

# MODELLING FOR THE IMPLEMENTATION OF EU AIR QUALITY DIRECTIVES

## AN EU PERSPECTIVE

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FAIRMODE, Kjeller, Septembre 2010



- **Restructuring in the European Commission**
- **AQ Implementation frame: Directive 2008/50/EC**
- **Activities and challenges (related to modelling)**
  - Time extension & enforcement
  - Workshop NO<sub>2</sub> in April 2010
  - Guidance, Implementing Provisions on Reporting
  - GMES
- **Perspectives**

# Restructuring in the Commission

## ■ In 2010 new Commission

- Janez Potočnik new ENV Commissioner (former RTD)
- DG ENV split into ENV and CLIMA

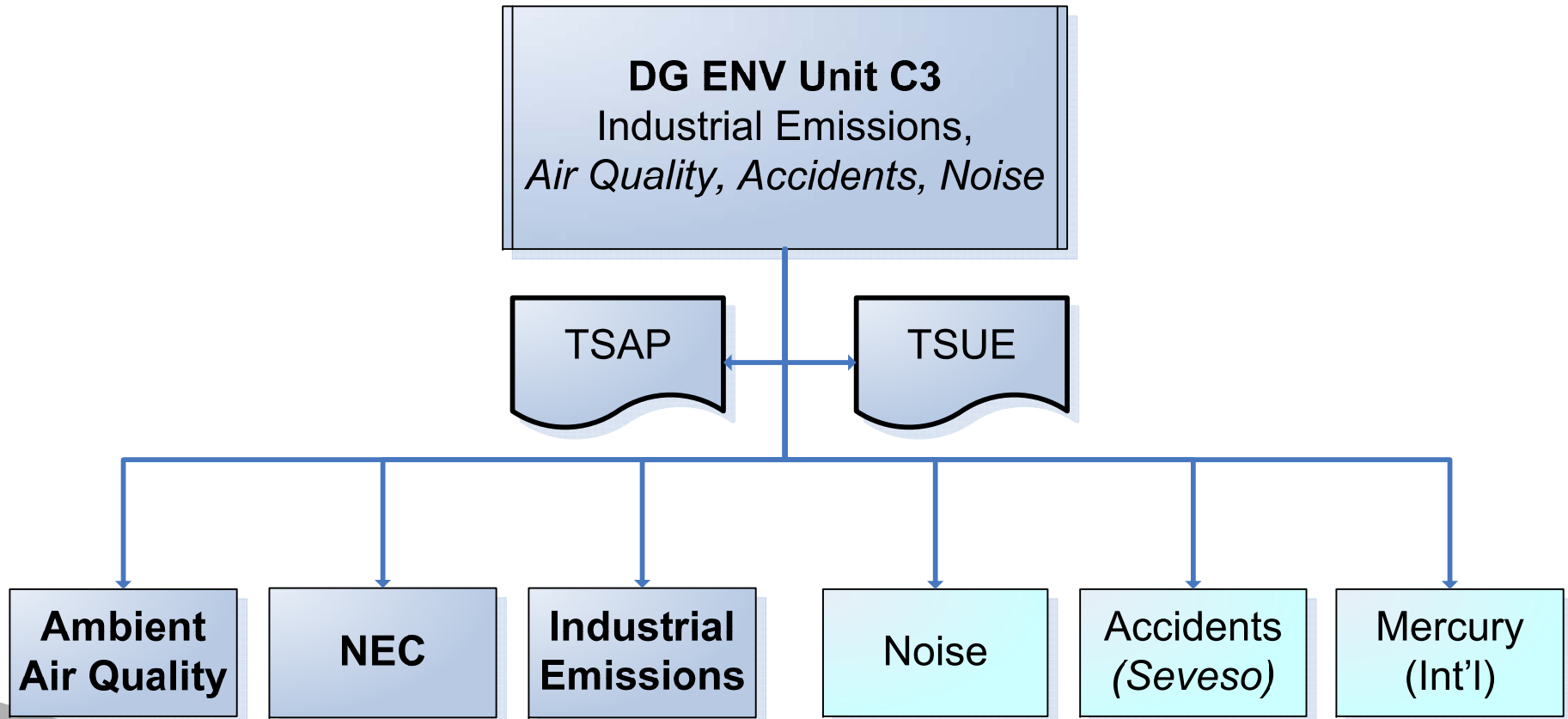
## ■ Old Clean Air and Transport unit split...

- ENV part united with industrial emissions, national emission ceilings, EPRTR...
- Name: Industrial emissions (to be changed soon)
- Head of Unit : Marianne Wenning

## ■ Synergies – related work on emissions and Air Quality reunited

- Continuous work to exploit commonalities with climate change

# DG Environment, new Unit ENV.C3



# Ongoing work and perspectives

## ■ Assessment of time extension notifications

- PM<sub>10</sub> notifications and re-notifications
- NO<sub>2</sub> notifications

## ■ Implementing the (new) Ambient Air Quality Directives

- Air Quality Committee
- Recasting Implementing Rules On Reporting (incl. Eol)
- Completing & Updating Implementing Guidelines
- Exchange of Best Practice (Workshops, databases, ...)
- EIONET, Aquila (measurement), and Fairmode (modelling),...

## ■ Monitoring the implementation of the TSAP (integration)

- Climate and Energy Package
- Emission Limit Values (Real World Emissions)
- ...

## ■ Review of the EU Ambient Air Quality Policies

- Preparations ongoing for delivery in 2013
- Issues: Health and other objectives (update), PM 2.5 (AAQD revision clause), EU vs Subsidiarity (cont'd), ...

# Principal implementation activities

## ■ Addressing PM10 compliance

- AQ plans developed/updated throughout EU
- Application of 2008/50/EC Art 22 (time extension up to June 2011) notified by almost all Member States
  - Most applications objected to by the Commission, arguments accepted
- Infringement cases against 21 Member States

## ■ NO2 annual limit value : widespread problem

- Wave of Art 22 (time extension max. up to 2015) applications expected in autumn 2010

## ■ Support the efforts of Member states by

- Exchange of practices (AQ management database)
- Reporting and information exchange
- Guidance documents
- Meetings and Workshops

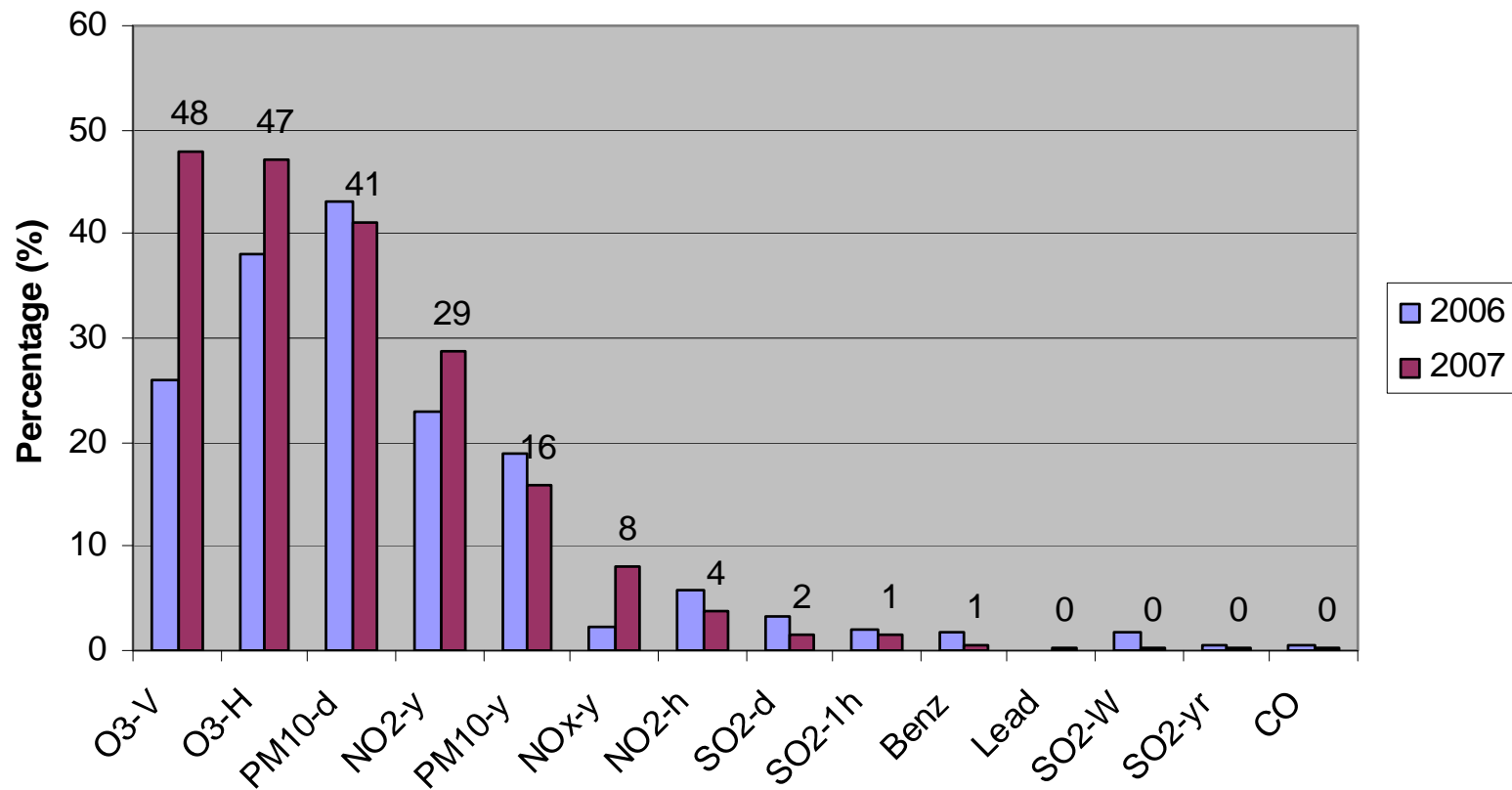
# The EU Ambient Air Quality Legislation (2008)

*Directives 2008/50/EC and 2004/107/EC (4DD HM and PAHs)*

- **Consolidating existing AQ legislation into a single Directive**
  - Various completing acts relating to monitoring and reporting
- **Confirming existing limit values that apply throughout the territory**
- **New air quality objectives for PM<sub>2.5</sub> (fine particles)**
  - A 25µg/m<sup>3</sup> (annual) target value attained as far as possible by 1.1.10
  - A 25µg/m<sup>3</sup> (annual) limit value to be attained everywhere by 1.1.15
  - A variable national exposure reduction target (reducing the measured average in a given calendar year between 0% and 20% by 2020)
  - A 20µg/m<sup>3</sup> "exposure concentration obligation" not be exceeded by end 2015 (calculated as the average measured concentrations over a calendar year)
- **Possibility for time extensions for compliance (see later)**
  - PM<sub>10</sub>: from 1 January 2005 to 11 June 2011
  - NO<sub>2</sub>, benzene: 1 January 2010 to 1 January 2015
- **Possibility to discount natural sources of pollution and resuspension attributable to winter sanding-salting of roads when assessing compliance against limit values**

# Percentage of zones in exceedance 2006-2008

(Source: annual report, Q461)





# Challenges: PM10 and NO2 exceedances (2008)

	<b>Nitrogen dioxide NO<sub>2</sub>*</b>		<b>Particulate matter PM<sub>10</sub></b>	
	Annual limit value of 40µg/m <sup>3</sup>	Hourly limit value of 200µg/m <sup>3</sup> (18 permitted exceedences)	Annual limit value of 40µg/m <sup>3</sup>	Daily Limit value 50µg/m <sup>3</sup> (35 permitted exceedences)
Zones in exceedence	179	18	96	288
Total N° zones	793	793	792	791
% exceedence	22.5%	2%	12%	36%

\* Limit values for NO<sub>2</sub> only enter into force on 1 January 2010 and so the exceedence is of LV+10% Margin of Tolerance

# Challenges : Enforcement

## ■ Failure to comply with PM<sub>10</sub> limit values

- 20 open cases
- 1 case closed in 2009 and further 2 cases to be closed for reasons of compliance
- 2 Member States referred to the Court

## ■ Failure to comply with SO<sub>2</sub> limit values

- 5 open cases
- 2 cases closed due to compliance

## Time extension - conditions

- All appropriate measures must have been taken before the original attainment date
- The exceedance must be due to site-specific dispersion characteristics, adverse climatic conditions or transboundary contributions
- The air quality plan must demonstrate that compliance will be achieved at the expiry of the exemption period

*Assessment by Commission confirmed 'subsidiarity principle' embedded in the Directive*

# Time Extension Notifications

## ■ PM<sub>10</sub> time extensions

- 43 Notifications from 20 Member States
- 22 decisions on daily and annual limit values covering 312 zones
  - Time extension granted: 54 zones
  - Objections raised on one or more conditions: 218 zones
  - Objections raised due to reported compliance: 115 zones
- Re-notifications of around 38 zones from six Member States
- Currently under assessment AT, DE, FR, PL, SK, UK, RO

## ■ NO<sub>2</sub> time extensions

- 4 Notifications from 4 MS (CZ, NL, PL, SK) covering 14 zones
- 3 Decisions covering 11 zones (4 ongoing for PL and SK)
  - Time extension granted for nine zones (NL)
  - Remaining 2 failed on at least one condition
- Re-Notification of 1 zone (PL)

## ■ Benzene time extensions

- One notifications from PL, No decision adopted yet, assessment ongoing

# NO2 Workshop 14-15 April 2010

## ■ Addressing the competent authorities

- Facilitate exchange of latest information and best practices in relation to abatement measures taken to comply with NO2 limit value
- Support preparation of quality notifications under Art.22

## ■ Relevant conclusions

- Modelling a necessary tool for management
- New emission factors for diesel – include at all scales!
- Local scale : issue of primary NO2 emissions
- NOx to NO2 conversion – getting it right

## ■ Presentations, minutes available on CIRCA

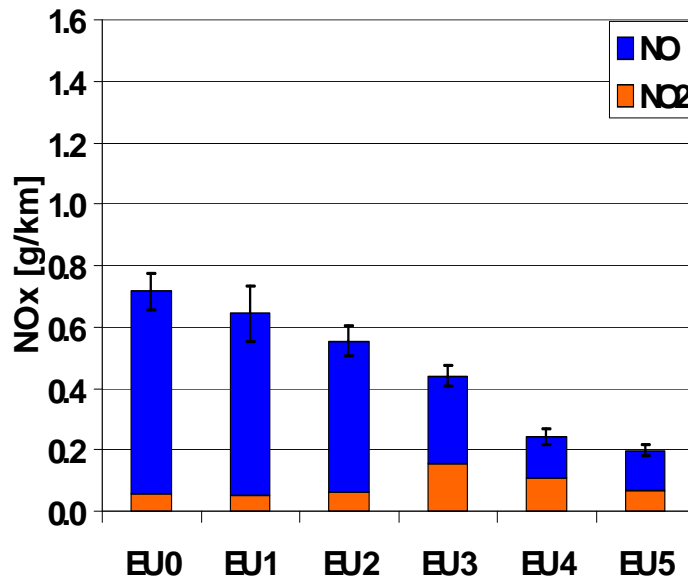
- [http://circa.europa.eu/Public/irc/env/ambient/library?l=/events/workshop\\_14-15\\_2010&vm=detailed&sb=Title](http://circa.europa.eu/Public/irc/env/ambient/library?l=/events/workshop_14-15_2010&vm=detailed&sb=Title)

# Challenges: NO<sub>2</sub> & Road Transport

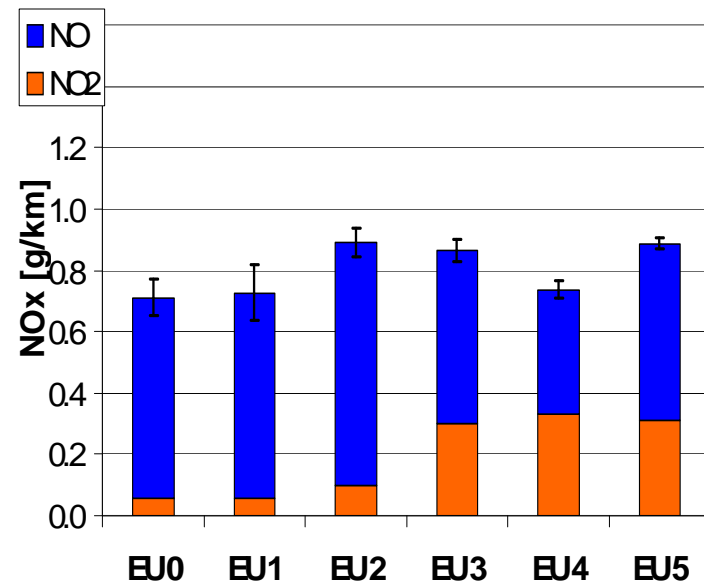
- **Road transport contributes to the emissions of several pollutants but is the dominant source of nitrogen oxides (NO<sub>x</sub>)**
- **Air quality limits for nitrogen dioxide (NO<sub>2</sub>) exceeded in 270 cities in 21 Member States in 2008 although the limits are only legally binding from 1 January 2010.**
- **Issues**
  - Real world emissions of NO<sub>x</sub> much higher than measured at type approval for cars, vans and heavy duty vehicles
  - Diesel cars have higher emissions than petrol cars and there has been a significant dieselization of the car fleet
  - Diesel cars have a higher proportion of total NO<sub>x</sub> emitted directly in the form of NO<sub>2</sub>.
- **Member States can get extra time to comply until 31 Dec 2014 but this may be challenging until vehicle emissions are reduced.**

# Emission coefficients, diesel

Diesel NEDC



Diesel CADC (hot start)



Source: S.Hausberger, TU Graz

# AAQD Implementing Measures – Scope

- **Replaces ALL reporting obligations under AQ directives**
  - Including supporting Decisions 2004/224/EC,2004/461/EC
- **Determines ALL reporting obligations under 2008/50/EC and 2004/107/EC**
- **Replaces Exchange of Information Decision 97/101/EC and defines frame for voluntary exchange of air quality information at EU level**
- **Determines What, When, and partly How (controlled process)**
  - Details on how will be further defined in guidance, schema
- **New solutions to support effective implementation**
  - Access to Near-Real-Time data to facilitate EU services such as GMES-Atmosphere, as well the regional/local management, local modelling, natural contributions assessment etc.
  - Extended platforms to exchange air quality information on assessment and management



## ■ Policy development

- Identify risk, set objectives
- Identify, develop Community measures
- integrated assessment, cost/benefit analysis
- Research

## ■ Implementation

- Concentration levels
  - Assessment/nowcasting/forecasting
- AQ Management
  - Spatial planning: **Environmental Impact Assessment**
  - Source apportionment
  - Measures, integrated assessment
- Public information, Input to services, Enforcement

## ■ Integration of policies

# GMES

- **User oriented operational service**
- **Space, in-situ, data assimilation and modelling**
  
- **MACC project to cover ‘core service’**
  - [www.gmes-atmosphere.eu](http://www.gmes-atmosphere.eu)
  - Free and accessible products at EU scale
    - Eye on Earth EEA/Microsoft uses MACC product
- **‘Downstream services’ already starting**
  - PASODOBLE
- **Up to 2014 pre-operational, financed under FP7**

# In summary...

- Modelling continuously increasing in importance as integral part of AQ assessment and management
  - ➔ Increased liability; transparency and interpretation required!
  - ➔ Critical appraisal of all inputs and the methodology required at all times
- GMES Atmosphere major development at EU level; products to be used directly or as input to further modelling by the Member states
- FAIRMODE is the principal forum working on responsible use of modelling
  - ➔ Support users and developers, provides recommendations to the Commission
  - ➔ Scrutinize new EU products such as of GMES, where appropriate promote common solutions
  - ➔ Feedback by the Community encouraged!
- Revision in 2013 to reflect modelling state-of-the art in updated provisions of EU legislation

# Thank you

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

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