Task Force on Hemispheric Transport of Air Pollution

# Joint WMO/TF HTAP/GEO Workshop on Integrated Observations for Assessing Hemispheric Transport

Geneva, 24-26 January 2007


Task Force Co-Chairs

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U.S. EPA


**http://www.htap.org**

# Overview of Presentation

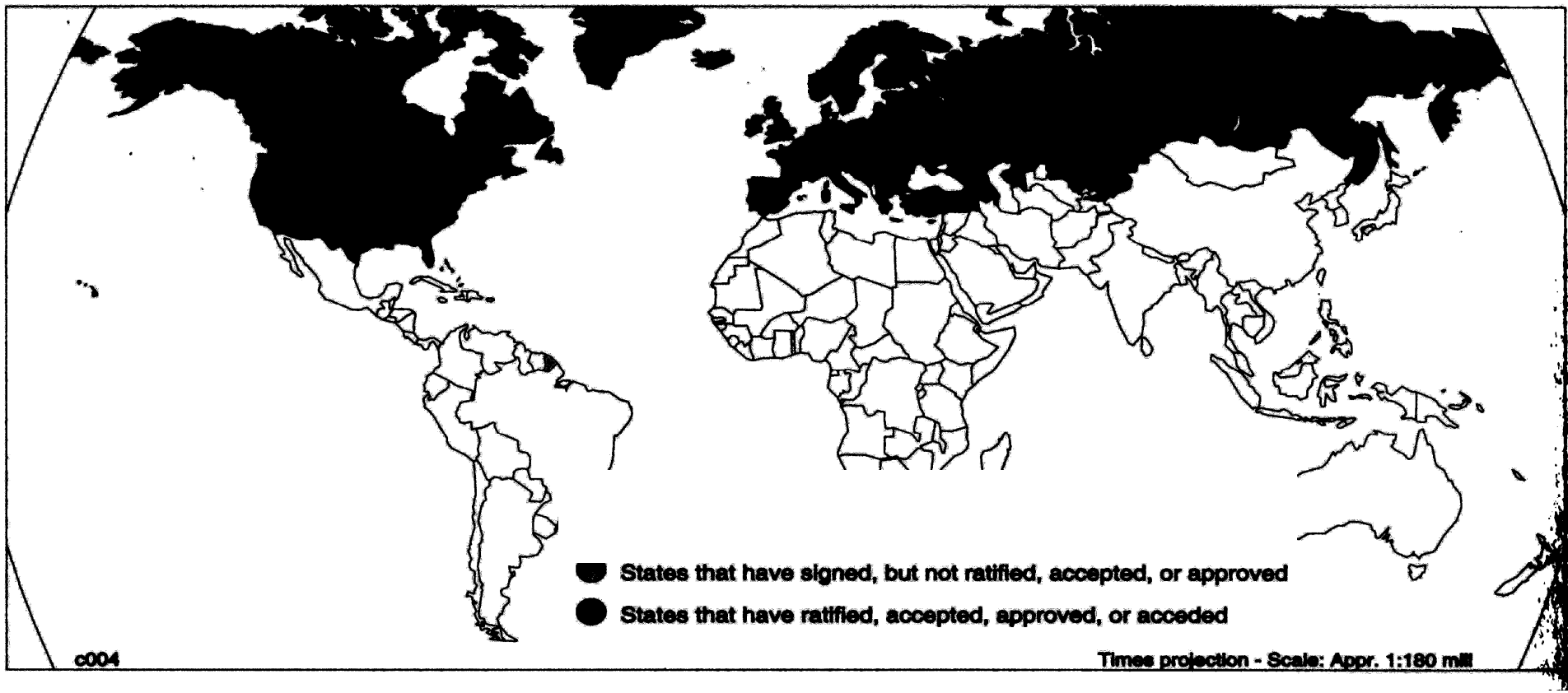
- Introduction to the LRTAP Convention & TF Hemispheric Transport of Air Pollution
- Overview of TF HTAP Assessment & Cooperative Research Activities
- Objectives and Structure of This Workshop

# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

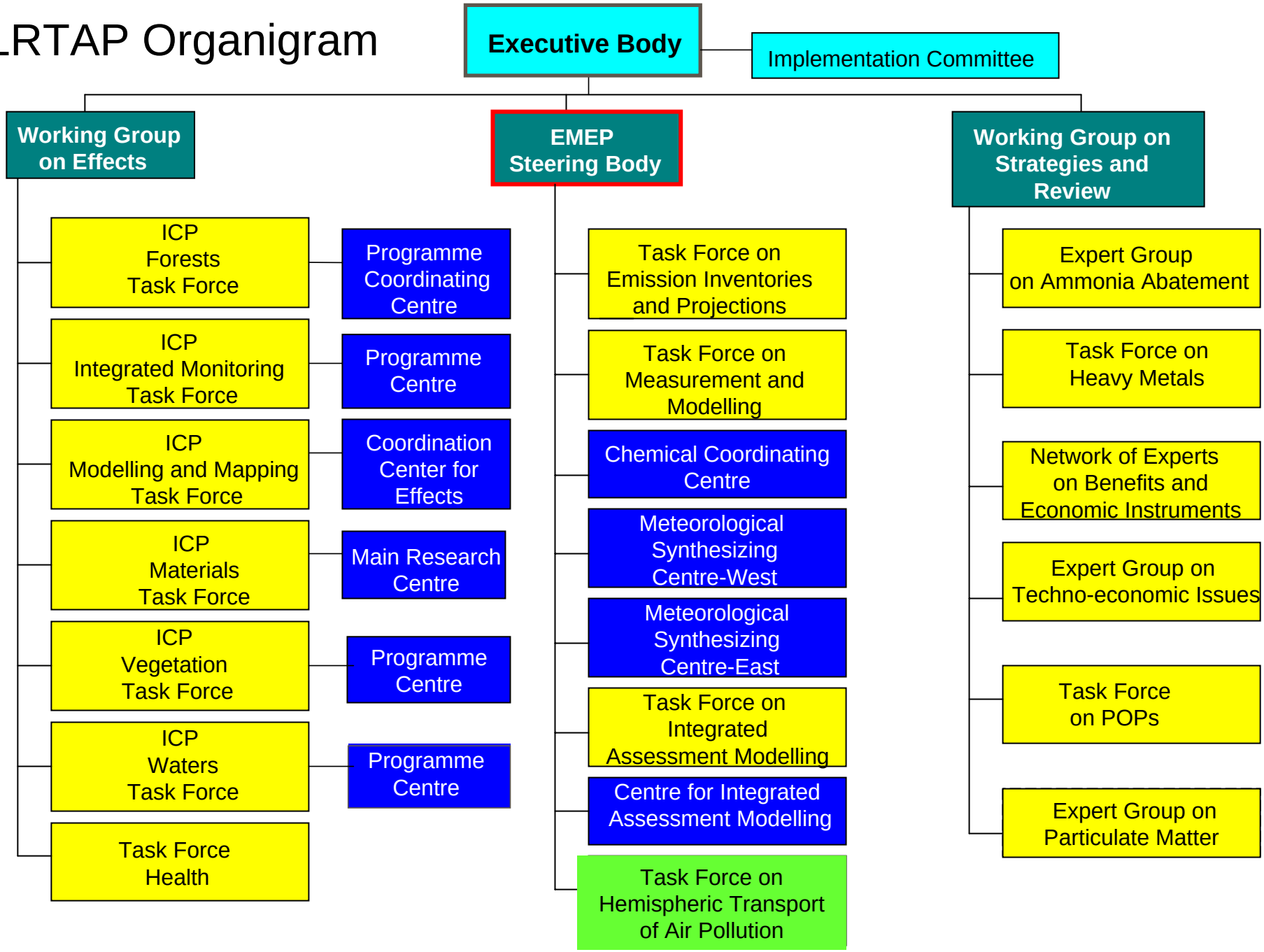
- Adopted in 1979, the first multi-lateral agreement on air pollution
- Created a framework on which has been built eight Protocols, all in force as of May 2005.
- The Protocols have aimed to increase ambition levels in a stepwise manner.
- Day to day activities supported by a Secretariat at the UN Economic Commission for Europe
- http://www.unece.org/env/lrtap/

# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

## 51 Parties in Europe, North America and Central Asia



# CLRTAP Organigram



# Task Force on Hemispheric Transport of Air Pollution

The Task Force is charged to "plan and conduct the technical work necessary to:

- develop a fuller understanding of the hemispheric transport of air pollution ...
- estimate the hemispheric transport of specific air pollutants for the use in reviews of protocols to the Convention
- prepare technical reviews thereon for submission to the Steering Body of EMEP"

The Task Force is encouraged to engage relevant experts from non-UNECE countries.

# Policy-Relevant Science Questions

1. How does hemispheric transport affect air pollution?
2. How much do emissions in one country or region affect air pollution in another country or region?
3. How confident are we of the results and what is our best estimate of the uncertainties?
4. How will changes in emissions in one country or region affect air pollution in another country or region?
5. How may the source-receptor relationships change over the next 20 to 50 years due to changes in emissions?
6. How may the source-receptor relationships change due to climate change?
7. What efforts are needed to develop an integrated system of observation data and models?

# A Path to a 2009 Assessment

| | | | **Focused Workshops** *Building Consensus* | **TF Meetings** *Reviewing Results, Planning* |
|---|---|---|---|---|
| 2005 | June | | | Science Questions, *Brussels* |
| 2006 | Jan | New Research | Modeling, *Washington* | |
| | June | & Report Writing | | Hg/POPs, $CH_4$, *Moscow* |
| | Oct | | Emissions, *Beijing* | |
| 2007 | Jan | | Integrated Observations, *Geneva* | |
| | May-June | | | Interim Report to Protocol Review, *London* |
| | Oct | | [Modeling, *Jülich*] | |
| 2008 | Jan | | ? | |
| | June | | | [Tropics, Climate] |
| | Oct | | ? | |
| 2009 | Jan | | ? | |
| | June | 1st Assessment Report | | ? |

# Model Intercomparison and Evaluation

- **4 Phases of Experiments**
  - Regional Emission Sensitivities
  - Artificial Tracers
  - Pollutant/Process Specific Experiments
  - Uncertainty Characterization
- **JRC Ispra coordinating data exchange**
  - http://aqm.jrc.it/HTAP/
  - Further development of JRC's EuroDelta Tool
  - Jülich FTP server
- **Standard naming convention for atmospheric chemistry**
  - Building upon existing NetCDF/CF convention
  - http://wiki.esipfed.org/index.php/Air_Quality/Chemistry_Naming_Conventions
- **Further face to face discussions**
  - Workshop, Geneva, 27 Jan 2007
  - Modeling Workshop, Jülich, Oct 2007

# TF HTAP Assessment Products

## 2009 Assessment Report

- State of knowledge concerning intercontinental transport of air pollutants in the Northern Hemisphere
- Covering all pollutants of interest under the LRTAP Convention
- Addressing identified policy-relevant science questions

## 2007 Interim Report

- Significance of intercontinental transport of air pollutants within the Northern Hemisphere for attaining the objectives of the 1999 Gothenburg Protocol

# The 2007 TF HTAP Interim Assessment Report

0. Executive Summary
1. Introduction
2. Conceptual Overview of Hemispheric or Intercontinental Transport Processes
3. Observational Evidence & Capabilities Related to Hemispheric or Intercontinental Transport
   a. Introduction
   b. Long range transport of ozone and its precursors
   c. Long range transport of particulate matter and its precursors
   d. Maximum concentrations seen at downwind receptor locations and implications for surface air quality in those regions.
   e. Observational evidence for attribution of source regions Can we track long-term trends in hemispheric transport from existing surface observations?
   f. Concluding Remarks
4. Emissions and Projections
5. Regional, Hemispheric & Global Modeling
6. Integration of Observations, Modeling, and Emissions
7. Activities of the Task Force
8. Conclusions and Recommendations

# The 2007 TF HTAP Interim Assessment Report

| | |
|---|---|
| June 2006 | Nominations for Lead Authors |
| October 2006 | Final List of Lead Authors |
| | Emissions Workshop (opportunity for some discussion) |
| November 2006 | Outline of Chapters submitted to WGSR |
| January 2007 | Observations Workshop (opportunity for some discussion) |
| March 2007 | Drafts of Chapters due to Co-Chairs |
| April 2007 | Full Draft circulated to TF |
| June 2007 | Full Draft discussed by TF |
| September 2007 | Full Draft submitted to EMEP SB and Exec Sum to WGSR |
| December 2007 | Full Draft and Exec Sum submitted to EB |

*This Workshop*

# Objectives

A. To take stock of the current state of observations relevant to:
   (i) TF HTAP's assessments,
   (ii) WMO weather, climate and environmental prediction applications and
   (iii) to the Societal Benefit Areas of GEOSS.

B. To determine the gaps in observations for priority air pollutants, gaps in data management, and make recommendations on how to fill those gaps taking into account ongoing efforts under regional networks, GAW, IGACO, and the development of the GEOSS.

C. To identify ways to produce a common data base of observations suitable for evaluation of models and inventories for priority air pollutants (e.g., O3, aerosols).

D. To recommend steps needed to create co-operative structures between regional observation networks and other sources of data.

E. To identify short-term and long-term efforts that will improve the information technology infrastructure for sharing relevant observational data and integrating observational data with modeling for purposes of evaluation and improved data assimilation for air quality forecasting.

F. To further encourage the participation of developing countries in long range air pollution observation systems

# Structure and Format

The workshop is organized into 3 sessions:

1. Observational evidence of intercontinental transport and hemispheric pollution
2. The use of integrated observations for evaluation of models and emission inventories
3. Improving the integration of observing systems and interoperability of observations and models

Conclusions and Recommendations

- Each session will conclude with a discussion of conclusions and recommendations.
- The conclusions will inform the TF HTAP assessment reports and future cooperative efforts.

# WCRP-SPARC/IGBP-IGAC
# Atmospheric Chemistry & Climate Initiative

*{sub-committees}*

- CCM-Val Strat.
- Trop. Chem.
- AEROCOM / Aerosols

## Projects

- 20 yr Hind-Cast
- Process Studies (5km-tropopause)
- Warm Cloud Processes
- Future Scenarios/Sensitivities

## Coordination Issues

Data Management

Emissions (Historical & Future)