Emission data review 2007
Inventory improvements and reporting

Vigdis Vestreng, EMEP/MSC-W

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Outline

• Introduction
• Feedback from 2007 review
• Major findings
• Statistics
• Gridded data
• Conclusions and further work

www.emep.int
webdab.emep.int
Party feedback to 2007 review

- Errors in x-pollutant and timeliness
  SORRY!
- Parties find the country specific review reports useful. However time (and resources) have come to make some changes
- IEFs: Strenghthened IEF tests should replace current IEF and x-pollutant tests. Use LRTAP Activity data consistent with emissions. Source of AD important.
- Time series: Are highly non-linear, hence anomalous with linear regression methods. Improvements needed for this important test to be more significant.
- Comparisons: Refine “East-West” reports and thresholds. Show only differences that are not explainable by differences in GLs (fuel, aviation/navigation) and deadlines
- Other: Insitu visits
- Guidebook: EFs lacking; Hg from the transport subsectors, PMs from agriculture
MSC-W feedback

• Non really substantial errors were detected in 2007
• "Outliers" could readily be explained
• Review tests need to be upgraded to reflect the maturity level of (most) inventories (Ref. Dick Derwent) and to continue to be helpful in inventory improvement
• Review replies are useful to highlight differences in inventoring praxis between countries and years (e.g. extrapolation for "not important", years yield lower accuracy)
• Review results are difficult to use for data compilers and scientific work and could be more valuable also for inventory improvement
Example of progress: IEF “outliers” EU-27

The chart shows the number of outliers for each EU country from 2006 to 2007 (LRTAP). The countries are represented along the x-axis, and the number of outliers is shown on the y-axis.
PROPOSALS

• Initiate a flagging system for emission and activity data
• Make the explained “outliers” readily available to different users along with the officially reported data
• Review tests also aiming at quantifying the uncertainty in sectors and inventories
Major findings - EECCA countries

• Lack of reporting
• Low data quality
• Reporting obligation for Parties to the Convention
• Many Parties report according to Protocols only
• Await reply from WGSR
Data quality - EECCA

- Underestimation: 30%
- Inconsistency: Road transport & Agriculture
- PM data: Preliminary character; Incomplete and lack of size distribution

RU: Contradicting example
Major findings - Completeness I

- Large difference in completeness in 1980s and 1990s

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Time series xx-2005</th>
<th>% of total (26/16/6 yrs)</th>
<th>Max-Min % (1 year)</th>
<th>Base year %</th>
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<tbody>
<tr>
<td>SO2</td>
<td>1980</td>
<td>54</td>
<td>22-80</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>72</td>
<td></td>
<td></td>
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<tr>
<td>NO2</td>
<td>1980</td>
<td>53</td>
<td>18-80</td>
<td>69</td>
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<td></td>
<td>1990</td>
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<tr>
<td>NMVOC</td>
<td>1980</td>
<td>43</td>
<td>8-69</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>62</td>
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<td></td>
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<tr>
<td>NH3</td>
<td>1980</td>
<td>43</td>
<td>12-69</td>
<td>59</td>
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<td></td>
<td>1990</td>
<td>61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>1980</td>
<td>50</td>
<td>16-78</td>
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<td></td>
<td>1990</td>
<td>35</td>
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<tr>
<td>PM2.5</td>
<td>2000</td>
<td>51</td>
<td>43-59</td>
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</tr>
<tr>
<td></td>
<td>1990</td>
<td>34</td>
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</table>

- Time series XX-2005; ~20% difference
Major findings - Completeness II

• After the review of the 1990-2005

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Time series xx-2005</th>
<th>BEFORE review</th>
<th>AFTER review</th>
<th>Change (%)</th>
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<tr>
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<td>2000</td>
<td>51</td>
<td>44</td>
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</table>

Maximum completeness of the EMEP inventory is still only 60%
Major findings - Completeness III

- Consequences
  - Policy
  - Compliance
  - Research
Ways of assessing uncertainty

- **Bottom up tier 1 and Monte Carlo tier 2 (IIRs)**

- **Comparison with (independant) estimates**

**RAINS: 30% difference in ECCA**

- **Recalculations**

<table>
<thead>
<tr>
<th>Country/Pollutant</th>
<th>SOx</th>
<th>NOx</th>
<th>NMVOC</th>
<th>NH3</th>
<th>CO</th>
<th>Estimation Technique</th>
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<td>22</td>
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<td>IPCC(2000), Tier 2 Monte Carlo</td>
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<td>23</td>
<td>34</td>
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<td>IPCC(2000), Tier 1</td>
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<td>17</td>
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<td>IPCC(2000), Tier 2 Monte Carlo</td>
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<tr>
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<td>18</td>
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<td>10</td>
<td>20</td>
<td>20</td>
<td>IPCC(2000), Tier 2 Monte Carlo</td>
</tr>
</tbody>
</table>
Major findings - Uncertainty

All recalculations

Significant recalculations

The size range of recalculations by pollutant (%) (/20 and /200 indicate division by 20 and 200 respectively for purposes of axis scaling).
Statistics - Timeliness

Before deadline 15. February

55%
Statistics - Transparency

CHALLENGE:
Better utilization of all the information

- Timeliness increase
- Transparency decrease

IIRs vary in:
Length, structure and content
US (2007): 2 Pages
GB (2005): 431 Pages

IIRs 2007
AT
BG
BY
CY
CZ
DK
ES
FI
FR
HU
LT
LV
MC
NL (2004 data)
NO
PT
PL
RO
SE
SI
SK
US

In addition
BE (2006)
EC (2006)
GB (2005)
MD (2005)
Serbia and Montenegro (2006)
Total: 26 (50%)
Gridded data

- Improved quantity and quality
- Preliminary tests on:
  - Format
  - Internal consistency
  - Boundaries
  - Completeness
  - \( \text{PMcoarse} = \text{PM10-PM2.5} \geq 0 \)
  - Cross-pollutant
  - LPS consistent with GL definition
- Encountered problems related to all these simple tests
- Substantial bi-lateral activity (94%)
- Only 32% of EMEP area is covered by official data

Develop and implement standardized tests according to new GL in due time for 2012 5-yearly reporting.

Parties requested to report 1990, 95, 2000, 05, 10 in the new sectors
Conclusions and further work I

- Country specific review reports are appreciated and should continue but changes are needed.
- Large volumes of data and additional information is submitted. More resources must be spent to digest and disseminate the essence.
- Reporting obligations should be clarified by WGSR.
- More attention to the less mature inventories to improve completeness.
- The completeness and quality of emission data for the 1980s should receive more attention.
- TFEIP focus and Guidebook improvements helps to increase completeness and accuracy.
- 40% of the EMEP inventory, and 70% of the EMEP area is covered by non-official estimates.
Conclusions and further work II

- The very high number of inventory submissions, together with the large amount of additional data (IIRs and replies) calls for increased efforts from EMEP/TFEIP to digest and share available information.
- Most inventories are now at a level where tests (including gridded data) need to be strengthened to be really helpful in inventory improvement work.
- The tests should better pinpoint and quantify problems in the inventories.
- Development of a databank to keep easy track of already explained “outliers” and quality flagging of emissions and activity data should be available to serve users of the EMEP data.
- Quality of the non-official data (both sector data and gridded data) should be assessed.
Bye, bye!
Question/comments to my conclusions?

Why don’t you report emission data?

Why don’t you take actively part in the review?