

## ***Interactive comment on “Introduction to the European Monitoring and Evaluation Programme (EMEP) and observed atmospheric composition change during 1972–2009” by K. Tørseth et al.***

**Anonymous Referee #1**

Received and published: 24 February 2012

General comments: This paper reviews the development of EMEP (the European Monitoring and Evaluation Programme) and presents some summaries of long-term trends, covering not only precipitation composition, but also particulate matter, ozone and precursors, heavy metals and persistent organic pollutants. The paper is well organised, and is clear to read. The breadth of coverage necessarily has to be at the expense of depth, and the analysis of the different measured components varies across components. Although the long-term trends identified by the monitoring network are described, there was not a comprehensive comparison with other long-term European datasets, or with previously published analyses of European trends. This is perhaps the role of the other papers in this special issue, but it would have been useful to high-

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light (perhaps in a Table) previous publications that have used EMEP data to explore long-term trends. As an introductory overview, the paper does a good job of alerting the community to the data that are available – but it would have been helpful in the abstract, as well as the text, to have been given details of how a prospective user of the data could access both the data themselves, but also the metadata that describe which parameters are available at which sites and over what time period. The abstract could also usefully summarise the key conclusions, e.g. that sulphate is still the dominant ion in PM.

Specific comments:

p.1746 l.25: the figure of 15% is misleading without a better description of “Europe”. Data from the website cited for 2009 show SO<sub>x</sub> emissions from ‘sea’ areas as 34% of EU27 land-based emissions. Presumably the 15% refers to the whole EMEP domain in Europe.

p.1747 l.25: there is very little description of siting criteria for EMEP sites, and this could have been discussed earlier, as part of the development of the network from monitoring ‘industrial’ emissions linked to fossil fuel combustion, to a wider suite of measurements.

p.1751 l.5: the term “AirBase” is not defined. See comment above about making data available to readers.

p.1755 l.22: this statement is important and should appear in the abstract

p.1763: reference could usefully be made to the recent paper by Wilson et al., Atmos. Chem. Phys. 12(1): 437-454 (2012)

Table A1 only contains site names and locations for the long-term studies. Other sites appear in some of the figures

Figure 13: there are 13 sites shown in Fig 11 but only 10 shown here – why?

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Figure 13 & 16: refer to Table A1 for site identification.

Technical corrections:

Abstract – line 2: early 1970s...which allows the evaluation of regional...

Line 12 (and elsewhere): 1990s

p.1736 l.18: "estimate cost efficient measures" is not clear – please reword whole sentence

l.20: ...human health...

p.1739 l.27: ...resolution are becoming available...

p.1740 l.21 ...in this study are given...

p.1741 l.3: the Mann-Kendall test is usually applied when data are NOT normally distributed

l.12: Sen's slope for first and last year...this is not clear, as the Sen's slope method should use all (pairs of) years from first to last. Please reword.

l.16: should this read "1980-1990"? also in following line the sense (dates) is not clear – cf. Figure 3.

p.1742: should read "3 Major inorganic ions in precipitation" to distinguish from PM

p.1744 l.26: reword "quite variable in numbers" to express more clearly what is meant

p.1747 l.20: the trend in emissions is not influenced by changes in the monitoring network, although the reason for the discrepancy between emissions and measurements may be – reword.

p.1766 l.21: Harmens (OK in reference list)

p.1767 l.15: ...efficient removal installations... Or 'scrubbing' installations.

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p.1772 l.9: Figure 23d was not present in my copy

p.1774 l.10: a bit pedantic, but 'meteorology' is the study of weather, and 'weather' would have been a better term to use.

Table 3: last column should show – sign for all rows

Table 4: Sen's.....

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 1733, 2012.

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