



Background and outcome of the Expert Meeting on SLCF in May 2018 and possible future work on SLCF inventories

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INTERGOVERNMENTAL PANEL ON climate change



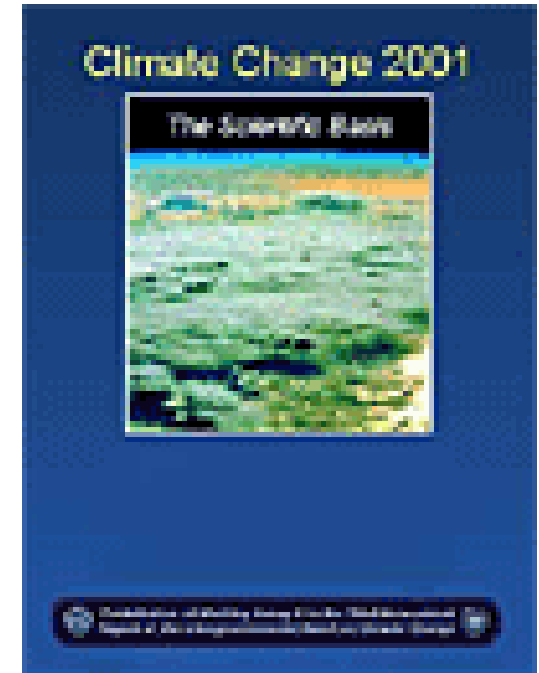
Outline

- Background
- Expert Meeting on SLCF
- Conclusions and recommendations
- Possible future work on SLCF inventories

Background

Background (1): Expert Meeting in 2005

- Recognizing the potentially significant influence of aerosols on climate change as identified in the **IPCC Third Assessment Report (TAR)** published in 2001, an IPCC Expert Meeting on Emission Estimation of Aerosols Relevant to Climate Change was held in May 2005.



Primary focus was on carbonaceous aerosols such as black carbon.

Background (2): Expert Meeting in 2005

- The expert meeting in 2005 concluded, among others:
 - Global inventories of emissions of aerosols relevant to climate change contained significant sources of uncertainty.
 - It was not yet possible to reliably produce internationally comparable national emission estimates and estimate real differences in emission characteristics between countries.
 - Work was needed to reduce some of the uncertainties.
 - Further similar meetings participated by WGI, TFI and other aerosol inventory experts should be held.

However, no follow-up expert meeting was held.

Background (3): IPCC Assessment Reports

- Understanding of aerosol radiative forcing advanced through AR4 (2007) and AR5 (2013).
- However, AR5 still concluded that aerosols contributed the largest uncertainty to the total radiative forcing estimate.
- AR6 production has started. WGI Contribution will be produced for approval/acceptance by the IPCC Plenary in 2021.



Background (4): Emerging Issue - SLCF

- Recently, the potential importance of reducing emissions of short-lived climate forcers (SLCF) such as methane, black carbon, and precursors of tropospheric ozone is recognized more and more.
 - to mitigate climate change;
 - to improve air quality; and therefore
 - to bring near-term co-benefits in terms of human health, agricultural yields and ecosystems.

Expert Meeting on SLCF

Expert Meeting on SLCF

- At the 45th Session in Guadalajara (March 2017), some member governments proposed on work of IPCC, among others:
 - development of robust inventory methodologies on estimation of SLCF emissions
- At the 46th Session in Montreal (September 2017), IPCC decided to hold an expert meeting on Short-lived Climate Forcers to discuss issues on estimation of emissions and climate effects. (Decision IPCC/XLVI-6)
- The meeting, organised jointly by TFI and WGI, took place on 28-31 May 2018 in Geneva, Switzerland.

Objectives of Expert Meeting

- To review existing methodological work to estimate emissions of SLCF with a view to considering suitability for the IPCC to develop methodological guidance;
- To consider which species of SLCF should be prioritized in the possible future work to develop inventory methodology, taking account of uncertainties in emission estimates and possible applicable common metrics as well as the extent to which it will contribute to inform decision making in mitigation policies and measures;
- To consider how the inventory methodology on SLCF would relate to the existing inventory methodology on greenhouse gases;

Objectives of Expert Meeting

- To identify gaps in scientific understanding on estimates of SLCF emissions that need to be filled in by scientific research community;
- To review existing methodological work to quantify the global radiative direct and indirect effects of SLCF, with a focus on new developments since the AR5;
- To identify gaps in scientific understanding on estimates of direct and indirect climate effects of SLCF on radiative forcing and climate response, including implications on clouds, that need to be filled in by scientific research community.

Substances discussed

- It should be noted that inventory methodologies on methane and HFC are already well covered by the 2006 IPCC Guidelines for National Greenhouse Gas Inventories produced by TFI as well as the on-going work by TFI to refine the 2006 IPCC Guidelines.
- Therefore, the substances of interest at this meeting are:
 - Black Carbon
 - Organic Carbon
 - PM_{2.5}
 - NO_x
 - CO
 - NMVOC (including BVOC)
 - SO₂
 - NH₃

Outcomes

- Meeting Report was published on TFI website:
https://www.ipcc-nggip.iges.or.jp/public/mtdocs/1805_Geneva.html
- The outcomes of the meeting:
 - will be used as a basis for consideration of future work of TFI; and
 - are also expected to feed into the WGI AR6 report, primarily in Chapter 6 (Short-lived climate forcers) but also Chapter 7 (The Earth's energy budget, climate feedbacks, and climate sensitivity),

Conclusions and recommendations

Conclusions and recommendations (1)

Science has advanced. Need has arisen.

- There has been substantial improvement in scientific understanding of emissions and climate effects of SLCFs since the last Expert Meeting in 2005, and continued improvements since the AR5 (2013).
- Improved SLCF emission inventories and methodologies are necessary:
 - to enhance scientific understanding and assessment of their role in climate change; as well as
 - to inform climate policy at the national and international levels, particularly through United Nations Framework Convention on Climate Change (UNFCCC).

Conclusions and recommendations (2)

IPCC can play an important role.

- Internationally-agreed, globally applicable methodologies and emission factors for SLCF emission inventories are necessary.
- The IPCC can play an important role because of its unique position, therefore considered to be the right organisation to fill gaps in existing methodologies and to develop and disseminate an internationally-agreed, globally applicable methodological guidance based on existing methodologies.
- This could be achieved in close cooperation and collaboration with other relevant international bodies.

Conclusions and recommendations (3)

All SLCFs should be considered.

- Some SLCF species are of key importance globally and/or regionally for climate change (e.g. CH₄, NO_x, OC, BC and SO₂).
- Others may become a high-priority over time in terms of mitigation strategies (e.g. NH₃ and VOC).
- In order to take into account trends and developments, all SLCFs should be considered with more focus on species and sources that are not well covered in existing guidance.

Conclusions and recommendations (4)

Careful consideration is required in consolidating existing inventory methodology.

- If the IPCC Plenary decides to engage into further work on SLCF inventories, careful consideration needs to be given to possible issues in consolidating existing inventory methodologies on GHGs and SLCFs.
- Generally, much of the existing good practice guidance on GHG inventory is applicable to, or can be a good basis for, SLCF inventories at a national level.
- For some emission sources, however, existing inventory methodology does not provide a good basis for SLCF inventory.

Conclusions and recommendations (5)

SLCF reporting should be in mass units, not in CO₂-eq.

- Reporting of SLCF inventories should be in mass units for each individual emitted compound.
- SLCF emissions should not be converted to CO₂ equivalent units in the same way as done based on GWP₁₀₀ in the inventory reporting under the UNFCCC.
- The understanding of emission metrics and how they can be used, particularly for SLCF, has advanced but there is currently no agreed recommendation.
- Issue of metrics and how they can be used may be further considered based on new scientific literature for coordination across WG reports (particularly WGI & WGIII).

Possible future work on SLCF inventories

Future work plan proposed at IPCC-48

A future work plan was proposed at IPCC-48 (Oct 2018, Incheon, Republic of Korea).

(1) Late 2019 – A paper will be prepared by a small task team about the alignment of the 2006 IPCC Guidelines and the EMEP/EEA Guidebook.

(2) Early 2020 - An expert meeting will be held by TFI, possibly jointly with UNECE/TFEIP.

(3) Outcomes of the steps (1) and (2) will be reported to the Panel as IPCC supporting materials.

They will help countries start producing SLCF inventories.

(4) A further work plan will be developed after consideration of the outcomes of the steps (1) and (2) above.

Future work plan proposed at IPCC-48

- At the step (4), the future work plan should take into account discussion by the Panel at a future session of IPCC as well as the views of the UNFCCC.
 - One possible approach may be to organize a series of expert meetings focusing specific sources/SLCF species to come up with detailed methodological advice.
 - Another possible action is to organize a joint TFI/WGI expert meeting on SLCF again in late 2021, building on the WGI contribution to the AR6 which will be approved/accepted in April 2021 as well as the outcomes of TFI expert meetings.
 - Production of a new Methodology Report which deals with SLCF inventory, if necessary, may be done in the AR7 cycle, building on the outcome of these steps.

Decision to be taken at IPCC-49

- In response to this proposal, several delegates made interventions - different views were heard:
 - Prefer an earlier start of the work on SLCF inventory guidelines so that a new Methodology Report can be developed in this AR6 cycle.
 - Support TFI proposal to produce a new Methodology Report during AR7 cycle because it is important to build it on the new findings of WGI's Contribution to AR6 report, and also because of the already tight schedule.
- IPCC will discuss and take a decision on the TFI's future work plan on SLCF inventory methodology at its 49th Session in May 2019 in Kyoto, Japan.



Thank you

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