

# Review of emission data submitted under CLRTAP Update of gridded emissions



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*SB meeting*

*14 Sept 2010, Geneva*

# Content

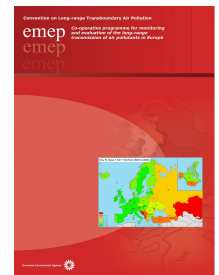


- **Review process and review results** under the CLRTAP
  - Stage 1 & 2
  - Stage 3 centralised in-depth review
  - Roster of experts
  - Challenges
- **Emission data for modellers**
  - Update of historical emissions 2000-2007
  - Parameters of new gridding system

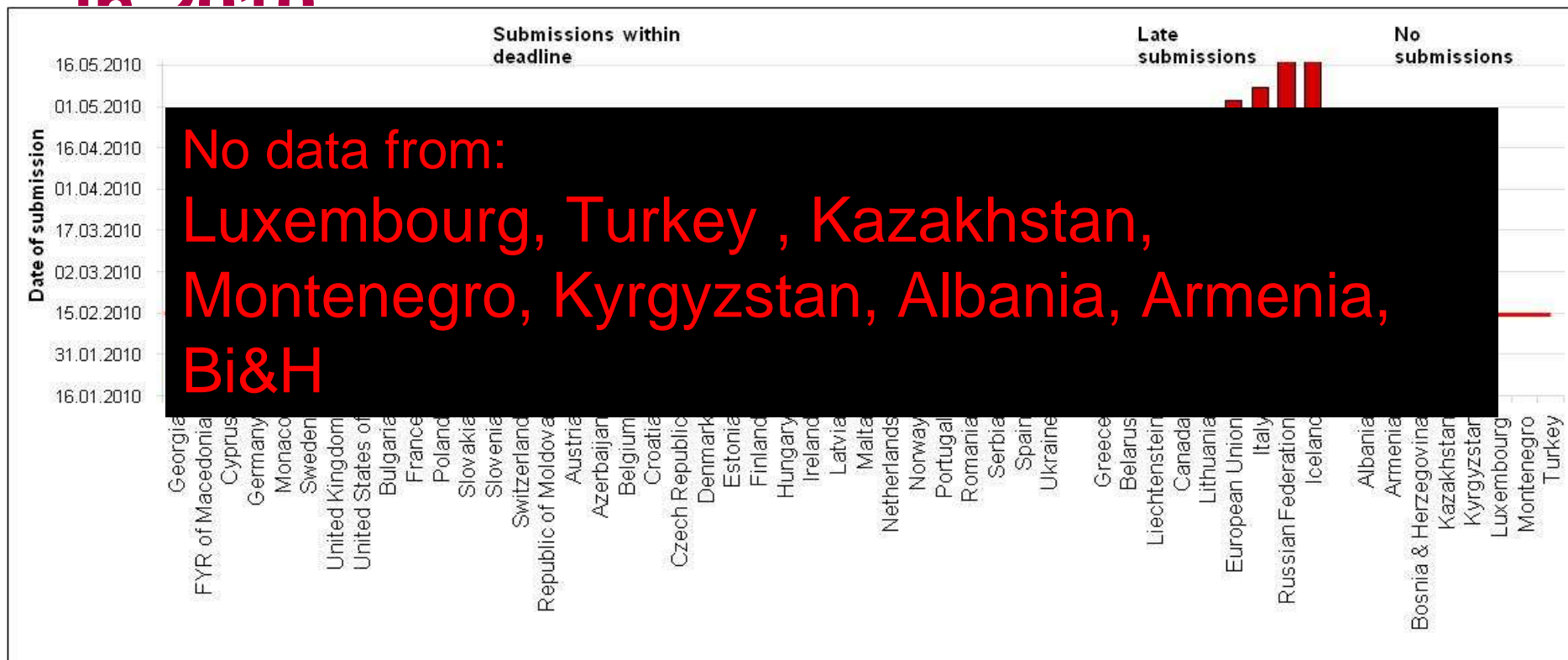
# Review Guidelines

(EB.AIR/GE.1/2007/16)

- Methods and procedures for the technical review of air pollutant emission inventories reported under the Convention and its protocols
  - ▣ **Stage 1** - automated tests, Country reports posted on the web by 15 March
  - ▣ **Stage 2** - S&A country reports posted 31 May
  
- Summary of findings:  
In technical report **Inventory review 2010**  
<http://www.ceip.at/fileadmin/inhalte/emep/pdf/2010/InvRevRept2010.pdf>



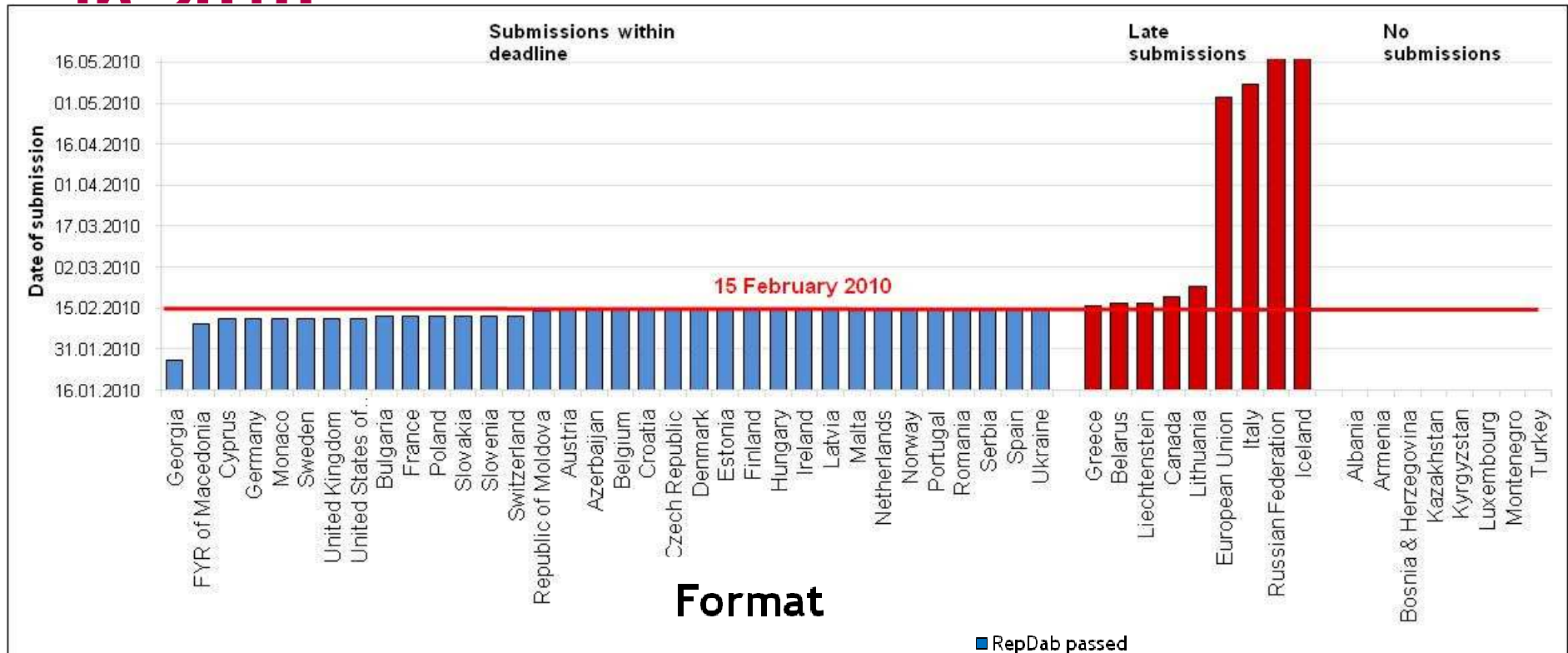
# Reporting of inventories under the CLRTAP in 2010



<http://www.ceip.at/emission-data-webdab/submissions-under-clrtap/2010-submissions/>

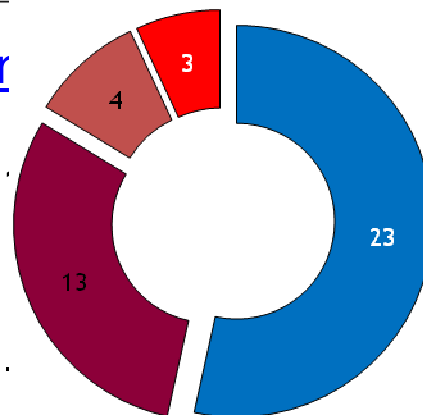
- 43 submissions (from 51 Parties), 34 Parties within deadline, 18 resubmissions
- 30 IIRs,
- 32 Parties reported AD – significant improvement comparing to 2009

# Reporting of inventories under the CLRTAP in 2010



<http://www.ceip.at/emission/submissions/>

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- 30 IIRs,
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■ RepDab passed

■ Modifications necessary to pass RepDab

■ Other format for part of the data

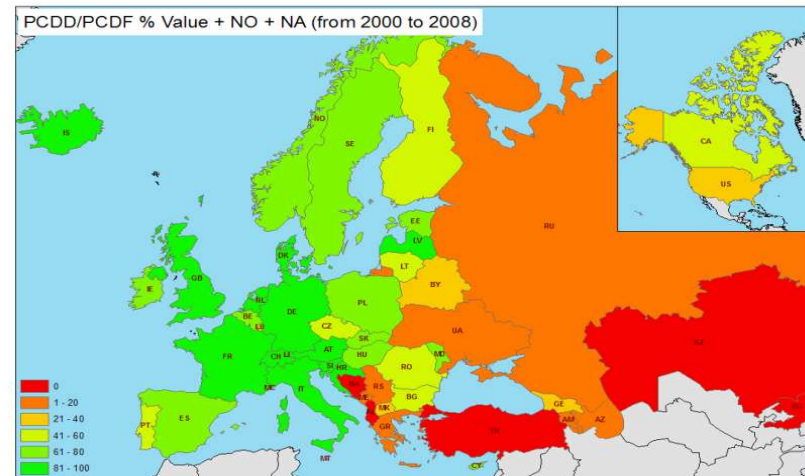
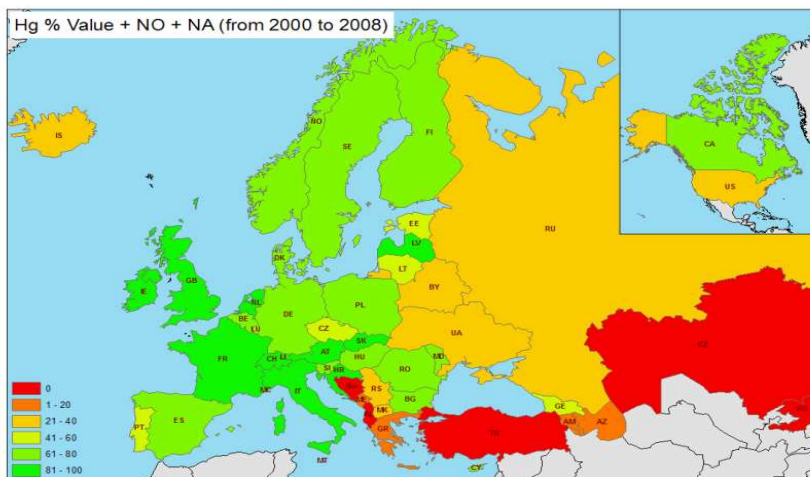
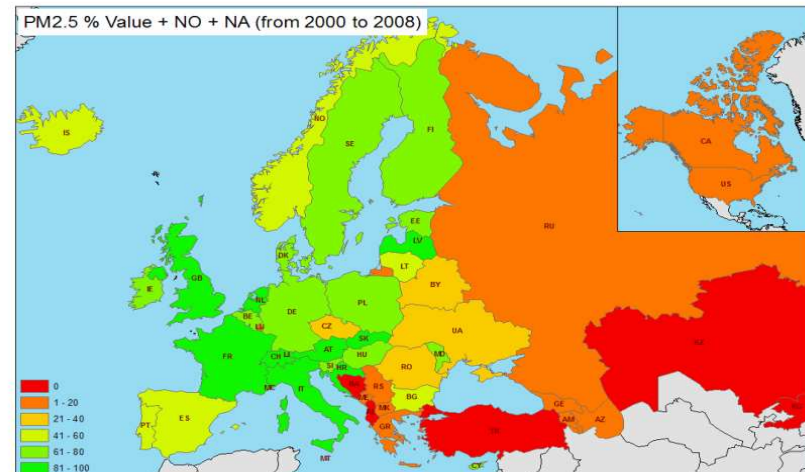
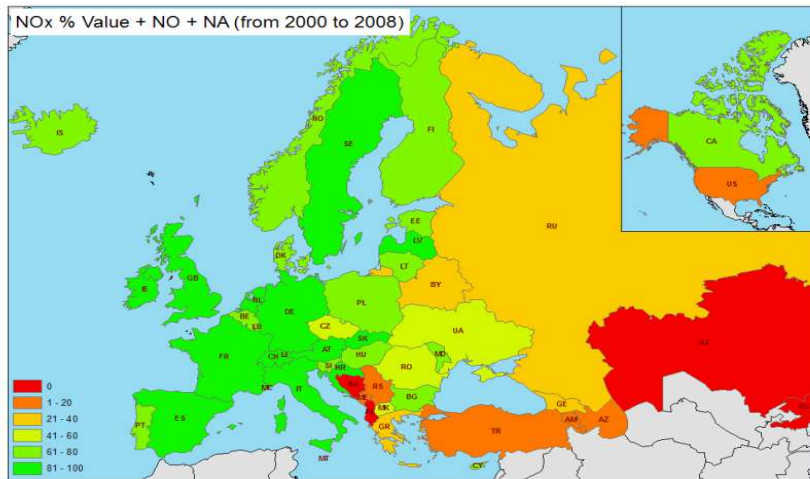
■ Other format

<http://www.ceip.at/emission/clrtap/2010-deadline>, 18

deadline, 18

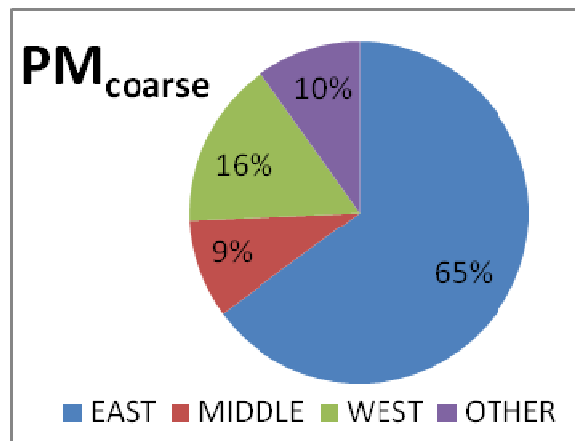
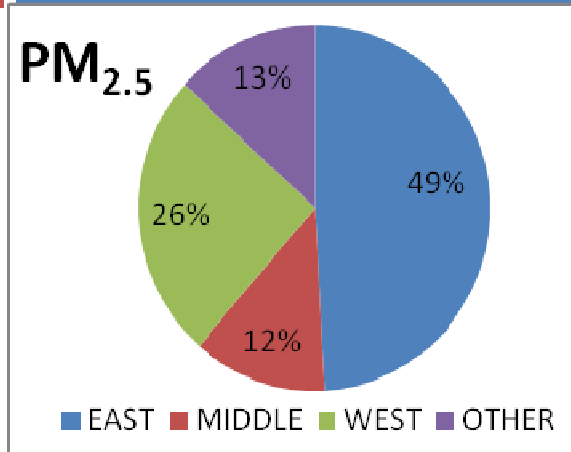
returning to 2009

# Completeness of sectoral (NFR09) reported data (from 2000 to 2008) - examples



This maps show which percentage of cells in the reporting template contains **emission data** or the notation key “NO” and “NA”

# Contribution of different EMEP regions to the total 2008 emissions - example



- **East:** Albania, Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Kazakhstan, Republic of Moldova, Russian Federation, Russian Federation extended, Turkey, Ukraine, Uzbekistan, Turkmenistan, Tajikistan
- **Middle:** Bosnia & Herzegovina, Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Montenegro, Malta, Macedonia, Poland, Romania, Slovenia, Slovakia, Serbia
- **West:** Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Iceland, Italy, Liechtenstein, Luxemburg, Monaco, the Netherlands, Norway, Portugal, Sweden
- **Other:** Arctic Ocean, Aral Lake, Remaining Asian Areas, Atlantic Ocean, Baltic Sea, Black Sea, Caspian Sea, Mediterranean Sea, North Africa, North Sea

# Recalculations & Update of gridded emissions

- **30 parties provided recalculated data** (out of 43 which reported emissions in 2010). 10 Parties submitted only 2008 emissions, which limit the number of assessments that can be made.
- The number of recalculations for individual pollutants does not differ significantly, although **NMVOC** is the pollutant that has been recalculated most often in 2010, followed by **CO, NO<sub>x</sub> and SO<sub>x</sub>**.
- **23 per cent** (16% in 2009, 11% in 2008) of all recalculations performed resulted in changes in the reported emissions **higher than  $\pm 10\%$** . Large recalculations were **most frequently observed for HMs and POPs emissions**.

# Recalculations & Update of gridded emissions

- To provide modellers with gridded data consistent with the latest (recalculated) emissions **CEIP developed a software tool** („RG tool“) for re-gridding
  - ▣ *The tool distributes resubmitted and gap-filled emissions using the given spatial distribution of the particular pollutant, sector and year*
- CEIP re-gridded main pollutants (SO<sub>x</sub>, NO<sub>x</sub>, CO, NMVOC, HN<sub>3</sub>) and PM (PM<sub>2.5</sub>, PM<sub>coarse</sub>) for the years 2000 to 2007
- 8 years \* 7 pollutants \* 10 SNAP sectors = gap-filling and re-gridding of **560 data sets**

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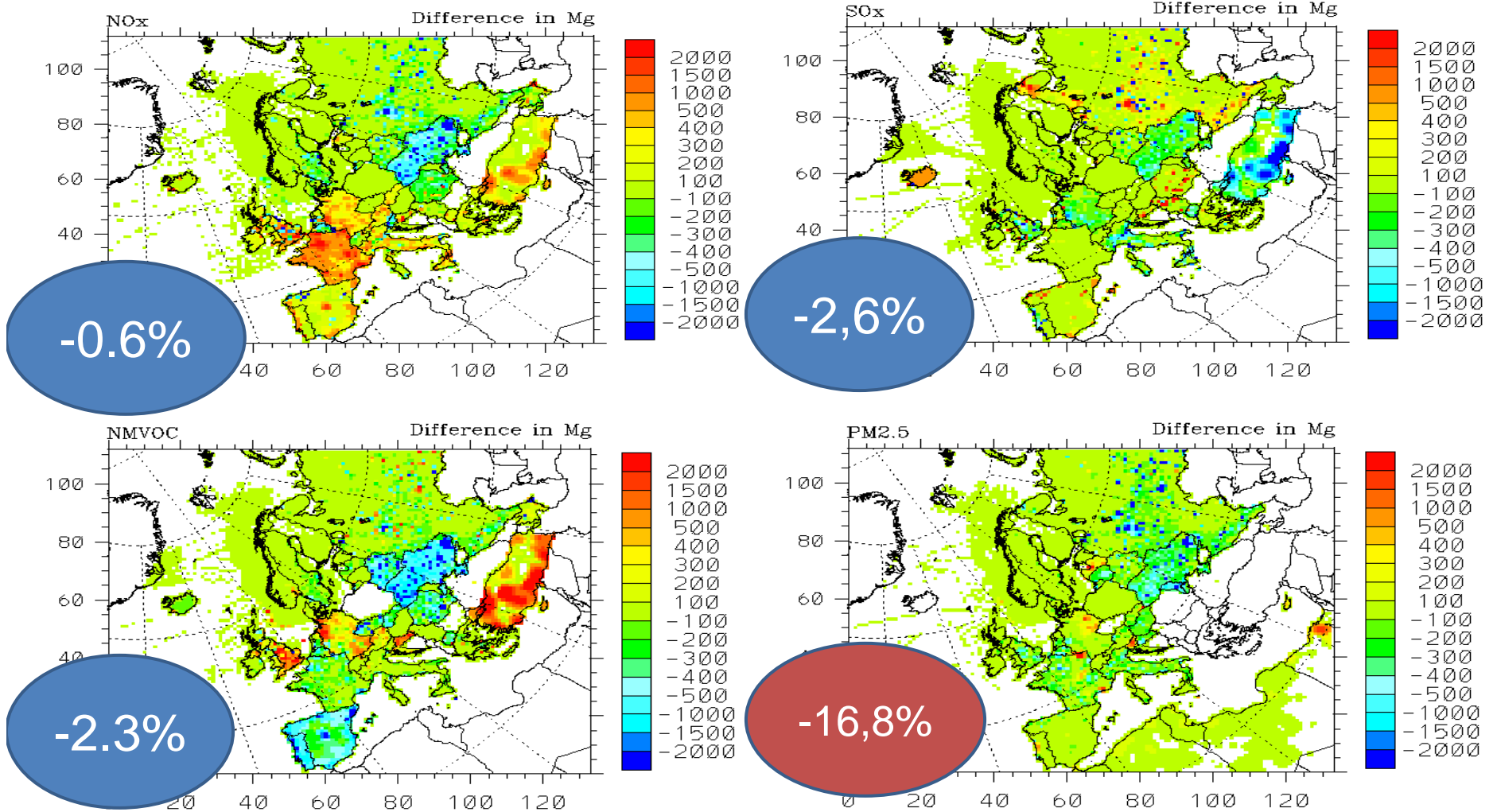
# Recalculations & Update of gridded emissions:

## ■ HMs&POPs

- **Calculation of new base grids** for the spatial distribution, using reported gridded national total data if reported gridded sectoral data was not available.
- **Detailed documentation of all data** we used for the gridding (information of the grid-distribution used for each pollutant, country and sector as well as information on the gap-filled emissions used on SNAP sector level).
- **Gap-filling and gridding of HM (Cd, Hg, Pb) and POP (PCDD/PCDF, PAH, HCB) emissions for 2008**
- **Re-gridding of HM (Cd, Hg, Pb) emissions for 2007** (regarding the new base grids)

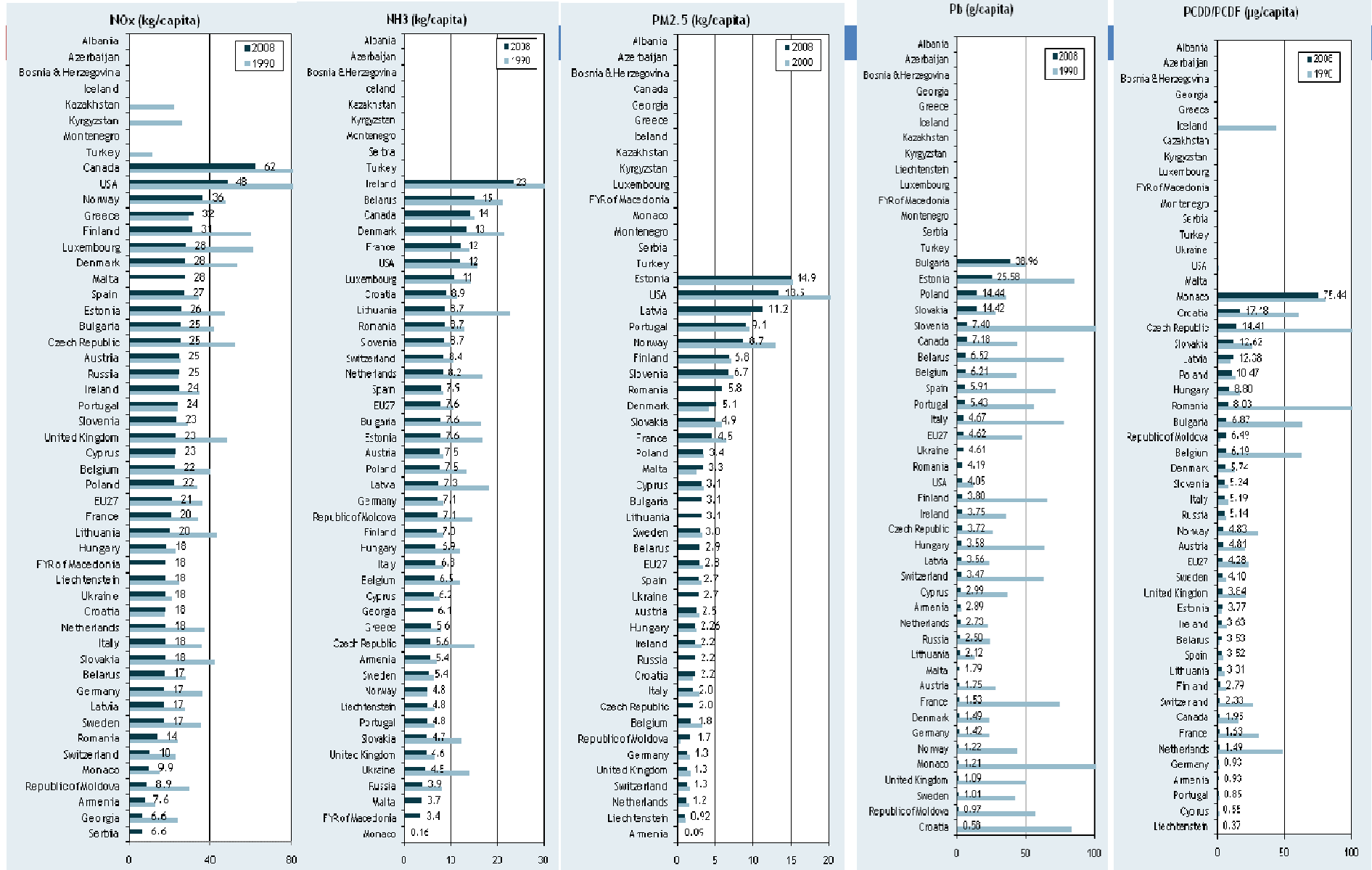
Gridded data can be visualized and downloaded from the CEIP homepage at <http://www.ceip.at/emission-data-webdab/emissions-used-in-emep-models>

# Recalculations & Update of gridded emissions)

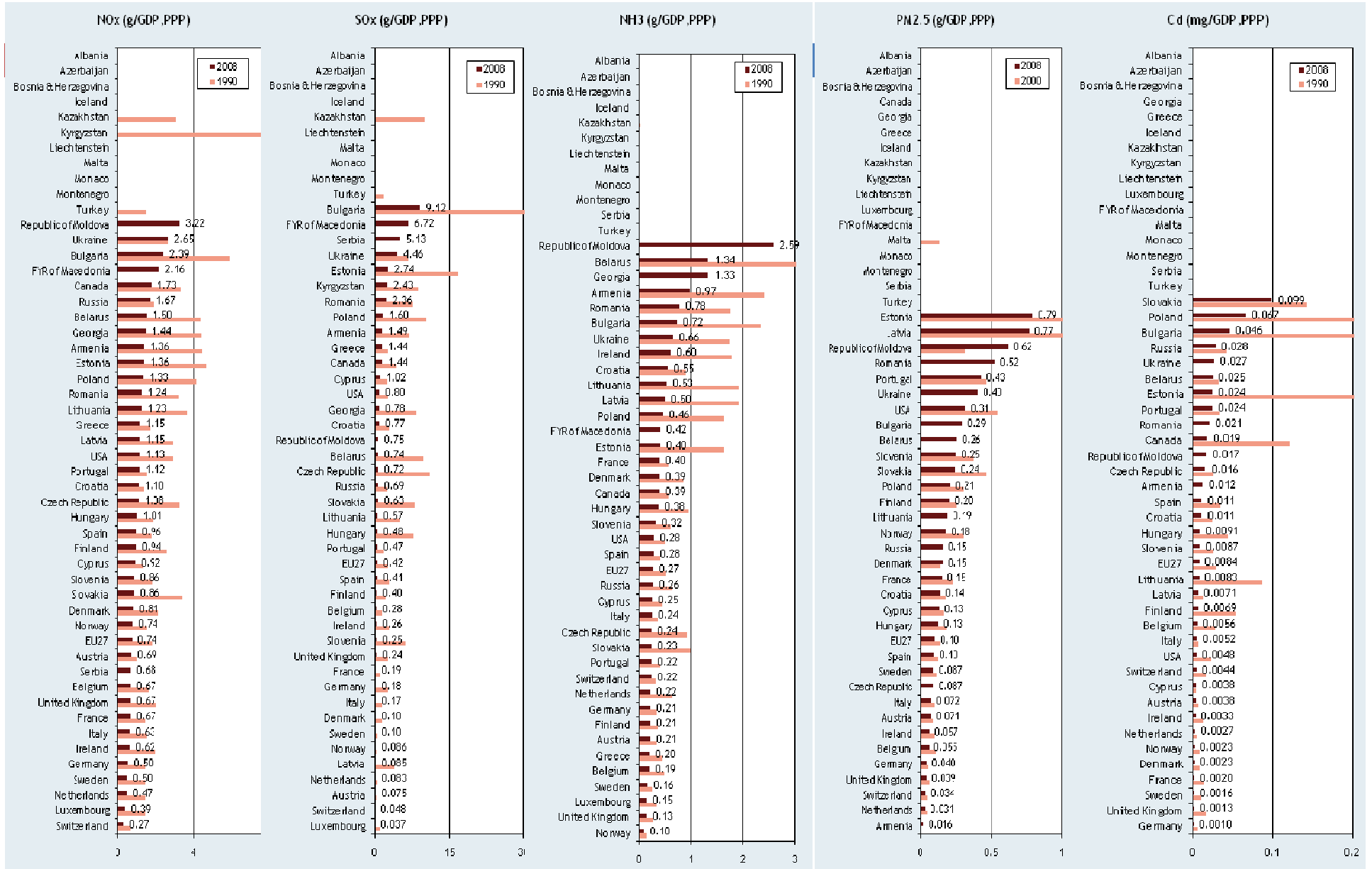


Difference between original and recalculated expert estimates

# Emissions per capita



# Emissions per GDP



# Stage 3 in-depth centralized review

- **Centralized review of quantitative and qualitative** information of selected inventories by pollutant, country or sector, as in the work plan agreed by the EMEP Executive Body
- The main objectives for the reviews are:
  - a) to complement the reporting guidelines in supporting Parties to compile and submit high quality inventories
  - b) to support Parties in meeting their reporting obligations under the Protocols
  - c) to increase policymakers' confidence in the data used for air pollution modelling
- The aim is to check in detail the inventories of each Party at least **once every five years** (review approximately 10 Parties annually)
- 2 expert review teams (ERT)
- ERT optimally: LR+ generalist + 8 sectoral experts

# Stage 3 in-depth centralized review

- CEIP
  - ▣ Coordination of the whole process
  - ▣ Technical support of ERT
  - ▣ Communication with Parties
  - ▣ Publication of final reports
- CEIP/TFEIP/EEA
  - ▣ Guidance for reviewers, transcripts and templates for

Review experts (10-15d):

Preparatory work and follow up activities

Review the inventory and complete transcripts and relevant chapters

LR – coordination of the team, compilation of the reports, assistance to less experienced reviewers

# Schedule for stage 3 in-depth reviews of Parties

<b>2008</b>	<i>France, Norway, Portugal and Sweden ( voluntary round of stage 3 )</i>
<b>2009</b>	<i>Belgium, Bulgaria, Denmark, Finland, Hungary, Ireland, Latvia, Lithuania, Poland and Spain</i>
<b>2010</b>	<i>Austria, Cyprus, Germany, Italy, Netherlands, Romania, Russian Federation*, Slovakia, Switzerland and United Kingdom</i>
<b>2011</b>	<i>Czech Republic, Belarus, Croatia, Estonia, Greece*, Iceland, Luxembourg*, Malta*, Slovenia and Ukraine*</i>
<b>2012</b>	<i>Georgia*, EU, Kazakhstan**, Kyrgyzstan**, Liechtenstein*, Monaco*, Rep. of Moldova*, Serbia*, the FYR of Macedonia and Turkey**</i>
<b>2013</b>	<i>Albania**, Armenia**, Azerbaijan**, Bosnia and Herzegovina**, France, Montenegro**, Norway, Portugal</i>

*\* Did not submit a complete emission inventory nor/or did not submit an IIR during the 2008, 2009, 2010 reporting rounds.*

*\*\*/ Did not submit complete inventory data in IIRs or an IIR in the last three reporting rounds.*

*Participation of the United States of America and Canada in the in-depth review process of emission inventories would require*

# Stage 3 - Experience 2010

## □ Review benefits

- Motivate experts to improve their own inventories
  - Provides a level of training on priorities for enhancing TCCCA of inventories
  - Builds an enthusiastic network of motivated and informed experts
- In general good interaction with Parties
- Most Parties responded on time and comprehensive
  - Russia – NIR not provided , limited explanatory information after the review week

## □ In all inventories identified areas for improvement

## □ The role of lead reviewer is very important – the

# Stage 3 - Experience 2010

- Difficulties arise if Parties has **to be reviewed as well as providing reviewers** to the ERT
- Time schedule – ERT needs to send questions before review week. Constraints - Reports are finalized during holiday season.
- The values for Parties providing reviewers is through internal qualification or gaining additional expertise
- **Participation of TF chair in the review process connects CEIP and TFEIP activities - EMEP should consider options for support**
- Not complete review teams

# Roster of emission experts

- **16 Parties** to the Convention (out of 51) have nominated experts to the roster
- **Austria, the Czech Republic, Denmark, the European Community, Finland, France, Germany, Ireland, Italy, Kazakhstan, Latvia, Norway, the Netherlands, Sweden, Switzerland and the United Kingdom**
- the roster currently contains a total of **49 inventory experts** (8 more comparing to 2008)
- the nominated experts are suitably qualified to review all emission sectors as well as general inventory issues, such as good practice, uncertainties, and quality assessment and quality

# Challenges



- The **limited number of review experts constitutes serious constraint** to the successful conducting of the reviews
- Not complete inventories resp. not provided NIRs limits the review
- Intercation with Parties
- Support the **participation of experts from EECCA and South-East European countries** in the review process



# Gridded emissions after 2012

# Reporting of gridded emissions now and in the future

## □ **Current system**

- 50x50km EMEP grid (polar stereographic projections)
- 11 SNAP sectors
- Reporting of LPS

## □ **2009 Reporting Guidelines (ECE/EB.AIR/97):**

- 50x50km EMEP grid,
- 21 GNFR sectors
- Reporting of LPS

# Reporting of gridded emissions - modellers needs

- **Finer spatial resolution** of emission data
  - ▣ If EMEP stereographic projection than 10x10 km (20 x 20 km)
  - ▣ Longitude/Latitude projection would be more appropriate to connect modelling at global and regional scales (0.2 x 0.2 degree )
- **Source categories** no more than 2 or 4 additional categories to SNAP11
  - limits - emission characteristics for new categories (seasonality, height distribution, VOC speciation, etc.)
  - ▣ include specific sector associated with shipping emissions
- 13 pollutants x 15 sectors x 10 y = 1950 data sets

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- **Source categories** no more than 2 or 4 additional categories to SNAP 11
  - limits - emission characteristics for new categories (seasonality, height distribution, VOC speciation, etc.)
  - ▣ include specific sector associated with shipping emissions
  - ▣ separate aviation from off road transport

# Main topics 2011

- Compilation and review of data submitted by Parties
- Compilation of data sets for modelers
- Develop new gridding system (finer resolution, 15(?) sectors)
- 13 pollutants x 21 sectors x 10 y = **2730 data sets**

7 pollutants x 15 sectors x 10 y = 1050 data sets