

1 ANNEX 1

2 MAPPING TABLES

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Annex 1: Mapping table for 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

This annex provides a road map for relating sections, equations, tables, figures and boxes in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Sections, equations, tables, figures and boxes with “No refinement” are not included in the mapping table.

U = Update

NG = New Guidance

E = Elaboration

NA = Not available

SECTIONS

Section Title	Type of Refinement	2006 Guidelines Section Number	2019 Refinement Section Number
Chapter 1			
Concepts	U	1.1	1.1
National Inventory Management Systems	NG	NA	1.5
Chapter 2			
Introduction	NG	2.1	2.1
Collecting data	NG	2.2	2.2
Use of Facility Data in Inventories	NG	2.3	2.3
General guidance on performing surveys	E	Annex 2A2	Annex 2A2
Chapter 3			
Overview of uncertainty analysis	E	3.1.1	3.1.1
Uncertainty assessment as part of inventory management	NG	NA	3.1.2
Overall structure of uncertainty analysis	U	3.1.2	3.1.3
Causes of uncertainty	E	3.1.5	3.1.6
Reducing uncertainty	E	3.1.6	3.1.7
Quantifying uncertainties	U	3.2	3.2
Methods to combine uncertainties	U	3.2.3	3.2.3
Approach 1: Propagation of error	U	3.2.3.1	3.2.3.1
Approach 2: Monte Carlo simulation (TBD)	U	3.2.3.2	3.2.3.2
Examples (TBD)	U	3.6	3.6
Chapter 4			
Introduction	E	4.1	4.1
Definition	U	4.1.1	4.1.1
Purpose of the key category analysis	E	4.1.2	4.1.2
General approach to identify key categories	E	4.1.3	4.1.3

General rules for identification of key categories	U	4.2	4.2
Approach 1 to identify key categories	U/E	4.3.1	4.3.1
Qualitative criteria to identify key categories	U	4.3.3	4.3.3
Reporting and Documentation	E	4.4	4.4
Examples of key category analysis	E	4.5	4.5
Chapter 5			
Recalculations due to methodological changes and refinements	E	5.2.1	5.2.1
Adding new categories	E	5.2.2	5.2.2
Tracking increases and decreases due to technological change and other factors	E	5.2.3	5.2.3
Issues with data availability	E	5.3.1	5.3.1
Splicing techniques	E	5.3.3	5.3.3
Non-linear trend analysis	NG	5.3.3.5	5.3.3.5
Reporting and documentation of trend information	E	5.4	5.4
Chapter 6			
Introduction	E	6.1	6.1
National level activity data	U	6.7.2.1	6.7.2.1
Comparisons of national estimates	U	6.10.1	6.10.1
Comparisons with atmospheric measurements	U/E	6.10.2	6.10.2
Use and reporting of models	NG	NA	6.11
Chapter 7			
Introduction	E	7.1	7.1
Precursor emissions	E	7.2	7.2
Indirect N ₂ O emissions from the atmospheric deposition of nitrogen in NO _x and NH ₃	E	7.3	7.3

Discussion: The authors of chapter 7 concluded that there is no coherent treatment of indirect emissions across sectors. However, the conclusion was that it would have been beyond the scope of the refinement of the 2006 Guidelines to introduce a rigorous framework across all sectors with respect to treatment of indirect emissions.

EQUATIONS

Equation Title	Type of Refinement	2006 Guidelines Equation Number	2019 Refinement Equation Number
Chapter 2			
Reported facility emissions	NG	NA	2.1
Emissions by Facility-Specific emission factors	NG	NA	2.2
General facility emissions integration	NG	NA	2.3
Chapter 3			

Combining uncertainties – approach 1 – AD x EF	E	NA	3.3
Combining uncertainties – approach 1 – EF = a x b x c	E	NA	3.4
Chapter 4			
Trend Assessment (Approach 1)	U	4.2	4.2
Trend Assessment with zero base year emissions	U	4.3	NA
Key category analysis combination of rankings	NG	NA	4.3

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27 **TABLES**

Table Title	Type of Refinement	2006 Guidelines Table Number	2019 Refinement Table Number
Chapter 1			
A suggested table for capturing and sharing information on the scope and mandate	NG	NA	1.1
Illustrative Scope and Mandate table for UK reporting and MRV requirements associated with its GHG inventory	NG	NA	1.2
List of stakeholder types with their general roles and capabilities needed to function	NG	NA	1.3
Illustrative workplan for the preparation of GHG inventory including an indicative timeline for a work programme of 52 weeks (1 year)	NG	NA	1.4
Chapter 2			
Sensitive parameters for specific sectors	NG	NA	2.2
Potential sources of literature data	U	2.3	2.3
Quality Goals of Facility Data	NG	NA	2.5
Potential Facility Greenhouse Gas Reporting Requirements	NG	NA	2.6
Chapter 3			
Approach 1 uncertainty calculation	U	3.1	3.1
Example of an approach 1 uncertainty analysis for Finland (TBD)	U	3.4	TBD
Example of reporting of approach 2 uncertainty analysis using general reporting table for uncertainty (TBD)	U	3.5	TBD
Chapter 4			
Suggested aggregation level of analysis for Approach 1	E	4.1	4.1
Spreadsheet for the Approach 1 analysis – Level Assessment	E	4.2	4.2

Spreadsheet for the Approach 1 analysis – Trend Assessment	E	4.3	4.3
Summary Key Category analysis table showing combined ranking and useful annotations to highlight reasons for key category identification. Iceland example using simple combination of approach 1 Level (2015) and trend (1990 – 2015)	NG	NA	4.4a
Example of Approach 1 Level Assessment for the Finnish GHG inventory for 2003	U	4.5	4.5
Example of Approach 1 Trend Assessment for the Finnish GHG inventory for 2003	U	4.6	4.6
Example of Approach 1 Level Assessment for the Finnish GHG inventory for 2003 using a subset	U	4.7	4.7
Example of Approach 1 Trend Assessment for the Finnish GHG inventory for 2003 using a subset	U	4.8	4.8
Example of Approach 2 Level Assessment for the Finnish GHG inventory for 2003	U	4.9	4.9
Example of Approach 2 Trend Assessment for the Finnish GHG inventory for 2003	U	4.10	4.10
Summary of key category analysis for Finland	U	4.11	4.11
Chapter 5			
Summary of splicing techniques	U/NG	5.1	5.1
Category-specific documentation of recalculations	U	5.2	5.2
Chapter 6			
Overview of the strengths and weaknesses of using atmospheric measurements for verification of GHG emissions	NG	NA	6.1
Summary of the key steps implemented in national examples	NG	NA	6.2
General outline of national inventory comparison to global/regional inverse modelling products	NG	NA	6.3
General Guidance related to models in Volumes 1 & 4 of the 2006 IPCC Guidelines	NG	NA	6.4
Chapter 7			
Sources of CO ₂ from the atmospheric oxidation of CH ₄ , CO, and NMVOCs	NG	NA	A7.1
Examples of NMVOCs from the different source categories	NG	NA	A7.2
Carbon content of various materials (percent carbon by mass, PC) and percent of total solvent NMVOC emissions (by mass, PU)	NG	NA	A7.3

29 **FIGURES**

Figure Title	Type of Refinement	2006 Guidelines Figure Number	2019 Refinement Figure Number
Chapter 1			
Illustrative GHG inventory organizational structure	NG	NA	1.1
Illustrative data flow overview diagram example for South Africa	NG	NA	1.2
Chapter 2			
Outline of Data Collection steps and decisions	NG	NA	2.1
Chapter 3			
Overall structure of a generic uncertainty analysis	U	3.1	3.1
Uncertainty analysis decision tree	NG	NA	3.2
Chapter 6			
A decision tree for checking the necessary criteria for using the inverse model estimates in the National Inventory verification	NG	NA	6.1
Schematic of typical model development/selection process	NG	NA	6.2

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31 **BOXES**

Box Title	Type of Refinement	2006 Guidelines Box Number	2019 Refinement Box Number
Chapter 3			
Example of reducing uncertainty in a source category by adopting higher tier methods	NG	NA	3.1
Standard deviation X Standard error	NG	NA	3.2
Example of uncertainty calculation: CH ₄ emissions from manure management (TBD)	NG	NA	3.3
Chapter 5			
Time series consistency when using facility level data from new legislation (e.g. data from emissions trading scheme, other national data reporting programmes)	NG	NA	5.2
Case study of overlap method methane emissions from charcoal production in Godonia	NG	NA	5.3
Case study of interpolating data – carbon dioxide emissions from fossil water incineration in Godonia	NG	NA	5.4
Case study of non-linear trend data – direct soil N ₂ O emissions from manure on non-federal grasslands	NG	NA	5.5
Chapter 6			

Definitions of QA/QC and verification	E	6.1	6.1
UK methane (CH ₄) and nitrous oxide (N ₂ O) inverse modelling	NG	NA	6.3
Chapter 7			
Calculating CO ₂ inputs to the atmosphere from emissions of carbon-containing compounds	E	7.2	7.1