

# Workshop on the Development of a Community Historical Emission Inventory



ACCENT-*Plus* Deliverable 2.5

**Summary**  
**Workshop on the Development of a Community Historical Emission Inventory**

20-21 November 2013  
Hamburg, Germany

In recent multi-model comparison efforts that simulate the past, current and future composition of the global atmosphere, including the IGAC-SPARC Atmospheric Chemistry and Climate Model Intercomparison Project (ACCMIP) and the Chemistry-Climate Model Initiative (CCMI) project, the models' ability to reproduce observed trends depends strongly on the specific surface emissions used. More such modeling exercises are planned during the coming years, either to forecast atmospheric composition at the regional and global scale or to quantify changes in atmospheric composition during past decades.

To support these modeling efforts, the global emissions community, led by IGAC's Global Emissions Initiative (GEIA), has launched a new initiative to develop a comprehensive community historical inventory for the 1750-2015 period. The inventory will provide annual and sectoral anthropogenic and biomass burning emissions for ozone precursors, aerosols and their precursors, greenhouse gases and halogenated compounds. The emissions will be provided at a spatial resolution of 0.1-0.5°.

A workshop was held in November 2013 in Hamburg, Germany, to define the process to develop this new dataset. The workshop was organized and sponsored by the ACCENT-Plus FP7 European project, as well as by IGAC and the European FP7 projects MACC (Monitoring Atmospheric Composition and Climate) and PEGASOS (Pan-European Gas-AeroSOls-climate interaction Study). 35 scientists from Europe, North America, Africa and Asia participated in the workshop.

The presentations given at the meeting, together with the conclusions are available from the GEIA website, at <http://www.geiacenter.org/analysis/working-groups/historic-emissions-working-group> (password protected).

The most recent anthropogenic inventories developed in Europe, the USA, the Middle East, Africa and Asia were discussed, with specific focus on different emission sectors, i.e., transportation, industrial activities, shipping, and agriculture. The possibility of updating emissions to the most recent years using inverse modeling techniques was also discussed.

The workshop covered advancements in determining recent biomass burning emissions information from satellite observations, such as active fires, burned areas or fire

radiative power. Long-term historical time series of fire emissions simulated by dynamical vegetation models were also considered.

Emissions data still have large uncertainties, so the participants suggested developing a reference inventory together with well-documented alternative datasets that could be used for sensitivity studies at both the global scale and in different regions. This approach could provide a measure of the uncertainty on the reference inventory.

It is expected that the GEIA emissions community will be entrained in this initiative, in particular through participation in working groups which are currently being formed to work on priority issues identified during the meeting, including:

- Extension of the dataset to the most recent years using available regional data and inverse modeling;
- Consistency of CO<sub>2</sub> emissions with those of other compounds;
- Speciation of VOCs and PM;
- Emissions from agriculture;
- Evaluations of fire emissions, land-use data, and emission factors;
- Emissions related to shipping;
- Emissions from flaring and oil and natural gas extraction;
- Seasonal variations in emissions;
- Data gridding issues and associated proxies;
- Uncertainties and propagation of uncertainty;
- On-line systems for calculating emissions;
- System for quick check/evaluation of emissions datasets;
- Documentation and metadata.

More information on the working groups and their activities will be available on the GEIA website as this information becomes available.