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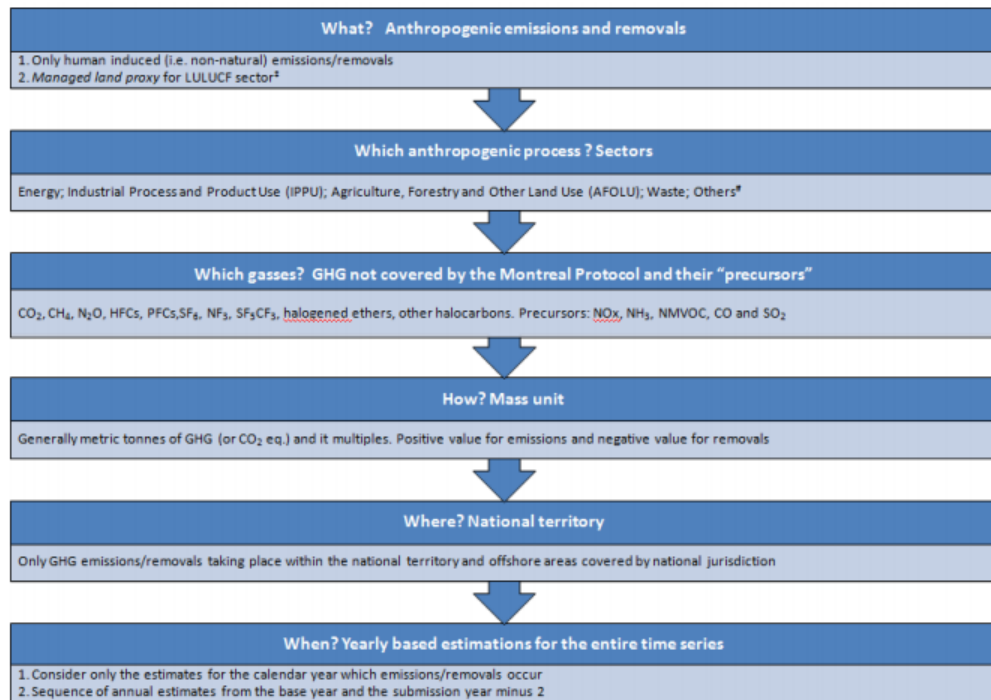
INVENTORY/REPORTING REQUIREMENTS FOR CO₂ RELATED TO FOSSIL FUEL

SECOND VERIFY NETWORK MEETING

Outline

- Basic principles of GHGI reporting
 - 2006 IPCC Guidelines and the UNFCCC Reporting Guidelines
- Current problems and differences
- Inventory uncertainties
- Requirements for data provision

Basic principles for GHG inventory reporting according to IPCC 2006 GL



- Quelle:
https://verify.lsce.ipsl.fr/images/D11_MRV_User_Requirement_Document.pdf

[‡] A discussion on the *Managed land proxy* definition is reported in the following chapters of this User Requirement Document.

[‡] Each sector can be subdivided in categories and subcategories. Broad sector subdivision is summarised in table 1.

Current problems and differences (1)

- Emission attribution problems:
 - GHGs require emissions by sources
 - This distinction may not be possible in climate science research projects
 - For example, it may be difficult to estimate emissions derived from energy and non-energy use of fuels/feedstock (e.g. in the chemical or iron and steel industry)
- Terminology
 - Terminological issues mainly affect the LULUCF sector

Current problems and differences (2)

- Methodological differences

- Direct and indirect emissions as well as GHG precursors are reported separately in the GHGI, while these are not separated in the climate science research or, when considered separately, their distinction may be arbitrary
- For example, indirect CO₂ from NMVOCs in the IPPU sector:
 - Reported in the GHG inventories
 - Not captured by satellite and in-situ monitoring of emissions
- The definition of anthropogenic and biogenic emissions may differ between GHGIs and climate science research.
 - In GHGIs anthropogenic is used for emissions caused by human-activities and biogenic as emissions within the natural carbon-cycle
 - In climate science anthropogenic is often used more narrow for emissions related to the energy and non-energy usage for fossil fuels. Emissions from biological processes, e.g. from agriculture and land use, are defined as biogenic emissions.

Current problems and differences (3)

- System boundary differences

- Spatial scale:

- GHGs have to be arranged at the country level
 - Top-down approaches of climate research are generally based on continental or global level, which can have a varying refined spatial resolution. Other climate study types are generally based at the local scale projects.

- Temporal scale:

- GHGs are based on yearly reports
 - Top-down approaches are based on a variable temporal scale but generally more refined (a few hours in some cases to monthly scales)

Inventory uncertainties

- Energy is the most relevant sector in terms of emissions in all countries (except for Iceland): overall, it is responsible for 78% of the total emissions.
- Its uncertainty level is lower with respect to that of the other sectors because of the generally solid data based on national energy statistics.
- Overall, lowest uncertainty level refers to the CO₂ emissions estimation, while those referring to N₂O and CH₄ are higher with respect to the previous one because several MS have adopted IPCC default factors for these gases and more complex chemical processes.
- Fuel combustion is characterised by the lowest estimation uncertainties - EU 2016 (2018): 0.9%.
- The highest uncertainties have been estimated for N₂O and CH₄ in the Fugitive emissions subsector - EU 2016 (2018): 18.4%.

Requirements for data provision (1)

- Sector / category specific reference:
 - Estimates based on measurements should be available at level of source/sink category or sector.
 - Disaggregate the emission/removal estimates based on measurements using for example proxy variables.
 - If this is not possible, increase the understanding of the components included; consult with the relevant experts from the inventory agencies related to the geographic area/sector of interest.

Requirements for data provision (2)

- Spatial and temporal:
 - Provide the results expressed in a format that can, at least, be aggregated on both national and yearly scales.
- Gas considered, GWPs used and mass units:
 - Estimates based on measurements should include data for each GHG separately.
 - If gases are reported in CO2 equivalents, the GWPs used should be reported
 - Provide data in metric tons

Requirements for data provision (3)

- Terminology:
 - Use clear and transparent definitions, taking into consideration as far as possible the terminology as defined by IPCC
- Uncertainty level:
 - Scientific community could focus on measurements of N₂O and CH₄ as these GHG emission estimates show highest uncertainties (at least EU wide).
 - At global level measurements of CO₂ may be more relevant because quality and availability of energy statistics may be more difficult than in the EU.

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