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Annual review of LRTAP and NEC submissions

PART I

Presented by Vigdis Vestreng, MSC-W

TFEIP/EIONET, 5th joint meeting, 19-20 October 2004

Outline

- Inventory Review 2004 (Joint EEA/EMEP report)
- Revision of emission distributions
- Feedback from Parties and MS on the 2004 review
- Way forward

Emission data documents 2004

EB.AIR/GE.1/2004/10 *"Present State of Emission Data"*

MSC-W Technical Report 1/2004
"Inventory Review 2004 "
Emission data reported to CLRTAP
EMEP/EEA Joint Review Report
Vigdis Vestreng, Martin Adams and Justin Goodwin

"Emission distribution used for source-receptor calculations and CAFÉ scenario analysis"
Leonor Tarrason, Heiko Klein, Philippe Thunis, Vigdis Vestreng and Les White
Chapter 3 in EMEP Status Report 1/04 *"Transboundary acidification, eutrophication and ground level ozone in Europe"* Joint MSC-W & CCC & CCE & ICP-M&M & JRC-EI Report

"An initial outlook into the future development of fine particulate matter in Europe"
Markus Amann, Janusz Cofala, Chris Heyes, Zbigniew Klimont, Wolfgang Schopp, Jan Eiof Jonson, David Simpson and Leonor Tarrason
Chapter 5 in EMEP Status Report 4/04 *"Transboundary particulate matter in Europe"*
Joint CCC & MSC-W & CIAM Report

WedDab at http://www.emep.int

European Environment Agency

EEA & emep

Inventory Review 2004

Vigdis Vestreng, Martin Adams and Justin Goodwin

Emission data reported to CLRTAP and under the NEC Directive

Timeliness of submissions

- *CLRTAP: 55% of submissions on time*
- *NEC: 40% of submissions on time*

CLRTAP experienced a clear improvement in emissions received on time in 2003 when the deadline for submissions was moved from 31 December to 15 February.

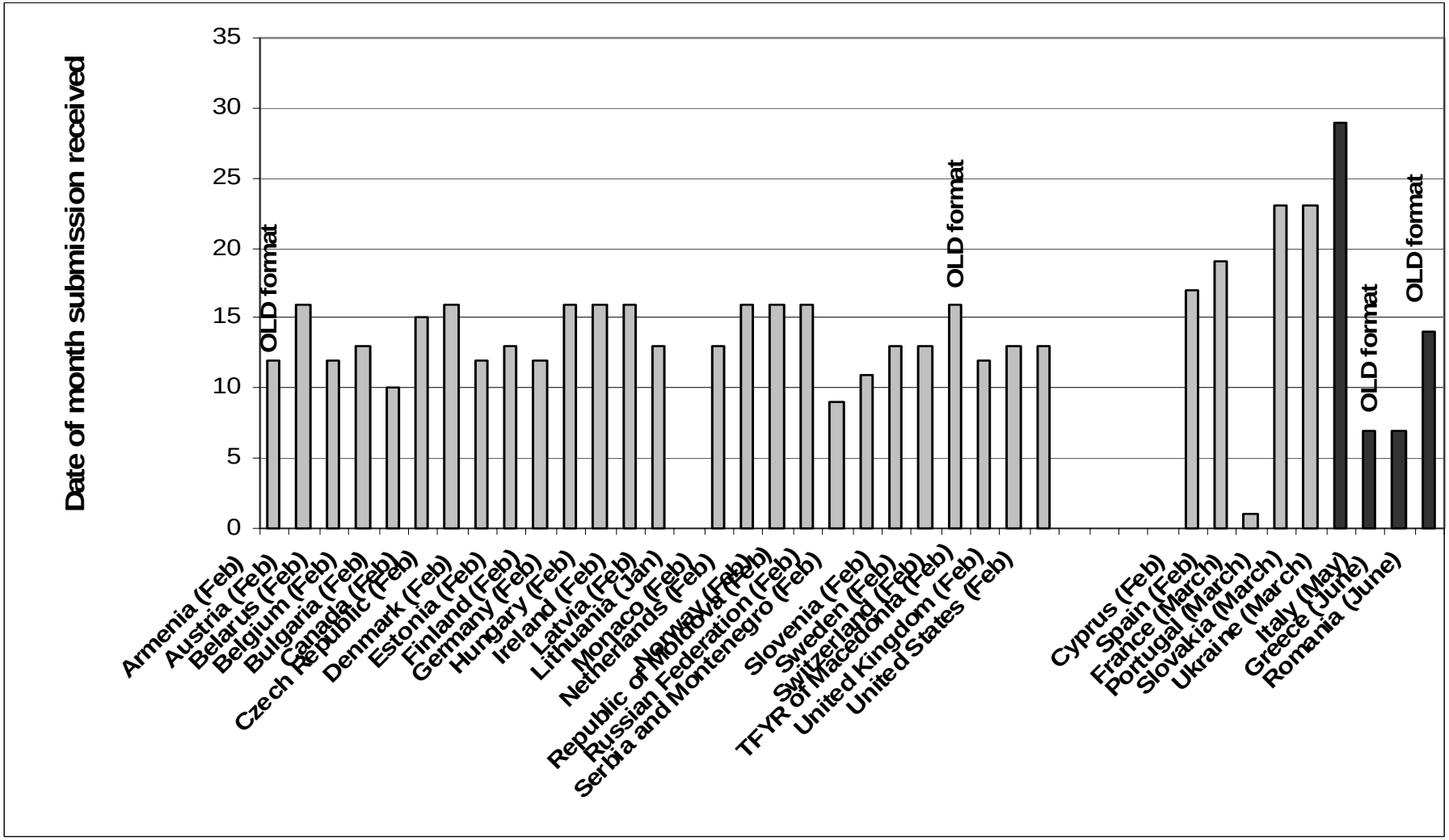
Format of submissions

- *CLRTAP: 94% of submissions in the new NFR format*
- *NEC: 65% of submissions in the new NFR format*

The switch from SNAP to NFR has been successfully carried out, especially by Parties to the Convention.

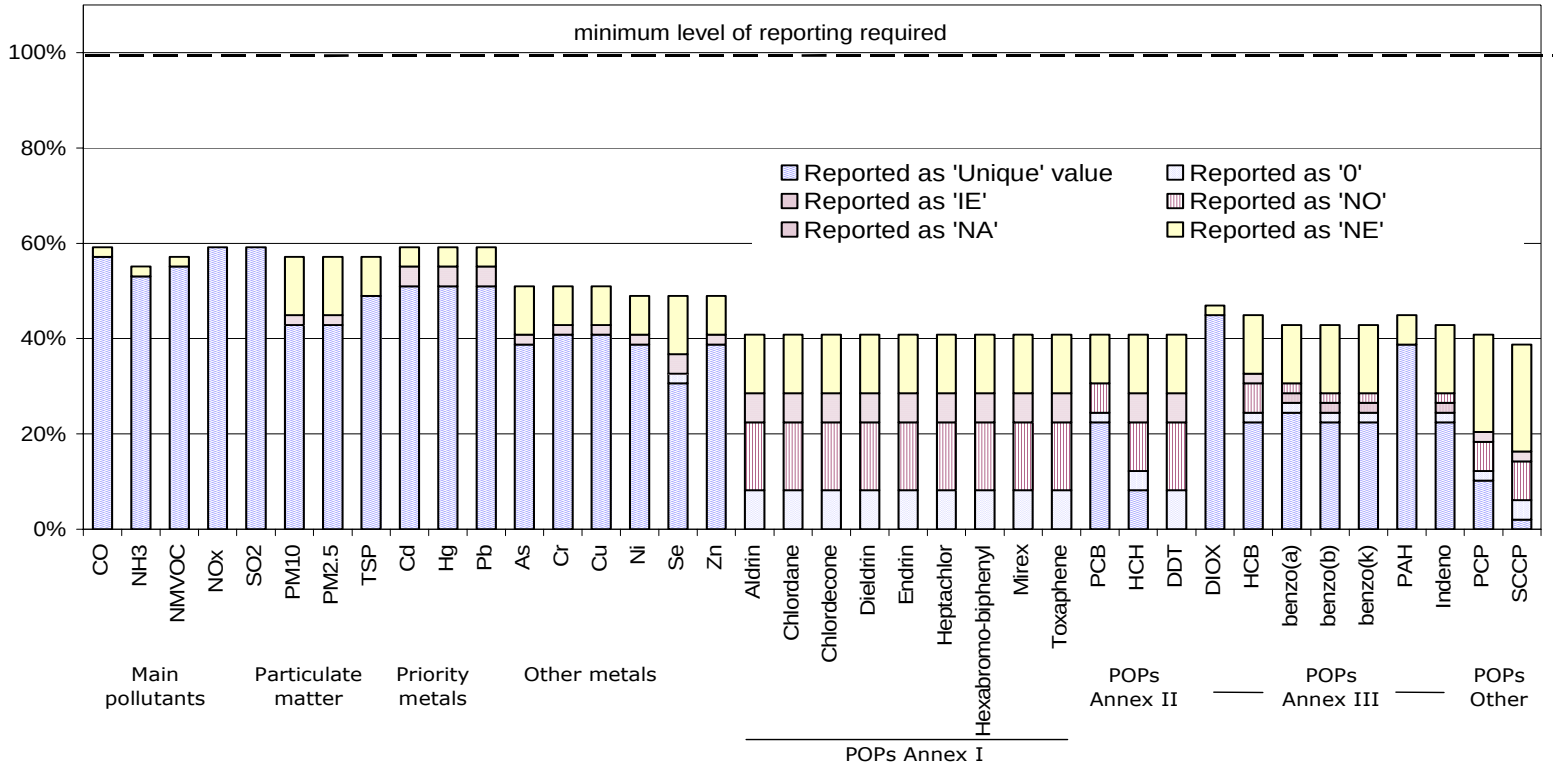
However only 34% passed the REPDAB format test indicating that the submitted data was not entered exactly as required in the reporting template. Specially there are problems with footnotes in REPDAB – need for an Informative Inventory Report (IIR) and changes in the reporting templates.

Timeliness


Date of month submission received
35
30
25
20
15
10
5
0
OLD format
OLD format
OLD format
OLD format
Armenia (Feb)
Austria (Feb)
Belarus (Feb)
Belgium (Feb)
Bulgaria (Feb)
Canada (Feb)
Czech Republic (Feb)
Denmark (Feb)
Estonia (Feb)
Finland (Feb)
Germany (Feb)
Hungary (Feb)
Ireland (Feb)
Latvia (Feb)
Lithuania (Jan)
Monaco (Feb)
Netherlands (Feb)
Norway (Feb)
Republic of Moldova (Feb)
Russian Federation (Feb)
Serbia and Montenegro (Feb)
Slovenia (Feb)
Sweden (Feb)
Switzerland (Feb)
TFYR of Macedonia (Feb)
United Kingdom (Feb)
United States (Feb)
Cyprus (Feb)
Spain (Feb)
France (March)
Portugal (March)
Slovakia (March)
Ukraine (March)
Italy (May)
Greece (June)
Romania (June)

Completeness of submissions

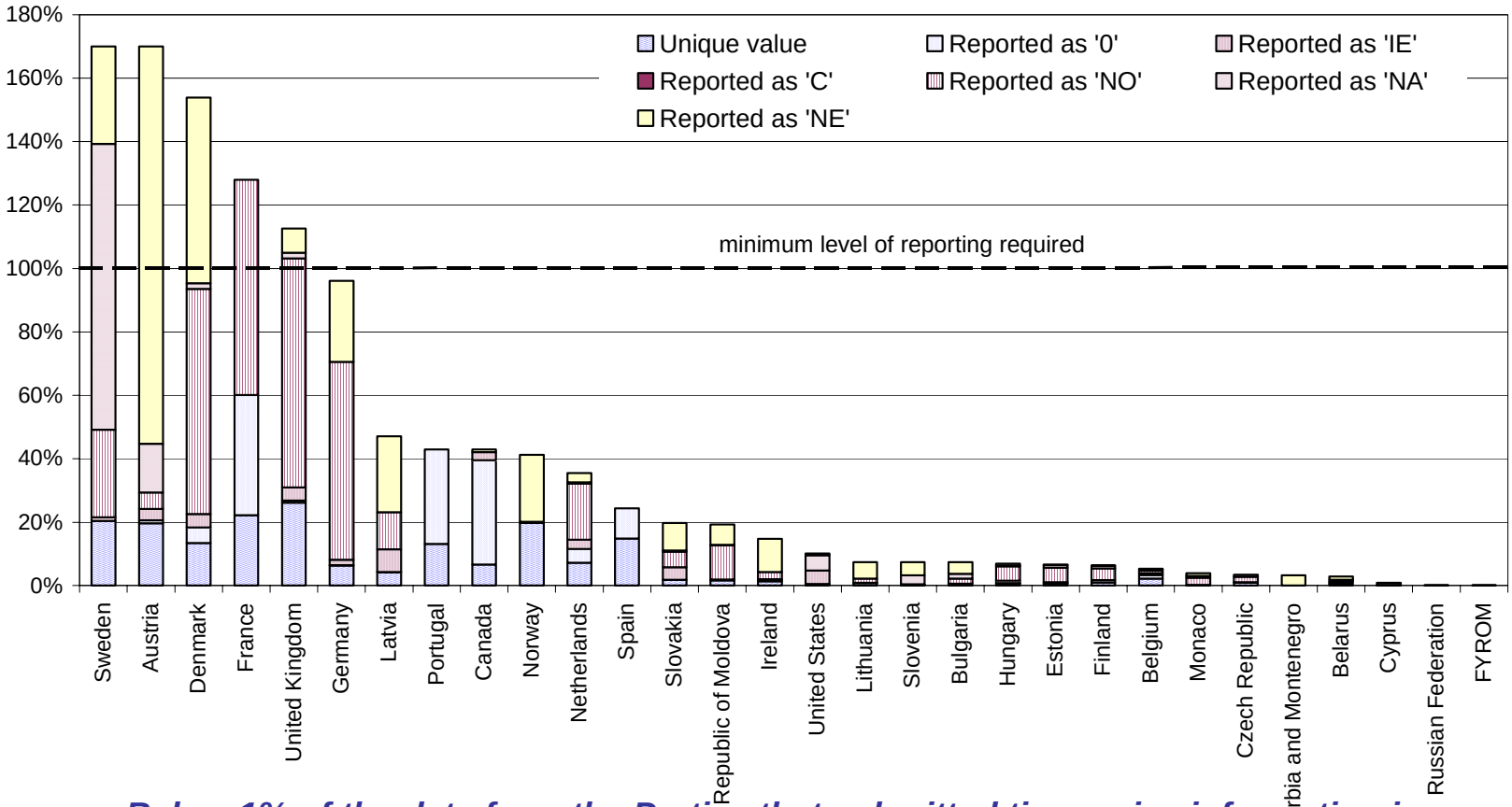
National Total 2002 emissions



60% for Main Pollutants ***50% for Heavy Metals*** ***40% for POPs and PM***

Completeness of submissions

Timeseries 1980- 2002 reporting in 2004

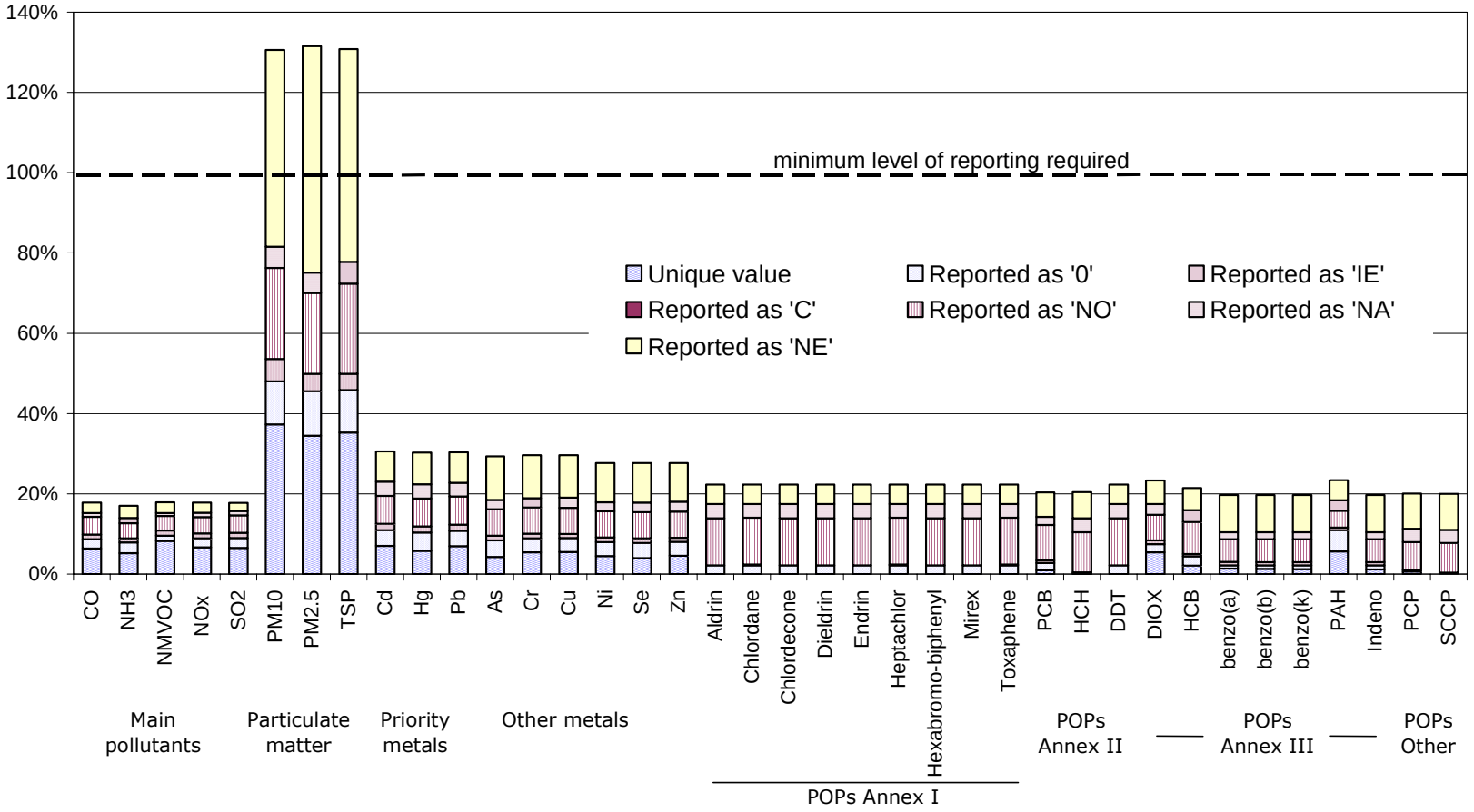


Below 1% of the data from the Parties that submitted timeseries information in 2004 was flagged as inconsistent (dips/jumps).

Completeness of submissions

Timeseries 1980- 2002 reporting in 2004

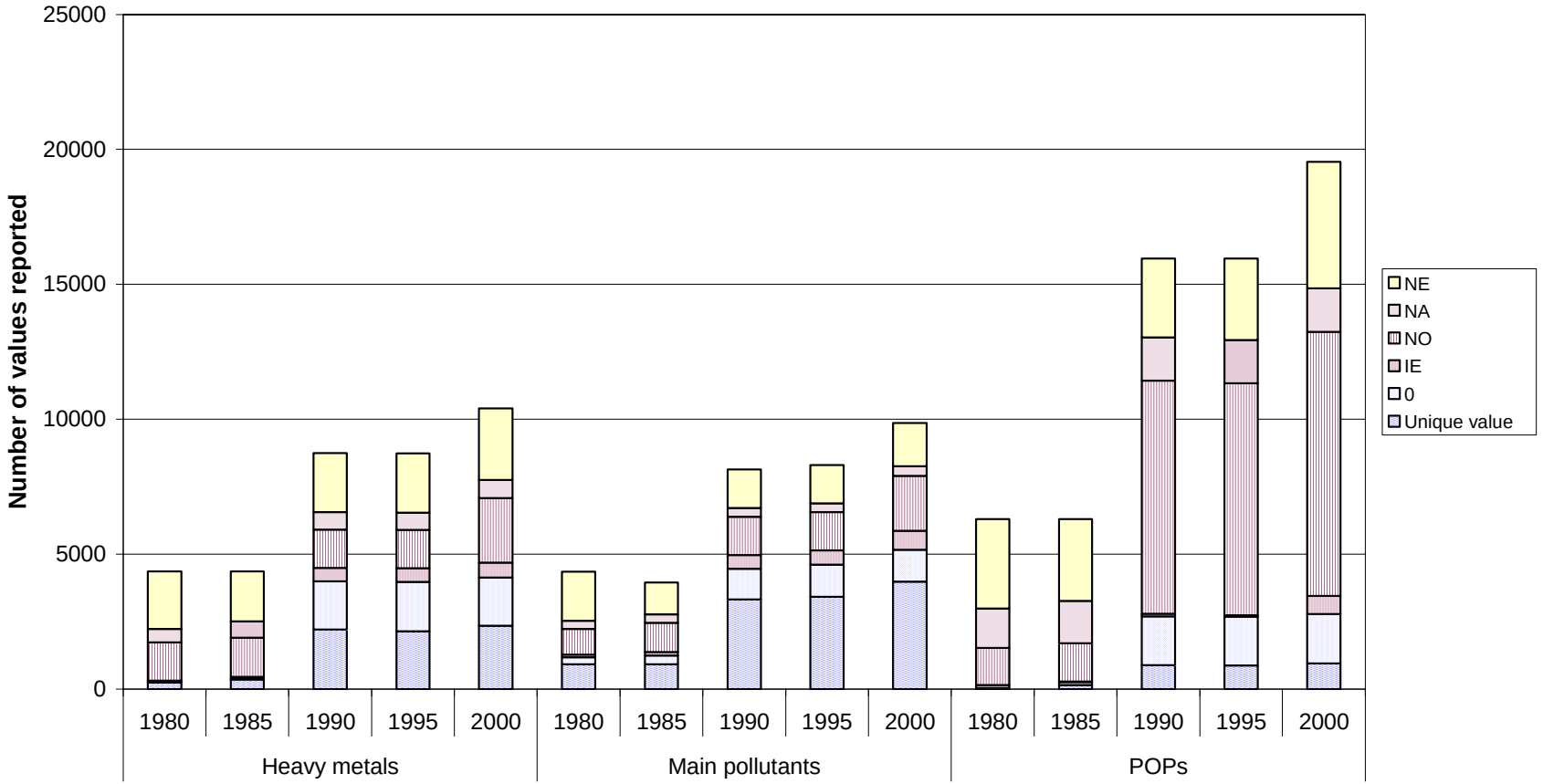
1980-2002 for main pollutants, 1990-2002 for HMs and POPs, 2000-2002 for PM



Completeness of submissions

Timeseries 1980- 2002 emissions

Increase in 1980-2002 reporting in 2004



Internal consistency

30% of the Parties submitted internally inconsistent data

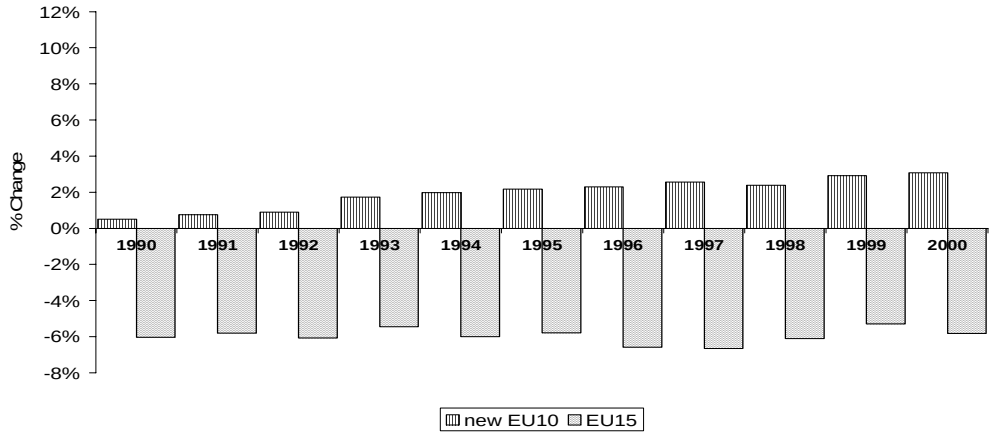
However, this does not imply that 70% of submissions reported fully consistent data, since consistency checking in REPDAB is linked to the completeness and cannot be performed if an incomplete dataset is reported.

- *Submissions should be tested for internal consistency (the task can be facilitated by REPDAB)*

Recalculations

Comparison of emission data submitted in 2002 and in 2004 show that differences are generally below 10%.

Recalculations have on average led to higher emissions of the main pollutants reported in 2004 for the new Member States and to lower reported emissions in the EU15. *(Example below for NH_3 emissions)*



Extended reviews

- ***Implied emission factors***

This is the most preliminary test in the Extended 2004 review.

In the initial feasibility test approximately 25% of the tested data was flagged, indicating a range of IEFs used by Parties.

There is a significant variation in the NH3 implied emission factors which identifies this area as susceptible to uncertainties and shows lack of harmonisation among Parties

- ***Inventory comparability***

In general the inventory data reported to LRTAP and NEC data are comparable

There were only 10 occurrences where differences were greater than +/-0.1%
All 10 occurrences were less than +/-3% - except for SO2 emissions from The Netherlands were there was a +17% – 18% difference. Bilateral discussions revealed that this was because of differences between CLRTAP and NEC in sea shipping definitions

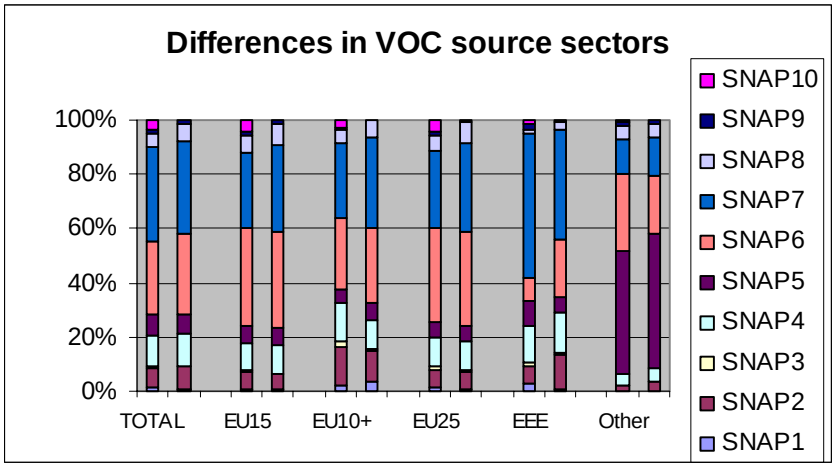
Revision of emission data used for modelling

CIAM, JRC-EI, MSC-W, Les White associates

Emission data used in EMEP Unified model

Based on :

- **National Totals reported by Parties**
- **Sector Distributions revised by IIASA**
- **New methodology to distribute emission data in the EMEP grid**



New methodology to distribute emission data

Use of ancillary data to distribute sector emissions:

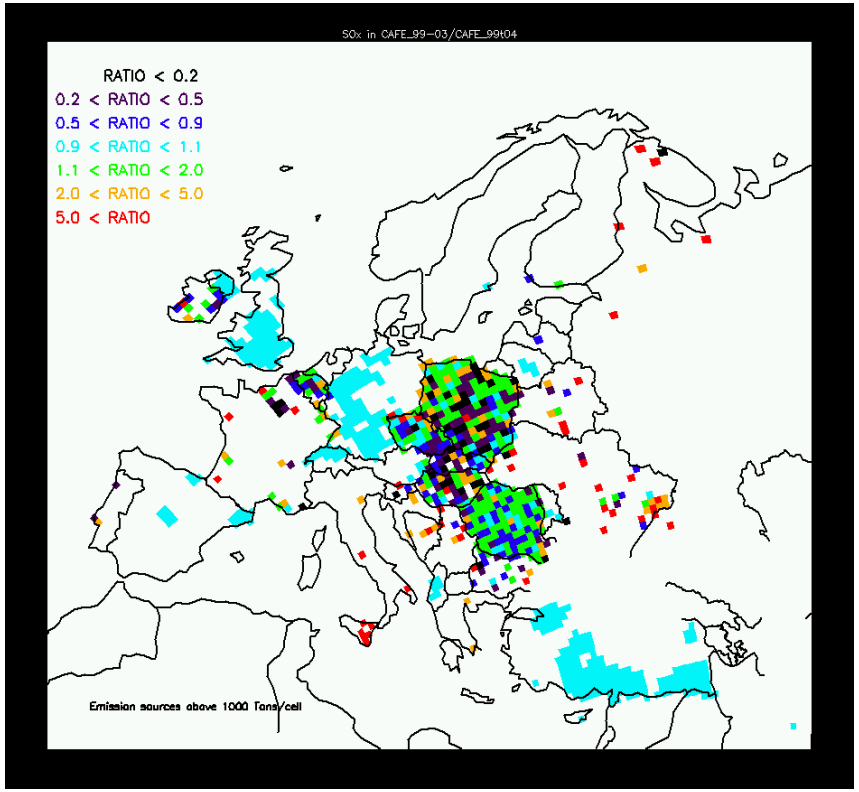
- **Large Point Source Information (LPS, both location and intensities)**
- **Population distribution (POP, common with IIASA)**
- **Information from the CEPMEIP project (TNO, land-use and road maps)**
- **Information on national gridded sector emissions (GS)**

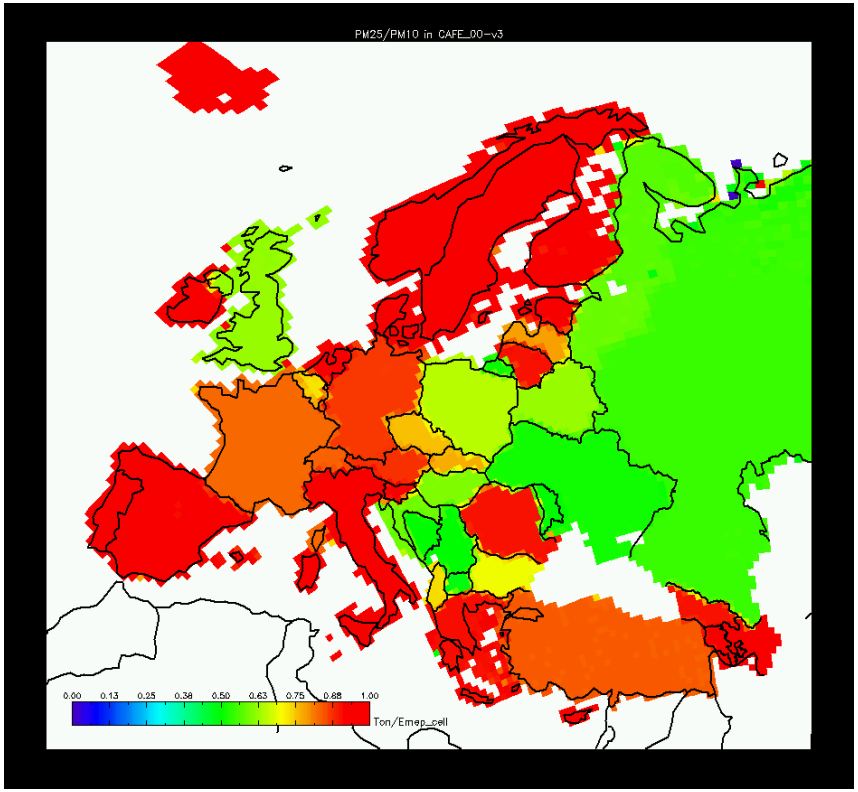
The method secures the consistency of emission sector distribution across Europe per component. Precursor gases and primary PM emissions are consistently distributed.

Ancillary data used per sector in 2002

Sector aggregation	Gridded according to following ancillary data (2004 methodology)	Notes
SNAP 1: Energy Combustion	LPS information for NOx , SOx (IER) LPS from countries, when available	Both spatial positions and intensities are presently used
SNAP 2: Residential Combustion	Population (IIASA)	
SNAP 3: Industrial Combustion	50% Population (IIASA) 50% LPS NOx, SOx (IER, countries)	Only few countries have reported LPS data
SNAP 4: Production Processes	LPS NOx, SOx (IER, countries)	Both spatial positions and intensities are presently used
SNAP 5: Extraction Fossil Fuels	GS data for S5 for PM (TNO, CEPMEIP)	
SNAP 6: Solvent and Product Use	Population (IIASA)	
SNAP 7: Road Transport	GS data for S7 for NOx, if available: or GS data for S7 for PM (TNO, CEPMEIP)	Only 11 countries have reported gridded sector data for NOx
SNAP 8: Other Mobile Sources	GS data for S8 for NOx, if available; or GS data for S8 for PM (TNO, CEPMEIP)	Only 11 countries have reported gridded sector data for NOx
SNAP 9: Waste	XX% Population (IIASA) XX% LPS (IER, countries) XX% Agriculture (S10,TNO, CEPMEIP)	Fractions per country based in CEPMEIP information
SNAP 10: Agriculture & Forestry	GS data for s10 for NH3, if available GS data in S10 for PM (TNO, CEPMEIP)	

Sector 2
residential combustion



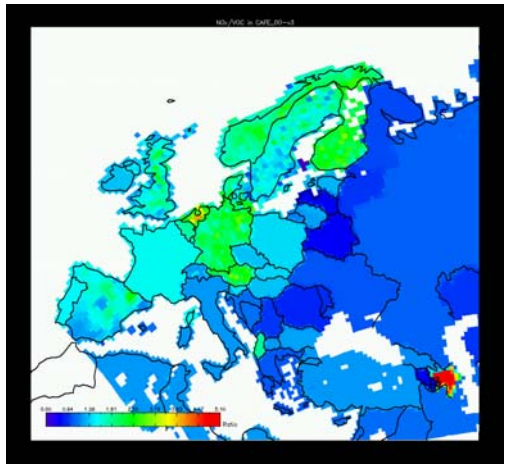


SO_2

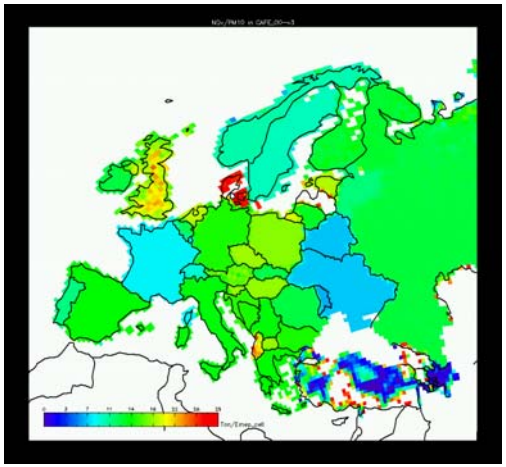
$PM_{2.5}/PM_{10}$

Eastern Europe = 0.5 Western Europe = 1

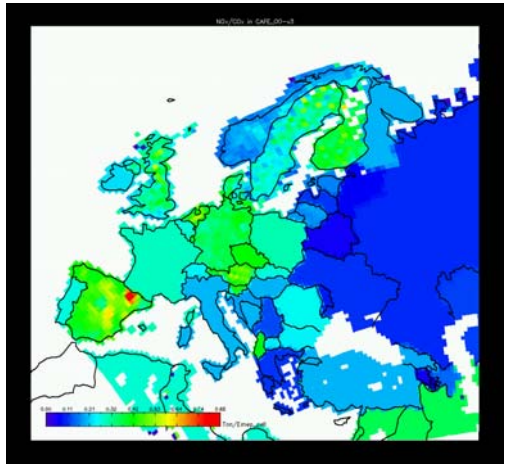
Sector 7
road traffic



NOx/VOC
(0.5-5.0)

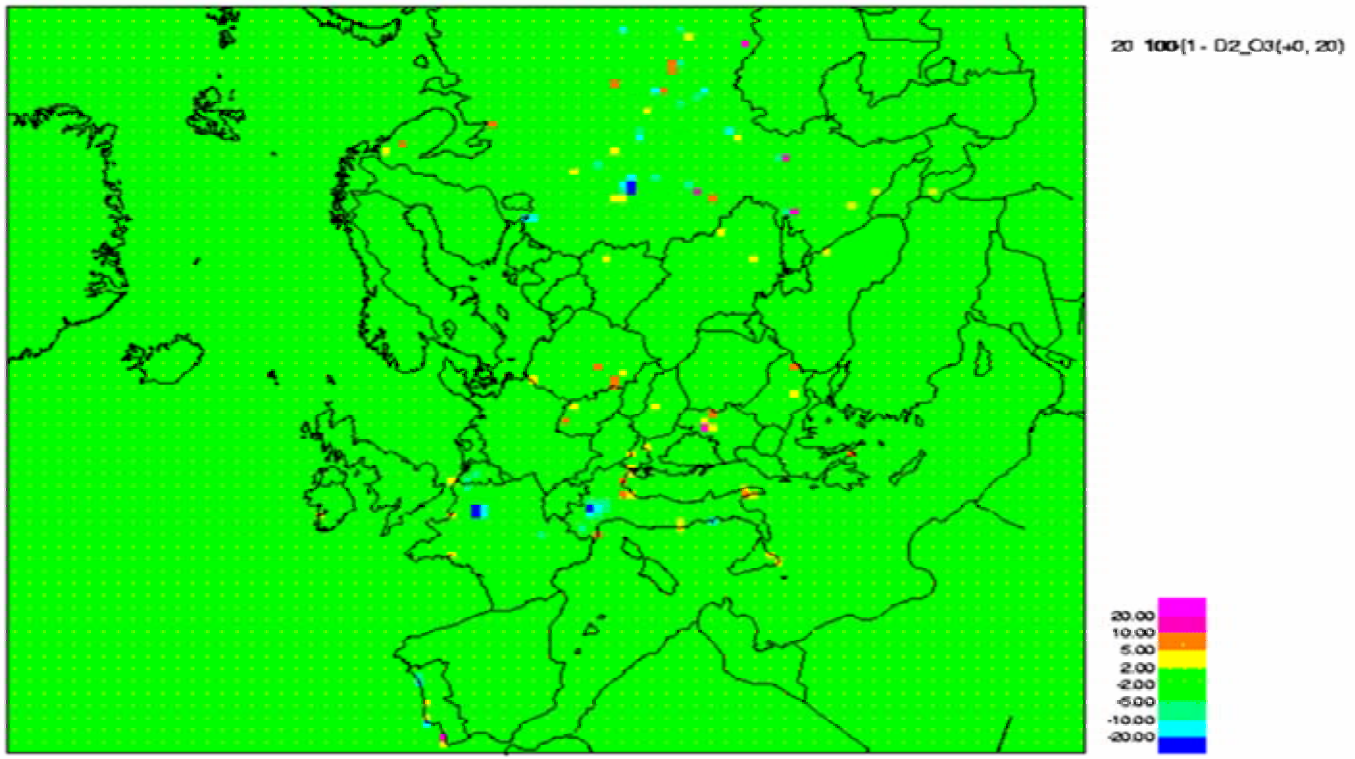


NOx/PM_{10}
(4.0-25.0)

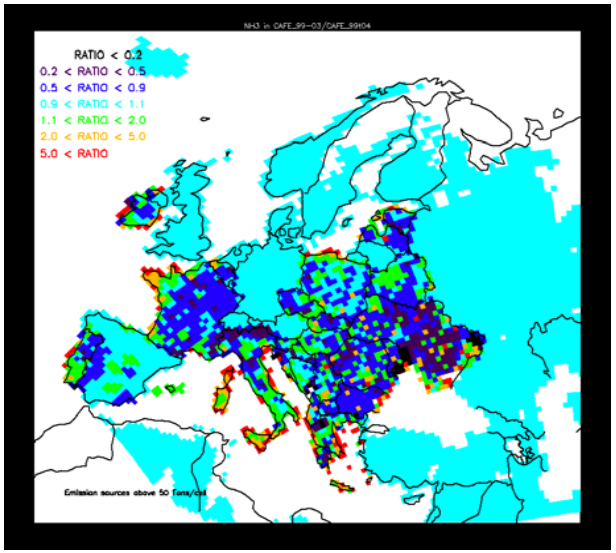


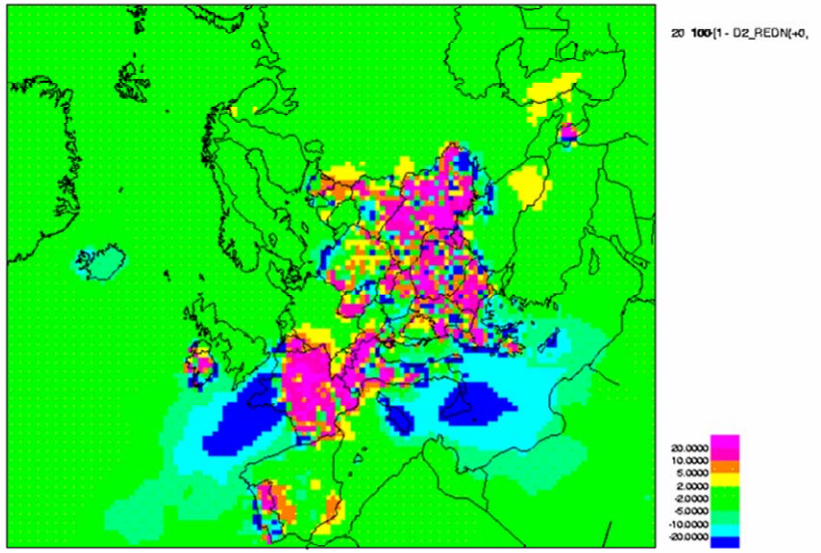
NOx/CO
(0.01-1.0)

Influence of emission distributions in modelled results: Ozone concentration changes in vicinity of cities



Influence of emission distributions in modelled results:
Ammonia emissions and ammonium concentrations





Preliminary results from work in progress show that the correlation of modelled data with observations generally increases with the new emission data.

Conclusions

- Timeliness:
  - NEC review – opportunity to harmonize deadline
  - In-country communication
  - Clearly defined in-country responsibility

- Completeness:
  - Low, but varies considerably between Convention Parties
  - Focus on pre-1990, HM and POPs.
  - Templates edited to facilitate reporting further. Transparency: IIR
  - Do not report blank cells.

- Consistency: Use REPDAB before submitting data

Conclusions cont.

- LRTAP and NEC data compare in general well. NB! Definition differences
- Recalculations below 10%
- Spatial distribution of emissions is important (human health, ecosystem,crops and life stock).
- Reporting of high quality GS data is requested!
- In Depth review. Yet to be discussed&defined.
- Improved Review