ANNEX 1 Key Category Analysis

The United States has identified national key categories based on the estimates presented in this report. The IPCC's *Good Practice Guidance* (IPCC 2000) describes a key category as a "[category] that is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of the absolute level of emissions, the trend in emissions, or both." By definition, key categories are sources or sinks that have the greatest contribution to the absolute overall level of national emissions in any of the years covered by the time series. In addition, when an entire time series of emission estimates is prepared, a determination of key categories must also account for the influence of the trends of individual categories. Therefore, a trend assessment is conducted to identify source and sink categories for which significant uncertainty in the estimate would have considerable effects on overall emission trends. Finally, a qualitative evaluation of key categories should be performed, in order to capture any key categories that were not identified in either of the quantitative analyses, but can be considered key because of the unique country-specific estimation methods.

The methodology for conducting a key category analysis, as defined by IPCC's *Good Practice Guidance* (IPCC 2000), IPCC's *Good Practice Guidance for Land Use, Land-Use Change, and Forestry (IPCC 2003)*, and IPCC's *2006 Guidelines for National Greenhouse Gas Inventories* IPCC (2006); includes:

- Tier 1 approach (including both level and trend assessments);
- Tier 2 approach (including both level and trend assessments, and incorporating uncertainty analysis); and
- Qualitative approach.

This Annex presents an analysis of key categories, both for sources only and also for sources and sinks (i.e., including LULUCF); discusses Tier 1, Tier 2, and qualitative approaches to identifying key categories; provides level and trend assessment equations; and provides a brief statistical evaluation of IPCC's quantitative methodologies for defining key categories. Table A- 1 presents the key categories for the United States (including and excluding LULUCF categories) using emissions and uncertainty data in this report, and ranked according to their sector and global warming potential-weighted emissions in 2012. The table also indicates the criteria used in identifying these categories (i.e., level, trend, Tier 1, Tier 2, and/or qualitative assessments).

Table A-1: Key Source Categories for the United States (1990-2012)

			Tie	er 1			Tie	er 2			
IPCC Source Categories	Gas	Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF	Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF	Qual	2012 Emissions (Tg CO ₂ Eq.
Energy											
CO ₂ Emissions from Stationary Combustion - Coal - Electricity Generation	CO ₂	•	•	•	•	•	•	•	•		1,512.2
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	•	•	•	•	•	•	•	•		1,469.8
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	•	•	•	•	•	•	•	•		492.2
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO ₂	•		•		•		•			428.5
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	•	•	•	•	•	•	•	•		267.0
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	•	•	•	•	•		•			225.8
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	•	•	•	•	•		•			157.0
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	•	•	•	•	•	•	•	•		145.1
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	•	•	•	•	•	•	•	•		110.6
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	•	•	•	•						83.9
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	•	•	•	•	•	•	•	•		74.3
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	•	•	•	•		•				63.7
CO ₂ Emissions from Stationary Combustion - Oil - U.S. Territories	CO ₂	•	•	•	•		•				44.7
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	•	•	•	•						36.8
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	•	•	•	•						36.6
CO ₂ Emissions from Natural Gas Systems	CO ₂	•		•		•		•			35.2
CO ₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	•	•	•	•		•		•		18.8
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂		•		•						4.1
Fugitive Emissions from Natural Gas Systems	CH₄	•	•	•	•	•	•	•	•		127.1
Fugitive Emissions from Coal Mining	CH ₄	•	•	•	•	•	•	•	•		55.8
Fugitive Emissions from Petroleum Systems	CH ₄	•		•		•	•	•	•		31.7
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄					•	•	•	•		3.1
Non-CO ₂ Emissions from Stationary Combustion - Electricity			_		_			_	•		10.2
Generation	N ₂ O		•		•	•	•	•	•		18.3
N ₂ O Emissions from Mobile Combustion: Road	N ₂ O	•	•	•	•	•	•	•	•		12.6
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N ₂ O						•				2.4
International Bunker Fuels ^b	Several									•	112.8

CO ₂ Emissions from Iron and Steel Production & Metallurgical Coke Production	CO ₂	•	•	•	•	•	•	•	•	54.3
CO ₂ Emissions from Cement Production	CO ₂	•		•						35.1
N ₂ O Emissions from Adipic Acid Production	N ₂ O		•		•					5.8
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	•	•	•	•	•	•	•	•	129.4
HFC-23 Emissions from HCFC-22 Production	HiGWP	•	•	•	•		•			6.9
SF ₆ Emissions from Electrical Transmission and Distribution	HiGWP		•		•		•		•	6.0
PFC Emissions from Aluminum Production	HiGWP		•		•					2.5
Agriculture										
CH ₄ Emissions from Enteric Fermentation	CH ₄	•		•		•		•		141.0
CH ₄ Emissions from Manure Management	CH ₄	•	•	•	•	•	•	•	•	52.9
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	•	•	•	•	•	•	•		260.9
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	•		•		•	•	•		45.7
Waste	•	•								
CH ₄ Emissions from Landfills	CH ₄	•	•	•	•	•	•	•	•	102.8
Land Use, Land Use Change, and Forestry									•	
CO ₂ Emissions from Land Converted to Cropland	CO ₂				•			•	•	16.8
CO ₂ Emissions from Grassland Remaining Grassland	CO ₂							•	•	6.7
CO ₂ Emissions from Landfilled Yard Trimmings and Food										(42.0)
Scraps	CO ₂				•			•	•	(13.2)
CO ₂ Emissions from Cropland Remaining Cropland	CO ₂			•	•			•	•	(26.5)
CO ₂ Emissions from Urban Trees	CO ₂			•	•			•	•	(88.4)
CO ₂ Emissions from Changes in Forest Carbon Stocks	CO ₂			•	•			•	•	(866.5)
CH ₄ Emissions from Forest Fires	CH ₄				•			•	•	15.3
N₂O Emissions from Forest Fires	N ₂ O				•			•	•	12.5
Subtotal Without LULUCF										6,300.7
Total Emissions Without LULUCF										6,463.8
Percent of Total Without LULUCF										97%
Subtotal With LULUCF										5,357.5
Total Emissions With LULUCF										5,522.1
Percent of Total With LULUCF										97%

^a Qualitative criteria.

^b Emissions from this source not included in totals.

Note: Parentheses indicate negative values (or sequestration). Table A- 2 provides a complete listing of source categories by IPCC sector, along with notations on the criteria used in identifying key categories, without LULUCF sources and sinks. Similarly, Table A- 3 provides a complete listing of source and sink categories by IPCC sector, along with notations on the criteria used in identifying key categories, including LULUCF sources and sinks. The notations refer specifically to the year(s) in the inventory time series (i.e., 1990 to 2009) in which each source category reached the threshold for being a key category based on either a Tier 1 or Tier 2 level assessment.

In addition to conducting Tier 1 and 2 level and trend assessments, a qualitative assessment of the source categories, as described in the IPCC's *Good Practice Guidance* (IPCC 2000), was conducted to capture any key categories that were not identified by any quantitative method. One additional key category, international bunker fuels, was identified using this qualitative assessment. International bunker fuels are fuels consumed for aviation or marine international transport activities, and emissions from these fuels are reported separately from totals in accordance with IPCC guidelines. If these emissions were included in the totals, bunker fuels would qualify as a key category according to the Tier 1 approach. The amount of uncertainty associated with estimation of emissions from international bunker fuels also supports the qualification of this source category as key, which would qualify it as a key category according to the Tier 2 approach.

Table A-2: U.S Greenhouse Gas Inventory Source Categories without LULUCF

		2012 Emissions			Level in
		(Tg CO ₂	Kev	ID	which
IPCC Source Categories	Direct GHG	Eq.)	Category?	Criteria ^a	year(s)?b
Energy		.,			• ()
CO ₂ Emissions from Stationary Combustion - Coal - Electricity	CO ₂	1,512.2	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
Generation					
CO ₂ Emissions from Mobile Combustion: Road	CO_2	1,469.8	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	492.2	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO_2	428.5	•	$L_1 L_2$	1990, 2012
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO_2	267.0	•	$L_1T_1L_2T_2$	1990, 2012
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO_2	225.8	•	$L_1 T_1 L_2$	1990, 2012
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO_2	157.0	•	$L_1 T_1 L_2$	1990, 2012
CO ₂ Emissions from Mobile Combustion: Aviation	CO_2	145.1	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Non-Energy Use of Fuels	CO_2	110.6	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	83.9	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO_2	74.3	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	63.7	•	$L_1 \; T_1 \; T_2$	1990 ₁ , 2012 ₁
CO ₂ Emissions from Stationary Combustion - Oil - U.S. Territories	CO ₂	44.7	•	$L_1 \; T_1 \; T_2$	2012 ₁
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	36.8	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	36.6	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Natural Gas Systems	CO ₂	35.2	•	L ₁ L ₂	1990, 2012
CO ₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	18.8	•	L ₁ T ₁ T ₂	19901
CO ₂ Emissions from Incineration of Waste	CO_2	12.1			
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂	4.1	•	T ₁	
CO ₂ Emissions from Stationary Combustion - Coal - U.S. Territories	CO ₂	3.4			
CO ₂ Emissions from Stationary Combustion - Gas - U.S. Territories	CO ₂	1.4			
CO ₂ Emissions from Petroleum Systems	CO_2	0.4			
CO ₂ Emissions from Stationary Combustion - Geothermal Energy	CO ₂	0.4			
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	+			
Fugitive Emissions from Natural Gas Systems	CH ₄	127.1	•	$L_1 \; T_1 \; L_2 \; T_2$	1990, 2012
Fugitive Emissions from Coal Mining	CH ₄	55.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2012 ₁
Fugitive Emissions from Petroleum Systems	CH ₄	31.7	•	$L_1 L_2 T_2$	1990,

				20122
CH ₄	4.7			
CH ₄	3.1	•	$L_2 T_2$	1990 ₂
CH ₄	1.2			
CH ₄	1.2			
CH ₄	0.8			
CH ₄	0.5			
CH ₄	0.1			
CH4	_			
		•	T ₄ L ₀ T ₀	19902,
11/20	10.5	•	11 62 12	20122
N ₂ O	12.6	•	L ₁ T ₁ L ₂ T ₂	1990
N ₂ O	2.4	•	T_2	
N ₂ O	2.0			
N ₂ O	1.4			
N ₂ O				
N ₂ O				
Several	112.8	•	Q	
CO ₂	54.3	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
		•		
CO ₂	35.1	•	L1 T1 L2 T2	1990, 2012 1990 ₁
CO ₂	35.1 13.3	•		
CO ₂ CO ₂ CO ₂	35.1 13.3 9.4	•		
CO ₂ CO ₂ CO ₂	35.1 13.3 9.4 8.0	•		
CO ₂ CO ₂ CO ₂ CO ₂	35.1 13.3 9.4 8.0 5.2	•		
CO ₂ CO ₂ CO ₂ CO ₂ CO ₂	35.1 13.3 9.4 8.0 5.2 3.5	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2	•		
CO ₂ CO ₄ CO ₅ CO ₆ CO ₇	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2 3.1 0.6	•		
CO ₂	35.1 13.3 9.4 8.0 5.2 3.5 3.4 2.7 1.8 1.7 1.7 1.4 1.2 1.1 0.5 0.2 3.1 0.6	•		
	CH4	CH ₄ 3.1 CH ₄ 1.2 CH ₄ 0.8 CH ₄ 0.5 CH ₄ 0.1 CH ₄ 0.1 CH ₄ + CH ₄ + CH ₄ + N ₂ O 18.3 N ₂ O 12.6 N ₂ O 2.4 N ₂ O 2.0 N ₂ O 1.4 N ₂ O 0.8 N ₂ O 0.5 N ₂ O 0.4 N ₂ O 0.4 N ₂ O 0.4 N ₂ O 0.3 N ₂ O 0.1	CH ₄ 3.1 • CH ₄ 1.2 CH ₄ 1.2 CH ₄ 0.8 CH ₄ 0.5 CH ₄ 0.1 CH ₄ 0.1 CH ₄ + CH ₄	CH ₄ 3.1 • L ₂ T ₂ CH ₄ 1.2 CH ₄ 0.8 CH ₄ 0.5 CH ₄ 0.1 CH ₄ + CH ₄ + CH ₄ + N ₂ O 18.3 • T ₁ L ₂ T ₂ N ₂ O 2.4 N ₂ O 2.0 N ₂ O 1.4 N ₂ O 0.8 N ₂ O 0.5 N ₂ O 0.4 N ₂ O 0.3 N ₂ O 0.1

N ₂ O Emissions from Product Uses	N_2O	4.4			
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	129.4	•	$L_1T_1L_2T_2$	2012
HFC-23 Emissions from HCFC-22 Production	HiGWP	6.9	•	$L_1 T_1 T_2$	1990 ₁
SF ₆ Emissions from Electrical Transmission and Distribution	HiGWP	6.0	•	T_1T_2	
PFC, HFC, and SF ₆ Emissions from Semiconductor Manufacture	HiGWP	3.7			
PFC Emissions from Aluminum Production	HiGWP	2.5	•	T_1	
SF ₆ Emissions from Magnesium Production and Processing	HiGWP	1.7			
Agriculture					
CH ₄ Emissions from Enteric Fermentation	CH ₄	141.0	•	L ₁ L ₂	1990, 2012
CH ₄ Emissions from Manure Management	CH ₄	52.9	•	$L_1 T_1 L_2 T_2$	2012
CH ₄ Emissions from Rice Cultivation	CH ₄	7.4			
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3			
Direct N ₂ O Emissions from Agricultural Soil Management	N_2O	260.9	•	$L_1 T_1 L_2 T_2$	1990, 2012
Indirect N ₂ O Emissions from Applied Nitrogen	N_2O	45.7	•	$L_1 L_2 T_2$	1990, 2012
N ₂ O Emissions from Manure Management	N_2O	18.0			
N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.1			
Waste					
CH ₄ Emissions from Landfills	CH ₄	102.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
CH ₄ Emissions from Wastewater Treatment	CH ₄	12.8			
CH ₄ Emissions from Composting	CH ₄	1.6			
N ₂ O Emissions from Wastewater Treatment	N_2O	5.0			
N ₂ O Emissions from Composting	N_2O	1.8			

^a For the ID criteria, L refers to a key category identified through a level assessment; T refers to a key category identified through a trend assessment and the subscripted number refers to either a Tier 1 or Tier 2 assessment (e.g., L₂ designates a source is a key category for a Tier 2 level assessment).

² subscripted number refers to either a Tier 1 or Tier 2 assessment (e.g., L₂ designates a source is a key category for a Tier 2 level assessment).

3 b If the source is a key category for both L₁ and L₂ (as designated in the ID criteria column), it is a key category for both assessments in the years provided unless noted by a subscript, in which case it is a key category for that assessment in that year only (i.e.g., 1990 designates a source is a key category for the Tier 2 assessment only in 1990).

^{6 °}Emissions from these sources not included in totals.

⁺ Does not exceed 0.05 Tg CO₂ Eq.

Note: LULUCF sources and sinks are not included in this analysis.

1 Table A- 3: U.S Greenhouse Gas Inventory Source Categories with LULUCF

IPCC Source Categories	Direct GHG	2012 Emissions (Tg CO ₂ Eq.)	Key Category?	ID Criteriaª	Level in which year(s)?b
Energy	Direct Gillo	<u> </u>	Calegory	Cilleria	year(s):
CO ₂ Emissions from Stationary Combustion - Coal - Electricity	CO ₂	1,512.2	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
Generation	002	1,012.2		L1 11 L2 12	1000, 2012
CO ₂ Emissions from Mobile Combustion: Road	CO_2	1,469.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	492.2	•	L ₁ T ₁ L ₂ T ₂	1990 ₁ , 2012
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO_2	428.5	•	L ₁ L ₂	1990, 2012
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO_2	267.0	•	L ₁ T ₁ L ₂ T ₂	1990, 201
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	225.8	•	$L_1 T_1 L_2$	1990, 201
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO_2	157.0	•	$L_1 T_1 L_2$	1990, 2012
CO ₂ Emissions from Mobile Combustion: Aviation	CO_2	145.1	•	$L_1 \; T_1 \; L_2 \; T_2$	1990, 2012
CO ₂ Emissions from Non-Energy Use of Fuels	CO_2	110.6	•	$L_1 \; T_1 \; L_2 \; T_2$	1990, 2012
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	83.9	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	74.3	•	L ₁ T ₁ L ₂ T ₂	1990, 201
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	63.7	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Stationary Combustion - Oil - U.S. Territories	CO ₂	44.7	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	36.8	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	36.6	•	L ₁ T ₁	1990 ₁ , 2012 ₁
CO ₂ Emissions from Natural Gas Systems	CO_2	35.2	•	$L_1 T_1 L_2$	1990, 201
CO ₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	18.8	•	L ₁ T ₁ T ₂	1990 ₁
CO ₂ Emissions from Incineration of Waste	CO_2	12.1			
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂	4.1	•	T ₁	
CO ₂ Emissions from Stationary Combustion - Coal - U.S. Territories	CO ₂	3.4			
CO ₂ Emissions from Stationary Combustion - Gas - U.S. Territories	CO ₂	1.4			
CO ₂ Emissions from Petroleum Systems	CO ₂	0.4			
CO ₂ Emissions from Stationary Combustion - Geothermal Energy	CO ₂	0.4			
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	+			
Fugitive Emissions from Natural Gas Systems	CH ₄	127.1	•	L ₁ T ₁ L ₂ T ₂	1990, 201
Fugitive Emissions from Coal Mining	CH ₄	55.8	•	L ₁ T ₁ L ₂ T ₂	1990,
Fugitive Emissions from Petroleum Systems	CH ₄	31.7	•	L ₁ L ₂ T ₂	2012 ₁ 1990, 201
Fugitive Emissions from Abandoned Underground Coal Mines	CH ₄	4.7	-	L L2 2	1000, 201
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄	3.1	•	L ₂ T ₂	1990 ₂
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	1.2		L2 12	10002
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH ₄	1.2			
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH ₄	0.8			
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	CH ₄	0.5			
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.4			
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	CH ₄	0.1			

CH ₄ Emissions from Manure Management	CH ₄	52.9	•	L ₁ T ₁ L ₂ T ₂	19901,
CH4 Emissions from Enteric Fermentation	CH₄	141.0 52.0	•	L ₁ L ₂	1990, 2012
Agriculture	CH.	1/1 0		1.1.	1000 2012
SF ₆ Emissions from Magnesium Production and Processing	півиг	1.7			
	HiGWP HiGWP	2.5 1.7	•	T ₁	
Manufacture PFC Emissions from Aluminum Production	H!C/V/D	2 5	_	т.	
PFC, HFC, and SF ₆ Emissions from Semiconductor	HiGWP	3.7			
SF ₆ Emissions from Electrical Transmission and Distribution	HiGWP	6.0	•	T_1T_2	
HFC-23 Emissions from HCFC-22 Production	HiGWP	6.9	•	L ₁ T ₁	19901
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	129.4	•	$L_1 \; T_1 \; L_2 \; T_2$	2012
N ₂ O Emissions from Product Uses	N_2O	4.4			
N ₂ O Emissions from Adipic Acid Production	N_2O	5.8	•	T ₁	
N ₂ O Emissions from Nitric Acid Production	N_2O	15.3			
Consumption					
CH ₄ Emissions from Silicon Carbide Production and	CH ₄	+			
CH ₄ Emissions from Ferroalloy Production	CH ₄	+			
CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	0.6			
CH ₄ Emissions from Petrochemical Production	CH ₄	3.1 0.6			
Consumption	CH.	2 1			
CO ₂ Emissions from Silicon Carbide Production and	CO_2	0.2			
CO ₂ Emissions from Lead Production	CO_2	0.5			
CO ₂ Emissions from Phosphoric Acid Production	CO_2	1.1			
CO ₂ Emissions from Glass Production	CO_2	1.2			
CO ₂ Emissions from Zinc Production	CO_2	1.4			
CO ₂ Emissions from Ferroalloy Production	CO_2	1.7			
CO ₂ Emissions from Titanium Dioxide Production	CO_2	1.7			
CO ₂ Emissions from Carbon Dioxide Consumption	CO_2	1.8			
CO ₂ Emissions from Soda Ash Production and Consumption	CO_2	2.7			
CO ₂ Emissions from Aluminum Production	CO_2	3.4			
CO ₂ Emissions from Petrochemical Production	CO_2	3.5			
CO ₂ Emissions from Urea Consumption for Non-Ag Purposes	CO_2	5.2			
CO ₂ Emissions from Limestone and Dolomite Use	CO_2	8.0			
CO ₂ Emissions from Ammonia Production	CO_2	9.4			
CO ₂ Emissions from Lime Production	CO_2	13.3			
CO ₂ Emissions from Cement Production	CO ₂	35.1	•	L ₁	1990₁, 2012₁
Coke Production			•		20121
CO ₂ Emissions from Iron and Steel Production & Metallurgical	CO ₂	54.3	•	L ₁ T ₁ L ₂ T ₂	1990,
Industrial Processes	OCVCIAI	112.0	-	Q	
Territories International Bunker Fuels ^c	Several	112.8		Q	
Non-CO ₂ Emissions from Stationary Combustion - U.S.	N_2O	0.1			
Non-CO ₂ Emissions from Stationary Combustion - Commercial	N_2O	0.3			
N ₂ O Emissions from Incineration of Waste	N_2O	0.4			
N ₂ O Emissions from Mobile Combustion: Marine	N_2O	0.5			
Non-CO ₂ Emissions from Stationary Combustion - Residential	N_2O	0.8			
N ₂ O Emissions from Mobile Combustion: Aviation	N_2O	1.4			
N ₂ O Emissions from Mobile Combustion: Other	N_2O	2.0			
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N_2O	2.4			
N ₂ O Emissions from Mobile Combustion: Road	N_2O	12.6	•	$L_1T_1L_2T_2$	1990
Generation	11/20	10.5	·	11 - 2 12	20122
Non-CO ₂ Emissions from Stationary Combustion - Electricity	V⊓4 N ₂ O	18.3	•	$T_1L_2T_2$	19902,
CH ₄ Emissions from Incineration of Waste	CH ₄	+			
CH ₄ Emissions from Mobile Combustion: Marine	CH₄	+			

					2012
CH ₄ Emissions from Rice Cultivation	CH ₄	7.4			
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3			
Direct N₂O Emissions from Agricultural Soil Management	N_2O	260.9	•	$L_1 L_2$	1990, 2012
Indirect N₂O Emissions from Applied Nitrogen	N_2O	45.7	•	$L_1 L_2$	1990, 2012
N₂O Emissions from Manure Management	N_2O	18.0			
N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.1			
Waste					
CH ₄ Emissions from Landfills	CH ₄	102.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
CH ₄ Emissions from Wastewater Treatment	CH ₄	12.8			
CH ₄ Emissions from Composting	CH ₄	1.6			
N ₂ O Emissions from Wastewater Treatment	N_2O	5.0			
N ₂ O Emissions from Composting	N_2O	1.8			
Land Use, Land Use Change, and Forestry					
CO ₂ Emissions from Land Converted to Cropland	CO ₂	6.8	•	T ₁ L ₂ T ₂	1990, 2012
CO ₂ Emissions from Grassland Remaining Grassland	CO_2	6.7	•	$L_2 T_2$	1990, 2012
CO ₂ Emissions from Liming of Agricultural Soils	CO_2	3.9			
CO ₂ Emissions from Urea Fertilization	CO_2	3.4			
CO ₂ Emissions from Wetlands Remaining Wetlands	CO_2	0.8			
CO ₂ Emissions from Land Converted to Grassland	CO_2	(8.5)			
CO ₂ Emissions from Landfilled Yard Trimmings and Food Scraps	CO ₂	(13.2)	•	$T_1L_2T_2$	19902
CO ₂ Emissions from Cropland Remaining Cropland	CO_2	(26.5)	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Urban Trees	CO_2	(88.4)	•	$L_1 T_1 L_2 T_2$	1990, 2012
CO ₂ Emissions from Changes in Forest Carbon Stocks	CO_2	(866.5)	•	L ₁ T ₁ L ₂ T ₂	1990, 2012
CH ₄ Emissions from Forest Fires	CH ₄	5.3	•	$T_1L_2T_2$	2012
N ₂ O Emissions from Forest Fires	N_2O	2.5	•	$T_1L_2T_2$	2012
N ₂ O Emissions from Settlement Soils	N_2O	.5			
N ₂ O Emissions from Forest Soils	N_2O	0.4			
N ₂ O Emissions from Wetlands Remaining Wetlands	N_2O	+			

^a For the ID criteria, L refers to a key category identified through a level assessment; T refers to a key category identified through a trend assessment and the subscripted number refers to either a Tier 1 or Tier 2 assessment (e.g., L₂ designates a source is a key category for a Tier 2 level assessment).

Evaluation of Key Categories

Level Assessment

When using a Tier 1 approach for the level assessment, a predetermined cumulative emissions threshold is used to identify key categories. When source and sink categories are sorted in order of decreasing absolute emissions, those that fall at the top of the list and cumulatively account for 95 percent of emissions are considered key categories. The 95 percent threshold in the *IPCC Good Practice Guidance* (IPCC 2000) was designed to establish a general level where the key category analysis covers approximately 75 to 92 percent of inventory uncertainty.

Including the Tier 2 approach provides additional insight into why certain source categories are considered key, and how to prioritize inventory improvements. In the Tier 2 approach, the level assessment for each category from the Tier 1 approach is multiplied by its percent relative uncertainty. If the uncertainty reported is asymmetrical, the absolute value of the larger uncertainty is used. Uncertainty is not estimated for the following sources: CO_2 emissions from stationary combustion – geothermal energy; CO_2 emissions from mobile combustion by mode of transportation; CH_4 and N_2O emissions from mobile combustion by mode of off-road transportation; and CH_4 from the incineration of waste. While CO_2 emissions from geothermal energy are included in the overall emissions estimate, they are not an official IPCC source category. As a result, there are no guidelines to associate uncertainty with the emissions estimate; therefore, an uncertainty

b If the source is a key category for both L₁ and L₂ (as designated in the ID criteria column), it is a key category for both assessments in the years provided unless noted by a subscript, in which case it is a key category only for that assessment in only that year (e.g., 1990₂ designates a source is a key category for the Tier 2 assessment only in 1990).

⁶ Emissions from these sources not included in totals.

⁺ Does not exceed 0.05 Tg CO2 Eq.

Note: Parentheses indicate negative values (or sequestration).

analysis was not conducted. The uncertainty associated with CO_2 from mobile combustion is applied to each mode's emissions estimate, and the uncertainty associated with off-road vehicle CH_4 and N_2O emissions are applied to both CH_4 and N_2O emissions from aviation, marine, and other sources. No uncertainty was associated with CH_4 emissions from waste incineration because emissions are less than 0.05 Gg CH_4 and an uncertainty analysis was not conducted. When source and sink categories are sorted in decreasing order of this calculation, those that fall at the top of the list and cumulatively account for 90 percent of emissions are considered key categories. The key categories identified by the Tier 2 level assessment may differ from those identified by the Tier 1 assessment. The final set of key categories includes all source and sink categories identified as key by either the Tier 1 or the Tier 2 assessment, keeping in mind that the two assessments are not mutually exclusive.

It is important to note that a key category analysis can be sensitive to the definitions of the source and sink categories. If a large source category is split into many subcategories, then the subcategories may have contributions to the total inventory that are too small for those source categories to be considered key. Similarly, a collection of small, non-key source categories adding up to less than 5 percent of total emissions could become key source categories if those source categories were aggregated into a single source category. The United States has attempted to define source and sink categories by the conventions which would allow comparison with other international key categories, while still maintaining the category definitions that constitute how the emissions estimates were calculated for this report. As such, some of the category names used in the key category analysis may differ from the names used in the main body of the report. Additionally, the United States accounts for some source categories, including fossil fuel feedstocks, international bunkers, and emissions from U.S. territories, that are derived from unique data sources using country-specific methodologies.

Table A- 4 through Table A- 7 contain the 1990 and 2012 level assessments for both with and without LULUCF sources and sinks, and contain further detail on where each source falls within the analysis. Tier 1 key categories are shaded dark gray. Additional key categories identified by the Tier 2 assessment are shaded light gray.

Trend Assessment

The Tier 1 approach for trend assessment is defined as the product of the source or sink category level assessment and the absolute difference between the source or sink category trend and the total trend. In turn, the source or sink category trend is defined as the change in emissions from the base year to the current year, as a percentage of current year emissions from that source or sink category. The total trend is the percentage change in total inventory emissions from the base year to the current year.

Thus, the source or sink category trend assessment will be large if the source or sink category represents a large percentage of emissions and/or has a trend that is quite different from the overall inventory trend. To determine key categories, the trend assessments are sorted in decreasing order, so that the source or sink categories with the highest trend assessments appear first. The trend assessments are summed until the threshold of 95 percent is reached; all categories that fall within that cumulative 95 percent are considered key categories.

For the Tier 2 approach, the trend assessment for each category from the Tier 1 approach is multiplied by its percent relative uncertainty. If the uncertainty reported is asymmetrical, the larger uncertainty is used. When source and sink categories are sorted in decreasing order of this calculation, those that fall at the top of the list and cumulatively account for 90 percent of emissions are considered key categories. The key categories identified by the Tier 2 trend assessment may differ from those identified by the Tier 1 assessment. The final set of key categories includes all source and sink categories identified as key by either the Tier 1 or the Tier 2 assessment, keeping in mind that the two assessments are not mutually exclusive.

Table A- 8 and Table A- 9 contain the 1990 through 2012 trend assessment for both with and without LULUCF sources and sinks, and contain further detail on where each source falls within the analysis. Tier 1 key categories are shaded dark gray. Additional key categories identified by the Tier 2 assessment are shaded light gray.

45 Table A-4: 1990 Key Source Category Tier 1 and Tier 2 Analysis—Level Assessment, without LULUCF

		1990 Estimate	Tier 1 Level	Cumulative		Tier 2 Level
IPCC Source Categories	Direct GHG	(Tg CO ₂ Eq.)	Assessment	Total	Uncertainty	Assessment
CO ₂ Emissions from Stationary Combustion - Coal - Electricity	CO ₂	1,547.6	0.25	0.25	10%	0.024
Generation						
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	1,188.9	0.19	0.44	8%	0.016
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO ₂	408.9	0.07	0.51	10%	0.007
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	280.9	0.05	0.55	20%	0.009
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	240.7	0.04	0.59	28%	0.011

CO. Emissions from Stationary Combustion. Co. Posidential	CO-	230 U	0.04	0.62	70/	0.003
CO ₂ Emissions from Stationary Combustion - Gas - Residential CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂ CO ₂	238.0 187.4	0.04 0.03	0.63 0.66	7% 8%	0.003 0.002
CO ₂ Emissions from Stationary Combustion - Gas - Electricity	CO ₂	175.3	0.03	0.69	5%	0.002
Generation	002	175.5	0.03	0.03	370	0.001
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	155.3	0.02	0.71	17%	0.004
Fugitive Emissions from Natural Gas Systems	CH ₄	152.9	0.02	0.74	30%	0.007
CH ₄ Emissions from Landfills	CH ₄	147.8	0.02	0.76	56%	0.013
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	142.1	0.02	0.78	7%	0.002
CH ₄ Emissions from Enteric Fermentation	CH ₄	137.9	0.02	0.80	18%	0.004
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	120.8	0.02	0.82	36%	0.007
CO ₂ Emissions from Iron and Steel Production & Metallurgical	CO ₂	99.8	0.02	0.84	17%	0.003
Coke Production				2.22	•••	
CO ₂ Emissions from Stationary Combustion - Oil - Electricity	CO ₂	97.5	0.02	0.86	9%	0.001
Generation CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	97.4	0.02	0.87	6%	0.001
Fugitive Emissions from Coal Mining	CH ₄	81.1	0.02	0.88	16%	0.002
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	73.3	0.01	0.90	8%	0.002
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	64.9	0.01	0.91	5%	0.001
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	44.5	0.01	0.91	8%	0.001
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	41.4	0.01	0.92	151%	0.001
N ₂ O Emissions from Mobile Combustion: Road	N ₂ O	40.3	0.01	0.93	27%	0.002
CO ₂ Emissions from Natural Gas Systems	CO ₂	37.7	0.01	0.93	30%	0.002
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	0.01	0.94	10%	0.001
Fugitive Emissions from Petroleum Systems	CH ₄	35.8	0.01	0.95	149%	0.009
CO ₂ Emissions from Cement Production	CO ₂	33.3	0.01	0.95	6%	<0.001
CH ₄ Emissions from Manure Management	CH ₄	31.5	0.01	0.96	20%	0.001
CO ₂ Emissions from Stationary Combustion - Oil - U.S.	CO ₂	27.2	<0.01	0.96	11%	<0.001
Territories	-					
SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	26.7	<0.01	0.96	25%	0.001
PFC Emissions from Aluminum Production	PFCs	18.4	< 0.01	0.97	6%	< 0.001
N ₂ O Emissions from Nitric Acid Production	N_2O	18.2	< 0.01	0.97	41%	0.001
N ₂ O Emissions from Adipic Acid Production	N_2O	15.8	<0.01	0.97	4%	< 0.001
N ₂ O Emissions from Manure Management	N_2O	14.4	< 0.01	0.97	24%	0.001
CH ₄ Emissions from Wastewater Treatment	CH ₄	13.2	< 0.01	0.98	27%	0.001
CO ₂ Emissions from Ammonia Production	CO_2	13.0	<0.01	0.98	7%	< 0.001
CO ₂ Emissions from Stationary Combustion - Coal -	CO ₂	12.0	<0.01	0.98	15%	<0.001
Commercial						
CO ₂ Emissions from Lime Production	CO ₂	11.4	<0.01	0.98	3%	<0.001
CO ₂ Emissions from Incineration of Waste	CO ₂	8.0	<0.01	0.98	14%	<0.001
CH ₄ Emissions from Rice Cultivation	CH ₄	7.7	<0.01	0.99	96%	0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity	N ₂ O	7.4	<0.01	0.99	173%	0.002
Generation CO ₂ Emissions from Aluminum Production	CO ₂	6.8	<0.01	0.99	2%	<0.001
Fugitive Emissions from Abandoned Underground Coal Mines	CO ₂ CH ₄	6.0	<0.01	0.99	2%	<0.001
SF ₆ Emissions from Magnesium Production and Processing	SF ₆	5.4	<0.01	0.99	12%	<0.001
CO ₂ Emissions from Limestone and Dolomite Use	CO ₂	4.9	<0.01	0.99	20%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄	4.9	<0.01	0.99	20 %	0.001
N ₂ O Emissions from Product Uses	N ₂ O	4.4	<0.01	0.99	24%	<0.002
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	4.2	<0.01	0.99	16%	<0.001
CO ₂ Emissions from Urea Consumption for Non-Ag Purposes	CO ₂	3.8	<0.01	0.99	10%	<0.001
N ₂ O Emissions from Wastewater Treatment	N ₂ O	3.5	<0.01	0.99	100%	0.001
CO ₂ Emissions from Petrochemical Production	CO ₂	3.4	<0.01	0.99	27%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N ₂ O	3.4	<0.01	0.99	217%	0.001
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	3.0	<0.01	0.99	15%	<0.001
002 Emissions from Stationary Combustion - Coal - Residential	002	5.0	~ 0.01	0.33	13/0	~0.00 i

PFC, HFC, and SF ₆ Emissions from Semiconductor Manufacture	Several	2.9	<0.01	0.99	5%	<0.001
CO ₂ Emissions from Soda Ash Production and Consumption	CO_2	2.7	< 0.01	1.00	6%	< 0.001
CH ₄ Emissions from Petrochemical Production	CH ₄	2.3	<0.01	1.00	10%	<0.001
CO ₂ Emissions from Ferroalloy Production	CO ₂	2.2	<0.01	1.00	12%	<0.001
N ₂ O Emissions from Mobile Combustion: Aviation	N ₂ O	1.8	<0.01	1.00	2%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH ₄	1.6	<0.01	1.00	50%	<0.001
CO ₂ Emissions from Phosphoric Acid Production	CO ₂	1.6	<0.01	1.00	21%	<0.001
CO ₂ Emissions from Glass Production	CO ₂	1.5	<0.01	1.00	5%	<0.001
CO ₂ Emissions from Carbon Dioxide Consumption	CO ₂	1.4	<0.01	1.00	40%	<0.001
N ₂ O Emissions from Mobile Combustion: Other	N ₂ O	1.3	<0.01	1.00	1%	<0.001
CO ₂ Emissions from Titanium Dioxide Production	CO ₂	1.2	<0.01	1.00	13%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Residential	N ₂ O	1.1	<0.01	1.00	201%	< 0.001
CH ₄ Emissions from Iron and Steel Production & Metallurgical	CH ₄	1.0	<0.01	1.00	22%	<0.001
Coke Production	O1 14	1.0	١٥.٥١	1.00	22 /0	10.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	CH ₄	0.9	<0.01	1.00	143%	< 0.001
CO ₂ Emissions from Stationary Combustion - Coal - U.S. Territories	CO ₂	0.6	<0.01	1.00	19%	<0.001
CO ₂ Emissions from Zinc Production	CO ₂	0.6	<0.01	1.00	17%	<0.001
N ₂ O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	28%	<0.001
CO ₂ Emissions from Lead Production	CO ₂	0.5	<0.01	1.00	15%	<0.001
N ₂ O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	317%	< 0.001
CO ₂ Emissions from Stationary Combustion - Geothermal Energy	CO ₂	0.4	<0.01	1.00	NA	<0.001
CO ₂ Emissions from Petroleum Systems	CO ₂	0.4	<0.01	1.00	149%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	80%	<0.001
CO ₂ Emissions from Silicon Carbide Production and Consumption	CO ₂	0.4	<0.01	1.00	9%	<0.001
N₂O Emissions from Composting	N_2O	0.4	<0.01	1.00	50%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	CH ₄	0.3	<0.01	1.00	42%	<0.001
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	<0.01	1.00	13%	<0.001
CH ₄ Emissions from Composting	CH ₄	0.3	<0.01	1.00	50%	<0.001
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.3	<0.01	1.00	1%	< 0.001
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3	<0.01	1.00	42%	< 0.001
N₂O Emissions from Field Burning of Agricultural Residues	N_2O	0.1	<0.01	1.00	32%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S.	N_2O	0.1	<0.01	1.00	204%	< 0.001
Territories						
CH ₄ Emissions from Mobile Combustion: Aviation	CH ₄	0.1	<0.01	1.00	8%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S.	CH₄	+	<0.01	1.00	57%	<0.001
Territories	CII		z0.01	1.00	00/	-0.001
CH ₄ Emissions from Silicon Carbide Production and Consumption	CH₄	+	<0.01	1.00	9%	<0.001
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	<0.01	1.00	7%	< 0.001
CH ₄ Emissions from Ferroalloy Production	CH₄	+	<0.01	1.00	11%	<0.001
CH ₄ Emissions from Incineration of Waste	CH ₄	+	<0.01	1.00	NE	<0.001
CO ₂ Emissions from Stationary Combustion - Gas - U.S.	CO ₂	+	<0.01	1.00	17%	<0.001
Territories Note: LTILLICE sources and sinks are not included in this analysis						

Territories

Note: LULUCF sources and sinks are not included in this analysis.

Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive.

NE Uncertainty not estimated.

+ Does not exceed 0.05 Tg CO₂ Eq.

 $\scriptstyle 1$ Table A- 5: 1990 Key Source Category Tier 1 and Tier 2 Analysis—Level Assessment, with LULUCF

Table A C. 1330 key coulde category flor I and flor 2 Am	,0.0 1010	1990 Estimate		Cumulative		Tier 2 Level
IPCC Source Categories	Direct GHG	(Tg CO ₂ Eq.)		Total	Uncertainty	Assessment
CO ₂ Emissions from Stationary Combustion - Coal - Electricity Generation	CO ₂	1,547.6	0.22	0.22	10%	0.021
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	1,188.9	0.17	0.38	8%	0.014
CO ₂ Emissions from Changes in Forest Carbon Stocks	CO ₂	704.6	0.10	0.48	15%	0.015
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO ₂	408.9	0.06	0.54	10%	0.006
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	280.9	0.04	0.58	20%	0.008
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	240.7	0.03	0.61	28%	0.010
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	238.0	0.03	0.65	7%	0.002
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	187.4	0.03	0.67	8%	0.002
CO ₂ Emissions from Stationary Combustion - Gas - Electricity	CO ₂	175.3	0.03	0.70	5%	0.002
Generation	CO ₂	175.5	0.02	0.70	370	0.001
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	155.3	0.02	0.72	17%	0.004
Fugitive Emissions from Natural Gas Systems	CH ₄	152.9	0.02	0.74	30%	0.006
CH ₄ Emissions from Landfills	CH ₄	147.8	0.02	0.76	56%	0.012
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	142.1	0.02	0.78	7%	0.001
CH ₄ Emissions from Enteric Fermentation	CH ₄	137.9	0.02	0.80	18%	0.003
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	120.8	0.02	0.82	36%	0.006
CO ₂ Emissions from Iron and Steel Production & Metallurgical	CO ₂	99.8	0.01	0.83	17%	0.002
Coke Production CO ₂ Emissions from Stationary Combustion - Oil - Electricity	CO ₂	97.5	0.01	0.85	9%	0.002
Generation	002	97.5	0.01	0.03	370	0.001
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	97.4	0.01	0.86	6%	0.001
Fugitive Emissions from Coal Mining	CH ₄	81.1	0.01	0.87	16%	0.002
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	73.3	0.01	0.88	8%	0.001
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	64.9	0.01	0.89	5%	<0.001
CO ₂ Emissions from Urban Trees	CO ₂	60.4	0.01	0.90	47%	0.004
CO ₂ Emissions from Cropland Remaining Cropland	CO ₂	51.9	0.01	0.91	167%	0.012
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	44.5	0.01	0.91	8%	0.001
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	41.4	0.01	0.92	151%	0.009
N ₂ O Emissions from Mobile Combustion: Road	N ₂ O	40.3	0.01	0.93	27%	0.002
CO ₂ Emissions from Natural Gas Systems	CO ₂	37.7	0.01	0.93	30%	0.002
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	0.01	0.94	10%	0.001
Fugitive Emissions from Petroleum Systems	CH ₄	35.8	0.01	0.94	149%	0.007
CO ₂ Emissions from Cement Production	CO ₂	33.3	<0.01	0.95	6%	<0.001
CH ₄ Emissions from Manure Management	CH ₄	31.5	<0.01	0.95	20%	0.001
CO ₂ Emissions from Stationary Combustion - Oil - U.S.	CO ₂	27.2	<0.01	0.95	11%	<0.001
Territories						
CO ₂ Emissions from Land Converted to Cropland	CO ₂	26.9	<0.01	0.96	77%	0.003
SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	26.7	<0.01	0.96	25%	0.001
CO ₂ Emissions from Landfilled Yard Trimmings and Food Scraps	CO ₂	24.2	<0.01	0.96	60%	0.002
PFC Emissions from Aluminum Production	PFCs	18.4	<0.01	0.97	6%	<0.001
N ₂ O Emissions from Nitric Acid Production	N_2O	18.2	<0.01	0.97	41%	0.001
N ₂ O Emissions from Adipic Acid Production	N_2O	15.8	<0.01	0.97	4%	<0.001
N₂O Emissions from Manure Management	N_2O	14.4	<0.01	0.97	24%	< 0.001
CH ₄ Emissions from Wastewater Treatment	CH ₄	13.2	<0.01	0.98	27%	0.001
CO ₂ Emissions from Ammonia Production	CO ₂	13.0	<0.01	0.98	7%	<0.001
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂	12.0	<0.01	0.98	15%	<0.001
CO ₂ Emissions from Lime Production	CO ₂	11.4	<0.01	0.98	3%	<0.001
CO ₂ Emissions from Grassland Remaining Grassland	CO ₂	9.6	<0.01	0.98	529%	0.007

CO. Emissions from Insignation of Wests	00	0.0	-0.01	0.00	4.40/	-0.001
CO ₂ Emissions from Incineration of Waste	CO₂ CH₄	8.0	<0.01 <0.01	0.98 0.98	14% 96%	<0.001 0.001
CH ₄ Emissions from Rice Cultivation	U⊓₄ N₂O	7.7 7.4	<0.01	0.98	96% 173%	0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	IN ₂ O	7.4	\0.01	0.99	173%	0.002
CO ₂ Emissions from Land Converted to Grassland	CO_2	7.3	<0.01	0.99	108%	0.001
CO ₂ Emissions from Aluminum Production	CO_2	6.8	<0.01	0.99	2%	< 0.001
Fugitive Emissions from Abandoned Underground Coal Mines	CH ₄	6.0	<0.01	0.99	26%	< 0.001
SF ₆ Emissions from Magnesium Production and Processing	SF ₆	5.4	<0.01	0.99	12%	< 0.001
CO ₂ Emissions from Limestone and Dolomite Use	CO_2	4.9	<0.01	0.99	20%	< 0.001
CO ₂ Emissions from Liming of Agricultural Soils	CO_2	4.7	<0.01	0.99	106%	0.001
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄	4.6	<0.01	0.99	225%	0.001
N₂O Emissions from Product Uses	N_2O	4.4	<0.01	0.99	24%	< 0.001
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	4.2	<0.01	0.99	16%	< 0.001
CO ₂ Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	<0.01	0.99	10%	< 0.001
N ₂ O Emissions from Wastewater Treatment	N_2O	3.5	<0.01	0.99	100%	< 0.001
CO ₂ Emissions from Petrochemical Production	CO ₂	3.4	<0.01	0.99	27%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N_2O	3.3	<0.01	0.99	211%	0.001
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	3.0	<0.01	0.99	15%	< 0.001
PFC, HFC, and SF ₆ Emissions from Semiconductor	Several	2.9	<0.01	0.99	5%	<0.001
Manufacture	00	0.7	10.04	1.00	C 0/	-0.004
CO ₂ Emissions from Soda Ash Production and Consumption	CO ₂	2.7	<0.01	1.00	6%	<0.001
CH ₄ Emissions from Forest Fires	CH ₄	2.5	<0.01	1.00	176%	0.001
CO ₂ Emissions from Urea Fertilization	CO ₂	2.4	<0.01	1.00	43%	<0.001
CH ₄ Emissions from Petrochemical Production	CH₄	2.3	<0.01	1.00	10%	<0.001
CO ₂ Emissions from Ferroalloy Production	CO ₂	2.2	<0.01	1.00	12%	<0.001
N ₂ O Emissions from Forest Fires	N ₂ O	2.0	<0.01	1.00	144%	<0.001
N ₂ O Emissions from Mobile Combustion: Aviation	N ₂ O	1.8	<0.01	1.00	2%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH ₄	1.6	<0.01	1.00	50%	<0.001
CO ₂ Emissions from Phosphoric Acid Production	CO ₂	1.6	<0.01	1.00	21%	<0.001
CO ₂ Emissions from Glass Production	CO ₂	1.5	<0.01	1.00	5%	<0.001
CO ₂ Emissions from Carbon Dioxide Consumption	CO ₂	1.4	<0.01	1.00	40%	<0.001
N ₂ O Emissions from Mobile Combustion: Other	N ₂ O	1.3	<0.01	1.00	1%	<0.001
CO ₂ Emissions from Titanium Dioxide Production	CO ₂	1.2	<0.01	1.00	13%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Residential	N_2O	1.1	<0.01	1.00	201%	<0.001
CO ₂ Emissions from Wetlands Remaining Wetlands	CO ₂	1.0	<0.01	1.00	30%	<0.001
N ₂ O Emissions from Settlement Soils	N_2O	1.0	<0.01	1.00	163%	<0.001
CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	1.0	<0.01	1.00	22%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	CH ₄	0.9	<0.01	1.00	143%	< 0.001
CO ₂ Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	0.6	<0.01	1.00	19%	<0.001
CO ₂ Emissions from Zinc Production	CO ₂	0.6	<0.01	1.00	17%	<0.001
N ₂ O Emissions from Mobile Combustion: Marine	N ₂ O	0.6	<0.01	1.00	28%	<0.001
CO ₂ Emissions from Lead Production	CO ₂	0.5	<0.01	1.00	15%	<0.001
N ₂ O Emissions from Incineration of Waste	N ₂ O	0.5	<0.01	1.00	317%	<0.001
CO ₂ Emissions from Stationary Combustion - Geothermal Energy	CO ₂	0.4	<0.01	1.00	NA	<0.001
CO ₂ Emissions from Petroleum Systems	CO_2	0.4	<0.01	1.00	149%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	80%	<0.001
CO ₂ Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	<0.01	1.00	9%	<0.001
N₂O Emissions from Composting	N_2O	0.4	<0.01	1.00	50%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity	CH ₄	0.3	<0.01	1.00	42%	<0.001
Generation		-	-			

Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	<0.01	1.00	13%	<0.001
CH ₄ Emissions from Composting	CH ₄	0.3	<0.01	1.00	50%	<0.001
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.3	<0.01	1.00	1%	<0.001
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3	<0.01	1.00	42%	<0.001
N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.1	<0.01	1.00	32%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S.	N_2O	0.1	<0.01	1.00	204%	<0.001
Territories						
N ₂ O Emissions from Forest Soils	N_2O	0.1	<0.01	1.00	211%	<0.001
CH ₄ Emissions from Mobile Combustion: Aviation	CH ₄	0.1	<0.01	1.00	8%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S.	CH ₄	+	<0.01	1.00	57%	< 0.001
Territories						
CH ₄ Emissions from Silicon Carbide Production and	CH ₄	+	<0.01	1.00	9%	<0.001
Consumption						
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	<0.01	1.00	7%	<0.001
CH ₄ Emissions from Ferroalloy Production	CH ₄	+	<0.01	1.00	11%	< 0.001
N ₂ O Emissions from Wetlands Remaining Wetlands	N_2O	+	<0.01	1.00	73%	< 0.001
CH ₄ Emissions from Incineration of Waste	CH ₄	+	<0.01	1.00	NE	< 0.001
CO ₂ Emissions from Stationary Combustion - Gas - U.S. Territories	CO ₂	+	<0.01	1.00	17%	<0.001

^a Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive. NE Uncertainty not estimated.

Table A- 6: 2012 Key Source Category Tier 1 and Tier 2 Analysis—Level Assessment, without LULUCF

		2012 Estimate	Tier 1 Level	Cumulative		Tier 2 Level
IPCC Source Categories	Direct GHG	(Tg CO ₂ Eq.)	Assessment	Total	Uncertainty	Assessment
CO ₂ Emissions from Stationary Combustion - Coal -	CO ₂	1,512.2	0.23	0.23	10%	0.023
Electricity Generation						
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	1,469.8	0.23	0.46	8%	0.018
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	492.2	0.08	0.54	5%	0.004
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO ₂	428.5	0.07	0.60	10%	0.007
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	267.0	0.04	0.65	20%	0.008
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	260.9	0.04	0.69	28%	0.011
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	225.8	0.03	0.72	7%	0.002
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	157.0	0.02	0.74	7%	0.002
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	145.1	0.02	0.77	8%	0.002
CH ₄ Emissions from Enteric Fermentation	CH ₄	141.0	0.02	0.79	18%	0.004
Emissions from Substitutes for Ozone Depleting Substances	Several	129.4	0.02	0.81	13%	0.003
Fugitive Emissions from Natural Gas Systems	CH ₄	127.1	0.02	0.83	30%	0.006
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	110.6	0.02	0.85	36%	0.006
CH ₄ Emissions from Landfills	CH ₄	102.8	0.02	0.86	56%	0.009
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	83.9	0.01	0.87	8%	0.001
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	74.3	0.01	0.89	17%	0.002
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	63.7	0.01	0.90	6%	0.001
Fugitive Emissions from Coal Mining	CH ₄	55.8	0.01	0.90	16%	0.001
CO ₂ Emissions from Iron and Steel Production & Metallurgical Coke Production	CO ₂	54.3	0.01	0.91	17%	0.001
CH ₄ Emissions from Manure Management	CH ₄	52.9	0.01	0.92	20%	0.002

⁺ Does not exceed 0.05 Tg CO_2 Eq.

Indirect No Emissions from Applied Nitrogen No 45.7 0.01 0.94 11% 0.001							
Territories COp. Emissions from Stationary Combustion - Oil -	Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	45.7	0.01	0.93	151%	0.011
CO2	· ·	CO ₂	44.7	0.01	0.94	11%	0.001
Constitution Coperation		00	22.2	0.04	2.24	5 0/	0.004
CO2	-	CO_2	36.8	0.01	0.94	5%	<0.001
CO2		CO_0	36.6	0.01	0.05	Q0/ ₂	<0.001
CO2							
Fugitive Emissions from Petroleum Systems							
CO2							
Generation Nor-OC Emissions from Stationary Combustion - Electricity Nor-OC Emissions from Manure Management Nor-OC 18.0 < 0.01 0.97 24% 0.001	•						
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generalizon N2O		CO_2	10.0	<0.01	0.97	9%	<0.001
		N ₂ O	18.3	< 0.01	0.97	173%	0.005
N2O Emissions from Nitric Acid Production N2O 15.3 <0.01 0.97 41% 0.001 CQ2 Emissions from Lime Production CQ2 13.3 <0.01							
CO₂ Emissions from Lime Production CO₂ 13.3 <0.01 0.98 3% <0.001 CH₂ Emissions from Wastewater Treatment CH₄ 12.8 <0.01	N ₂ O Emissions from Manure Management	N ₂ O	18.0	<0.01	0.97	24%	0.001
CO₂ Emissions from Lime Production CO₂ 13.3 <0.01 0.98 3% <0.001 CH₂ Emissions from Wastewater Treatment CH₄ 12.8 <0.01	N ₂ O Emissions from Nitric Acid Production	N ₂ O	15.3	< 0.01	0.97	41%	0.001
CHL Emissions from Wastewater Treatment N≥O Emissions from Mobile Combustion: Road N≥O 12.6 0.01 0.98 27% 0.001 N≥O Emissions from Mobile Combustion: Road N≥O 12.6 0.01 0.98 27% 0.001 CO₂ Emissions from Mobile Combustion: Road N≥O 12.1 0.01 0.98 14% 0.001 CO₂ Emissions from Ammonia Production CO₂ 0.02 0.01 0.98 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.99 0.001 0.9							
N₂O Emissions from Mobile Combustion: Road N₂O 12.6 <0.01 0.98 27% 0.001 CO₂ Emissions from Incineration of Waste CO₂ 12.1 <0.01							
CO₂ Emissions from Incineration of Waste CO₂ 12.1 <0.01 0.98 14% <0.001 CO₂ Emissions from Ammonia Production CO₂ 9.4 <0.01							
CO₂ Emissions from Ammonia Production CO₂ Emissions from Limestone and Dolomite Use CO₂ Emissions from Limestone and Dolomite Use CO₂ Emissions from Rice Cultivation CO₂ Emissions from Adipic Acid Production SF6 6.0 <0.01 0.99 10% <0.001 N₂O Emissions from Adipic Acid Production N₂O 5.8 <0.01							
CO₂ Emissions from Limestone and Dolomite Use CO₂ 8.0 <0.01 0.98 20% <0.001 CH₂ Emissions from Rice Cultivation CH₄ 7.4 <0.01							
CH₄ Emissions from Rice Cultivation CH₄ 7.4 <0.01 0.98 96% 0.001 HFC-23 Emissions from HCFC-22 Production HFCs 6.9 <0.01							
HFC-23 Emissions from HCFC-22 Production Fe Emissions from Electrical Transmission and Distribution Fe Emissions from Belectrical Transmission and Distribution N₂O Emissions from Adipic Acid Production N₂O Emissions from Adipic Acid Production N₂O Emissions from Matipic Acid Production N₂O Emissions from Matipic Acid Production N₂O Emissions from Matipic Acid Production N₂O Emissions from Wastewater Treatment N₂O S.0 N₂O Emissions from Wastewater Treatment N₂O S.0 N₂O Emissions from Matewater Treatment N₂O S.0 N₂O Emissions from Matipic							
SF6 Emissions from Electrical Transmission and Distribution N2O 5.8 <0.01 0.99 25% <0.001 N2O Emissions from Adipic Acid Production N2O 5.8 <0.01 0.99 4% <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001 <0.001							
N₂O Emissions from Adipic Acid Production N₂O 5.8 <0.01 0.99 4% <0.001 CO₂ Emissions from Urea Consumption for Non-Ag CO₂ 5.2 <0.01							
CO₂ Emissions from Urea Consumption for Non-Ag CO₂ 5.2 <0.01 0.99 10% <0.001 Purposes N₂O Emissions from Wastewater Treatment N₂O 5.0 <0.01							
Purposes N₂O Emissions from Wastewater Treatment N₂O Emissions from Wastewater Treatment N₂O Emissions from Wastewater Treatment N₂O Emissions from Abandoned Underground Coal Mines N₂O Emissions from Product Uses N₂O Emissions from Stationary Combustion - Coal - CO₂ 4.1 CO₂ Emissions from Stationary Combustion - Coal - CO₂ Co₂ Emissions from Stationary Combustion - Coal - Co₂ Emissions from Petrochemical Production CO₂ Emissions from Petrochemical Production CO₂ Emissions from Petrochemical Production CO₂ Emissions from Stationary Combustion - Coal - U.S. CO₂ Emissions from Stationary Combustion - Coal - U.S. CO₂ Emissions from Stationary Combustion NaO CO₂ Emissions from Stationary Combustion NaO CO₂ Emissions from Stationary Combustion NaO CO₂ Emissions from Stationary Combustion CO₂ Emissions from Carbon Dioxide Consumption CO₂ Emissions from Titanium Dioxide Production CO₂ Emissions from Ferroalloy Production and Processing SF6 1.7 CO₂ Emissions from Ferroalloy Production CO₂	·						
N2O Emissions from Wastewater Treatment N2O 5.0 <0.01 0.99 100% 0.001 Fugitive Emissions from Abandoned Underground Coal CH4 4.7 <0.01		CO_2	5.2	\0.01	0.99	10 76	~ 0.001
Fugitive Emissions from Abandoned Underground Coal Mines N₂O A.4 4.7 4.0 0.99 26% <0.001 Mines N₂O Emissions from Product Uses N₂O A.4 4.4 <0.01 0.99 24% <0.001 CO₂ Emissions from Stationary Combustion - Coal - CO₂ A.1 4.0 0.01 0.99 15% <0.001 Commercial PFC, HFC, and SF₀ Emissions from Semiconductor Several 3.7 4.0 0.99 5% <0.001 Manufacture CO₂ Emissions from Petrochemical Production CO₂ 3.5 4.0 0.99 27% <0.001 CO₂ Emissions from Aluminum Production CO₂ 3.4 4.0 0.99 2% <0.001 CO₂ Emissions from Stationary Combustion - Coal - U.S. CO₂ 3.4 4.0 0.99 2% 4.0 0.001 CO₂ Emissions from Stationary Combustion - Coal - U.S. CO₂ 3.4 4.0 0.99 19% 4.0 0.001 CO₂ Emissions from Stationary Combustion - CH₄ 3.1 4.0 0.99 225% 0.001 CO₂ Emissions from Stationary Combustion - CH₄ 3.1 4.0 0.99 225% 0.001 CO₂ Emissions from Petrochemical Production CH₄ 3.1 4.0 0.99 6% 4.0 0.001 CO₂ Emissions from Stationary Combustion - CO₂ 2.7 4.0 0.99 6% 4.0 0.001 CO₂ Emissions from Aluminum Production PFC S 2.5 4.0 0.99 6% 4.0 0.001 CO₂ Emissions from Aluminum Production PFC S 2.5 4.0 0.01 0.99 6% 4.0 0.001 CO₂ Emissions from Mobile Combustion - Industrial N₂O 2.4 4.0 0.1 0.001		N ₂ O	5.0	< 0.01	0.99	100%	0.001
Mines N₂O Emissions from Product Uses N₂O 4.4 <0.01 0.99 24% <0.001 CO₂ Emissions from Stationary Combustion - Coal - Commercial PFC, HFC, and SF₀ Emissions from Semiconductor Several 3.7 <0.01							
CO2 Emissions from Stationary Combustion - Coal - CO2 4.1 <0.01 0.99 15% <0.001 Commercial PFC, HFC, and SF ₆ Emissions from Semiconductor Several 3.7 <0.01	•						
Commercial PFC, HFC, and SF ₆ Emissions from Semiconductor Several 3.7 <0.01 0.99 5% <0.001 Manufacture CO₂ Emissions from Petrochemical Production CO₂ 3.5 <0.01	N ₂ O Emissions from Product Uses	N_2O	4.4	<0.01	0.99	24%	<0.001
PFC, HFC, and SF ₆ Emissions from Semiconductor Several Manufacture 3.7 <0.01 0.99 5% <0.001 CO ₂ Emissions from Petrochemical Production CO ₂ 3.5 <0.01		CO_2	4.1	<0.01	0.99	15%	<0.001
Manufacture CO₂ Emissions from Petrochemical Production CO₂ 3.5 <0.01 0.99 27% <0.001 CO₂ Emissions from Aluminum Production CO₂ 3.4 <0.01				0.04		-0/	
CO2 Emissions from Petrochemical Production CO2 Semissions from Aluminum Production CO2 Semissions from Stationary Combustion - Coal - U.S. CO2 Semissions from Stationary Combustion - Coal - U.S. CO2 Semissions From Stationary Combustion - Coal - U.S. CO2 Semissions From Stationary Combustion - Coal - U.S. CO2 Semissions From Stationary Combustion - Coal - U.S. CO2 Semissions From Stationary Combustion - Coal - U.S. CO2 Semissions From Stationary Combustion - Coal - U.S. CO3 Semissions From Stationary Combustion - Coal - U.S. CO3 Semissions From Stationary Combustion - Coal - U.S. CO3 Semissions From Stationary Combustion - Industrial N2O Semissions From Stationary Combustion - Industrial N2O Semissions From Stationary Combustion - Industrial N2O Semissions From Mobile Combustion: Other N2O Semissions From Carbon Dioxide Consumption Semismory Coal Semissions From Magnesium Production Semismory Semismory Coal Semissions From Magnesium Production Semismory Coal Semissions From Magnesium Production CO2 Semissions From Ferroalloy Production CO2 Semissions From Ferroalloy Production CO3 Semissions From Ferroalloy Production CO4 Semissions Fro		Several	3.7	<0.01	0.99	5%	<0.001
CO2 Emissions from Aluminum Production CO2 3.4 <0.01		CO_0	3.5	<0.01	0.00	27%	<0.001
CO2 Emissions from Stationary Combustion - Coal - U.S. CO2 3.4 <0.01 0.99 19% <0.001 Territories Non-CO2 Emissions from Stationary Combustion - CH4 3.1 <0.01							
Territories Non-CO₂ Emissions from Stationary Combustion - Residential CH₄ 3.1 <0.01 0.99 225% 0.001 CH₄ Emissions from Petrochemical Production CH₄ 3.1 <0.01							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		CO ₂	5.4	\0.01	0.55	1970	\0.001
Residential CH ₄ Emissions from Petrochemical Production CH ₄ 3.1 <0.01 0.99 10% <0.001 CO ₂ Emissions from Soda Ash Production and CO ₂ 2.7 <0.01 0.99 6% <0.001 Consumption PFC Emissions from Aluminum Production PFCs 2.5 <0.01 1.00 6% <0.001 Non-CO ₂ Emissions from Stationary Combustion - Industrial N ₂ O 2.4 <0.01 1.00 211% 0.001 N ₂ O Emissions from Mobile Combustion: Other N ₂ O 2.0 <0.01 1.00 1% <0.001 CO ₂ Emissions from Carbon Dioxide Consumption CO ₂ 1.8 <0.01 1.00 40% <0.001 N ₂ O Emissions from Composting N ₂ O 1.8 <0.01 1.00 50% <0.001 CO ₂ Emissions from Titanium Dioxide Production CO ₂ 1.7 <0.01 1.00 13% <0.001 SF ₆ Emissions from Magnesium Production and Processing SF ₆ 1.7 <0.01 1.00 12% <0.001 CO ₂ Emissions from Ferroalloy Production CO ₂ 1.7 <0.01 1.00 12% <0.001		CH ₄	3.1	<0.01	0.99	225%	0.001
CO2 Emissions from Soda Ash Production and CO2 2.7 <0.01 0.99 6% <0.001 Consumption PFC Emissions from Aluminum Production PFCs 2.5 <0.01 1.00 6% <0.001 Non-CO2 Emissions from Stationary Combustion - Industrial N2O 2.4 <0.01 1.00 211% 0.001 N2O Emissions from Mobile Combustion: Other N2O 2.0 <0.01 1.00 1% <0.001 CO2 Emissions from Carbon Dioxide Consumption CO2 1.8 <0.01 1.00 40% <0.001 N2O Emissions from Composting N2O 1.8 <0.01 1.00 50% <0.001 CO2 Emissions from Titanium Dioxide Production CO2 1.7 <0.01 1.00 13% <0.001 SF6 Emissions from Magnesium Production and Processing SF6 1.7 <0.01 1.00 12% <0.001 CO2 Emissions from Ferroalloy Production CO2 1.7 <0.01 1.00 12% <0.001 CO2 Emissions from Ferroalloy Production CO2 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO2 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 12% <0.001 CO3 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 1.00 1.00 1.00 Emissions from Ferroalloy Production CO3 1.7 <0.01 1.00 1.00 1.00 1.00 1.00 1.00 1.0							
Consumption PFC Emissions from Aluminum Production PFCs 2.5 <0.01 1.00 6% <0.001 Non-CO2 Emissions from Stationary Combustion - Industrial N2O 2.4 <0.01 1.00 211% 0.001 N2O Emissions from Mobile Combustion: Other N2O 2.0 <0.01 1.00 1% <0.001 CO2 Emissions from Carbon Dioxide Consumption CO2 1.8 <0.01 1.00 40% <0.001 N2O Emissions from Composting N2O 1.8 <0.01 1.00 50% <0.001 CO2 Emissions from Titanium Dioxide Production CO2 1.7 <0.01 1.00 13% <0.001 SF6 Emissions from Magnesium Production and Processing SF6 1.7 <0.01 1.00 12% <0.001 CO2 Emissions from Ferroalloy Production CO2 1.7 <0.01 1.00 12% <0.001	CH ₄ Emissions from Petrochemical Production		3.1				
PFC Emissions from Aluminum Production PFCs 2.5 < 0.01 1.00 6% < 0.001 Non-CO ₂ Emissions from Stationary Combustion - Industrial N ₂ O 2.4 < 0.01 1.00 211% 0.001 N ₂ O Emissions from Mobile Combustion: Other N ₂ O 2.0 < 0.01 1.00 1% < 0.001 CO ₂ Emissions from Carbon Dioxide Consumption CO ₂ 1.8 < 0.01 1.00 40% < 0.001 N ₂ O Emissions from Composting N ₂ O 1.8 < 0.01 1.00 50% < 0.001 CO ₂ Emissions from Titanium Dioxide Production CO ₂ 1.7 < 0.01 1.00 13% < 0.001 SF ₆ Emissions from Magnesium Production and Processing SF ₆ 1.7 < 0.01 1.00 12% < 0.001 CO ₂ Emissions from Ferroalloy Production CO ₂ 1.7 < 0.01 1.00 12% < 0.001		CO_2	2.7	<0.01	0.99	6%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial N ₂ O 2.4 <0.01 1.00 211% 0.001 N ₂ O Emissions from Mobile Combustion: Other N ₂ O 2.0 <0.01 1.00 1% <0.001 CO ₂ Emissions from Carbon Dioxide Consumption CO ₂ 1.8 <0.01 1.00 40% <0.001 N ₂ O Emissions from Composting N ₂ O 1.8 <0.01 1.00 50% <0.001 CO ₂ Emissions from Titanium Dioxide Production CO ₂ 1.7 <0.01 1.00 13% <0.001 SF ₆ Emissions from Magnesium Production and Processing SF ₆ 1.7 <0.01 1.00 12% <0.001 CO ₂ Emissions from Ferroalloy Production CO ₂ 1.7 <0.01 1.00 12% <0.001				0.04		00/	
N_2O Emissions from Mobile Combustion: Other N_2O 2.0 <0.01 1.00 1% <0.001 CO ₂ Emissions from Carbon Dioxide Consumption CO_2 1.8 <0.01 1.00 40% <0.001 N_2O Emissions from Composting N_2O 1.8 <0.01 1.00 50% <0.001 CO_2 Emissions from Titanium Dioxide Production CO_2 1.7 <0.01 1.00 13% <0.001 SF_6 Emissions from Magnesium Production and Processing SF_6 1.7 <0.01 1.00 12% <0.001 CO_2 Emissions from Ferroalloy Production CO_2 1.7 <0.01 1.00 12% <0.001							
CO ₂ Emissions from Carbon Dioxide Consumption CO_2 1.8 <0.01 1.00 40% <0.001 N_2O Emissions from Composting N_2O 1.8 <0.01 1.00 50% <0.001 CO_2 Emissions from Titanium Dioxide Production CO_2 1.7 <0.01 1.00 13% <0.001 SF_6 Emissions from Magnesium Production and Processing SF_6 1.7 <0.01 1.00 12% <0.001 CO_2 Emissions from Ferroalloy Production CO_2 1.7 <0.01 1.00 12% <0.001	•						
N2O Emissions from Composting N2O 1.8 < 0.01 1.00 50% < 0.001 CO ₂ Emissions from Titanium Dioxide Production CO ₂ 1.7 < 0.01 1.00 13% < 0.001 SF ₆ Emissions from Magnesium Production and Processing SF ₆ 1.7 < 0.01 1.00 12% < 0.001 CO ₂ Emissions from Ferroalloy Production CO ₂ 1.7 < 0.01 1.00 12% < 0.001							
CO ₂ Emissions from Titanium Dioxide Production CO_2 1.7 <0.01 1.00 13% <0.001 SF_6 Emissions from Magnesium Production and Processing SF_6 1.7 <0.01 1.00 12% <0.001 CO_2 Emissions from Ferroalloy Production CO_2 1.7 <0.01 1.00 12% <0.001	·						
SF_6 Emissions from Magnesium Production and Processing SF_6 1.7 <0.01 1.00 12% <0.001 CO_2 Emissions from Ferroalloy Production CO_2 1.7 <0.01 1.00 12% <0.001	· · · · · · · · · · · · · · · · · · ·						
CO ₂ Emissions from Ferroalloy Production CO ₂ 1.7 <0.01 1.00 12% <0.001							
·							
CH ₄ Emissions from Composting CH ₄ 1.6 <0.01 1.00 50% <0.001	·						
, •	· · · · · · · · · · · · · · · · · · ·						
CO ₂ Emissions from Stationary Combustion - Gas - U.S. CO ₂ 1.4 <0.01 1.00 17% <0.001		CO_2	1.4	<0.01	1.00	17%	<0.001
Torritorios		CO_2	1 /	<0.01	1 00	17%	<0.001
Territories CO2 Emissions from Zinc Production CO3 14 < 0.01 1.00 17% < 0.001	OOZ EIIIIOOIOIIO IIOIII ZIIIC FIOUUCIIOII	002	1.4	~ U.U1	1.00	17/0	~U.UU I
Tamitaniaa		CO-	1 /	<0.01	1.00	170/	~ 0.001
Territories CO ₂ Emissions from Zinc Production CO ₂ 1.4 < 0.01 1.00 17% < 0.001	5 52 EISSISTIC HOTT EITO F TOURSHOTT	332		0.01		11.70	0.001

N ₂ O Emissions from Mobile Combustion: Aviation	N_2O	1.4	<0.01	1.00	2%	<0.001
CO ₂ Emissions from Glass Production	CO_2	1.2	<0.01	1.00	5%	<0.001
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	1.2	<0.01	1.00	16%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH ₄	1.2	<0.01	1.00	50%	<0.001
CO ₂ Emissions from Phosphoric Acid Production	CO_2	1.1	<0.01	1.00	21%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Residential	N_2O	0.8	<0.01	1.00	201%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	CH ₄	0.8	<0.01	1.00	143%	<0.001
CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	0.6	<0.01	1.00	22%	<0.001
CO ₂ Emissions from Lead Production	CO ₂	0.5	<0.01	1.00	15%	<0.001
N ₂ O Emissions from Mobile Combustion: Marine	N_2O	0.5	<0.01	1.00	28%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	CH ₄	0.5	<0.01	1.00	42%	<0.001
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.4	<0.01	1.00	1%	<0.001
CO ₂ Emissions from Petroleum Systems	CO_2	0.4	<0.01	1.00	149%	<0.001
CO ₂ Emissions from Stationary Combustion - Geothermal Energy	CO ₂	0.4	<0.01	1.00	NA	<0.001
N ₂ O Emissions from Incineration of Waste	N_2O	0.4	<0.01	1.00	317%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	N_2O	0.3	<0.01	1.00	80%	<0.001
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3	<0.01	1.00	42%	< 0.001
CO ₂ Emissions from Silicon Carbide Production and Consumption	CO ₂	0.2	<0.01	1.00	9%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	N ₂ O	0.1	<0.01	1.00	204%	<0.001
N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.1	<0.01	1.00	32%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	CH ₄	0.1	<0.01	1.00	57%	<0.001
CH ₄ Emissions from Mobile Combustion: Aviation	CH ₄	+	<0.01	1.00	8%	<0.001
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	<0.01	1.00	7%	<0.001
CH ₄ Emissions from Ferroalloy Production	CH ₄	+	<0.01	1.00	11%	<0.001
CH ₄ Emissions from Silicon Carbide Production and Consumption	CH ₄	+	<0.01	1.00	9%	<0.001
CH ₄ Emissions from Incineration of Waste	CH ₄	+	<0.01	1.00	NE	<0.001
CO ₂ Emissions from Stationary Combustion - Coal -	CO_2	+	<0.01	1.00	15%	<0.001

Residential

Note: LULUCF sources and sinks are not included in this analysis.

Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive.

NE Uncertainty not estimated. Note: LULUCF sources and sinks are not included in this analysis.

a Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and NE Uncertainty not estimated.

+ Does not exceed 0.05 Tg CO₂ Eq.

Table A-7: 2012 Key Source Category Tier 1 and Tier 2 Analysis—Level Assessment with LULUCF

2012 Tier 1

		2012	Tier 1			
		Estimate (Tg	Level	Cumulative		Tier 2 Level
IPCC Source Categories	Direct GHG	CO ₂ Eq.)	Assessment	Total	Uncertainty	Assessment
CO ₂ Emissions from Stationary Combustion - Coal -	CO ₂	1,512.2	0.20	0.20	10%	0.019
Electricity Generation						
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	1,469.8	0.20	0.40	8%	0.016
CO ₂ Emissions from Changes in Forest Carbon Stocks	CO ₂	866.5	0.12	0.51	15%	0.018
CO ₂ Emissions from Stationary Combustion - Gas -	CO ₂	492.2	0.07	0.58	5%	0.003
Electricity Generation						
CO ₂ Emissions from Stationary Combustion - Gas -	CO ₂	428.5	0.06	0.63	10%	0.006
Industrial						
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	267.0	0.04	0.67	20%	0.007

D: 1110 E : : (A : H 10 111	NO	000.0	0.00	0.70	000/	0.040
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	260.9	0.03	0.70	28%	0.010
CO ₂ Emissions from Stationary Combustion - Gas -	CO ₂	225.8	0.03	0.73	7%	0.002
Residential						
CO ₂ Emissions from Stationary Combustion - Gas -	CO ₂	157.0	0.02	0.75	7%	0.001
Commercial						
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	145.1	0.02	0.77	8%	0.002
CH ₄ Emissions from Enteric Fermentation	CH ₄	141.0	0.02	0.79	18%	0.003
Emissions from Substitutes for Ozone Depleting	Several	129.4	0.02	0.81	13%	0.002
Substances						
Fugitive Emissions from Natural Gas Systems	CH ₄	127.1	0.02	0.83	30%	0.005
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	110.6	0.01	0.84	36%	0.005
CH ₄ Emissions from Landfills	CH ₄	102.8	0.01	0.85	56%	0.008
CO ₂ Emissions from Urban Trees	CO ₂	88.4	0.01	0.87	47%	0.006
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	83.9	0.01	0.88	8%	0.001
CO ₂ Emissions from Stationary Combustion - Coal -	CO ₂	74.3	0.01	0.89	17%	0.002
Industrial	002	74.5	0.01	0.03	17 /0	0.002
CO ₂ Emissions from Stationary Combustion - Oil -	CO ₂	63.7	0.01	0.90	6%	<0.001
Residential	002	00.7	0.01	0.00	070	-0.001
Fugitive Emissions from Coal Mining	CH ₄	55.8	0.01	0.90	16%	0.001
CO ₂ Emissions from Iron and Steel Production &	CO ₂	54.3	0.01	0.91	17%	0.001
Metallurgical Coke Production	002	0 1.0	0.01	0.01	11 /0	0.001
CH ₄ Emissions from Manure Management	CH ₄	52.9	0.01	0.92	20%	0.001
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	45.7	0.01	0.92	151%	0.009
CO ₂ Emissions from Stationary Combustion - Oil - U.S.	CO ₂	44.7	0.01	0.93	11%	0.001
Territories	002	44.7	0.01	0.93	1170	0.001
CO ₂ Emissions from Stationary Combustion - Oil -	CO ₂	36.8	<0.01	0.93	5%	<0.001
Commercial	002	00.0	-0.01	0.00	070	-0.001
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	36.6	<0.01	0.94	8%	<0.001
CO ₂ Emissions from Natural Gas Systems	CO ₂	35.2	<0.01	0.94	30%	0.001
CO ₂ Emissions from Cement Production	CO ₂	35.1	<0.01	0.95	6%	<0.001
	CH ₄	31.7	<0.01	0.95	149%	0.006
Fugitive Emissions from Petroleum Systems						
CO ₂ Emissions from Cropland Remaining Cropland	CO ₂	26.5	<0.01	0.96	167%	0.006
CO ₂ Emissions from Stationary Combustion - Oil - Electricity	CO_2	18.8	<0.01	0.96	9%	<0.001
Generation	NO	10.2	-0.01	0.00	1720/	0.004
Non-CO ₂ Emissions from Stationary Combustion - Electricity	N ₂ O	18.3	<0.01	0.96	173%	0.004
Generation N ₂ O Emissions from Manure Management	N ₂ O	18.0	<0.01	0.96	24%	0.001
-						
CO ₂ Emissions from Land Converted to Cropland	CO ₂	16.8	<0.01	0.97	77%	0.002
CH ₄ Emissions from Forest Fires	CH ₄	15.3	<0.01	0.97	176%	0.004
N ₂ O Emissions from Nitric Acid Production	N ₂ O	15.3	<0.01	0.97	41%	0.001
CO ₂ Emissions from Lime Production	CO_2	13.3	<0.01	0.97	3%	<0.001
CO ₂ Emissions from Landfilled Yard Trimmings and Food	CO_2	13.2	<0.01	0.97	60%	0.001
Scraps						
CH ₄ Emissions from Wastewater Treatment	CH ₄	12.8	<0.01	0.98	27%	<0.001
N ₂ O Emissions from Mobile Combustion: Road	N_2O	12.6	<0.01	0.98	27%	<0.001
N ₂ O Emissions from Forest Fires	N ₂ O	12.5	<0.01	0.98	144%	0.002
CO ₂ Emissions from Incineration of Waste	CO ₂	12.1	<0.01	0.98	14%	<0.001
CO ₂ Emissions from Ammonia Production	CO ₂	9.4	<0.01	0.98	7%	<0.001
CO ₂ Emissions from Land Converted to Grassland			<0.01		108%	0.001
	CO ₂	8.5		0.98		
CO ₂ Emissions from Limestone and Dolomite Use	CO ₂	8.0	<0.01	0.98	20%	<0.001
CH ₄ Emissions from Rice Cultivation	CH ₄	7.4	<0.01	0.98	96%	0.001
HFC-23 Emissions from HCFC-22 Production	HFCs	6.9	<0.01	0.99	10%	<0.001
CO ₂ Emissions from Grassland Remaining Grassland	CO ₂	6.7	<0.01	0.99	529%	0.005
SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	6.0	<0.01	0.99	25%	<0.001
N ₂ O Emissions from Adipic Acid Production	N_2O	5.8	< 0.01	0.99	4%	<0.001
·						

OO Emissions from Hose Opposition for New Arr	00	F 0	-0.04	0.00	400/	-0.004
CO ₂ Emissions from Urea Consumption for Non-Ag Purposes	CO ₂	5.2	<0.01	0.99	10%	<0.001
N ₂ O Emissions from Wastewater Treatment	N_2O	5.0	<0.01	0.99	100%	0.001
Fugitive Emissions from Abandoned Underground Coal	CH ₄	4.7	<0.01	0.99	26%	<0.001
Mines	2114					
N ₂ O Emissions from Product Uses	N ₂ O	4.4	<0.01	0.99	24%	< 0.001
CO ₂ Emissions from Stationary Combustion - Coal -	CO_2	4.1	<0.01	0.99	15%	< 0.001
Commercial	00	0.0	0.04	0.00	1000/	0.004
CO ₂ Emissions from Liming of Agricultural Soils	CO ₂	3.9	<0.01	0.99	106%	0.001
PFC, HFC, and SF ₆ Emissions from Semiconductor Manufacture	Several	3.7	<0.01	0.99	5%	<0.001
CO ₂ Emissions from Petrochemical Production	CO_2	3.5	<0.01	0.99	27%	<0.001
CO ₂ Emissions from Urea Fertilization	CO ₂	3.4	<0.01	0.99	43%	<0.001
CO ₂ Emissions from Aluminum Production	CO ₂	3.4	<0.01	0.99	2%	<0.001
CO ₂ Emissions from Stationary Combustion - Coal - U.S.	CO ₂	3.4	<0.01	0.99	19%	<0.001
Territories						
Non-CO ₂ Emissions from Stationary Combustion -	CH ₄	3.1	<0.01	0.99	225%	0.001
Residential	011	2.4	-0.04	0.00	400/	-0.004
CH ₄ Emissions from Petrochemical Production	CH₄	3.1	<0.01	0.99	10%	< 0.001
CO ₂ Emissions from Soda Ash Production and Consumption	CO ₂	2.7	<0.01	1.00	6%	<0.001
PFC Emissions from Aluminum Production	PFCs	2.5	<0.01	1.00	6%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N ₂ O	2.4	<0.01	1.00	211%	0.001
N ₂ O Emissions from Mobile Combustion: Other	N ₂ O	2.0	<0.01	1.00	1%	<0.001
CO ₂ Emissions from Carbon Dioxide Consumption	CO ₂	1.8	<0.01	1.00	40%	<0.001
N ₂ O Emissions from Composting	N ₂ O	1.8	<0.01	1.00	50%	< 0.001
CO ₂ Emissions from Titanium Dioxide Production	CO_2	1.7	<0.01	1.00	13%	< 0.001
SF ₆ Emissions from Magnesium Production and Processing	SF ₆	1.7	<0.01	1.00	12%	< 0.001
CO ₂ Emissions from Ferroalloy Production	CO ₂	1.7	<0.01	1.00	12%	< 0.001
CH ₄ Emissions from Composting	CH ₄	1.6	<0.01	1.00	50%	< 0.001
N ₂ O Emissions from Settlement Soils	N ₂ O	1.5	<0.01	1.00	163%	< 0.001
CO ₂ Emissions from Stationary Combustion - Gas - U.S.	CO ₂	1.4	<0.01	1.00	17%	< 0.001
Territories						
CO ₂ Emissions from Zinc Production	CO_2	1.4	<0.01	1.00	17%	<0.001
N ₂ O Emissions from Mobile Combustion: Aviation	N_2O	1.4	<0.01	1.00	2%	<0.001
CO ₂ Emissions from Glass Production	CO ₂	1.2	<0.01	1.00	5%	< 0.001
CH ₄ Emissions from Mobile Combustion: Road	CH₄	1.2	<0.01	1.00	16%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Industrial	CH₄	1.2	<0.01	1.00	50%	< 0.001
CO ₂ Emissions from Phosphoric Acid Production	CO_2	1.1	<0.01	1.00	21%	<0.001
CO ₂ Emissions from Wetlands Remaining Wetlands	CO_2	8.0	<0.01	1.00	30%	<0.001
Non-CO ₂ Emissions from Stationary Combustion -	N_2O	0.8	<0.01	1.00	201%	<0.001
Residential	CH	0.0	-0.01	1.00	1420/	~ 0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	CH ₄	8.0	<0.01	1.00	143%	<0.001
CH ₄ Emissions from Iron and Steel Production &	CH ₄	0.6	<0.01	1.00	22%	<0.001
Metallurgical Coke Production	2114					
CO ₂ Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	< 0.001
N ₂ O Emissions from Mobile Combustion: Marine	N_2O	0.5	<0.01	1.00	28%	< 0.001
Non-CO ₂ Emissions from Stationary Combustion - Electricity	CH₄	0.5	<0.01	1.00	42%	< 0.001
Generation						
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.4	<0.01	1.00	1%	<0.001
CO ₂ Emissions from Petroleum Systems	CO_2	0.4	<0.01	1.00	149%	<0.001
CO ₂ Emissions from Stationary Combustion - Geothermal	CO_2	0.4	<0.01	1.00	NA	<0.001
Energy		• •		4.00	0.1-0:	
N ₂ O Emissions from Incineration of Waste	N_2O	0.4	<0.01	1.00	317%	<0.001

N ₂ O Emissions from Forest Soils	N_2O	0.4	<0.01	1.00	211%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - Commercial	N_2O	0.3	<0.01	1.00	80%	<0.001
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3	<0.01	1.00	42%	<0.001
CO ₂ Emissions from Silicon Carbide Production and Consumption	CO ₂	0.2	<0.01	1.00	9%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	N ₂ O	0.1	<0.01	1.00	204%	<0.001
N ₂ O Emissions from Field Burning of Agricultural Residues	N ₂ O	0.1	<0.01	1.00	32%	<0.001
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	CH ₄	0.1	<0.01	1.00	57%	<0.001
CH ₄ Emissions from Mobile Combustion: Aviation	CH ₄	+	<0.01	1.00	8%	<0.001
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	<0.01	1.00	7%	<0.001
CH ₄ Emissions from Ferroalloy Production	CH ₄	+	<0.01	1.00	11%	<0.001
CH ₄ Emissions from Silicon Carbide Production and Consumption	CH ₄	+	<0.01	1.00	9%	<0.001
N ₂ O Emissions from Wetlands Remaining Wetlands	N ₂ O	+	<0.01	1.00	73%	<0.001
CH ₄ Emissions from Incineration of Waste	CH ₄	+	<0.01	1.00	NE	<0.001
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	+	<0.01	1.00	15%	<0.001

Residential

a Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always

NE Uncertainty not estimated.

+ Does not exceed 0.05 Tg CO₂ Eq.

Table A-8: 1990-2012 Key Source Category Tier 1 and 2 Analysis—Trend Assessment, without LULUCF Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive. NE Uncertainty not estimated.

		1990	2012			%	
		Estimate	Estimate	Tier 1 Trend	Tier 2 Trend	Contribution	Cumulative
IPCC Source Categories	Direct GHG	(Tg CO ₂ Eq.)(Tg CO ₂ Eq.)	Assessment	Assessment	to Trend	Total
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	175.3	492.2	0.05	0.002	19.9	20
CO ₂ Emissions from Mobile Combustion: Road	CO ₂	1,188.9	1,469.8	0.04	0.003	15.0	35
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	129.4	0.02	0.003	8.3	43
CO ₂ Emissions from Stationary Combustion - Coal - Electricity Generation	CO ₂	1,547.6	1,512.2	0.02	0.001	6.2	49
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	155.3	74.3	0.01	0.002	5.6	55
CO ₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	97.5	18.8	0.01	0.001	5.3	60
CH ₄ Emissions from Landfills	CH ₄	147.8	102.8	0.01	0.004	3.3	64
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	187.4	145.1	0.01	0.001	3.2	67
CO ₂ Emissions from Iron and Steel Production & Metallurgical Coke Production	CO ₂	99.8	54.3	0.01	0.001	3.2	70
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	97.4	63.7	0.01	<0.001	2.4	72
Fugitive Emissions from Natural Gas Systems	CH ₄	152.9	127.1	0.01	0.001	2.1	74
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	6.9	<0.01	<0.001	2.0	76
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	64.9	36.8	<0.01	<0.001	2.0	78
N ₂ O Emissions from Mobile Combustion: Road	N ₂ O	40.3	12.6	<0.01	0.001	1.9	80
Fugitive Emissions from Coal Mining	CH ₄	81.1	55.8	<0.01	0.001	1.8	82
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	280.9	267.0	<0.01	0.001	1.6	84
SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	26.7	6.0	<0.01	0.001	1.4	85
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	238.0	225.8	<0.01	<0.001	1.4	87

CH ₄ Emissions from Manure Management	CH ₄	31.5	52.9	<0.01	0.001	1.3	88
PFC Emissions from Aluminum Production	PFCs	18.4	2.5	<0.01	<0.001	1.1	89
CO ₂ Emissions from Stationary Combustion - Oil - U.S. Territories	CO ₂	27.2	44.7	<0.01	<0.001	1.1	90
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	120.8	110.6	<0.01	0.001	1.0	91
N ₂ O Emissions from Adipic Acid Production	N ₂ O	15.8	5.8	<0.01	<0.001	0.7	92
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	N ₂ O	7.4	18.3	<0.01	0.003	0.7	92
Direct N ₂ O Emissions from Agricultural Soil Management	N ₂ O	240.7	260.9	<0.01	<0.001	0.7	93
CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	44.5	36.6	<0.01	<0.001	0.6	94
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	142.1	157.0	<0.01	<0.001	0.6	94
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂	12.0	4.1	<0.01	<0.001	0.5	95
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	73.3	83.9	<0.01	<0.001	0.5	95
Fugitive Emissions from Petroleum Systems	CH ₄	35.8	31.7	<0.01	0.001	0.4	96
CO ₂ Emissions from Ammonia Production	CO ₂	13.0	9.4	<0.01	<0.001	0.3	96
SF ₆ Emissions from Magnesium Production and Processing	SF ₆	5.4	1.7	<0.01	<0.001	0.3	96
CO ₂ Emissions from Natural Gas Systems	CO_2	37.7	35.2	<0.01	<0.001	0.3	96
CO ₂ Emissions from Incineration of Waste	CO_2	8.0	12.1	<0.01	<0.001	0.2	97
CO ₂ Emissions from Aluminum Production	CO_2	6.8	3.4	<0.01	<0.001	0.2	97
N ₂ O Emissions from Nitric Acid Production	N_2O	18.2	15.3	< 0.01	< 0.001	0.2	97
CO ₂ Emissions from Stationary Combustion - Gas - Industrial	CO ₂	408.9	428.5	<0.01	<0.001	0.2	97
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	4.2	1.2	<0.01	< 0.001	0.2	97
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	3.0	+	<0.01	<0.001	0.2	98
N ₂ O Emissions from Manure Management	N_2O	14.4	18.0	<0.01	<0.001	0.2	98
CO ₂ Emissions from Limestone and Dolomite Use	CO_2	4.9	8.0	<0.01	<0.001	0.2	98
CO ₂ Emissions from Stationary Combustion - Coal - U.S. Territories	CO ₂	0.6	3.4	<0.01	<0.001	0.2	98
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	41.4	45.7	<0.01	0.001	0.2	98
CH ₄ Emissions from Enteric Fermentation	CH ₄	137.9	141.0	<0.01	<0.001	0.2	98
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄	4.6	3.1	<0.01	0.001	0.1	98
Fugitive Emissions from Abandoned Underground Coal Mines	CH ₄	6.0	4.7	<0.01	<0.001	0.1	99
CO ₂ Emissions from Lime Production	CO ₂	11.4	13.3	<0.01	<0.001	0.1	99
CO ₂ Emissions from Stationary Combustion - Gas - U.S. Territories	CO ₂	+	1.4	<0.01	<0.001	0.1	99
N ₂ O Emissions from Wastewater Treatment	N_2O	3.5	5.0	<0.01	<0.001	0.1	99
N ₂ O Emissions from Composting	N_2O	0.4	1.8	< 0.01	<0.001	0.1	99
CO ₂ Emissions from Urea Consumption for Non- Ag Purposes	CO ₂	3.8	5.2	<0.01	<0.001	0.1	99
CH ₄ Emissions from Composting	CH ₄	0.3	1.6	<0.01	<0.001	0.1	99
Non-CO ₂ Emissions from Stationary Combustion - Industrial	N ₂ O	3.3	2.4	<0.01	<0.001	0.1	99
CH ₄ Emissions from Wastewater Treatment	CH ₄	13.2	12.8	<0.01	<0.001	0.1	99
CO ₂ Emissions from Zinc Production	CO_2	0.6	1.4	<0.01	<0.001	<0.1	99
CH ₄ Emissions from Petrochemical Production	CH ₄	2.3	3.1	<0.01	<0.001	<0.1	99
PFC, HFC, and SF ₆ Emissions from Semiconductor Manufacture	Several	2.9	3.7	<0.01	<0.001	<0.1	99
N ₂ O Emissions from Mobile Combustion: Other	N_2O	1.3	2.0	<0.01	<0.001	<0.1	99
CH ₄ Emissions from Rice Cultivation	CH ₄	7.7	7.4	<0.01	<0.001	<0.1	99
CO ₂ Emissions from Ferroalloy Production	CO ₂	2.2	1.7	<0.01	<0.001	<0.1	99

CO ₂ Emissions from Phosphoric Acid Production	CO_2	1.6	1.1	<0.01	<0.001	<0.1	99
CO ₂ Emissions from Titanium Dioxide Production	CO ₂	1.2	1.7	<0.01	<0.001	<0.1	100
N ₂ O Emissions from Mobile Combustion: Aviation	N ₂ O	1.8	1.4	<0.01	<0.001	<0.1	100
-	CH ₄	1.6	1.4	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion - Industrial							
CO ₂ Emissions from Cement Production	CO_2	33.3	35.1	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion - Residential	N ₂ O	1.1	8.0	<0.01	<0.001	<0.1	100
CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	1.0	0.6	<0.01	<0.001	<0.1	100
CO ₂ Emissions from Glass Production	CO_2	1.5	1.2	<0.01	< 0.001	<0.1	100
CO ₂ Emissions from Carbon Dioxide Consumption	CO_2	1.4	1.8	<0.01	< 0.001	<0.1	100
CO ₂ Emissions from Silicon Carbide Production and Consumption	CO ₂	0.4	0.2	<0.01	<0.001	<0.1	100
N ₂ O Emissions from Product Uses	N_2O	4.4	4.4	<0.01	< 0.001	<0.1	100
CO ₂ Emissions from Soda Ash Production and Consumption	CO ₂	2.7	2.7	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion - Electricity Generation	CH ₄	0.3	0.5	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion - Commercial	CH ₄	0.9	0.8	<0.01	<0.001	<0.1	100
CH ₄ Emissions from Mobile Combustion: Other	CH ₄	0.3	0.4	<0.01	< 0.001	<0.1	100
N ₂ O Emissions from Incineration of Waste	N ₂ O	0.5	0.4	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion -	N ₂ O	0.4	0.4	<0.01	<0.001	<0.1	100
Commercial	11/20	0.4	0.0	٧٥.٥١	١٥.٥٥١	٧٥.١	100
N ₂ O Emissions from Mobile Combustion: Marine	N ₂ O	0.6	0.5	<0.01	< 0.001	<0.1	100
CO ₂ Emissions from Petrochemical Production	CO_2	3.4	3.5	<0.01	< 0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion -	N ₂ O	0.1	0.1	<0.01	<0.001	<0.1	100
U.S. Territories		•••	• • • •				
CH ₄ Emissions from Mobile Combustion: Aviation	CH ₄	0.1	+	<0.01	< 0.001	<0.1	100
CH ₄ Emissions from Field Burning of Agricultural Residues	CH ₄	0.3	0.3	<0.01	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary Combustion - U.S. Territories	CH ₄	+	0.1	<0.01	<0.001	<0.1	100
CH ₄ Emissions from Silicon Carbide Production	CH ₄	+	+	<0.01	<0.001	<0.1	100
and Consumption CO ₂ Emissions from Stationary Combustion -	CO_2	0.4	0.4	<0.01	<0.001	<0.1	100
Geothermal Energy	002	•	•	0.0.	0.00	• • • • • • • • • • • • • • • • • • • •	
CO ₂ Emissions from Lead Production	CO_2	0.5	0.5	<0.01	< 0.001	<0.1	100
CH ₄ Emissions from Ferroalloy Production	CH ₄	+	+	<0.01	< 0.001	<0.1	100
CO ₂ Emissions from Petroleum Systems	CO_2	0.4	0.4	<0.01	< 0.001	<0.1	100
N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	+	<0.01	< 0.001	<0.1	100
CH ₄ Emissions from Incineration of Waste	CH ₄	+	+	<0.01	<0.001	<0.1	100
	J. 14	·		0.01	0.001	V.1	100

Note: LULUCF sources and sinks are not included in this analysis.

+ Does not exceed 0.05 Tg CO₂ Eq.

Table A- 9: 1990-2012 Key Source Category Tier 1 and 2 Analysis—Trend Assessment, with LULUCF

ubion o. 1000 zoiz koj odulog dutogolj	iliulyolo i	Trong Addodonion, With Lotoor					
		1990	2012				
		Estimate	Estimate			Percent	Cumulative
		(Tg CO2	(Tg CO₂	Tier 1 Trend	Tier 2 Trend	Contribution to	Contribution to
IPCC Source Categories	Direct GHG	Eq.)	Eq.)	Assessment	Assessment	Trend (%)	Trend (%)
CO ₂ Emissions from Stationary Combustion - Gas - Electricity Generation	CO ₂	175.3	492.2	0.043	0.002	16.9	17
CO ₂ Emissions from Mobile Combustion:	CO ₂	1,188.9	1,469.8	0.030	0.002	11.6	29

Road	_	_	_	_	_	_	
Emissions from Substitutes for Ozone	Several	0.3	129.4	0.018	0.002	7.1	36
Depleting Substances	00	4.547.0	4.540.0	0.040	0.000	0.0	40
CO ₂ Emissions from Stationary Combustion - Coal - Electricity Generation	CO ₂	1,547.6	1,512.2	0.018	0.002	6.9	43
CO ₂ Emissions from Changes in Forest Carbon Stocks	CO ₂	704.6	866.5	0.017	0.003	6.7	49
CO ₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	155.3	74.3	0.013	0.002	5.0	54
CO ₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	97.5	18.8	0.012	0.001	4.6	59
CH ₄ Emissions from Landfills	CH ₄	147.8	102.8	0.008	0.004	2.9	62
CO ₂ Emissions from Mobile Combustion: Aviation	CO ₂	187.4	145.1	0.007	0.001	2.9	65
CO ₂ Emissions from Iron and Steel Production & Metallurgical Coke Production	CO ₂	99.8	54.3	0.007	0.001	2.8	67
CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	97.4	63.7	0.006	<0.001	2.2	70
Fugitive Emissions from Natural Gas Systems	CH ₄	152.9	127.1	0.005	0.001	1.9	72
CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO ₂	64.9	36.8	0.004	<0.001	1.8	73
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	6.9	0.004	<0.001	1.7	75
CO ₂ Emissions from Stationary Combustion - Oil - Industrial	CO ₂	280.9	267.0	0.004	0.001	1.7	77
N₂O Emissions from Mobile Combustion: Road	N ₂ O	40.3	12.6	0.004	0.001	1.7	78
Fugitive Emissions from Coal Mining	CH ₄	81.1	55.8	0.004	0.001	1.6	80
CO ₂ Emissions from Cropland Remaining Cropland	CO ₂	51.9	26.5	0.004	0.007	1.6	82
CO ₂ Emissions from Stationary Combustion - Gas - Residential	CO ₂	238.0	225.8	0.004	<0.001	1.4	83
CO ₂ Emissions from Urban Trees	CO ₂	60.4	88.4	0.003	0.002	1.3	84
SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	26.7	6.0	0.003	0.001	1.2	86
CH ₄ Emissions from Manure Management	CH ₄	31.5	52.9	0.003	0.001	1.1	87
CO ₂ Emissions from Non-Energy Use of Fuels	CO ₂	120.8	110.6	0.002	0.001	1.0	88
PFC Emissions from Aluminum Production	PFCs	18.4	2.5	0.002	<0.001	0.9	88
CO ₂ Emissions from Stationary Combustion - Oil - U.S. Territories	CO ₂	27.2	44.7	0.002	<0.001	0.9	89
CH ₄ Emissions from Forest Fires	CH ₄	2.5	15.3	0.002	0.003	0.7	90
CO ₂ Emissions from Landfilled Yard Trimmings and Food Scraps	CO ₂	24.2	13.2	0.002	0.001	0.7	91
CO ₂ Emissions from Land Converted to Cropland	CO ₂	26.9	16.8	0.002	0.001	0.6	91
N ₂ O Emissions from Adipic Acid Production	N ₂ O	15.8	5.8	0.002	<0.001	0.6	92
Non-CO ₂ Emissions from Stationary	N ₂ O	7.4	18.3	0.001	0.003	0.6	93
Combustion - Electricity Generation CO ₂ Emissions from Mobile Combustion: Marine	CO ₂	44.5	36.6	0.001	<0.001	0.6	93
N ₂ O Emissions from Forest Fires	N ₂ O	2.0	12.5	0.001	0.002	0.6	94
CO ₂ Emissions from Stationary Combustion - Coal - Commercial	CO ₂	12.0	4.1	0.001	<0.002	0.5	94
CO ₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	142.1	157.0	0.001	<0.001	0.4	95
CO ₂ Emissions from Mobile Combustion: Other	CO ₂	73.3	83.9	0.001	<0.001	0.4	95
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Direct N ₂ O Emissions from Agricultural Soil Management	N_2O	240.7	260.9	0.001	<0.001	0.3	95
Fugitive Emissions from Petroleum Systems	CH ₄	35.8	31.7	0.001	0.001	0.3	96
CH ₄ Emissions from Enteric Fermentation	CH ₄	137.9	141.0	0.001	<0.001	0.3	96
CO ₂ Emissions from Natural Gas Systems	CO_2	37.7	35.2	0.001	<0.001	0.3	96
CO ₂ Emissions from Ammonia Production	CO_2	13.0	9.4	0.001	< 0.001	0.2	96
CO ₂ Emissions from Stationary Combustion	CO_2	408.9	428.5	0.001	< 0.001	0.2	97
- Gas - Industrial	_						
SF ₆ Emissions from Magnesium Production and Processing	SF ₆	5.4	1.7	0.001	<0.001	0.2	97
N ₂ O Emissions from Nitric Acid Production	N_2O	18.2	15.3	0.001	<0.001	0.2	97
CO ₂ Emissions from Aluminum Production	CO ₂	6.8	3.4	0.001	<0.001	0.2	97
CO ₂ Emissions from Incineration of Waste	CO ₂	8.0	12.1	0.001	<0.001	0.2	97
CO ₂ Emissions from Grassland Remaining	CO ₂	9.6	6.7	0.000	0.003	0.2	98
Grassland							
CH ₄ Emissions from Mobile Combustion: Road	CH ₄	4.2	1.2	0.000	<0.001	0.2	98
CO ₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	3.0	+	0.000	<0.001	0.2	98
N ₂ O Emissions from Manure Management	N_2O	14.4	18.0	0.000	<0.001	0.2	98
CO ₂ Emissions from Limestone and	CO_2	4.9	8.0	0.000	<0.001	0.2	98
Dolomite Use CO ₂ Emissions from Stationary Combustion	CO ₂	0.6	3.4	0.000	<0.001	0.1	98
- Coal - U.S. Territories							
Indirect N ₂ O Emissions from Applied Nitrogen	N ₂ O	41.4	45.7	0.000	<0.001	0.1	99
Non-CO ₂ Emissions from Stationary Combustion - Residential	CH ₄	4.6	3.1	0.000	0.001	0.1	99
Fugitive Emissions from Abandoned Underground Coal Mines	CH ₄	6.0	4.7	0.000	<0.001	0.1	99
CO ₂ Emissions from Stationary Combustion - Gas - U.S. Territories	CO ₂	+	1.4	0.000	<0.001	0.1	99
N ₂ O Emissions from Composting	N ₂ O	0.4	1.8	0.000	< 0.001	0.1	99
N ₂ O Emissions from Wastewater Treatment	N_2O	3.5	5.0	0.000	< 0.001	0.1	99
CH ₄ Emissions from Composting	CH ₄	0.3	1.6	0.000	<0.001	0.1	99
CO ₂ Emissions from Urea Consumption for	CO ₂	3.8	5.2	0.000	<0.001	0.1	99
Non-Ag Purposes CO ₂ Emissions from Lime Production	CO ₂	11.4	13.3	0.000	<0.001	0.1	99
CH ₄ Emissions from Wastewater Treatment	CH ₄	13.2	12.8	0.000	<0.001	0.1	99
Non-CO ₂ Emissions from Stationary	N ₂ O	3.3	2.4	0.000	<0.001	0.1	99
Combustion - Industrial							
CO ₂ Emissions from Liming of Agricultural Soils	CO ₂	4.7	3.9	0.000	<0.001	0.1	99
CO ₂ Emissions from Urea Fertilization	CO_2	2.4	3.4	0.000	<0.001	<0.1	99
CH ₄ Emissions from Rice Cultivation	CH ₄	7.7	7.4	0.000	<0.001	<0.1	99
CO ₂ Emissions from Land Converted to Grassland	CO ₂	7.3	8.5	0.000	<0.001	<0.1	99
CO ₂ Emissions from Zinc Production	CO_2	0.6	1.4	0.000	< 0.001	<0.1	99
CH ₄ Emissions from Petrochemical	CH ₄	2.3	3.1	0.000	< 0.001	<0.1	100
Production							
PFC, HFC, and SF ₆ Emissions from Semiconductor Manufacture	Several	2.9	3.7	0.000	<0.001	<0.1	100
CO ₂ Emissions from Ferroalloy Production	CO_2	2.2	1.7	0.000	<0.001	<0.1	100
N ₂ O Emissions from Mobile Combustion:	N_2O	1.3	2.0	0.000	<0.001	<0.1	100
Other CO ₂ Emissions from Phosphoric Acid	CO ₂	1.6	1.1	0.000	<0.001	<0.1	100
Production N₂O Emissions from Mobile Combustion:	N ₂ O	1.8	1.4	0.000	<0.001	<0.1	100

Aviation							
Non-CO ₂ Emissions from Stationary	CH ₄	1.6	1.2	0.000	<0.001	<0.1	100
Combustion - Industrial	0114	1.0		0.000	0.001	0.1	100
CO ₂ Emissions from Titanium Dioxide Production	CO_2	1.2	1.7	0.000	<0.001	<0.1	100
N ₂ O Emissions from Settlement Soils	N ₂ O	1.0	1.5	0.000	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary	N ₂ O	1.1	0.8	0.000	<0.001	<0.1	100
Combustion - Residential							
CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	1.0	0.6	0.000	<0.001	<0.1	100
CO ₂ Emissions from Glass Production	CO_2	1.5	1.2	0.000	< 0.001	<0.1	100
CO ₂ Emissions from Carbon Dioxide	CO_2	1.4	1.8	0.000	< 0.001	<0.1	100
Consumption							
N ₂ O Emissions from Forest Soils	N_2O	0.1	0.4	0.000	<0.001	<0.1	100
N ₂ O Emissions from Product Uses	N_2O	4.4	4.4	0.000	<0.001	<0.1	100
CO ₂ Emissions from Wetlands Remaining	CO_2	1.0	8.0	0.000	<0.001	<0.1	100
Wetlands							
CO ₂ Emissions from Silicon Carbide	CO_2	0.4	0.2	0.000	<0.001	<0.1	100
Production and Consumption	00	0.7	0.7	0.000	<0.001	-0.1	100
CO ₂ Emissions from Soda Ash Production and Consumption	CO ₂	2.7	2.7	0.000	<0.001	<0.1	100
Non-CO ₂ Emissions from Stationary	CH ₄	0.9	0.8	0.000	<0.001	<0.1	100
Combustion - Commercial	0114	0.0	0.0	0.000	10.001	-0.1	100
CO ₂ Emissions from Cement Production	CO ₂	33.3	35.1	0.000	< 0.001	<0.1	100
Non-CO ₂ Emissions from Stationary	CH ₄	0.3	0.5	0.000	<0.001	<0.1	100
Combustion - Electricity Generation							
N ₂ O Emissions from Incineration of Waste	N_2O	0.5	0.4	0.000	<0.001	<0.1	100
CH ₄ Emissions from Mobile Combustion:	CH_4	0.3	0.4	0.000	<0.001	<0.1	100
Other							
Non-CO ₂ Emissions from Stationary	N_2O	0.4	0.3	0.000	<0.001	<0.1	100
Combustion - Commercial	00	2.4	2.5	0.000	-0.001	-0.1	100
CO ₂ Emissions from Petrochemical Production	CO_2	3.4	3.5	0.000	<0.001	<0.1	100
N ₂ O Emissions from Mobile Combustion:	N ₂ O	0.6	0.5	0.000	<0.001	<0.1	100
Marine	1120	0.0	0.0	0.000	10.001	10.1	100
Non-CO ₂ Emissions from Stationary	N_2O	0.1	0.1	0.000	< 0.001	<0.1	100
Combustion - U.S. Territories							
CH ₄ Emissions from Field Burning of	CH ₄	0.3	0.3	0.000	<0.001	<0.1	100
Agricultural Residues							
CH ₄ Emissions from Mobile Combustion:	CH ₄	0.1	+	0.000	<0.001	<0.1	100
Aviation Non-CO ₂ Emissions from Stationary	CH ₄		0.1	0.000	<0.001	<0.1	100
Combustion - U.S. Territories	СП4	+	0.1	0.000	<0.001	<0.1	100
CO ₂ Emissions from Stationary Combustion	CO_2	0.4	0.4	0.000	<0.001	<0.1	100
- Geothermal Energy	002	0.1	0.1	0.000	0.001	0.1	100
CO ₂ Emissions from Lead Production	CO_2	0.5	0.5	0.000	<0.001	<0.1	100
CH ₄ Emissions from Silicon Carbide	CH ₄	+	+	0.000	< 0.001	<0.1	100
Production and Consumption							
CO ₂ Emissions from Petroleum Systems	CO_2	0.4	0.4	0.000	<0.001	<0.1	100
CH ₄ Emissions from Ferroalloy Production	CH ₄	+	+	0.000	<0.001	<0.1	100
N ₂ O Emissions from Field Burning of	N_2O	0.1	0.1	0.000	<0.001	<0.1	100
Agricultural Residues							
N ₂ O Emissions from Wetlands Remaining	N_2O	+	+	0.000	<0.001	<0.1	100
Wetlands	CLI			0.000	-0.004	-0.4	400
CH ₄ Emissions from Mobile Combustion: Marine	CH ₄	+	+	0.000	<0.001	<0.1	100
CH ₄ Emissions from Incineration of Waste	CH ₄	+	+	0.000	<0.001	<0.1	100
String Emissions from monitoration of waste	O1 14	•	•	0.000	-0.001	-0.1	100

⁺ Does not exceed 0.05 Tg CO₂ Eq.

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