

# The European Ambient Air policy

## Developments and the role of Modelling

*„Aerem corrumpere non  
licet”*

[Roman senate, BC]

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# 2002: 6th Environmental Action Programme

***‘achieving levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment’;***  
**(Art 7.1. of 6th EAP)**

# Outline

- **EU ambient air policy – overview**
  - ➔ New Directive 2008/50/EC published in June 2008
- **Why have we done it, what are the expectations?**
- **Reality check (current status)**
- **Models to the rescue (implementation)**
- **Challenges and future outlook**

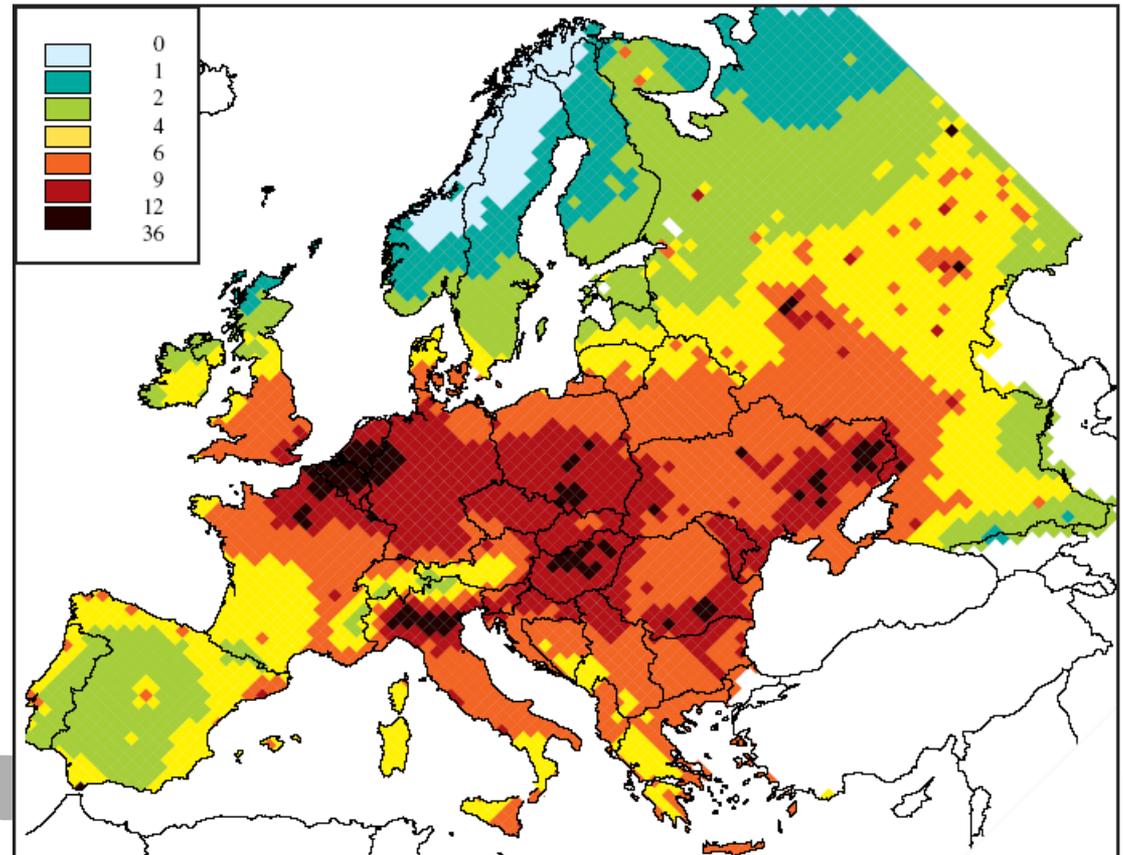
# Fine particles serious health issue

**CAFE  
2000**

**Loss in life  
expectancy due to  
fine particles**

**(in months)**

**350,000 premature  
deaths annually**



# Community Air Policy

Concentrations

Emissions

Framework Directive

1<sup>st</sup> Daughter

2<sup>nd</sup> Daughter

3<sup>rd</sup> Daughter

4<sup>th</sup> Daughter

Exchange Information

CAFE Directive

National emissions ceilings

Stationary sources

Mobile Sources

IPPC

LCP's

Incineration

VOC's

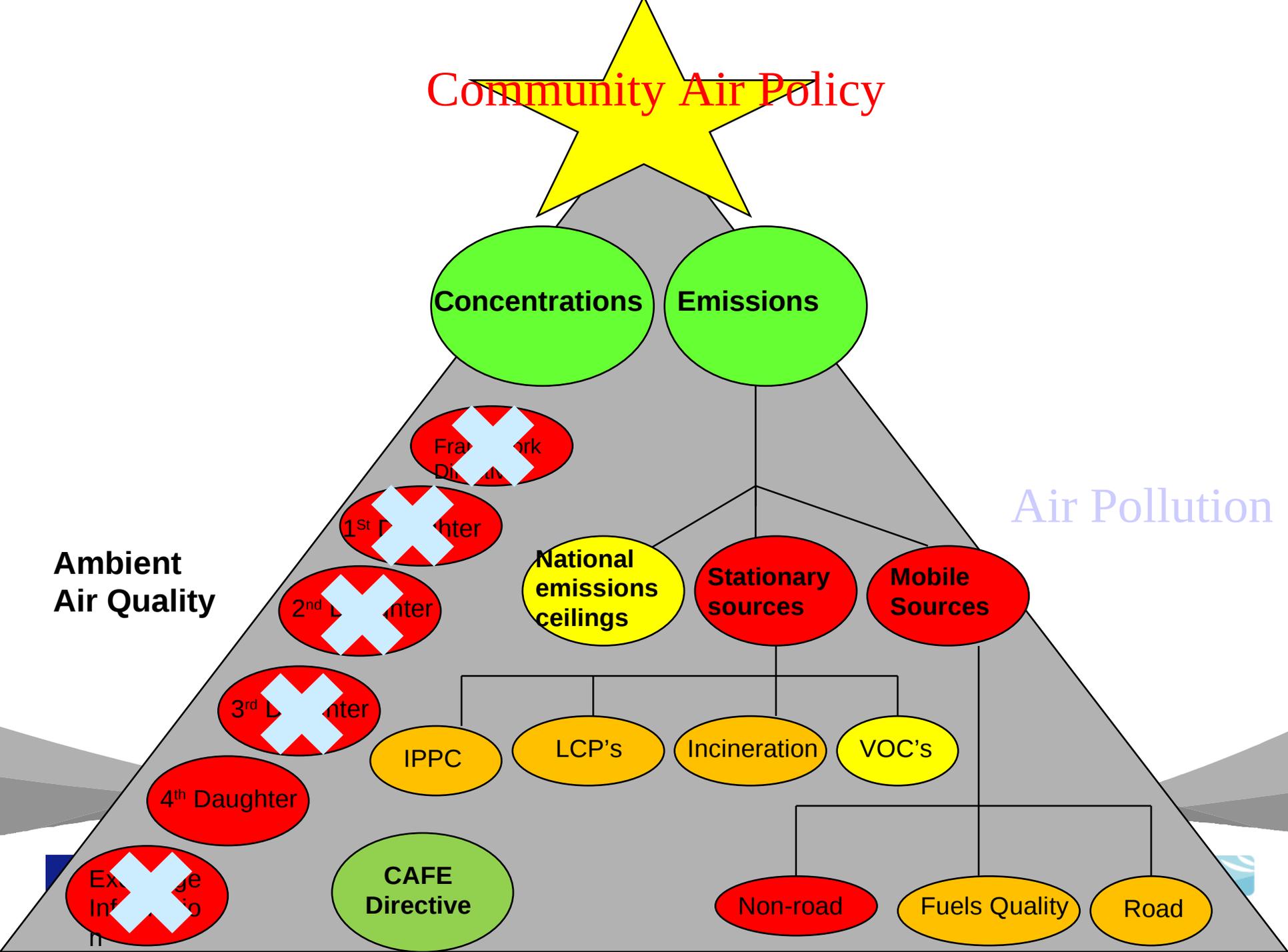
Non-road

Fuels Quality

Road

Air Pollution

Ambient Air Quality



# EU Air Policy - How does it work?

## ■ Understanding : research, WHO, CAFE

## ■ Community measures

- Reducing emissions
- Current : EURO standards, fuel quality (also shipping), VOC, IPPC
- National emission ceilings
- Coherence between Community policies (☺)

## ■ Environmental standards

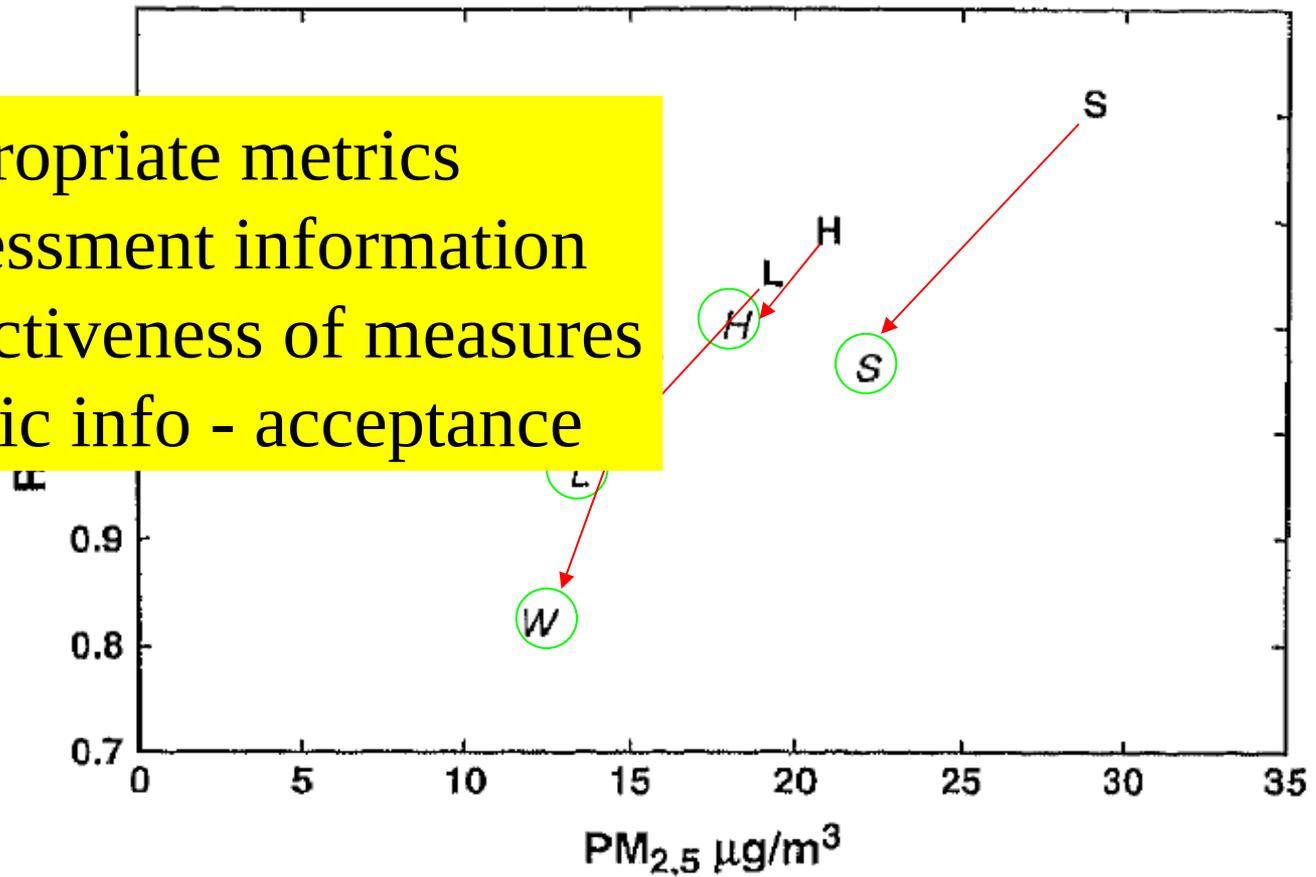
- Triggering further action at more local level

## ■ Enforcement

- Everyone must do its part

# What is needed?

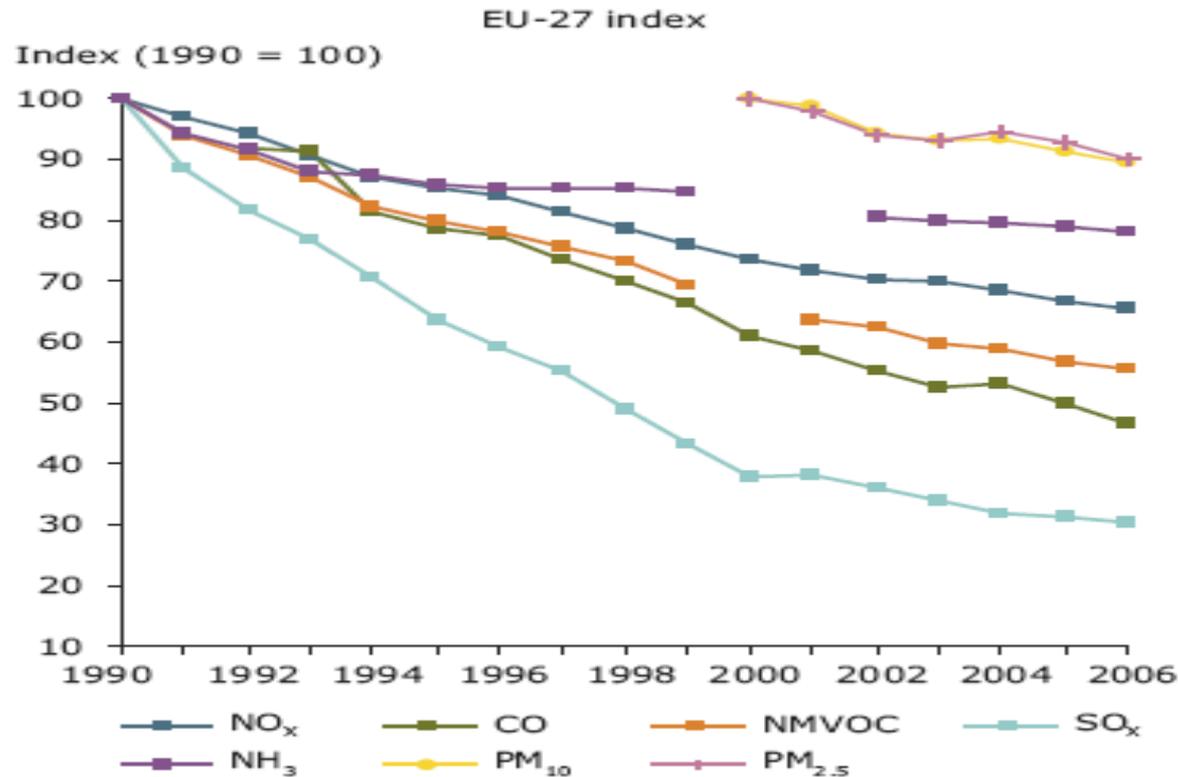
Appropriate metrics  
Assessment information  
Effectiveness of measures  
Public info - acceptance



# EU AQ Directive(s) - How does it work?

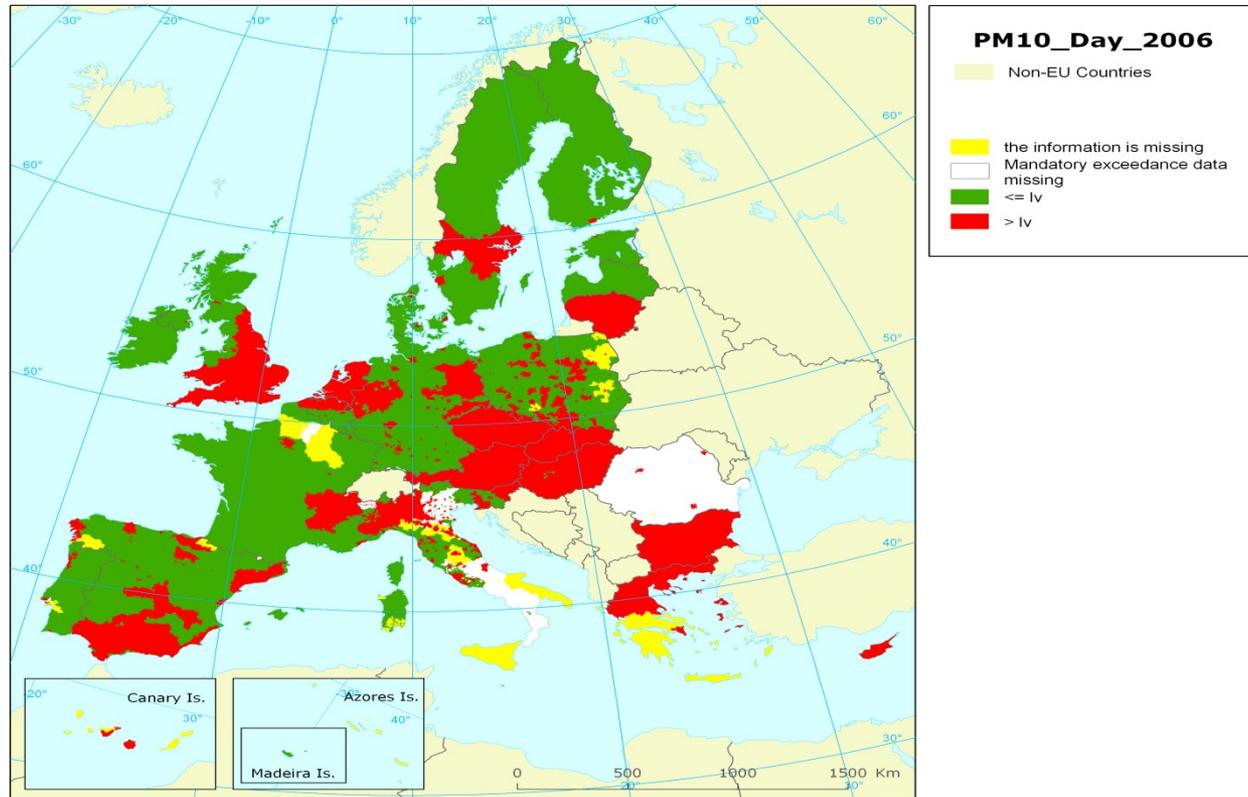
- **Assessment (monitor, model, estimate) throughout the territory**
- **Inform public, Commission & Member States**
- **Develop air quality plan where necessary**
  - ➔ good understanding, abatement measures
- **Implement!**
- **Legal sanctions before European Court of Justice for non-compliance after limits in force.**

# Emissions are going down...



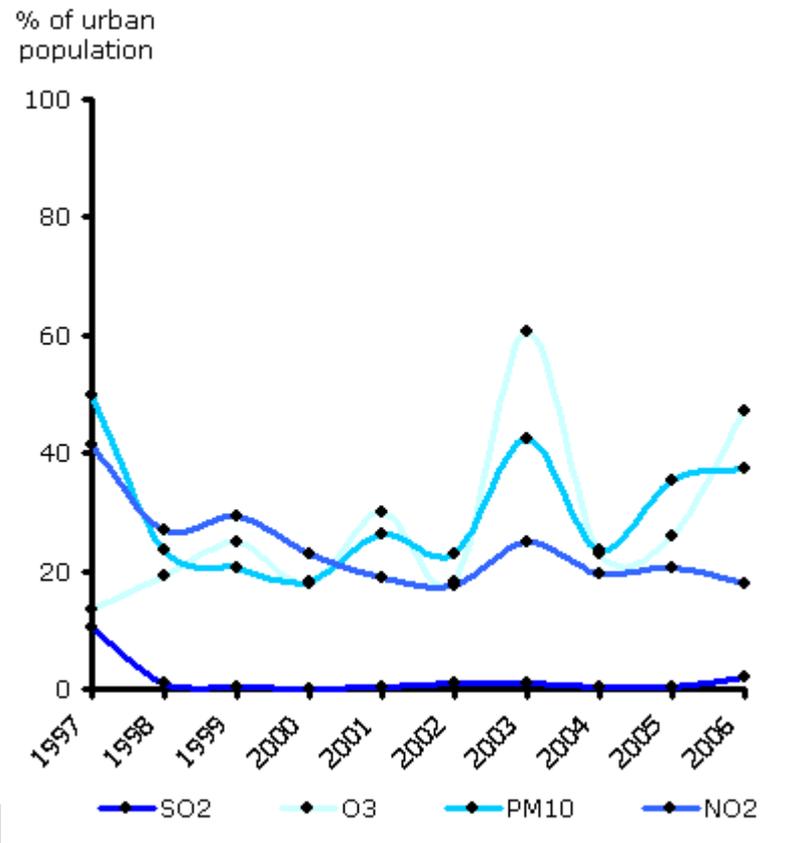
LRTAP (EEA 2008)

# But there is work to be done...



By EEA ETC/ACC, Source : Q461

# Is there improvement?



By EEA ETC/ACC

# New Directive - Expectations(I)

- **Streamlined provisions, more clarity in implementation**
  - Where limit values apply?
- **PM2.5 objectives, monitoring requirements**
  - Focused , more coherent measures, better information for further policy development
- **More time for compliance, under conditions**
  - Assessment of measures by Commission

# New Directive - Expectations(II)

- **Expanded concept of deduction of natural contributions**
  - Better Assessment > better understanding of sources, more effective measures
- **Additional QA/QC provisions, reference methods...**
  - higher quality data (monitoring & modelling)
- **New reporting provisions,**
  - Faster availability (NRT), higher quality, spatial dimension of AQ
- **Updated guidance**
  - Support to implementation and more harmonized approach

# Modelling

- **Assessment - concentration levels**
- **Measurement stations location**
- **Analysis : source apportionment**
- **Projections, assessment of impacts**
  
- **Directive**
  - ➔ Assessment method under national competence
  - ➔ Model quality objectives
    - 50% deviation from relevant measurements
  - ➔ Potential for 50% reduction in number of stations

# Modelling in practice...

- **Few States comprehensively in assessment (UK,NL)**
  - Sometimes used but not reported
- **Often used to develop air quality plans**
  - Use of EU-wide products (EMEP)...Kopernikus?
  - Regional models, local application
  - Natural contributions, winter sanding
  - Integrated assessment modelling
- **Issues**
  - Metrics
  - Where limit value applies > interpretation of model result
  - Link to exposure

# AQD Implementation Ongoing (I)

## ■ Notifications under Art.22 – time extensions

- Communication/Guidance
- Forms
- NL currently still the only Member state to notify

## ■ Enforcement

- Lack of Plans and Programmes
- Sulphur dioxide
- PM10 : pending

# AQD Implementation Ongoing (II)

## ■ Guidance preparation

- Review & update of existing
- Specific guidance
  - Equivalence
  - Natural contributions
  - Winter sanding/salting
  - Common measurement stations

## ■ New provisions under AQD – important!

- Modified modelling quality objectives
- Traceability of measurements
- QA/QC also for data reporting

# AQD Implementation Ongoing (III)

- **Assessment, reporting, exchange, public info**
  - Q questionnaire updated to include 4<sup>th</sup> DD
  - Zoning/GIS
  - Implementing provisions in preparation, supported by DEG
  - AQUILA (meeting 18-19 November)
  - **FAIRMODE (kick-off 10 October)**
  - EIONET : implementation experience on reporting
  - GMES/Kopernikus (EC Communication still in 2008)
  - INSPIRE, pilot – implementation of INSPIRE under AQ
  - SEIS
  - EEA : data centre + SEIS implementation pilots

- **Some questions remain open...**
- **Air Quality Directive review in 2013**
  - 'Mini CAFE' including review of health effects and impact of Community measures
  - **Explicit objectives in Article 32**
    - Review provision for all pollutants as appropriate
    - Explicitly PM2.5
      - Legally binding exposure reduction target, review exposure concentration obligation
      - More ambitious limit value
      - Confirm/modify indicative limit value
      - Monitoring
  - **Chance to review other provisions**
    - Assessment requirements in view of availability of GMES GAS, work on modelling
    - Operational SEIS, INSPIRE

# Final messages

## ■ New AQD is adopted.

- PM2,5 objectives, Art. 22 time extensions
- QA/QC, reporting overhaul

## ■ Major steps in related AQ information collection/exchange

- Watch this space : DEG, AQUILA, FAIRMODE
- EEA-SEIS, JRC-Inspire
- FP MACC, CAir4Health, ESCAPE...

## ■ Review/revision

- Positive trends & good information base crucial for successful revision
- Important links: Climate change, transport, indoor air quality

# Thank you

<http://ec.europa.eu/environment/air/index.htm>

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# Air /climate change links

- **Climate sensitivity (aerosols)**
- **CC may exacerbate AP health, agricultural production, and ecosystem impacts**  
(ACCENT network – ‘common issues’ report)
  
- **Link through measures**
  - Synergies (energy efficiency – beware: indoor air quality)
  - Trade-offs (wood burning)
  - tbd (effect varies : land use, transport solutions, biofuels...)
- **Need for consistent integrated assessment models (IAM)**
  - Example : revision of national emission ceilings
- **Scales issue**
  - Regional/hemispheric AP becoming increasingly important
  - AP/CC linkage more apparent at larger scales...

# Summary

## ■ New AQD is adopted. What is new?

- PM2,5 objectives
- Art. 22 time extensions: PM10, NO2, benzene
- Deduction of natural contributions
- Where limit values apply?

## ■ Implementation & enforcement

- Time extension process
- Infringements, abatement measures and local action
- Objectives and further Community measures at source
- Immediate action : PM2.5 exposure monitoring
- Implementation guidance overhaul
- Other activities including GMES

# CAFE research needs I

- **Understanding changes in environment, society and structural shift**
  - New technologies for production and abatement of emissions
  - global changes of trade and industry
  - Effects of Climate change (in environment and of CC policy)
- **Emission sources, atmospheric chemistry and air pollution dispersion**
  - Sources of PM : natural/anthropogenic, secondary organics...
  - Long distance
  - Links air pollution/climate change
  - Improved assessment: advanced monitoring, modelling, use of remote sensing

# CAFE research needs II

## ● Effects of air pollution

- How changing sources and composition impacts on the human population
- health-related studies on exposure patterns and effects of air pollution abatement and policies (*ex post* evaluations).
- the sensitivity and vulnerability of the population and different population groups, which may also change with time. Identify contributing sources of exposure outdoor/indoor, to the different groups
- effects of long term exposure to different size fractions
- fuel-source specific risks (e.g emissions from diesel engines and combustion sources) including also ultra-fine particles.
- understand the composition specific effects of particulate matter (e.g. secondary organic and inorganic aerosols, metals) - epidemiology and toxicology.
- long term studies of air pollution impact on different European population groups including children, and to follow this group (cohort) over substantial time. Also other population groups would be followed in epidemiological studies. Closely linked with the Environment and health strategy of the Commission (jointly between DG ENV, DG SANCO and DG RTD)

# CAFE research needs III

- **Assessment tools and policy instruments and abatement strategies and technologies**
  - support to introduction of new technologies and abatement techniques for bench/feasibility test, pilot scale and full scale early introduction
  - on-board diagnostics and portable emissions monitoring equipment of air pollution
  - develop integrated approaches to facilitate the development and implementation of existing effective emission abatement strategies – includes downscaling of EU Impact Assessment
  - further develop integrated assessment
  - Comparison *ex-ante* and *ex-post*
  - Risk communication, indicators