	1.993.274	5
Campania	5.652.492	5
Emilia-Romagna	3.960.549	9
Friuli-Venezia Giulia	1.180.375	4
Lazio	4.976.184	5
Liguria	1.560.748	4
Lombardia	8.922.463	11
Marche	1.463.868	4
Molise	316.548	2
Piemonte	4.166.442	8
Puglia	3.983.487	5
Sardegna	1.599.511	4
Sicilia	4.866.202	9
Toscana	3.460.835	10
Trento	476.442	1
Umbria	815.588	2
Valle D'Aosta	119.356	1
Veneto	4.490.586	7

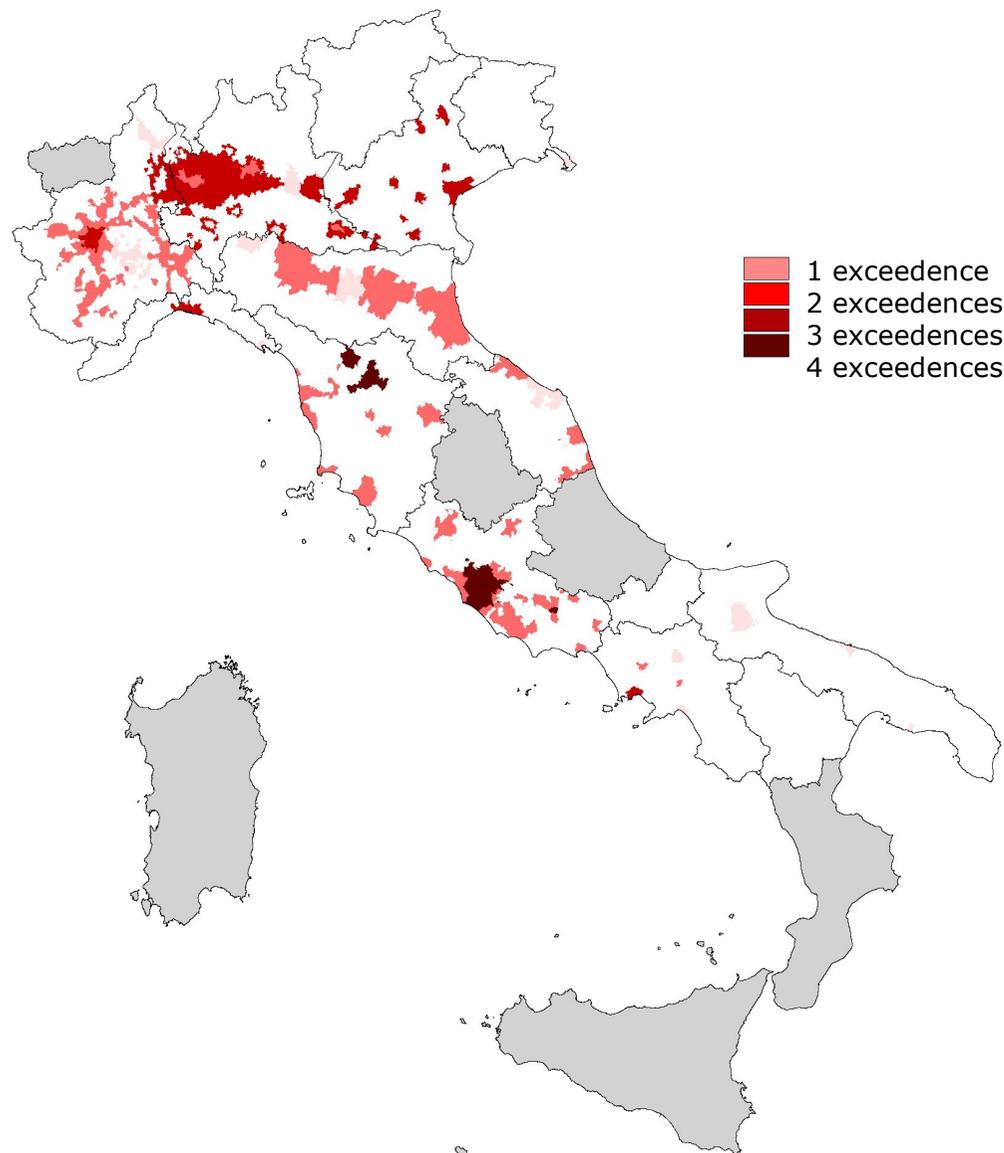


## EXCEEDENCES - Zones and Agglomerations

Region/Aut. Province	N Zones /Aggl (2001)	N Zones /Aggl where levels >LV+MT (2001)	N Zones /Aggl (2002)	N Zones /Aggl where levels >LV+MT (2002)
Abruzzo	8	4	8	4
Basilicata	3	1	3	0
Bolzano	2	0	2	0
Calabria	3	-	3	-
Campania	5	1	5	5
Emilia Romagna	30	21	30	13
Friuli Venezia Giulia	7	0	5	1
Lazio	5	3	5	3
Liguria	6	2	6	2
Lombardia	15	5	15	9
Marche	4	2	3	3
Molise	2	0	1	0
Piemonte	17	8	17	8
Puglia	2	2	3	3
Sardegna	29	4	29	2
Sicilia	20	3	20	3
Toscana	20	4	5	3
Trento	2	0	2	0
Umbria	4	1	4	1
Valle d'Aosta	3	1	3	2
Veneto	5	1	5	1

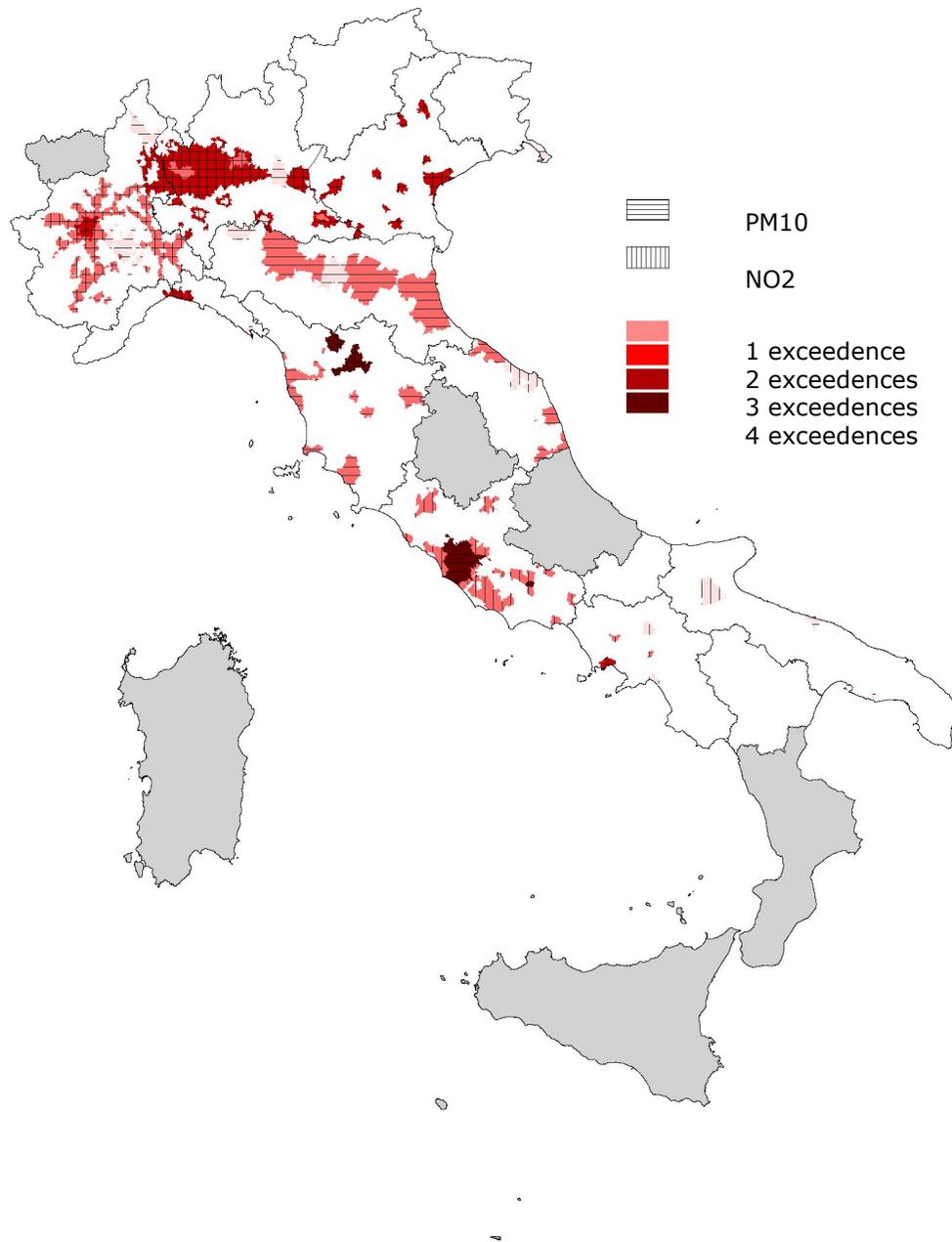
## EXCEEDENCES – pollutants and averaging times

Region/ Aut. Province	Exceedences for each pollutant (2001)	Exceedences for each pollutant (2002)
Abruzzo	2 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 2 y.a. PM <sub>10</sub>	1 y.a. NO <sub>2</sub> ; 3 d.a. PM <sub>10</sub> ; 3 y.a. PM <sub>10</sub>
Campania	1 h.a. NO <sub>2</sub> ; 1 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub>	3 h.a. NO <sub>2</sub> ; 5 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub>
Emilia Romagna	20 d.a. PM <sub>10</sub> ; 12 y.a. PM <sub>10</sub>	13 d.a. PM <sub>10</sub> ; 11 y.a. PM <sub>10</sub>
Friuli Venezia Giulia	0	1 d.a. PM <sub>10</sub>
Lazio	3 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 2 y.a. PM <sub>10</sub>	2 h.a. NO <sub>2</sub> ; 3 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 2 y.a. PM <sub>10</sub>
Liguria	2 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>	1 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>
Lombardia	3 y.a. NO <sub>2</sub> ; 3 d.a. PM <sub>10</sub> ; 4 y.a. PM <sub>10</sub>	5 y.a. NO <sub>2</sub> ; 8 d.a. PM <sub>10</sub> ; 5 y.a. PM <sub>10</sub>
Marche	1 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>	1 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 2 y.a. PM <sub>10</sub>
Piemonte	6 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 8 y.a. PM <sub>10</sub>	1 d.a. NO <sub>2</sub> ; 6 y.a. NO <sub>2</sub> ; 2 d.a. PM <sub>10</sub> ; 8 y.a. PM <sub>10</sub>
Puglia	1 y.a. NO <sub>2</sub> ; 2 y.a. PM <sub>10</sub>	1 y.a. NO <sub>2</sub> ; 2 y.a. PM <sub>10</sub>
Sardegna	3 h.a. SO <sub>2</sub> ; 1 d.a. SO <sub>2</sub> ; 2 h.a. NO <sub>2</sub>	2 h.a. SO <sub>2</sub> ; 2 d.a. SO <sub>2</sub> ; 1 h.a. NO <sub>2</sub>
Sicilia	1 h.a. SO <sub>2</sub> ; 2 y.a. NO <sub>2</sub>	2 y.a. NO <sub>2</sub> ; 3 d.a. PM <sub>10</sub> ; 2 y.a. PM <sub>10</sub>
Toscana	2 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>	1 h.a. NO <sub>2</sub> ; 1 y.a. NO <sub>2</sub> ; 3 d.a. PM <sub>10</sub> ; 3 y.a. PM <sub>10</sub>
Umbria	1 y.a. NO <sub>2</sub>	1 y.a. NO <sub>2</sub>
Valle d'Aosta	1 h.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub>	1 h.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub>
Veneto	1 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>	1 y.a. NO <sub>2</sub> ; 1 d.a. PM <sub>10</sub> ; 1 y.a. PM <sub>10</sub>



ZONES/AGGLOMERATIONS WHERE  
1/2/3/4  
EXCEEDENCES  
(LV+TM) WERE  
RECORDED IN 2002  
(DM 60/2002)

GREY REGIONS: NO  
PROCESSABLE DATA

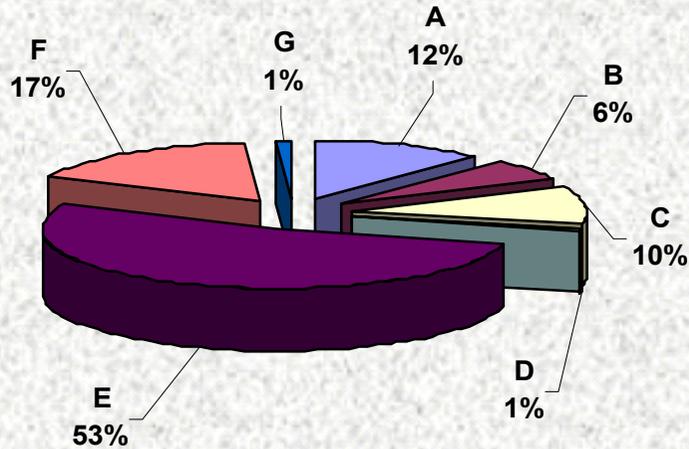


ZONES/AGGLOMERATIONS WHERE PM10 OR/AND NO2 ARE EXCEEDED (LV+TM) WERE RECORDED IN 2002 (DM 60/2002)

GREY REGIONS: NO PROCESSABLE DATA

# NATIONAL EMISSIONS SOURCES

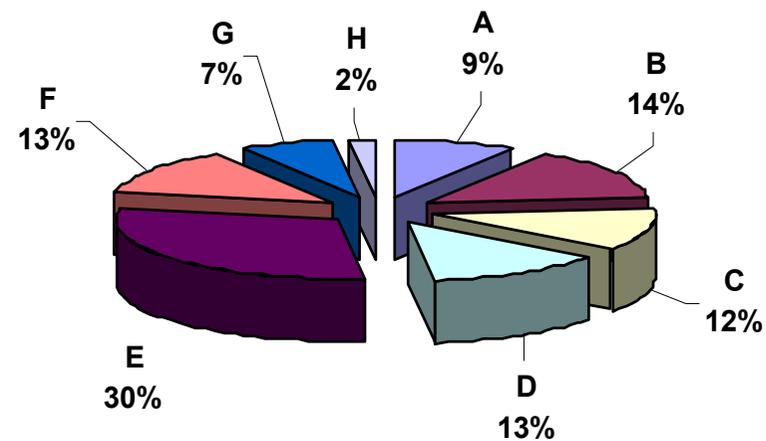
**NOx emissions - 2001**



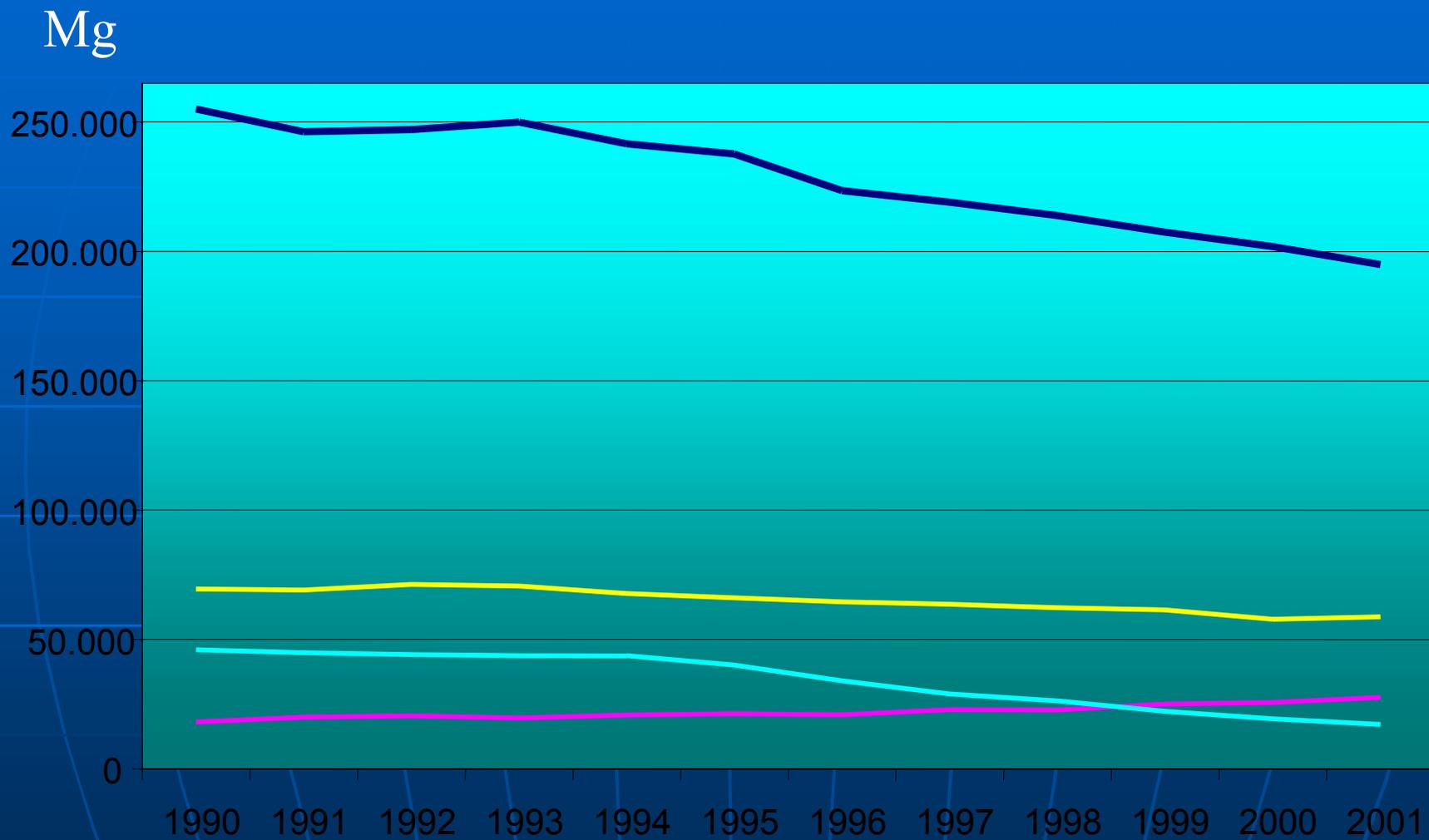
NOx national emissions		2001
A	Combustion Energy Transformation Industry	12%
B	Non Industrial Combustion	6%
C	Industrial Combustion	10%
D	Industrial Processes	1%
E	Road Transport	53%
F	Other Mobile Sources	17%
G	Treatment-Removal Refuses	1%

PM10 national emissions		2001
A	Combustion Energy Transformation Industry	9%
B	Non Industrial Combustion	14%
C	Industrial Combustion	12%
D	Industrial Processes	13%
E	Road Transport	30%
F	Other Mobile Sources	13%
G	Agricultural Refuses Incineration	7%
H	Forestal Fire	2%

**PM10 emissions - 2001**

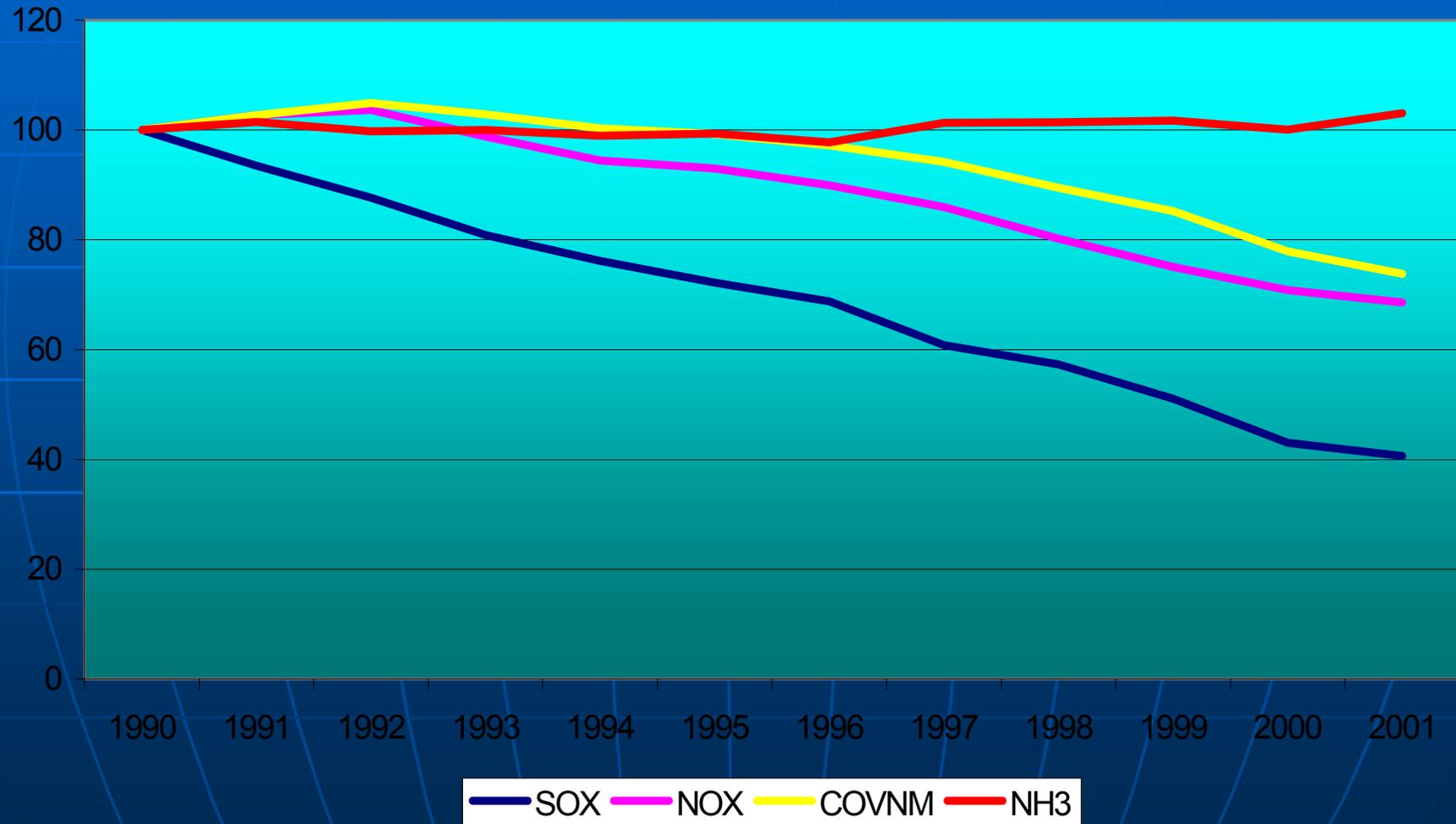


# PM<sub>10</sub> EMISSIONS IN ITALY (Mg)



— Total — Domestic — Transport — Energy & Industry

# NATIONAL ITALIAN EMISSIONS OF PM PRECURSORS (NO<sub>x</sub>, SO<sub>x</sub>, COVNM and NH<sub>3</sub>) 1990=100



# NATIONAL MEASURES

more stringent provisions concerning emissions with respect to EC directives

## European Directives

## Italian decrees provisions

1999/13/EC

- More restrictive emission limits are maintained with reference to existing authorization;
- Institution of a WG for identifying maximum permitted concentrations of VOC in raw materials and introducing economic instruments in order to reduce their emissions.

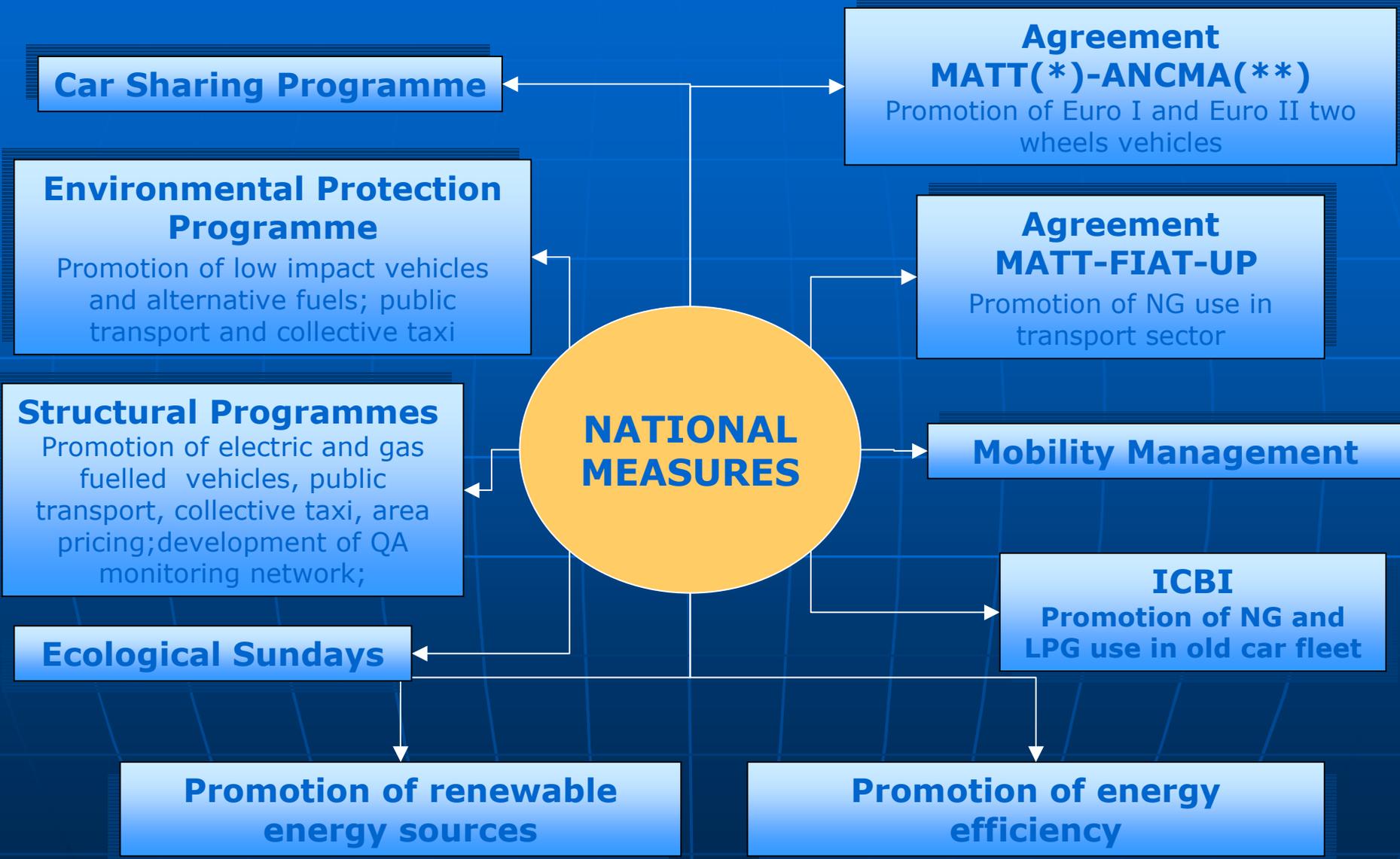
2001/80/EC

- Emission limits for heavy metals;
- NO<sub>x</sub> emission limit equal to 50 mg/Nm<sup>3</sup> for gas turbines with nominal thermal power superior to 300 MW-th (elimination of the derogation allowing emission limits up to 75 mg/Nm<sup>3</sup>).

2001/81/EC

- National plan to reduce SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub> and VOC emissions.

# NATIONAL MEASURES - NEC national program



\* Ministry for the Environment

\*\* National Association Mopeds, Motorcycles, Accessories

## NATIONAL MEASURES - NEC national programme

Measures	Sector	Public Funds (10 <sup>6</sup> €)	Environmental results
Mobility Management	Mobility	15	Mobility demand control and guidance actions
Environmental Protection Program	Mobility	52.5	Promotion of low impact vehicles and alternative fuels; collective taxi.
Car Sharing Initiative	Mobility	9.3	Traffic reduction
Agreement MATT-ANCMA	Mobility	25	Promotion of Euro I and Euro II two wheels vehicles ~ 2000 t/y HC ; ~ 4200 t/y CO
Ecological Sundays	Mobility	30	Traffic flow controls and promotion of low impact vehicles and alternative fuels
Structural Programmes	Mobility	35	Promotion of low impact vehicles and development of air quality monitoring network
Agreement MATT-FIAT-UP	Alternative fuels	15.5	Promotion of NG vehicles and construction of new methane refueling stations
ICBI	Alternative fuels	25	Promotion of NG and LPG use in old car fleet ~ 2200 t/y COVNM
D.Lgs. 79/99 D.Lgs. 387/03	Renewable energy sources	-	Year 2010: 76 electric TW-h produced by Renewable energy sources (49 electric TW-h in 2002)
DM 24/4/01	Energy conservation	-	2010, t/y avoided: 7737 SO <sub>2</sub> , 15566 NO <sub>x</sub> , 4291 CO, 1925 PM <sub>10</sub>

# NATIONAL COORDINATION for AQFD&DD implementation

**State-Regions  
Working Group**

**Coordination of the activities of Air  
Quality Assessment and Management  
carried out by the Regions**

Improve the  
implementation of  
Air Quality  
Directives

Harmonisation of the  
questionnaires on  
monitoring and on  
Plans and Programs

Institution of a Task Force on  
PM to evaluate natural  
contribution to PM10  
concentrations

Transmission to the  
EC of Air Quality  
information  
according to current  
directives

Drafting the "Guidelines for  
rationalization of monitoring  
network"

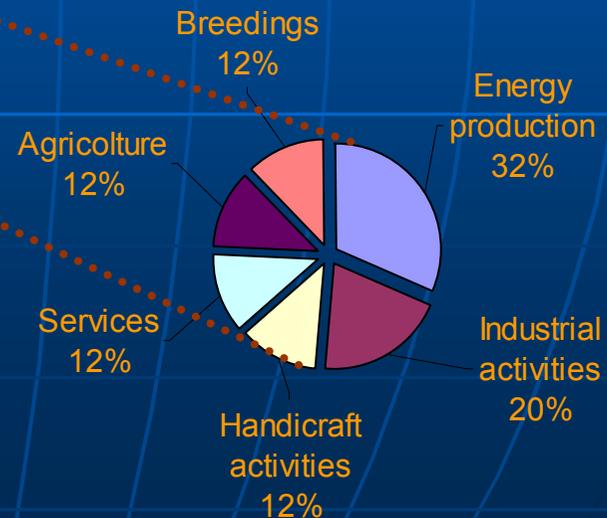
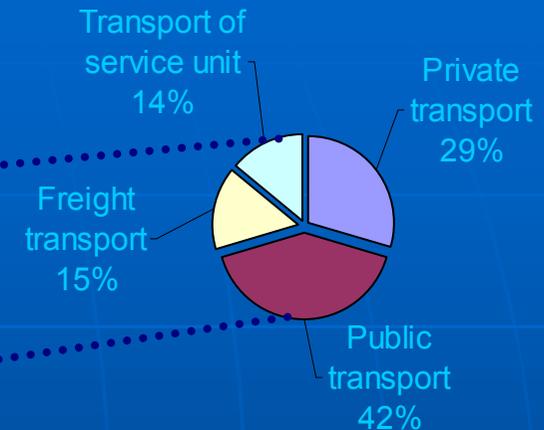
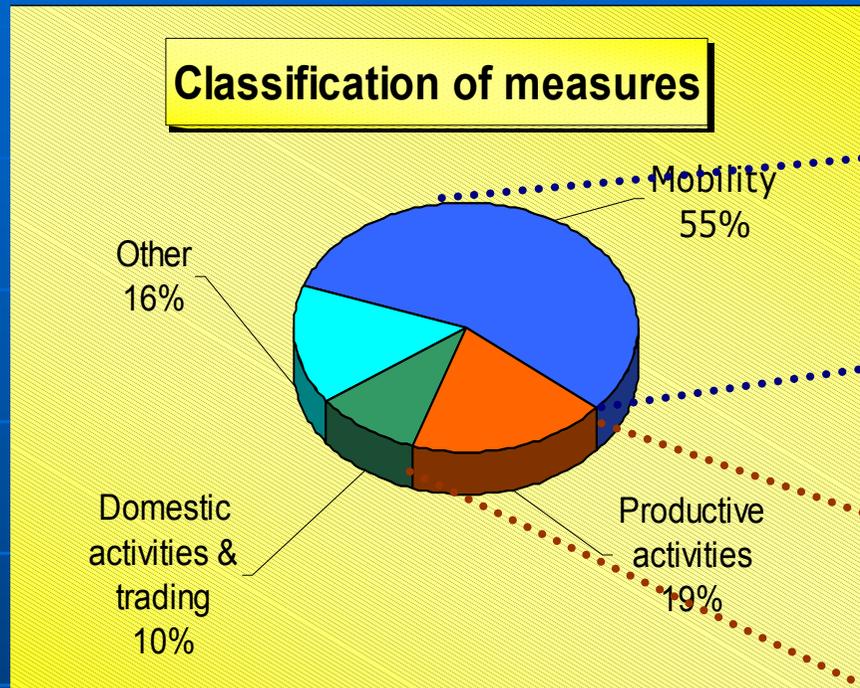
## **SITUATION OF THE PPs REPORTING** related to the exceedances observed in 2001

### **16 REGIONS declared exceedances of LV+MT**

- 12 Regions filled in the questionnaire on Plans and Programs (PPs)
- Technical meetings with remaining 3 Regions were organized to support compilation of the PPs questionnaire
- 1 Region transmitted wrong information in 2001 questionnaire; in the corrected one no exceedances result

# MEASURES CHARACTERIZATION

(% refers to the total number of measures, irrespective of their importance)

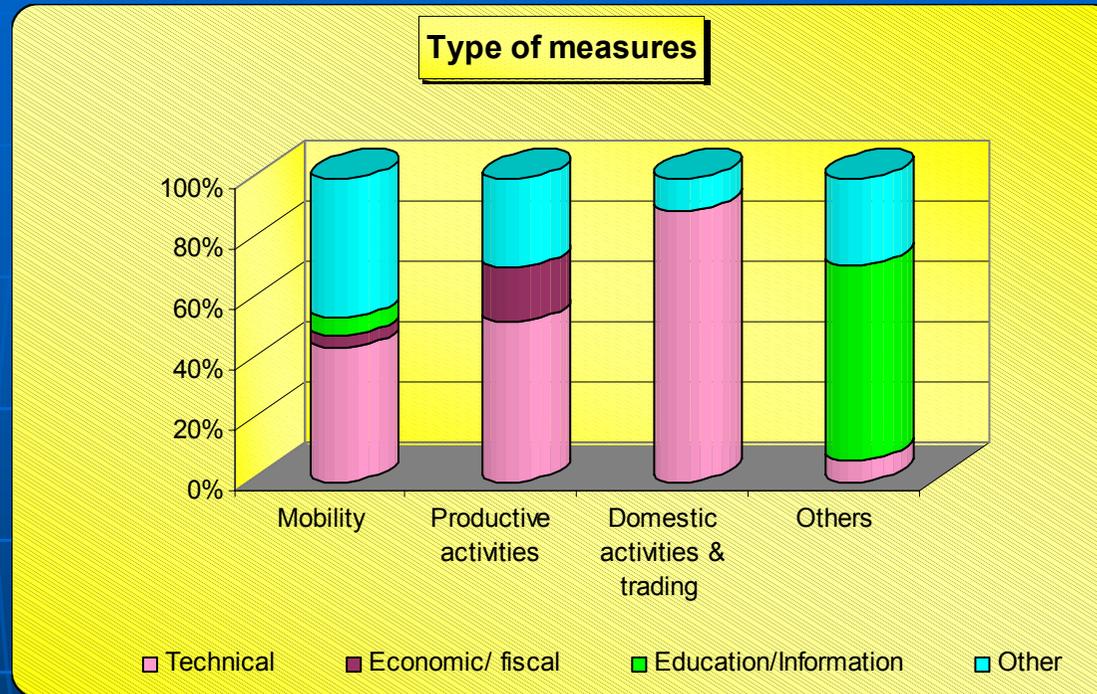


In 2001 most of measures adopted by the Regions concern mobility and productive activities

The measures of "Other" type concern actions of information and communications, elaboration of emission inventory, cleaning of roads, research

# MEASURES CHARACTERIZATION

(% refers to the total number of measures, irrespective of their importance)



- The measures adopted in the mobility sector especially concern actions of renewal, strengthening and substitutions of private and public transport fleet (low emission systems, low impact fuels)
- The measures adopted in the productive and domestic sectors, especially concern renewable energies, low impact fuels (GN and LPG), low emission technologies and energy efficiency promotion

## NATIONAL LEVEL PROBLEMS

1

- Many monitoring stations are not located according to normative criteria
- Preponderance of traffic oriented stations compared to urban and suburban background monitoring stations
- High number of stations

**Overestimation of population exposure respect to the real air quality state**

2

- Regions used different criteria to individuate zones and agglomerations
- High number of zones

**• Data and information submitted from different Regions in the annual reporting are not immediately comparable**  
**• Fragmentation of planning activity**

## **NATIONAL LEVEL ISSUES CONCERNING MONITORING NETWORKS**

**1**

- **Adjust monitoring station locations according to recent normative criteria**
- **Rebalance the number of traffic oriented stations vs. the number of urban and suburban background stations**
- **Redistribute the spatial allocation of monitoring stations in order to have a more homogeneous spatial coverage**

**2**

- **Harmonize regional criteria to individuate zones and agglomerations**

## **LOCAL LEVEL ISSUES**

- **Some Regions elaborated plans and programs as provided by art. 8 and 9 of the DLgs.351/99, but the administrative approval iter has not been finalized yet;**
- **Some Regions carried out important measures for air quality improvement and protection, but they have not yet adopted plans or programs as provided by art. 8 and 9 of the DLgs.351/99;**
- **Gaps in Air Quality assessment and management activities still result in few Regions**

## ON-GOING ACTIVITIES

- **Guidelines to support Regions in redesign monitoring networks according to recent air quality directives;**
- **Periodic meetings of State-Regions working group to harmonize the finalization of monitoring and PPs questionnaires, national and regional emission inventories, national and regional plans, use of models and the other initiatives concerned to AQD implementation;**
- **Agreements between the Ministry for the Environment and some Regions finalized to assure financial resources to complete and redesign monitoring networks, to update/complete regional emission inventories and for the planning activity.**

# NATIONAL NEC PLAN AND REGIONAL AQ PLANS

Coordination among MATT, APAT, ENEA and Regions in order to apply harmonized tools both at national and local level for PPs drafting:

## NATIONAL NEC PLAN

1-National emission inventory

2-Application of RAINs Italy in order to elaborate national emission business as usual scenarios to 2010, to determine deposition and concentration of atmospheric pollutants and to identify the cost-minimal allocation of emission controls

3-Study of atmospheric polluting flows and transboundary pollution

## REGIONAL PPs

1-Harmonization of local Vs National Emission Inventory: derivation of local inventories (with a spatial resolution of 20x20 km) from national emission inventory, refining them on with local data (productive activities and energetic scenarios)

2-RAINs Italy applying to regional level in order to elaborate emission business as usual scenarios to 2010, to determine cost/effective measures and to study pollutant flows between different regions

3-Pollutant deposition and concentration model applied to regional level

## MODELS PROGRAM

Assessment of air pollution control strategies at regional level (or agglomeration)

Local or sectorial analysis



Comparative analysis in order to identify least-cost strategies

Analysis of emission reduction strategies, focusing on acidification, eutrophication and tropospheric ozone

## REMARKS AND PROPOSALS

**High pollution level in a zone or agglomeration is often measured only in a traffic oriented station: considering the whole zone or agglomeration as non compliance one bring to overestimate population exposition. It seems more appropriate in this case to characterize the LV compliance of the zone or agglomeration through the average value determined by the measured values in different kind of stations of that zone**

**In some areas, whenever particular meteorological conditions occur, the same high PM levels are measured in both traffic oriented and background station, because of the preponderance of the resuspended fraction. No measures result effective in these conditions to reduce PM levels. It seems appropriate in these case to introduce an analogous approach to that used to assess the natural sources contribution**