



IPPU BOG Report

Joint 1st and 2nd IPCC Expert Meeting
on Short-Lived Climate Forcers (SLCFs)

Virtual sessions, 13-20 October 2021

Participants

- Abraham Ortinez-Alvarez (Instituto Nacional de Ecología y Cambio Climático, Mexico)
- Andrew P. Grieshop (North Carolina State University, USA)
- Bofeng Cai (Chinese Academy for Environmental Planning)
- Camila Labarca (Chilean Ministry of Environment)
- Detlev Helmig (Boulder A.I.R. LLC, USA)
- Kendal Blanco Salas (National Meteorological Institute, Costa Rica)
- Kevin Hausmann (UBA, Germany)
- Laura Elena Dawidowski (Comisión Nacional de Energía Atómica, Argentina)
- Robert W. Pinder (United States Environmental Protection Agency)
- S. Enrique Puliafito (CONICET, Universidad Tecnologica Nacional, Argentina)
- Sergey Kakareka (Institute for Nature Management of the National Academy of Sciences of Belarus)

Chair: Kristina Saarinen (Finnish Environment Institute SYKE)

Rapporteur: Vigdis Vestreng (Norwegian Environment Agency)

Pavel Shermanau and Eduard Karapoghosyan from IPCC TFI TSU facilitated the meeting

- ✓ *Also, via email comments were provided by Damian Zasina (Institute of Environmental Protection – National Research Institute, The National Centre for Emissions Management, Poland)*

Outline

- ✓ *Scope*
- ✓ *Cross cutting issues*
- ✓ *Highlights of IPPU issues*
- ✓ *Knowledge gaps*
- ✓ *Conclusions*

Scope

- ✓ *SLCFs considered: BC, OC, SO_x, NO_x, CO, NMVOC and NH₃.*
- ✓ *The task of the expert meeting is not to provide EFs for all regions of the world, but to focus on the availability and applicability of the methodology to estimate emissions and to identify possible gaps*
- ✓ *Assessment of the source categories and associated SLCF species, as well as expert judgement on whether a source is insignificant or not should be focussed on the climate effect of the SLCFs (not on the air pollution)*
- ✓ *“IPCC methodology” in Table 1 means the 2006 IPCC Guidelines and the 2019 Refinement methodology (even though the latter is not yet adopted by the UNFCCC).*

Cross cutting issues

Definitions and reporting units

Assessment of significance of sources

- ✓ *The IPPU experts felt that whether a source is insignificant is a cross-cutting issue and should further be clarified between different BOGs*

BC and OC

- ✓ *A definition of BC and OC and possibly EC should be included in SLCF Guidelines. EFs should include information of the measurement method used to develop them as well as possible inclusion of condensable particle fraction.*
- ✓ *BC can be estimated using direct EFs or with the use of shares of BC in PM_{2.5}, in case no direct emission factors are available. If using shares of PM emissions to estimate BC, the PM emissions should include information on whether the condensable particle fraction is included as well as on the measurement method used in the development of the EF*

NMVOC

- ✓ *Definition of VOC for climate purposes*

SO_x and NO_x

- ✓ *All SO_x and NO_x reported will be as NO₂ and SO₂.*

Cross cutting issues

Tier Methods and AD

- ✓ *The differences between IPCC, EMEP/EEA and AP42 methodologies in terms of the different approaches (e.g. the Tier 1 approach in each methodology)*
- ✓ *Default emissions factors must include information on the associated assumed abatement level and abatement efficiency.*
- ✓ *Although the default Tier 1 methods may be globally applicable, the default Tier 1 EFs may not if they have been developed in the context of a specific region. E.g. many of EMEP/EEA EFs are representative to EU 2015 abatement level, which may not be the global case.*
- ✓ *The higher Tier methods provided e.g. in the EMEP/EEA Guidebook can be used on regional, local or plant level, if detailed data is collected on both the process and abatement technologies*
- ✓ *Need to collect new/additional activity data where the AD is not the same as for the greenhouse gas inventories. Guidance should be given on how to collect or estimate activity data that can be used in the calculation of SLCF emissions.*

Highlights of IPPU Issues

Allocation

- ✓ Principles of the allocation of emissions between Industry, Energy and Waste and on-site transport as well as the methods themselves should be detailed to avoid double counting.

Subcategorization

- ✓ New source categories could be added to the IPCC categories to include sources that are not GHG sources but sources of SLCFs (e.g. Handling and Storage) and to expand the IPCC category Solvent and Other Product Use by adding sub-categories especially relevant for NMVOC

Highlights of IPPU Issues

Category specific issues of allocation and subcategorization

- ✓ *Even though there are no PM process emissions from Lime productions, there might other emissions from Storage and Handling and Transport on site. On-site transport and mobile machinery should be allocated under Energy/Transport and the part of storage and handling relevant to IPPU should be reported in this sector, if not emissions will not be accounted for.*
- ✓ *Solvent and Other Product Use (covers various emission sources which are not covered in the current IPCC Guidance) to be divided into sub-categories such as: Domestic solvent use including fungicides, Road paving with asphalt, Asphalt roofing, Coating applications, Degreasing, Dry cleaning, Chemical products, Printing, Other solvent use, Other product use*
- ✓ *For non-ferrous industry (copper, lead, zinc, nickel), a mass balance approach to estimate SO₂ could provide more accurate results than emission factor approach.*
- ✓ *Food and Beverage charbroiling, fat frying, grain handling, fermenting/ distilling, drying/ roasting, natural gas cooking – risk for double counting with Energy.*
- ✓ *Ammonia production and Hydrogen production (Chemical Industry) is increasing and should be monitored.*

General knowledge gaps

- ✓ *Lack of AD, additional or different AD can be needed for SLCFs than to GHGs*
- ✓ *Abatement techniques and efficiencies*
- ✓ *Availability of regional or country specific EFs for all SLCFs*
- ✓ *Definition of BC and OC and documentation of EFs with indication of measurements used in the development of the EFs*
- ✓ *Definition of NMVOC, speciation*
- ✓ *Guidance of allocation of emissions between Energy, Process and Waste sectors*
- ✓ *No agreed climate metrics for SLCFs (e.g. GWP)*

Category knowledge gaps

- ✓ *2A2 Lime production – Data collection by type of kiln, and abatement*
- ✓ *2B8f Carbon black – BC and OC from diffuse emissions; NMVOCs from storage tanks*
- ✓ *2C1 Iron and Steel – Fugitive PM emissions, SO₂ from desulfurization, PM and SO₂ from foundries, PM, OC, EC, CO and VOCs from scrap preparation. Rolling mills – SO₂ from use of volatile halogenated organics (VHO)*
- ✓ *2C5 Lead production and 2C6 Zinc production – Data collection of domestic industries (processes, abatement, raw material)*
- ✓ *2C7 Other (Copper) – SO₂ from acid mist*

Category knowledge gaps

- ✓ *2D3 Solvent use (Domestic solvent use) – Guidance on how to collect AD and on how to estimate AD if there are no statistics (e.g. modelling from a similar country etc.)*
- ✓ *2D3 Solvent use (Coating application and Degreasing) – AD*
- ✓ *2D3 Solvent use (Printing) – Collection of AD (use of ink and/or applied abatement techniques)*
- ✓ *2D3 Solvent use (Other Solvent use) – AD product/solvent use*
- ✓ *2D4 Other (Asphalt Roofing) – SO₂ emissions in roofing materials*
- ✓ *2F Product Uses as Substitutes for Ozone Depleting Substances – NH₃, NMVOC – Methods, AD, EFs*
- ✓ *2H1 Pulp and Paper Industry – Updated EFs*

Conclusions

- ✓ *Table 1 and 2 identifies IPPU source categories and associated SLCF species*
- ✓ *List of knowledge gaps was prepared (not exhaustive)*
- ✓ *Additional or different AD than in the GHG inventory may be needed for SLCF inventories*
- ✓ *Need for clear guidance on how to estimate and allocate emissions between Energy, IPPU and Waste sectors*
- ✓ *Better understanding of the different approaches in the tier levels of IPCC, EMEP/EEA and AP-42 Guidelines is needed*
- ✓ *General cross-cutting issues should be discussed further, e.g. during the third expert meeting*



Thank you!