

POSSIBLE WORKPROGRAMME OF MATCH

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The objective of the paper is to stimulate a discussion prior and at the November MATCH meeting. All issues mentioned here are up for discussion, no decisions have been made on the work plan so far.

1. TIMELINE

The SBSTA in May 2006 agreed that the scientific community should submit its final work on contributions to climate change by 30 October 2007. This basically leaves 1 year to complete the work with the following proposed schedule:

- **MATCH Meeting** in November 2006 to plan work
- **MATCH Meeting** in May 2007 to report progress
- **MATCH Meeting** in September 2007 to finalize work
- **MATCH Workshop** in September 2007 to present MATCH work to broader audience
- Submission of the **final report** to SBSTA in October 2007
- In-session **special side event** at SBSTA 27 (December 2007) to present the work to UNFCCC delegation
- Countries submit their views on the matter by 7 March 2008
- SBSTA agreed to complete the consideration of this agenda item once the scientific work is sufficiently completed, and indicated that it would like to be able to do this finally at SBSTA 28 (June 2008) or soon after.

This following list is long and it may be overambitious to attempt to finalize all issues by October 2007. We therefore have to be very selective, focused and realistic in our choice of topics.

2. POSSIBLE PAPER ON “CONTRIBUTIONS TO CLIMATE CHANGE” AS UPDATE OF PAPER #1

2.1 CONTENT / OUTLINE

The purpose of this paper is to present an update of paper #1. Paper #1 focussed on the effect of different scientific and methodological choices. Together with paper #2 we now have an overview, which of the choices have a large influence and which choices have a small influence. The new paper could give more numerical detail (i.e. per country and sector) for the most important choices. We would leave out the choices that do not make a large difference. The focus would therefore be on providing numerical estimates of the historical responsibility that can be used in the future. The approach is pragmatic and result-oriented as opposed to comprehensive and all encompassing. [Comment: This is a suggestion and can be discussed at the meeting.]

Step 1:

Prepare one emission dataset for countries

- For (most important) individual countries
- For CO₂, CH₄, N₂O, (F-gases)
- For the sectors
 - Energy industries and industrial processes
 - Transport (?)
 - Agriculture/Waste (non-CO₂)
 - LUCF
- From 1750 to 2004
- For each emission estimate (per gas, sector and country) a best estimate, an upper and lower bound (using simple assumptions about the uncertainty, e.g. +/- 10% for each year in the time series based on paper #2)

Such datasets (without uncertainty) already exist: The Java Climate Model (Ben Matthews) and Ecofys (Niklas Höhne) have developed datasets on individual countries, scaling back regional data to country level.

Step 2

[One model group] [Any interested model group] calculates relative and absolute contributions to climate change in all permutations of the following:

- Indicators (2)
 - Cumulative GWP weighted emissions
 - Temperature increase in 2004
- Start dates (3)
 - 1750
 - 1900
 - 1990
 - 2050 (?)
- Sectors and gases (2)
 - All sectors and gases excluding LUCF
 - All sectors and gases including LUCF
- Emissions (3)
 - Lower bound
 - Best estimate
 - Upper bound
- Sources (192+4)
 - All separate individual countries
 - All globally aggregated sectors

Step 3:

Compilation of data in one dataset, analyse it and present it in the paper.

2.2 RESPONSIBILITIES AND TIMELINE

Lead author: ...

Authors: ...

Task	Responsible	Deadline
1. Preparation of emission dataset	Niklas Höhne, ...	1. January 2007
2. Preparation of model	?	1. March 2007

runs		
3. Compilation of data	Niklas Höhne,...	1. April 2007
4. Writing of the paper		First draft May 2007 Final draft for submission September 2007

3. POSSIBLE PAPER ON HISTORICAL EMISSIONS AND UNCERTAINTIES FROM LAND USE CHANGE

3.1 CONTENT / OUTLINE

In preparing earlier papers we have learned that emissions from LUCF (historical and present) are particularly difficult to estimate. Several estimates are available and they do not necessarily correspond.

The purpose of this paper is compare all available estimates of historical and current emissions from LULUCF and derive an uncertainty range per country.

Possible sources:

- MATCH paper #1
- MATCH paper #2
- Work of Christiano comparing different datasets of LUCF emissions
- IPCC AR4
- ...

Step 1

Compilation of emission estimates from LUCF in one database

Step 2

Analysis and explanation of the differences

Step 3

Derive an indicative uncertainty range per country

Step 4

Writing of the paper

3.2 RESPONSIBILITIES AND TIMELINE

Lead author: ...

Authors: ...

Task	Responsible	Deadline
1. Compilation of emission estimates	...	1. January 2007
2. Analysis and explanation of differences	...	1. March 2007
3. Derive indicative uncertainty range	...	1. April 2007
4. Writing of the paper		First draft May 2007

4. POSSIBLE PAPER ON THE ETHICAL AND EQUITY ASPECTS OF HISTORICAL RESPONSIBILITY

4.1 CONTENT / OUTLINE

So far MATCH papers have only covered the quantitative aspects of historical responsibility and have not covered the interpretation of the results as in the light of equity.

Possible sources:

- White Paper on the Ethical Dimensions of Climate Change, <http://rockethics.psu.edu/climate/whitepaper-intro.htm>
- ...

A new paper could cover the following aspects:

1. Historical responsibility in general

A literature review on how historical responsibility, not only for climate change, is treated.

2. Historical responsibility on the climate negotiations

An overview of how historical responsibility has been treated in the climate negotiations (reference to agreed text of the Framework Convention and the Kyoto Protocol and related decisions)

3. Interpretation of the quantitative results

Several aspects are important to consider, when interpreting the results. The paper would describe these issues and provide recommendations, where possible, on possible interpretations. The issues include:

- *Non-linear climate system:* The climate system is not linear. For example for the saturation effect of CO₂ in the atmosphere, this means an emission today has less effect than the same amount of emissions 50 years ago. The current effect is due to earlier emissions of others. A decision to use a complex system with non-linearities and feedbacks or to use a simplified linear system is therefore not only a technical, but also a political question, which should be taken with care.
- *Technological development:* Technology develops and late emitters benefit from the technology development of early emitters. The contribution to climate change of countries that are developing later is likely to be lower than that of countries that have developed earlier. Even if a country that is today a 'developing country' will reach the same level economic development as a country that is today an 'industrialized country', the developing country's per-capita contribution to climate change will be lower than that of the industrialized country.
- *Long time scales and geographical borders:* Due to the long residence time of CO₂, time horizons in the order of 100 years are relevant for historical contributions. How can one treat the fact that geographical borders of countries change with time, including colonies?

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- *Imports and exports:* Many countries, in particular developing countries, produce emission intensive commodities that are then exported to couter countries. Currently emission inventories are based on the principle that emissions are accounted where they occur, so e.g. in the steel producing not in the steel consuming country.
 - *Size:* Historical responsibility could be displayed in many ways. Total contribution, related to (current or past) population or GDP. How can it be displayed in a meaningful way?

4. Conclusions

General lessons from the above.

4.2 RESPONSIBILITIES AND TIMELINE

Lead author: ...

Authors: ...

Task	Responsible	Deadline
1. Historical responsibility in general	...	1. January 2007
2. Historical responsibility on the climate negotiations	...	1. March 2007
3. Interpretation of the quantitative results	...	1. April 2007
4. Writing of the paper		First draft May 2007 Final draft for submission September 2007