



## **Task Force on Hemispheric Transport of Air Pollution**

# **TF HTAP and NASA Earth Science: An International Science/Policy Application**

Task Force Co-Chairs

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<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
- Some Needs and Opportunities

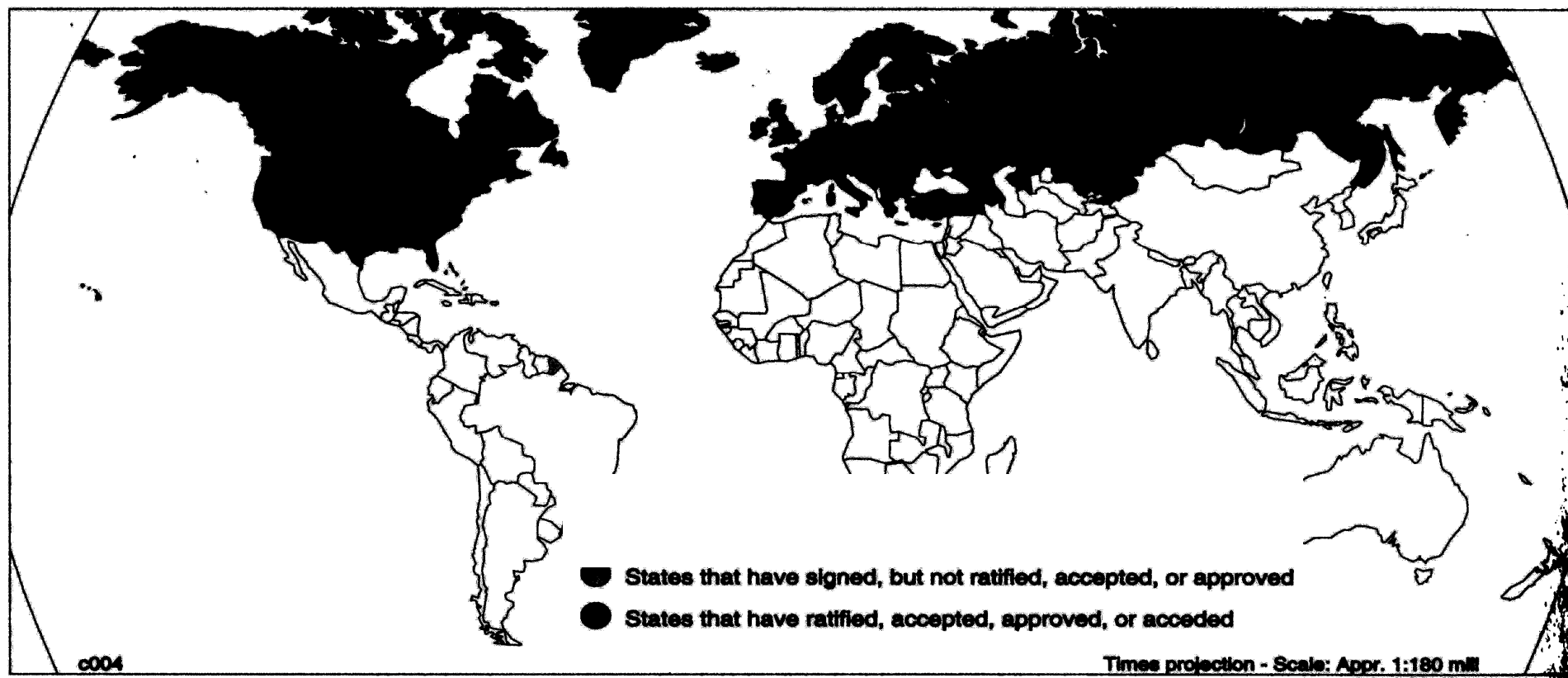
# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

- 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/>

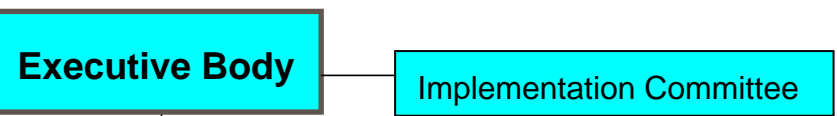


# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

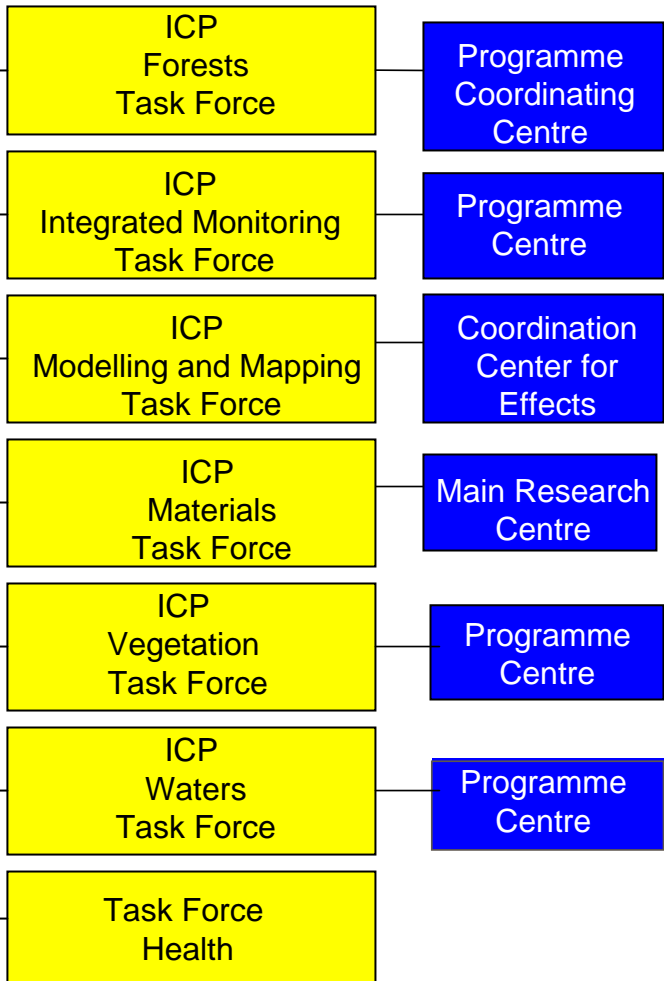
51 Parties in Europe, North America and Central Asia



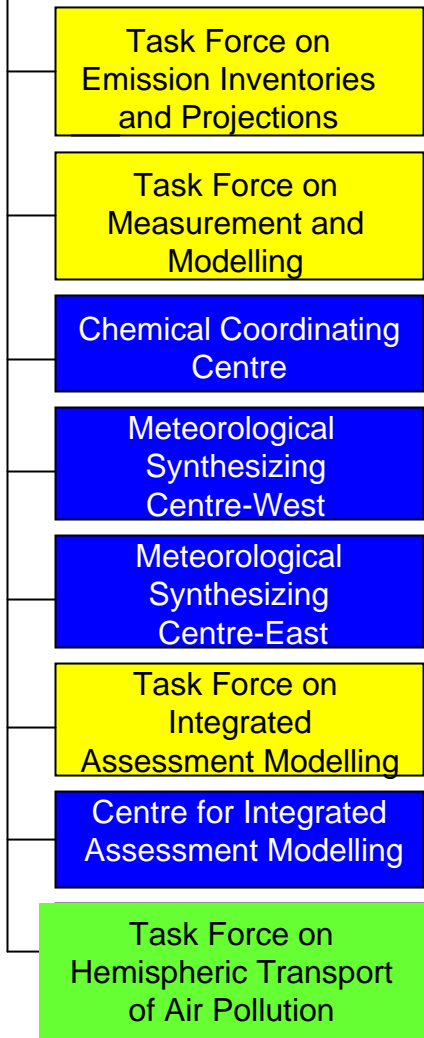
# CLRTAP Organigram



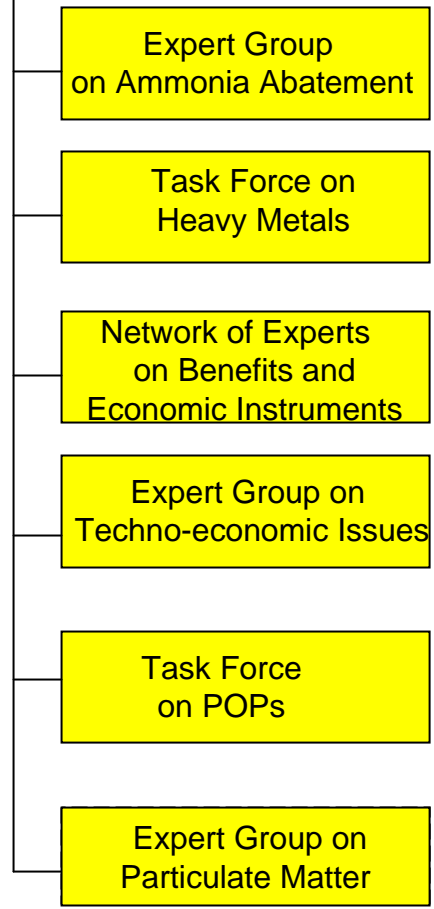
## Working Group on Effects



## EMEP Steering Body



## Working Group on Strategies and Review





## 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?

# Introduction to TF HTAP

## 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<sub>4</sub>, *Moscow*

Oct

Emissions, *Beijing*

2007 Jan

Integrated Observations,  
*Geneva*

May-  
June

Interim Report to Protocol  
Review, Climate, *Reading*

Oct

Modeling, *Jülich*

2008 Jan

[U.S.]

May

[POPs/Hg, *Rome*]

Oct

[Tropics, *Asia*]?

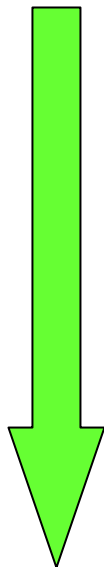
2009 Jan

?

June

1<sup>st</sup> Assessment Report

?





# 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
- **Comments accepted until 1 July 2007**

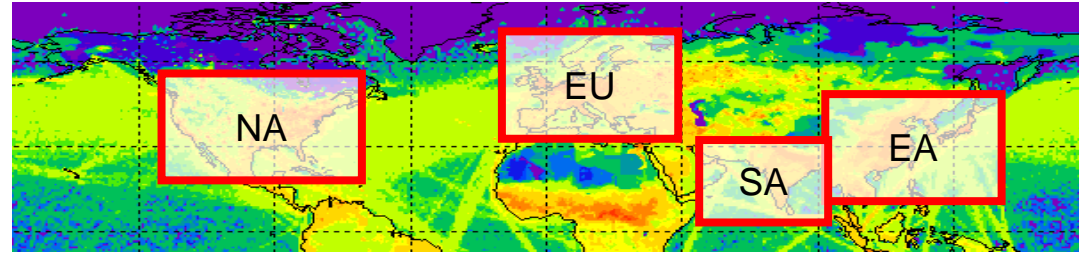
## **Advancing Our Understanding**

- **Model Intercomparison and Evaluation**
- **Emissions Inventories**
- **Integrated Observations**

# Model Intercomparison Experiment Set-Up



<http://aqm.jrc.it/HTAP/>



## APPROACH:

**Base simulation with 3-D models**

→ horizontal resolution of 4°x5° or finer

→ 2001 meteorology

→ each group's best estimate for emissions in 2001

→ methane set to a uniform value of 1760 ppb

## Model experiments

Set 1: source-receptor simulations

20% reduction of global methane, 20% emission reduction of NO<sub>x</sub>, CO, NMVOC or combined in 4 geographical regions

Set 2: transport and process studies

All models use common emissions and fixed global uniform lifetime. Pulse experiments, "transition to reality"

Set 3: detailed analysis of field campaigns

Specific runs for NASA GTE TRACE-P and ICARTT/INTEX field experiments

Set 4: final source-receptor studies

To be determined



# Experiment status

- ▶ 20 models participated in SR1
- ▶ 15 models ran SR2–SR6 scenarios
- ▶ 10 models ran TP1

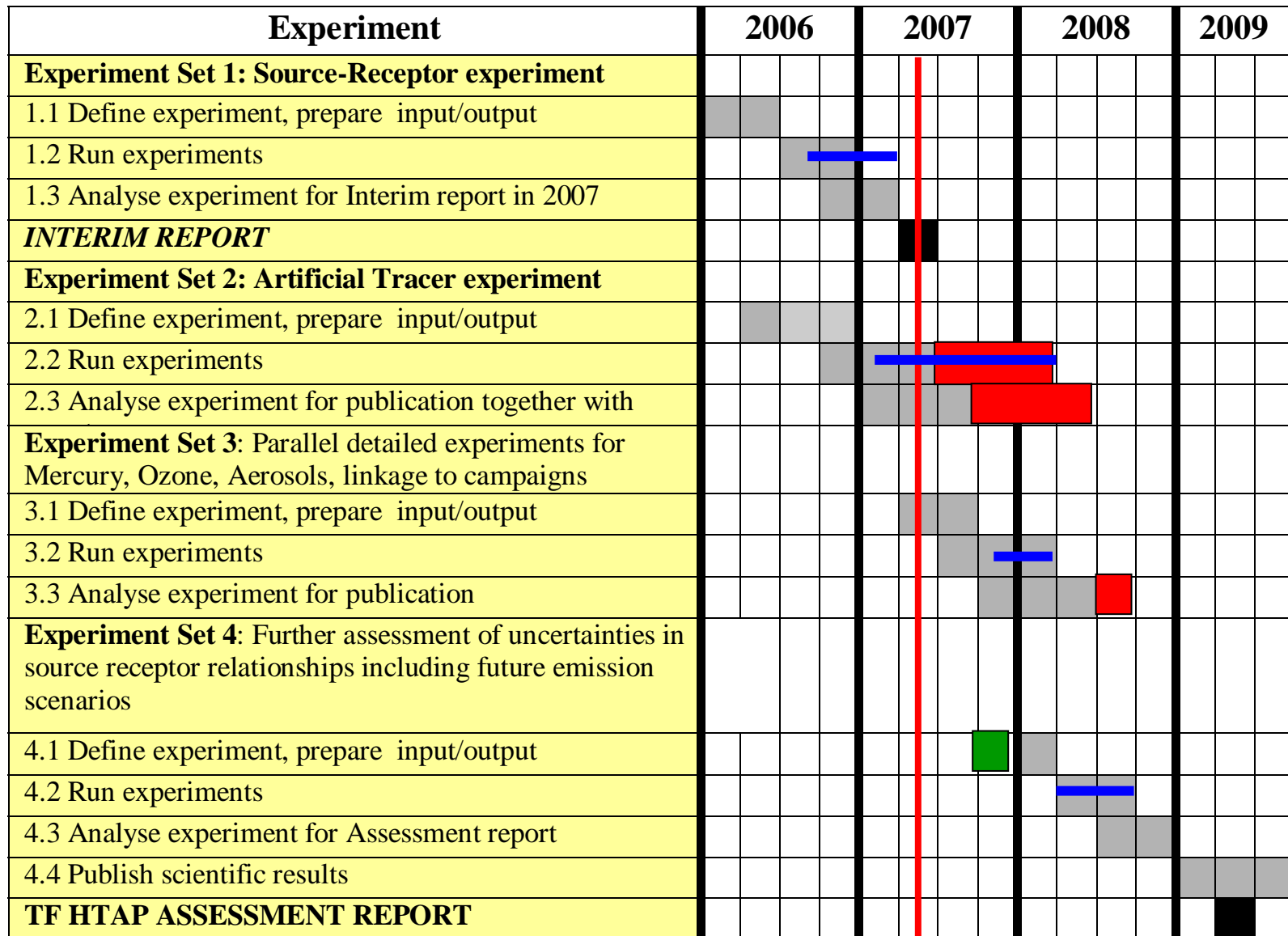
All model output stored on HTAP server in Jülich (htap.icg.kfa-juelich.de) – 27 accounts created

Output includes monthly mean fields and hourly surface data

Server disk space (1 TByte) filled to 65%

- ▶ SR series completed (but remains open as community benchmark and for 2009 assessment)
- ▶ TP1 almost completed – new efforts should be directed to TP1x
- ▶ TP2 and TP3 to be started by August 2007
- ▶ Discussion on Experiment and Analysis Design on <http://icg-ii-wikis.icg.fz-juelich.de/HTAPWiki/>

# Timeline 2006-2009 for coordinated model studies





## TFHTAP Workshop on Global and Regional Modelling for Assessing Hemispheric Air Pollution

Forschungszentrum Jülich  
Leo-Brandt-Str. 13  
Jülich, Germany  
17 – 19 October 2007

- **Discuss results**
- **Complete planning of remaining model experiments**

## **Emission Inventories**

- **Workshop, October 2006, Beijing**
- **Need to update global emissions inventories using national and sub-national data**
  - **EDGAR-HTAP, JRC Ispra**
- **Need to utilize satellite observations and other observations to evaluate inventories**
- **Need to develop future scenarios**
  - **with IPCC and IGAC/WCRP AC&C Projects**

## **Integrated Observations**

- **Workshop, January 2007, Geneva**
  - Joint with WMO and GEO Secretariat
- **Need to integrate observations from different platforms to understand observed trends**
- **Need to establish a reference multi-platform observational database for model evaluation**
  - **Surface Networks**
    - EC DG Environment Open Call
  - **Aircraft Campaigns**
    - Model Intercomparison Experiment Set 3
  - **Satellite Observations**



## *TF HTAP Needs and Opportunities*

### **Where can NASA Expertise be Applied?**

- **2007 and 2009 Assessment Reports**
- **Model Intercomparison Exercise**
- **Integration of Observations for**
  - **Trend Analysis**
  - **Model Evaluation**
  - **Emissions Estimation**
- **Information System Architecture**
  - **DAACs (Giovanni), DataFed (NEISGEI), EPA, NOAA**
  - **JRC, Juelich, GEMS, NILU, WMO, GEIA**

