2019 Refinement to the 2006 IPCC Guidelines: Refinements in Volume 5 (Waste)

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Overview

• Refinements are made in the following chapters:
  • Chapter 2: Waste generation, composition and management data
  • Chapter 3: Solid waste disposal
  • Chapter 5: Incineration and open burning of waste
  • Chapter 6: Wastewater treatment and discharge

• Volume 5 contains annexes:
  • Annex 1 (Mapping tables)
  • Annex 2 (Worksheets)

• IPCC Waste Model for estimation of methane (CH$_4$) emissions from solid waste disposal site (SWDS) has been updated reflecting the refinements made in relevant chapters.

• The refinements are made to include new and updated default data as well as new and up-to-date information and guidance, among others.
Chapter 2: Waste generation, composition and management data

- **Updated and new default data** on waste generation and treatment e.g., new data on municipal solid waste (MSW) open dumped (updated Table 2.1 and updated Annex 2A.1)
- **Updated and new default data** on MSW composition e.g., new data on garden waste and nappies (updated Table 2.3 and new Annex 2A.2)
- **New default data** on carbon (C) and nitrogen (N) content in domestic and industrial sludge (new Table 2.4a)
- **New and updated default data** on degradable organic carbon (DOC) content in domestic and industrial sludge (new Table 2.4a)
- **Updated/elaborated guidance** on sludge e.g., definition of sludge; DOC of sludge (Section 2.3.2)
Chapter 3: Solid waste disposal

• New types of managed SWDS and respective default methane correction factors (MCF) (updated Table 3.1)
  • Managed poorly–semi-aerobic
  • Managed well–active aeration
  • Managed poorly–active aeration
Chapter 3: Solid waste disposal

- **New default data** on fraction of degradable organic carbon which decomposes (DOC$_f$) by type of waste (new Table 3.0):
  - Less decomposable (e.g., wood, tree branches)
  - Moderately decomposable (e.g., paper, textile, nappies)
  - Highly decomposable (e.g., food waste, grasses)

- **Appendices** provide information as basis for future methodological development:
  - Information on nitrous oxide (N$_2$O) emissions from SWDS (Appendix 3A.1)
  - Information on estimation of CH$_4$ emissions from SWDS managed by active aeration using locally available measured data (Appendix 3A.2)
Chapter 5: Incineration and open burning of waste

- **New technologies** of thermal treatment of waste: pyrolysis, gasification and plasma (Section 5.1)
- **New default emission factors** for CH$_4$ and N$_2$O emissions from combined systems of pyrolysis-melting and gasification-melting (new Tables 5.3a and 5.4a)
- **Updated default oxidation factor** for opening burning of MSW (updated Table 5.2)
Chapter 6: Wastewater treatment and discharge

The chapter has been substantially refined:

• Updated and elaborated guidance
  • Introduction (Section 6.1)
  • CH$_4$ emissions from wastewater (Section 6.2)
  • N$_2$O emissions from domestic wastewater (Section 6.3)
• New guidance
  • N$_2$O emissions from industrial wastewater (Section 6.4)
• New and updated default data
• Annexes (Annex 6A.1-6A.7) provide additional details related to new or updated default data
• Information on non-biogenic CO$_2$ emissions from wastewater treatment as basis for future methodological development (Appendix 6A.1)
Chapter 6: Wastewater treatment and discharge

Introduction (Section 6.1)

- Figure 6.1 has been updated and simplified to show different pathways for wastewater treatment and discharge
- New subsections have been added to discuss
  - Centralized treatment systems (Section 6.1.1)
  - Decentralized treatment systems of domestic wastewater (onsite sanitation) (Section 6.1.2)
  - Emissions from receiving waters (Section 6.1.3)
Chapter 6: Wastewater treatment and discharge

CH₄ emissions from wastewater (Section 6.2)

- Certain MCFs for domestic and industrial wastewater treatment and discharge have been updated (e.g., septic systems; centralized wastewater treatment plants; discharge to aquatic environments)
  - There are no longer separate MCFs for “well managed” and “not well managed” centralized aerobic treatment systems
- New Tier 2 MCFs/emanion factors for wastewater discharged to aquatic environments (discharge to reservoirs, lakes and estuaries; discharge to aquatic environments other than reservoirs, lakes and estuaries)
- New guidance on the calculation of organic component removed as sludge
Chapter 6: Wastewater treatment and discharge

$\text{N}_2\text{O}$ emissions from domestic wastewater (Section 6.3)

- Updated guidance on estimation of $\text{N}_2\text{O}$ emissions from wastewater treatment plants
- Updated and new emission factors for discharges to aquatic environments
- Updated emission factor for wastewater treatment plants
- New emission factor for septic systems
Chapter 6: Wastewater treatment and discharge

N₂O emissions from industrial wastewater (new Section 6.4)

- New guidance (no methodology in the 2006 IPCC Guidelines)
  - Emissions from industrial wastewater treatment plants
  - Emissions from industrial wastewater effluent discharged to aquatic environments
Summary

Volume 5 of the 2019 Refinement provides:

- **Updated and elaborated guidance** (e.g., new types of managed solid waste disposal sites; CH$_4$ and N$_2$O emissions from gasification and pyrolysis of waste; CH$_4$ and N$_2$O emissions from wastewater)
  - Better understanding of emissions/sources and more clearer guidance (e.g., clarification to the existing guidance)

- **New guidance** (e.g., N$_2$O emissions from industrial wastewater)
  - Improved completeness

- **New and updated default data** (e.g., waste generation and composition; parameters of domestic and industrial sludge; CH$_4$ and N$_2$O emissions from domestic and industrial wastewater treatment and discharge)
  - Improved accuracy
Thank you

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