Status regarding the EMEP measurement program incl work on PM with MSC-W

CCC: Wenche Aas, Kjetil Tørseth Karl Espen Yttri, Stephen Platt
MSC-W: Svetlana Tsyro, David Simpson, Hilde Fagerli
External: Maria Cruz Minguillón, Jean-Philippe Putaud, Fabrizia Cavalli, Laurent Poulain, Patrick Schlag, Liine M. Heikkinen, Erik Swietlicki, Johan Martinsson, Milan Vana, Adeala Holubova Smejkalova, Giorgos Kouvarakis, Nikos Mihalopoulos
Outline

- This year reporting
  - PM episodes in Europe in 2015
  - High time resolution measurements
    - ACSM
    - Black carbon from fossil fuel and wood burning
      - Feasibility study prior to the intensive measurement period winter 2017/2018

- Compliance with the monitoring strategy
- Data quality, reporting and database issues
- Future work
Status and technical reports

Status 1-3

Data reports 1-4

+lab inter.cal results on web
PM episodes 2015

- large-scale PM episodes in Febr., March, Nov. (W, C., SE Europe)
- Variety of sources (wood burning, traffic, agriculture). Local and LRT
- WHO AQG exceeded at about half the sites
- The model agree quite well with the observations (better for PM$_{10}$ than for PM$_{2.5}$)
High time resolution measurements of chemical composition of fine aerosol (ACSM)

- Geographical and seasonal differences in aerosol diurnal profiles.
- Spanish site with special features
- EMEP model underestimate Org. and overestimate the night-time levels of NO₃
Equivalent Black Carbon (EBC) from fossil fuel (FF) and biomass burning sources (BB) (i)

Feasibility study prior to EMEP/ACTRIS intensive campaign des 2017 – march 2018
Equivalent Black Carbon (EBC) from fossil fuel (FF) and biomass burning sources (BB) (ii)

Validation of multi-wavelength PMF approach using data from levoglucosan –proxy for BB (Vavili 2015)
Equivalent Black Carbon (EBC) from fossil fuel (FF) and biomass burning (BB) sources (ii)

Comparing with EMEP model

Daily mean at SE11

Diurnal at CZ03

NILU
EMEP/ACTRIS intensive measurement period. Des 2017 – March 2018

- Currently **34 sites**, whereof 6 urban background. Not all confirmed. **17 Parties**.
- A wish to get more sites in East Europe involved – more influence by coal burning.
- Coordination to be discussed at the COST Action meeting COLOSSAL and ACTRIS meetings in October.
- Core activity: Multi-wavelength Aethalometer (EBC) and off line EC/OC + levoglucosan.
- Additional measurements at some sites
Implementation of monitoring strategy, level 1

Main components

Particulate matter

Ozone

Implementation index (2000-2015)
Implementation of monitoring strategy, level 2

- **Particulate matter**
- **Oxidant precursors**
- **Trace gases**
- **Heavy metals**
- **POPs**
Summary monitoring strategy

Level 1
• 31 Parties and 158 sites in total report
• Less than one third of the EMEP Parties have an implementation index exceeding 50%.
• 42% of Parties have improved since 2010 while 28% have less monitoring presently than in 2010.

Level 2
• 56 sites reported at least one of the required EMEP level 2 parameters; however only 9 of these sites with complete aerosol program and even less the required oxidant measurements.
Data quality

- Workshop in Oct. 2017
  - Revised of DQO
  - Discussed common problems
  - Include metadata for reporting DQ info together with the observations data

- EMEP manual will not be updated in the future. SOPs and reference methods will be found at: http://ebas-submit.nilu.no/Standard-Operating-Procedures

- VOC. Much work last year in the frame of ACTRIS and WMO/GAW

- Two new projects in the European Metrology Programme (EURAMET/EMPIR) where CCC is involved
  - Improvements in data quality and traceability for Aerosol (AEROMET) and NO2 (MetNO2) measurements.
Data reporting

✔ Streamlined data reporting portal at EBAS

(http://ebas-submit.nilu.no)

✔ Data to be submitted using the format checking tool:

http://ebas-submit-tool.nilu.no

» more than 700 users the last year

» this has improved the correctness of the data files significantly
Future work

- Assess and improve **data quality** (especially VOC, Hg)
- Improve and fasten the data reporting **production line**
- Further develop **data products** from the database web-interface (maps, statistics etc)
- Update of the **Monitoring strategy**
- Deposition (data model fusion products)
- Intensive measurement periods
  - Equivalent Black Carbon (EBC) from fossil fuel (FF) and biomass burning sources (BB)
  - Passive sampling for mercury?
EMEP monitoring strategy
2020 -> onwards

• Kjetil Tørseth
• EMEP-CCC

• EMEP SB, Geneva, Sept 2017
The EMEP monitoring strategy
Background document with justificiation and recommendation of the EMEP monitoring programme 2010–2019

EMEP MONITORING STRATEGY
AND MEASUREMENT PROGRAMME 2004-2009

As amended and adopted by the EMEP Steering Body at its twenty-eighth session

Introduction
1. Monitoring of atmospheric concentrations and deposition is one of the basic elements to achieve the objectives of EMEP. The Convention identifies a number of issues where close cooperation of its Parties is important to achieve its goals. These include requirements with respect to instrumentation and other techniques for monitoring ambient concentrations of air pollutants, the need to exchange meteorological and physical-chemical data relating to the processes during transmission, the need to use comparable or standardized procedures for monitoring whenever possible and the establishment of monitoring stations.

2. The EMEP Steering Body at its twenty-sixth session in 2002 requested the EMEP centres to further elaborate, in close collaboration with national experts, the EMEP monitoring strategy, which would be the basis for the measurement programme of EMEP in the coming years (2004-2009).

3. At its twenty-seventh session, in 2003, the EMEP Steering Body discussed a proposal for a revised monitoring strategy (EB AIR/GE.1/2003/Add.1). The Steering Body welcomed the strategy, acknowledged that it covered all the major issues and approved the proposed level approach. However, some Parties expressed concerns about the costs associated with implementing it. The Steering Body took note of the draft monitoring strategy and stressed that it would be an excellent basis for further discussion and requested the Task Force on Measurements and Modelling to consider the issues raised, propose revisions to the draft strategy accordingly, and report back to it at its twenty-eighth session.

UNITED NATIONS

Economic and Social Council

ECONOMIC COMMISSION FOR EUROPE

EXECUTIVE BODY FOR THE CONVENTION ON LONG-RANGE TRANSBORDIARY AIR POLLUTION

Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)

Thirty-third session
Geneva, 5–9 September 2009
Item 8(a) of the provisional agenda

PROGRESS IN ACTIVITIES IN 2008 AND FUTURE WORK

MEASUREMENTS AND MODELLING (ACIDIFICATION, EUTROPHICATION, PHOTO-OXIDANTS, HEAVY METALS, PARTICULATE MATTER AND PERSISTENT ORGANIC POLLUTANTS)

DRAFT REVISED MONITORING STRATEGY

Prepared by the Chemical Coordinating Centre in consultation with the Bureau of the Steering Body

1. This document presents the draft monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) for 2010–2019 as revised by the Chemical Coordinating Centre (CCC) in consultation with the Bureau of the EMEP Steering Body and in consultation with the Bureau of the EMEP Steering Body at its thirty-third session in 2006 (EC/EUB/AB/GE.1/2008/2, para. 35 (a)).

GE.09-22544
The revision needs to consider a numbers of issues (not limited to...)

- Needs, gaps, limitations
  Nitrogen and sulphur cycle
  PM sources and properties
  SLCPs, NOx/VOC/ozone
  HMs
  POPs
  Tracers, CO, CH4,

- Emerging needs

- Implementation
Taking into account

• “New” tools/approaches/opportunities
• Spatial issues, temporal resolution, timeliness
• Climate/AQ links
• QAQC issues
• Other legislation and monitoring data needs
• Capacity building
Timeline for revision process

• Bureaux 2017-> TFMM2017-> SB2017 -> work plan 2018-2019

• TFMM spring 2018
  • «scoping CCC»
  • establish Working Group,

• Workshop fall 2018

• draft spring 2019 (discussion/approval Bureaux + TFMM),

• Finalization June 2019, discussions SB2019 -> approval by EB2019
EMEP observations for Copernicus

- Kjetil Tørseth
- EMEP-CCC
- EMEP SB, Geneva, Sept 2017
Invitation from Copernicus

Access to EMEP data is requested, budget to support efforts of 400k€ in total over 4 years

Similar contracts with ACTRIS, WMO-GAW, ICOS, EEA, +++

Service for everyone, not exclusive to CAMS!

Validated and «real real time» data of interest (~Near real time...)
15. The monitoring strategy of EMEP is to use progress in scientific understanding represented by new methods for the conduct of monitoring, new technologies and techniques to integrate observations from measurement platforms (e.g. in situ, profiles, remote sensing) and methods for integrating observational data with modelling efforts through, for example, data assimilation. EMEP will, where relevant and appropriate, introduce monitoring of parameters at a timeliness allowing more rapid access to data on the air pollution situation across the EMEP domain. EMEP will in collaboration with the European Environment Agency contribute to the provision of near-real time data for Global Monitoring for the Environment and Security (GMES) in agreement with the Parties. Such efforts will be based on voluntary contributions from Parties and will follow the guidance of the EMEP Steering Body.
Latest Near-Real-Time Data

This service has been funded or supported by the Norwegian Institute for Air Research (NILU), the EU research infrastructure ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure), the European Monitoring and Evaluation Programme (EMEP), and the WMO Global Atmosphere Watch (GAW) programme.
What’s in it for….?

CLRTAP/EMEP politically
Copernicus (GMES) is high on the political agenda
Major developments ongoing relevant for EMEP, wants to make use of existing observations
Mutual interest through collaboration

EMEP centres
• Secures that tools and data arrangements are utilized
• Allow further development
• More active engagement with providers
• Opens for more immediate production of model results

External data users/society
• EMEP information as open and rapidly available as possible
• Innovations, New services/developments can be established
• Outreach, education, media, population, health, aviation…

Data providers
• Demonstrates use of data/importance of EMEP (helpful for funding)
• Offers easy access to EMEP data nationally and internationally:
  • QAQC, more use, earlier detection of errors etc
  • Basis for interpretation
  • Advice to stakeholders when episodes occur
  • Scientific collaboration
• Increase discovery and use of data
• Evolve monitoring strategy
• Improved data reporting routines

-> Improved visibility of EMEP monitoring
Way forward:

Finalize contract issues
Voluntary participation, invitation fall 2017
No QA or calibration

1. Templates and tools finalized, support will be offered

2. Country by country implementation after prioritization
   – Site level
   – National AQM-efforts
   – Comprehensive sites – geographical gaps – easy wins – quick implementation

3. Operational phase
   – Monitoring and trouble fixing
   – Support to CAMS and external user
   – Workshop, on use and improvements