

Annexes to the Inventory of U.S. GHG Emissions and Sinks

The following nine annexes provide additional information related to the material presented in the main body of this report as directed in the *UNFCCC Guidelines on Reporting and Review* (UNFCCC 2014). Annex I contains an analysis of the key categories of emissions discussed in this report and a review of the methodology used to identify those key categories. Annex 2 describes the methodologies used to estimate CO₂ emissions from fossil fuel combustion, the carbon content of fossil fuels, and the amount of carbon stored in products from non-energy uses of fossil fuels. Annex 3 discusses the methodologies used for a number of individual source categories in greater detail than was presented in the main body of the report and includes explicit activity data and emission factor tables. Annex 4 presents the IPCC reference approach for estimating CO₂ emissions from fossil fuel combustion. Annex 5 addresses the criteria for the inclusion of an emission source or sink category and discusses some of the sources that are excluded from U.S. estimates. Annex 6 provides a range of additional information that is relevant to the contents of this report. Annex 7 provides data on the uncertainty of the emission estimates included in this report. Annex 8 provides information on the QA/QC methods and procedures used in the development of the Inventory, including responses to UNFCCC reviews. Finally, Annex 9 provides an overview of GHGRP data use in the Inventory.

Annexes to the Inventory of U.S. GHG Emissions and Sinks	1
ANNEX 1 Key Category Analysis	3
ANNEX 2 Methodology and Data for Estimating CO ₂ Emissions from Fossil Fuel Combustion	55
2.1. Methodology for Estimating Emissions of CO ₂ from Fossil Fuel Combustion	55
2.2. Methodology for Estimating the Carbon Content of Fossil Fuels	95
2.3. Methodology for Estimating Carbon Emitted from Non-Energy Uses of Fossil Fuels	133
ANNEX 3 Methodological Descriptions for Additional Source or Sink Categories	163
3.1. Methodology for Estimating Emissions of CH ₄ , N ₂ O, and Indirect Greenhouse Gases from Stationary Combustion	163
3.2. Methodology for Estimating Emissions of CH ₄ , N ₂ O, and Indirect Greenhouse Gases from Mobile Combustion and Methodology for and Supplemental Information on Transportation-Related Greenhouse Gas Emissions	171
3.3. Methodology for Estimating Emissions from Commercial Aircraft Jet Fuel Consumption	222
3.4. Methodology for Estimating CH ₄ Emissions from Coal Mining	228
3.5. Methodology for Estimating CH ₄ , CO ₂ , and N ₂ O Emissions from Petroleum Systems	237
3.6. Methodology for Estimating CH ₄ , CO ₂ , and N ₂ O Emissions from Natural Gas Systems	243
3.7. Methodology for Estimating CO ₂ , CH ₄ , and N ₂ O Emissions from the Incineration of Waste	252
3.8. Methodology for Estimating Emissions from International Bunker Fuels used by the U.S. Military	260
3.9. Methodology for Estimating HFC and PFC Emissions from Substitution of Ozone Depleting Substances	267
3.10. Methodology for Estimating CH ₄ Emissions from Enteric Fermentation	298
3.11. Methodology for Estimating CH ₄ and N ₂ O Emissions from Manure Management	326
3.12. Methodologies for Estimating Soil Organic C Stock Changes, Soil N ₂ O Emissions, and CH ₄ Emissions and from Agricultural Lands (Cropland and Grassland)	363
3.13. Methodology for Estimating Net Carbon Stock Changes in Forest Ecosystems and Harvested Wood Products for <i>Forest Land Remaining Forest Land</i> and <i>Land Converted to Forest Land</i> as well as Non-CO ₂ Emissions from Forest Fires. ...	417
3.14. Methodology for Estimating CH ₄ Emissions from Landfills	459
ANNEX 4 IPCC Reference Approach for Estimating CO ₂ Emissions from Fossil Fuel Combustion	481
ANNEX 5 Assessment of the Sources and Sinks of Greenhouse Gas Emissions Not Included	492
ANNEX 6 Additional Information	503
6.1. Global Warming Potential Values	503
6.2. Ozone Depleting Substance Emissions	511
6.3. Sulfur Dioxide Emissions	513
6.4. Complete List of Source Categories	515
6.5. Constants, Units, and Conversions	516
6.6. Abbreviations	519
6.7. Chemical Formulas	526
ANNEX 7 Uncertainty	531
7.1. Overview	531
7.2. Methodology and Results	532
7.3. Reducing Uncertainty	539
7.4. Planned Improvements	540

7.5.	Summary Information on Uncertainty Analyses by Source and Sink Category.....	541
ANNEX 8	QA/QC Procedures.....	543
8.1.	Background.....	543
8.2.	Purpose.....	543
8.3.	Assessment Factors	545
8.4.	Responses to Review Processes	546
ANNEX 9	Use of EPA Greenhouse Gas Reporting Program in Inventory.....	593