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)

IPCC Source Categories	Gas	Tier 1				Tier 2				Qual	2012 Emissions ($Tg\ CO_2$ Eq.)
		Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF	Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF		
Energy											
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	•	•	•	•	•	•	•	•		1,511.2
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	•	•	•		•		•			434.7
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	•	•	•	•	•	•	•	•		265.2
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	•	•	•	•	•		•			224.8
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	•	•	•	•	•		•			156.9
CO_2 Emissions from Mobile Combustion: Aviation	CO_2	•	•	•	•	•	•	•	•		145.1
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	•	•	•	•	•	•	•	•		110.3
CO_2 Emissions from Mobile Combustion: Other	CO_2	•	•	•	•						84.5
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	•	•	•	•	•	•	•	•		74.3
CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	•	•	•	•		•				64.1
CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	•	•	•	•						44.7
CO_2 Emissions from Mobile Combustion: Marine	CO_2	•	•	•	•						40.1
CO_2 Emissions from Stationary Combustion - Oil – Commercial	CO_2	•	•	•	•						36.4
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
CO_2 Emissions from Stationary Combustion - Coal – Residential	CO_2						•				0.0
CH_4 Emissions from Natural Gas Systems	CH_4	•	•	•	•	•	•	•	•		129.9
Fugitive Emissions from Coal Mining	CH_4	•	•	•	•	•	•	•	•		55.8
CH_4 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 Generation	N_2O		•		•	•	•	•	•		18.3
N_2O Emissions from Mobile Combustion: Road	N_2O	•	•	•	•	•	•	•	•		12.6

Non-CO_2 Emissions from Stationary Combustion - Industrial	N_2O	•					•				
International Bunker Fuels[c]	Several									•	112.8
Industrial Processes											
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_2O Emissions from Adipic Acid Production	N_2O		•		•						5.8
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	•	•	•	•	•	•	•	•		146.8
SF_6 Emissions from Electrical Transmission and Distribution	HiGWP	•	•	•	•		•				6.0
HFC-23 Emissions from HCFC-22 Production	HiGWP		•		•		•		•		4.3
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_2O Emissions from Agricultural Soil Management	N_2O	•	•	•	•	•	•	•			260.9
Indirect N_2O Emissions from Applied Nitrogen	N_2O	•		•		•	•	•			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 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
N_2O Emissions from Forest Fires	N_2O				•			•	•		12.5
Subtotal Without LULUCF											**6,324.6**
Total Emissions Without LULUCF											**6,487.8**
Percent of Total Without LULUCF											**97%**
Subtotal With LULUCF											**5,379.1**
Total Emissions With LULUCF											**5,546.3**
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 2012) 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

IPCC Source Categories	Direct GHG	2012 Emissions (Tg CO_2 Eq.)	Key Category?	ID Criteria[a]	Level in which year(s)?[b]
Energy					
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,511.2	•	L_1 T_1 L_2 T_2	1990, 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, 2012
CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	434.7	•	L_1 T_1 L_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	265.2	•	L_1 T_1 L_2 T_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	224.8	•	L_1 T_1 L_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	156.9	•	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	110.3	•	L_1 T_1 L_2 T_2	1990, 2012
CO_2 Emissions from Mobile Combustion: Other	CO_2	84.5	•	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	64.1	•	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	2012_1
CO_2 Emissions from Mobile Combustion: Marine	CO_2	40.1	•	L_1 T_1	1990_1, 2012_1
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	36.4	•	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	1990_1
CO_2 Emissions from Incineration of Waste	CO_2	12.2			
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	0.0	•	T_2	
CH_4 Emissions from Natural Gas Systems	CH_4	129.9	•	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
CH_4 Emissions from Petroleum Systems	CH_4	31.7	•	L_1 L_2 T_2	$1990, 2012_2$
Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	4.7			
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	3.1	•	L_2 T_2	1990_2
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.2			
CH_4 Emissions from Mobile Combustion: Road	CH_4	1.2			
Non-CO_2 Emissions from Stationary Combustion - Commercial	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 Mobile Combustion: Aviation	CH_4	+			
CH_4 Emissions from Mobile Combustion: Marine	CH_4	+			
CH_4 Emissions from Incineration of Waste	CH_4	+			
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	18.3	•	T_1 L_2 T_2	1990_2, 2012_2
N_2O Emissions from Mobile Combustion: Road	N_2O	12.6	•	L_1 T_1 L_2 T_2	1990
Non-CO_2 Emissions from Stationary Combustion - Industrial	N_2O	2.5	•	T_2	
N_2O Emissions from Mobile Combustion: Other	N_2O	2.0			
N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.4			
Non-CO_2 Emissions from Stationary Combustion - Residential	N_2O	0.8			
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6			
N_2O Emissions from Incineration of Waste	N_2O	0.4			
Non-CO_2 Emissions from Stationary Combustion - Commercial	N_2O	0.3			
Non-CO_2 Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1			
International Bunker Fuels[c]	Several	112.8	•	Q	
Industrial Processes					
CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	54.3	•	L_1 T_1 L_2 T_2	$1990, 2012_1$
CO_2 Emissions from Cement Production	CO_2	35.1	•	L_1	1990_1
CO_2 Emissions from Lime Production	CO_2	13.3			
CO_2 Emissions from Ammonia Production	CO_2	9.4			
CO_2 Emissions from Other Process Uses of Carbonates	CO_2	8.0			
CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	5.2			
CO_2 Emissions from Petrochemical Production	CO_2	3.5			
CO_2 Emissions from Aluminum Production	CO_2	3.4			
CO_2 Emissions from Soda Ash Production and Consumption	CO_2	2.7			
CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.8			
CO_2 Emissions from Titanium Dioxide Production	CO_2	1.7			
CO_2 Emissions from Ferroalloy Production	CO_2	1.7			
CO_2 Emissions from Zinc Production	CO_2	1.4			
CO_2 Emissions from Glass Production	CO_2	1.2			
CO_2 Emissions from Phosphoric Acid Production	CO_2	1.1			
CO_2 Emissions from Lead Production	CO_2	0.5			
CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2			
CH_4 Emissions from Petrochemical Production	CH_4	3.1			
CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	0.6			
CH_4 Emissions from Ferroalloy Production	CH_4	+			
CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+			
N_2O Emissions from Nitric Acid Production	N_2O	15.3			
N_2O Emissions from Adipic Acid Production	N_2O	5.8	•	T_1	
N_2O Emissions from Product Uses	N_2O	4.4			
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	146.8	•	L_1 T_1 L_2 T_2	2012
SF_6 Emissions from Electrical Transmission and Distribution	HiGWP	6.0	•	T_1 T_2	
HFC-23 Emissions from HCFC-22 Production	HiGWP	4.3	•	L_1 T_1 T_2	1990_1
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_2O Emissions from Agricultural Soil Management	N_2O	260.9	•	L_1 T_1 L_2 T_2	1990, 2012
Indirect N_2O Emissions from Applied Nitrogen	N_2O	45.7	•	L_1 L_2 T_2	1990, 2012
N_2O Emissions from Manure Management	N_2O	18.0			
N_2O 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_2O Emissions from Wastewater Treatment	N_2O	5.0			
N_2O 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., L_2 designates a source is a key category for a Tier 2 level assessment).

[b] If the source is a key category for both L_1 and L_2 (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 (.e.g., 1990 designates a source is a key category for the Tier 2 assessment only in 1990).

[c] Emissions from these sources not included in totals.

+ Does not exceed 0.05 Tg CO_2 Eq.

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

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 Criteria[a]	Level in which year(s)?[b]
Energy					
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,511.2	•	L_1 T_1 L_2 T_2	1990, 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	434.7	•	L_1 L_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	265.2	•	L_1 T_1 L_2 T_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	224.8	•	L_1 T_1 L_2	1990, 2012
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	156.9	•	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_1
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	110.3	•	L_1 T_1 L_2 T_2	1990, 2012
CO_2 Emissions from Mobile Combustion: Other	CO_2	84.5	•	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	64.1	•	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 Mobile Combustion: Marine	CO_2	40.1	•	L_1 T_1	1990_1, 2012_1
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	36.4	•	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	1990_1
CO_2 Emissions from Incineration of Waste	CO_2	12.2			
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	0.0			
CH_4 Emissions from Natural Gas Systems	CH_4	129.9	•	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
CH_4 Emissions from Petroleum Systems	CH_4	31.7	•	L_1 T_1 L_2 T_2	1990, 2012
Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	4.7			
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	3.1	•	L_2 T_2	1990_2
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.2			
CH_4 Emissions from Mobile Combustion: Road	CH_4	1.2			
Non-CO_2 Emissions from Stationary Combustion - Commercial	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 Mobile Combustion: Aviation	CH_4	+			
CH_4 Emissions from Mobile Combustion: Marine	CH_4	+			
CH_4 Emissions from Incineration of Waste	CH_4	+			
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	18.3	•	T_1 L_2 T_2	1990_2, 2012_2
N_2O Emissions from Mobile Combustion: Road	N_2O	12.6	•	L_1 T_1 L_2 T_2	1990

Non-CO_2 Emissions from Stationary Combustion - Industrial	N_2O	2.5			
N_2O Emissions from Mobile Combustion: Other	N_2O	2.0			
N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.4			
Non-CO_2 Emissions from Stationary Combustion - Residential	N_2O	0.8			
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6			
N_2O Emissions from Incineration of Waste	N_2O	0.4			
Non-CO_2 Emissions from Stationary Combustion - Commercial	N_2O	0.3			
Non-CO_2 Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1			
International Bunker Fuels[c]	Several	112.8	•	Q	
Industrial Processes					
CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	54.3	•	L_1 T_1 L_2 T_2	1990, 2012_1
CO_2 Emissions from Cement Production	CO_2	35.1	•	L_1	1990_1, 2012_1
CO_2 Emissions from Lime Production	CO_2	13.3			
CO_2 Emissions from Ammonia Production	CO_2	9.4			
CO_2 Emissions from Other Process Uses of Carbonates	CO_2	8.0			
CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	5.2			
CO_2 Emissions from Petrochemical Production	CO_2	3.5			
CO_2 Emissions from Aluminum Production	CO_2	3.4			
CO_2 Emissions from Soda Ash Production and Consumption	CO_2	2.7			
CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.8			
CO_2 Emissions from Titanium Dioxide Production	CO_2	1.7			
CO_2 Emissions from Ferroalloy Production	CO_2	1.7			
CO_2 Emissions from Zinc Production	CO_2	1.4			
CO_2 Emissions from Glass Production	CO_2	1.2			
CO_2 Emissions from Phosphoric Acid Production	CO_2	1.1			
CO_2 Emissions from Lead Production	CO_2	0.5			
CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2			
CH_4 Emissions from Petrochemical Production	CH_4	3.1			
CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	0.6			
CH_4 Emissions from Ferroalloy Production	CH_4	+			
CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+			
N_2O Emissions from Nitric Acid Production	N_2O	15.3			
N_2O Emissions from Adipic Acid Production	N_2O	5.8	•	T_1	
N_2O Emissions from Product Uses	N_2O	4.4			
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	146.8	•	L_1 T_1 L_2 T_2	2012
SF_6 Emissions from Electrical Transmission and Distribution	HiGWP	6.0	•	T_1 T_2	
HFC-23 Emissions from HCFC-22 Production	HiGWP	4.3	•	L_1 T_1	1990_1
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	1990_1, 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_2O Emissions from Agricultural Soil Management	N_2O	260.9	•	L_1 L_2	1990, 2012
Indirect N_2O Emissions from Applied Nitrogen	N_2O	45.7	•	L_1 L_2	1990, 2012
N_2O Emissions from Manure Management	N_2O	18.0			
N_2O 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_2O Emissions from Wastewater Treatment	N_2O	5.0			
N_2O Emissions from Composting	N_2O	1.8			
Land Use, Land Use Change, and Forestry					
CO_2 Emissions from Land Converted to Cropland	CO_2	16.8	•	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_1 L_2 T_2	1990_2
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_1 L_2 T_2	2012
N_2O Emissions from Forest Fires	N_2O	2.5	•	T_1 L_2 T_2	2012
N_2O Emissions from Settlement Soils	N_2O	1.5			
N_2O Emissions from Forest Soils	N_2O	0.4			
N_2O 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., L_2 designates a source is a key category for a Tier 2 level assessment).

[b] If the source is a key category for both L_1 and L_2 (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., 1990_2 designates a source is a key category for the Tier 2 assessment only in 1990).

[c] Emissions from these sources not included in totals.

+ Does not exceed 0.05 Tg CO_2 Eq.

Note: Parentheses indicate negative values (or sequestration).

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 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.

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

IPCC Source Categories	Direct GHG	1990 Estimate (Tg CO_2 Eq.)	Tier 1 Level Assessment	Cumulative Total	Uncertainty	Tier 2 Level Assessment
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,547.6	0.25	0.25	10%	0.024
CO_2 Emissions from Mobile Combustion: Road	CO_2	1,188.9	0.19	0.44	7%	0.013
CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.9	0.07	0.51	7%	0.005
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	280.9	0.05	0.55	20%	0.009
Direct N_2O Emissions from Agricultural Soil Management	N_2O	240.7	0.04	0.59	28%	0.011
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	238.0	0.04	0.63	7%	0.003
CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	0.03	0.66	7%	0.002
CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.3	0.03	0.69	5%	0.001
CH_4 Emissions from Natural Gas Systems	CH_4	156.4	0.03	0.71	30%	0.007
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.3	0.02	0.74	16%	0.004
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	0.81	18%	0.004
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	120.8	0.02	0.82	35%	0.007
CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	99.8	0.02	0.84	17%	0.003
CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	0.02	0.86	8%	0.001
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	0.01	0.88	35%	0.005
CO_2 Emissions from Mobile Combustion: Other	CO_2	73.3	0.01	0.90	7%	0.001
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	7%	<0.001
Indirect N_2O Emissions from Applied Nitrogen	N_2O	41.4	0.01	0.92	151%	0.010
N_2O Emissions from Mobile Combustion: Road	N_2O	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
CH_4 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. Territories	CO_2	27.2	<0.01	0.96	11%	<0.001
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_2O Emissions from Nitric Acid Production	N_2O	18.2	<0.01	0.97	38%	0.001
N_2O Emissions from Adipic Acid Production	N_2O	15.8	<0.01	0.97	4%	<0.001
N_2O 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 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 Generation	N_2O	7.4	<0.01	0.99	171%	0.002
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 Other Process Uses of Carbonates	CO_2	4.9	<0.01	0.99	20%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	4.6	<0.01	0.99	225%	0.002
N_2O 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_2O 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	NE	<0.001
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_2O Emissions from Mobile Combustion: Aviation	N_2O	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	49%	<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_2O Emissions from Mobile Combustion: Other	N_2O	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	205%	<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	138%	<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_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	16%	<0.001
CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
N_2O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	313%	<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	38%	<0.001
CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	<0.01	1.00	9%	<0.001
N_2O 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	3%	<0.001
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	<0.01	1.00	14%	<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_2O 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	N_2O	0.1	<0.01	1.00	203%	<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. Territories	CH_4	+	<0.01	1.00	57%	<0.001
CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	9%	<0.001
CH_4 Emissions from Mobile Combustion: Marine	CH_4	+	<0.01	1.00	4%	<0.001
CH_4 Emissions from Ferroalloy Production	CH_4	+	<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. Territories	CO_2	+	<0.01	1.00	17%	<0.001

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 always positive.
NE Uncertainty not estimated.
+ Does not exceed 0.05 Tg CO_2 Eq.

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

IPCC Source Categories	Direct GHG	1990 Estimate (Tg CO_2 Eq.)	Tier 1 Level Assessment	Cumulative Total	Uncertainty	Tier 2 Level 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	7%	0.011
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	7%	0.004

CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	280.9	0.04	0.58	20%	0.008
Direct N_2O Emissions from Agricultural Soil Management	N_2O	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	7%	0.002
CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.3	0.02	0.70	5%	0.001
CH_4 Emissions from Natural Gas Systems	CH_4	156.4	0.02	0.72	30%	0.007
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.3	0.02	0.74	16%	0.003
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	35%	0.006
CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	99.8	0.01	0.83	17%	0.002
CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	0.01	0.85	8%	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	35%	0.004
CO_2 Emissions from Mobile Combustion: Other	CO_2	73.3	0.01	0.88	7%	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	7%	<0.001
Indirect N_2O Emissions from Applied Nitrogen	N_2O	41.4	0.01	0.92	151%	0.009
N_2O Emissions from Mobile Combustion: Road	N_2O	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
CH_4 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. Territories	CO_2	27.2	<0.01	0.95	11%	<0.001
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_2O Emissions from Nitric Acid Production	N_2O	18.2	<0.01	0.97	38%	0.001
N_2O Emissions from Adipic Acid Production	N_2O	15.8	<0.01	0.97	4%	<0.001
N_2O 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_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	0.98	96%	0.001
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	7.4	<0.01	0.99	171%	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 Other Process Uses of Carbonates	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
N_2O 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_2O 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	NE	<0.001
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 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	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_2O Emissions from Forest Fires	N_2O	2.0	<0.01	1.00	144%	<0.001
N_2O Emissions from Mobile Combustion: Aviation	N_2O	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	49%	<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_2O Emissions from Mobile Combustion: Other	N_2O	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	205%	<0.001
CO_2 Emissions from Wetlands Remaining Wetlands	CO_2	1.0	<0.01	1.00	30%	<0.001
N_2O 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	138%	<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_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	16%	<0.001
CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
N_2O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	313%	<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	38%	<0.001
CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	<0.01	1.00	9%	<0.001
N_2O 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	3%	<0.001
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	<0.01	1.00	14%	<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_2O 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	N_2O	0.1	<0.01	1.00	203%	<0.001

N_2O 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. Territories	CH_4	+	<0.01	1.00	57%	<0.001
CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	9%	<0.001
CH_4 Emissions from Mobile Combustion: Marine	CH_4	+	<0.01	1.00	4%	<0.001
CH_4 Emissions from Ferroalloy Production	CH_4	+	<0.01	1.00	11%	<0.001
N_2O 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.
+ Does not exceed 0.05 Tg CO_2 Eq.

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

IPCC Source Categories	Direct GHG	2012 Estimate (Tg CO_2 Eq.)	Tier 1 Level Assessment	Cumulative Total	Uncertainty	Tier 2 Level Assessment
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,511.2	0.23	0.23	10%	0.022
CO_2 Emissions from Mobile Combustion: Road	CO_2	1,469.8	0.23	0.46	7%	0.015
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	434.7	0.07	0.60	7%	0.005
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	265.2	0.04	0.64	20%	0.008
Direct N_2O Emissions from Agricultural Soil Management	N_2O	260.9	0.04	0.68	28%	0.011
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	224.8	0.03	0.72	7%	0.002
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	156.9	0.02	0.74	7%	0.002
Emissions from Substitutes for Ozone Depleting Substances	Several	146.8	0.02	0.76	14%	0.003
CO_2 Emissions from Mobile Combustion: Aviation	CO_2	145.1	0.02	0.79	7%	0.001
CH_4 Emissions from Enteric Fermentation	CH_4	141.0	0.02	0.81	18%	0.004
CH_4 Emissions from Natural Gas Systems	CH_4	129.9	0.02	0.83	30%	0.006
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	110.3	0.02	0.85	35%	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	84.5	0.01	0.87	7%	0.001
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	74.3	0.01	0.89	16%	0.002
CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	64.1	0.01	0.90	6%	0.001
Fugitive Emissions from Coal Mining	CH_4	55.8	0.01	0.90	35%	0.003
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
Indirect N_2O Emissions from Applied Nitrogen	N_2O	45.7	0.01	0.93	151%	0.011
CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	44.7	0.01	0.94	11%	0.001
CO_2 Emissions from Mobile Combustion: Marine	CO_2	40.1	0.01	0.94	7%	<0.001
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	36.4	0.01	0.95	5%	<0.001
CO_2 Emissions from Natural Gas Systems	CO_2	35.2	0.01	0.95	30%	0.002
CO_2 Emissions from Cement Production	CO_2	35.1	0.01	0.96	6%	<0.001

CH_4 Emissions from Petroleum Systems	CH_4	31.7	<0.01	0.96	149%	0.007
CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	18.8	<0.01	0.97	8%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	18.3	<0.01	0.97	171%	0.005
N_2O Emissions from Manure Management	N_2O	18.0	<0.01	0.97	24%	0.001
N_2O Emissions from Nitric Acid Production	N_2O	15.3	<0.01	0.97	38%	0.001
CO_2 Emissions from Lime Production	CO_2	13.3	<0.01	0.98	3%	<0.001
CH_4 Emissions from Wastewater Treatment	CH_4	12.8	<0.01	0.98	27%	0.001
N_2O Emissions from Mobile Combustion: Road	N_2O	12.6	<0.01	0.98	27%	0.001
CO_2 Emissions from Incineration of Waste	CO_2	12.2	<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 Other Process Uses of Carboantes	CO_2	8.0	<0.01	0.98	20%	<0.001
CH_4 Emissions from Rice Cultivation	CH_4	7.4	<0.01	0.99	96%	0.001
SF_6 Emissions from Electrical Transmission and Distribution	SF_6	6.0	<0.01	0.99	25%	<0.001
N_2O Emissions from Adipic Acid Production	N_2O	5.8	<0.01	0.99	4%	<0.001
CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	5.2	<0.01	0.99	10%	<0.001
N_2O Emissions from Wastewater Treatment	N_2O	5.0	<0.01	0.99	100%	0.001
Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	4.7	<0.01	0.99	26%	<0.001
N_2O Emissions from Product Uses	N_2O	4.4	<0.01	0.99	24%	<0.001
HFC-23 Emissions from HCFC-22 Production	HFCs	4.3	<0.01	0.99	10%	<0.001
CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	4.1	<0.01	0.99	15%	<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 Aluminum Production	CO_2	3.4	<0.01	0.99	2%	<0.001
CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	3.4	<0.01	0.99	19%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	3.1	<0.01	0.99	225%	0.001
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 Consumption	CO_2	2.7	<0.01	0.99	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_2O	2.5	<0.01	1.00	211%	0.001
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
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. Territories	CO_2	1.4	<0.01	1.00	17%	<0.001
CO_2 Emissions from Zinc Production	CO_2	1.4	<0.01	1.00	17%	<0.001
N_2O 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
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.2	<0.01	1.00	49%	<0.001
CH_4 Emissions from Mobile Combustion: Road	CH_4	1.2	<0.01	1.00	16%	<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	205%	<0.001

Non-CO_2 Emissions from Stationary Combustion - Commercial	CH_4	0.8	<0.01	1.00	138%	<0.001
CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	0.6	<0.01	1.00	22%	<0.001
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	16%	<0.001
CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	CH_4	0.5	<0.01	1.00	3%	<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_2O Emissions from Incineration of Waste	N_2O	0.4	<0.01	1.00	313%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Commercial	N_2O	0.3	<0.01	1.00	38%	<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_2O	0.1	<0.01	1.00	203%	<0.001
N_2O 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	4%	<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 - Residential	CO_2	0.0	<0.01	1.00	NE	<0.001

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 always positive.
NE Uncertainty not estimated.
+ Does not exceed 0.05 Tg CO_2 Eq.

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

IPCC Source Categories	Direct GHG	2012 Estimate (Tg CO_2 Eq.)	Tier 1 Level Assessment	Cumulative Total	Uncertainty	Tier 2 Level Assessment
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,511.2	0.20	0.20	10%	0.019
CO_2 Emissions from Mobile Combustion: Road	CO_2	1,469.8	0.19	0.39	7%	0.013
CO_2 Emissions from Changes in Forest Carbon Stocks	CO_2	866.5	0.11	0.51	15%	0.018
CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	492.2	0.07	0.57	5%	0.003
CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	434.7	0.06	0.63	7%	0.004
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	265.2	0.04	0.67	20%	0.007
Direct N_2O Emissions from Agricultural Soil Management	N_2O	260.9	0.03	0.70	28%	0.010
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	224.8	0.03	0.73	7%	0.002
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	156.9	0.02	0.75	7%	0.001
Emissions from Substitutes for Ozone Depleting Substances	Several	146.8	0.02	0.77	14%	0.003
CO_2 Emissions from Mobile Combustion: Aviation	CO_2	145.1	0.02	0.79	7%	0.001

CH_4 Emissions from Enteric Fermentation	CH_4	141.0	0.02	0.81	18%	0.003
CH_4 Emissions from Natural Gas Systems	CH_4	129.9	0.02	0.83	30%	0.005
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	110.3	0.01	0.84	35%	0.005
CH_4 Emissions from Landfills	CH_4	102.8	0.01	0.86	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	84.5	0.01	0.88	7%	0.001
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	74.3	0.01	0.89	16%	0.002
CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	64.1	0.01	0.90	6%	<0.001
Fugitive Emissions from Coal Mining	CH_4	55.8	0.01	0.90	35%	0.003
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%	0.001
Indirect N_2O Emissions from Applied Nitrogen	N_2O	45.7	0.01	0.92	151%	0.009
CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	44.7	0.01	0.93	11%	0.001
CO_2 Emissions from Mobile Combustion: Marine	CO_2	40.1	0.01	0.94	7%	<0.001
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	36.4	<0.01	0.94	5%	<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 Emissions from Petroleum Systems	CH_4	31.7	<0.01	0.95	149%	0.006
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 Generation	CO_2	18.8	<0.01	0.96	8%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	18.3	<0.01	0.96	171%	0.004
N_2O Emissions from Manure Management	N_2O	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_2O Emissions from Nitric Acid Production	N_2O	15.3	<0.01	0.97	38%	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 Scraps	CO_2	13.0	<0.01	0.97	60%	0.001
CH_4 Emissions from Wastewater Treatment	CH_4	12.8	<0.01	0.98	27%	<0.001
N_2O Emissions from Mobile Combustion: Road	N_2O	12.6	<0.01	0.98	27%	<0.001
N_2O Emissions from Forest Fires	N_2O	12.5	<0.01	0.98	144%	0.002
CO_2 Emissions from Incineration of Waste	CO_2	12.2	<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	CO_2	8.5	<0.01	0.98	108%	0.001
CO_2 Emissions from Other Process Uses of Carbonates	CO_2	8.0	<0.01	0.98	20%	<0.001
CH_4 Emissions from Rice Cultivation	CH_4	7.4	<0.01	0.99	96%	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_2O Emissions from Adipic Acid Production	N_2O	5.8	<0.01	0.99	4%	<0.001
CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	5.2	<0.01	0.99	10%	<0.001
N_2O Emissions from Wastewater Treatment	N_2O	5.0	<0.01	0.99	100%	0.001
Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	4.7	<0.01	0.99	26%	<0.001
N_2O Emissions from Product Uses	N_2O	4.4	<0.01	0.99	24%	<0.001
HFC-23 Emissions from HCFC-22 Production	HFCs	4.3	<0.01	0.99	10%	<0.001
CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	4.1	<0.01	0.99	15%	<0.001

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. Territories	CO_2	3.4	<0.01	0.99	19%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	3.1	<0.01	0.99	225%	0.001
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 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_2O	2.5	<0.01	1.00	211%	0.001
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
CH_4 Emissions from Composting	CH_4	1.6	<0.01	1.00	50%	<0.001
N_2O Emissions from Settlement Soils	N_2O	1.5	<0.01	1.00	163%	<0.001
CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	1.4	<0.01	1.00	17%	<0.001
CO_2 Emissions from Zinc Production	CO_2	1.4	<0.01	1.00	17%	<0.001
N_2O 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
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.2	<0.01	1.00	49%	<0.001
CH_4 Emissions from Mobile Combustion: Road	CH_4	1.2	<0.01	1.00	16%	<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	0.8	<0.01	1.00	30%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Residential	N_2O	0.8	<0.01	1.00	205%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Commercial	CH_4	0.8	<0.01	1.00	138%	<0.001
CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	0.6	<0.01	1.00	22%	<0.001
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	16%	<0.001
CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	CH_4	0.5	<0.01	1.00	3%	<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_2O Emissions from Incineration of Waste	N_2O	0.4	<0.01	1.00	313%	<0.001
N_2O 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	38%	<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_2O	0.1	<0.01	1.00	203%	<0.001

N_2O 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	4%	<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_2O 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 - Coal - Residential	CO_2	0.0	<0.01	1.00	NE	<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.
+ Does not exceed 0.05 Tg CO_2 Eq.

Table A- 8: 1990-2012 Key Source Category Tier 1 and 2 Analysis—Trend Assessment, without LULUCF

IPCC Source Categories	Direct GHG	1990 Estimate (Tg CO_2 Eq.)	2012 Estimate (Tg CO_2 Eq.)	Tier 1 Trend Assessment	Tier 2 Trend Assessment	% Contribution to Trend	Cumulative Total
CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.3	492.2	0.05	0.002	19.5	19
CO_2 Emissions from Mobile Combustion: Road	CO_2	1,188.9	1,469.8	0.04	0.002	14.4	34
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	146.8	0.02	0.003	9.2	43
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,547.6	1,511.2	0.02	0.002	6.5	50
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.3	74.3	0.01	0.002	5.5	55
CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	18.8	0.01	0.001	5.2	60
CH_4 Emissions from Landfills	CH_4	147.8	102.8	0.01	0.004	3.2	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	3.1	70
CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	64.1	0.01	<0.001	2.4	72
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	4.3	0.01	0.001	2.1	74
CH_4 Emissions from Natural Gas Systems	CH_4	156.4	129.9	0.01	0.002	2.1	76
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	64.9	36.4	0.01	<0.001	2.0	78
N_2O Emissions from Mobile Combustion: Road	N_2O	40.3	12.6	<0.01	0.001	1.9	80
Fugitive Emissions from Coal Mining	CH_4	81.1	55.8	<0.01	0.002	1.8	82
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	280.9	265.2	<0.01	0.001	1.7	84
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	238.0	224.8	<0.01	<0.001	1.5	85
SF_6 Emissions from Electrical Transmission and Distribution	SF_6	26.7	6.0	<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	1.0	90
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	120.8	110.3	<0.01	0.001	1.0	91
N_2O Emissions from Adipic Acid Production	N_2O	15.8	5.8	<0.01	<0.001	0.7	92
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	7.4	18.3	<0.01	0.003	0.7	92
Direct N_2O Emissions from Agricultural Soil	N_2O	240.7	260.9	<0.01	<0.001	0.6	93

Management							
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.1	156.9	<0.01	<0.001	0.5	94
CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	4.1	<0.01	<0.001	0.5	94
CO_2 Emissions from Mobile Combustion: Other	CO_2	73.3	84.5	<0.01	<0.001	0.5	95
CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.9	434.7	<0.01	<0.001	0.5	95
CO_2 Emissions from Mobile Combustion: Marine	CO_2	44.5	40.1	<0.01	<0.001	0.4	95
CH_4 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
CO_2 Emissions from Natural Gas Systems	CO_2	37.7	35.2	<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	0.2	97
CO_2 Emissions from Incineration of Waste	CO_2	8.0	12.2	<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_2O Emissions from Nitric Acid Production	N_2O	18.2	15.3	<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	0.0	<0.01	0.001	0.2	98
N_2O Emissions from Manure Management	N_2O	14.4	18.0	<0.01	<0.001	0.2	98
CO_2 Emissions from Other Process Uses of Carbonates	CO_2	4.9	8.0	<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
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_2O Emissions from Applied Nitrogen	N_2O	41.4	45.7	<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 Stationary Combustion - Gas - U.S. Territories	CO_2	+	1.4	<0.01	<0.001	0.1	99
N_2O Emissions from Wastewater Treatment	N_2O	3.5	5.0	<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
N_2O 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
CH_4 Emissions from Wastewater Treatment	CH_4	13.2	12.8	<0.01	<0.001	0.1	99
Non-CO_2 Emissions from Stationary Combustion - Industrial	N_2O	3.3	2.5	<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
CH_4 Emissions from Rice Cultivation	CH_4	7.7	7.4	<0.01	<0.001	<0.1	99
N_2O Emissions from Mobile Combustion: Other	N_2O	1.3	2.0	<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	100
N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.8	1.4	<0.01	<0.001	<0.1	100
CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	1.7	<0.01	<0.001	<0.1	100
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.6	1.2	<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
Non-CO_2 Emissions from Stationary Combustion - Residential	N_2O	1.1	0.8	<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 Cement Production	CO_2	33.3	35.1	<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_2O 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_2O Emissions from Incineration of Waste	N_2O	0.5	0.4	<0.01	<0.001	<0.1	100
Non-CO_2 Emissions from Stationary Combustion - Commercial	N_2O	0.4	0.3	<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 - U.S. Territories	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	0.6	<0.01	<0.001	<0.1	100
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 and Consumption	CH_4	+	+	<0.01	<0.001	<0.1	100
CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4	0.4	<0.01	<0.001	<0.1	100
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_2O 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

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

+ Does not exceed 0.05 Tg CO_2 Eq.

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

IPCC Source Categories	Direct GHG	1990 Estimate (Tg CO_2 Eq.)	2012 Estimate (Tg CO_2 Eq.)	Tier 1 Trend Assessment	Tier 2 Trend Assessment	Percent Contribution to Trend (%)	Cumulative Contribution to Trend (%)
CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.3	492.2	0.04	0.002	16.6	17
CO_2 Emissions from Mobile Combustion: Road	CO_2	1,188.9	1,469.8	0.03	0.002	11.3	28
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	146.8	0.02	0.003	8.0	36
CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,547.6	1,511.2	0.02	0.002	7.1	43
CO_2 Emissions from Changes in Forest Carbon Stocks	CO_2	704.6	866.5	0.02	0.003	6.5	49
CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.3	74.3	0.01	0.002	4.9	54
CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	18.8	0.01	0.001	4.6	59
CH_4 Emissions from Landfills	CH_4	147.8	102.8	0.01	0.004	2.9	62

CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	145.1	0.01	<0.001	2.9	65
CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	99.8	54.3	0.01	0.001	2.8	68
CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	64.1	0.01	<0.001	2.1	70
CH_4 Emissions from Natural Gas Systems	CH_4	156.4	129.9	0.01	0.002	2.0	72
HFC-23 Emissions from HCFC-22 Production	HFCs	36.4	4.3	<0.01	<0.001	1.9	74
CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	280.9	265.2	<0.01	0.001	1.8	75
CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	64.9	36.4	<0.01	<0.001	1.8	77
Fugitive Emissions from Coal Mining	CH_4	81.1	55.8	<0.01	0.001	1.6	79
N_2O Emissions from Mobile Combustion: Road	N_2O	40.3	12.6	<0.01	0.001	1.6	80
CO_2 Emissions from Cropland Remaining Cropland	CO_2	51.9	26.5	<0.01	0.007	1.6	82
CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	238.0	224.8	<0.01	<0.001	1.5	83
CO_2 Emissions from Urban Trees	CO_2	60.4	88.4	<0.01	0.002	1.3	85
SF_6 Emissions from Electrical Transmission and Distribution	SF_6	26.7	6.0	<0.01	0.001	1.2	86
CH_4 Emissions from Manure Management	CH_4	31.5	52.9	<0.01	0.001	1.1	87
CO_2 Emissions from Non-Energy Use of Fuels	CO_2	120.8	110.3	<0.01	0.001	1.0	88
PFC Emissions from Aluminum Production	PFCs	18.4	2.5	<0.01	<0.001	0.9	89
CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	27.2	44.7	<0.01	<0.001	0.9	90
CO_2 Emissions from Landfilled Yard Trimmings and Food Scraps	CO_2	24.2	13.0	<0.01	0.001	0.7	91
CH_4 Emissions from Forest Fires	CH_4	2.5	15.3	<0.01	0.003	0.7	91
CO_2 Emissions from Land Converted to Cropland	CO_2	26.9	16.8	<0.01	0.001	0.6	92
N_2O Emissions from Adipic Acid Production	N_2O	15.8	5.8	<0.01	<0.001	0.6	92
Non-CO_2 Emissions from Stationary Combustion - Electricity Generation	N_2O	7.4	18.3	<0.01	0.003	0.6	93
N_2O Emissions from Forest Fires	N_2O	2.0	12.5	<0.01	0.002	0.6	94
CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	4.1	<0.01	<0.001	0.5	94
CO_2 Emissions from Mobile Combustion: Marine	CO_2	44.5	40.1	<0.01	<0.001	0.4	94
CO_2 Emissions from Mobile Combustion: Other	CO_2	73.3	84.5	<0.01	<0.001	0.4	95
CH_4 Emissions from Petroleum Systems	CH_4	35.8	31.7	<0.01	0.001	0.3	95
CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.1	156.9	<0.01	<0.001	0.3	95
Direct N_2O Emissions from Agricultural Soil Management	N_2O	240.7	260.9	<0.01	<0.001	0.3	96
CH_4 Emissions from Enteric Fermentation	CH_4	137.9	141.0	<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 Ammonia Production	CO_2	13.0	9.4	<0.01	<0.001	0.2	97
SF_6 Emissions from Magnesium Production and Processing	SF_6	5.4	1.7	<0.01	<0.001	0.2	97
N_2O Emissions from Nitric Acid Production	N_2O	18.2	15.3	<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
CO_2 Emissions from Incineration of Waste	CO_2	8.0	12.2	<0.01	<0.001	0.2	97
CO_2 Emissions from Grassland Remaining Grassland	CO_2	9.6	6.7	<0.01	0.003	0.2	98
CH_4 Emissions from Mobile Combustion: Road	CH_4	4.2	1.2	<0.01	<0.001	0.2	98
CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	3.0	+	<0.01	<0.001	0.2	98
CO_2 Emissions from Other Process Uses of	CO_2	4.9	8.0	<0.01	<0.001	0.2	98

Carbonates							
N_2O Emissions from Manure Management	N_2O	14.4	18.0	<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	0.1	98
Non-CO_2 Emissions from Stationary Combustion - Residential	CH_4	4.6	3.1	<0.01	0.001	0.1	98
Indirect N_2O Emissions from Applied Nitrogen	N_2O	41.4	45.7	<0.01	<0.001	0.1	99
Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	6.0	4.7	<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_2O Emissions from Composting	N_2O	0.4	1.8	<0.01	<0.001	0.1	99
N_2O Emissions from Wastewater Treatment	N_2O	3.5	5.0	<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
CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	5.2	<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
CH_4 Emissions from Wastewater Treatment	CH_4	13.2	12.8	<0.01	<0.001	0.1	99
Non-CO_2 Emissions from Stationary Combustion - Industrial	N_2O	3.3	2.5	<0.01	<0.001	0.1	99
CO_2 Emissions from Liming of Agricultural Soils	CO_2	4.7	3.9	<0.01	<0.001	0.1	99
CO_2 Emissions from Urea Fertilization	CO_2	2.4	3.4	<0.01	<0.001	<0.1	99
CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.9	434.7	<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 Zinc Production	CO_2	0.6	1.4	<0.01	<0.001	<0.1	99
CO_2 Emissions from Land Converted to Grassland	CO_2	7.3	8.5	<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	100
PFC, HFC, and SF_6 Emissions from Semiconductor Manufacture	Several	2.9	3.7	<0.01	<0.001	<0.1	100
CO_2 Emissions from Ferroalloy Production	CO_2	2.2	1.7	<0.01	<0.001	<0.1	100
N_2O Emissions from Mobile Combustion: Other	N_2O	1.3	2.0	<0.01	<0.001	<0.1	100
CO_2 Emissions from Phosphoric Acid Production	CO_2	1.6	1.1	<0.01	<0.001	<0.1	100
N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.8	1.4	<0.01	<0.001	<0.1	100
CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	1.7	<0.01	<0.001	<0.1	100
Non-CO_2 Emissions from Stationary Combustion - Industrial	CH_4	1.6	1.2	<0.01	<0.001	<0.1	100
N_2O Emissions from Settlement Soils	N_2O	1.0	1.5	<0.01	<0.001	<0.1	100
Non-CO_2 Emissions from Stationary Combustion - Residential	N_2O	1.1	0.8	<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
N_2O Emissions from Forest Soils	N_2O	0.1	0.4	<0.01	<0.001	<0.1	100
N_2O Emissions from Product Uses	N_2O	4.4	4.4	<0.01	<0.001	<0.1	100
CO_2 Emissions from Wetlands Remaining Wetlands	CO_2	1.0	0.8	<0.01	<0.001	<0.1	100
CO_2 Emissions from Cement Production	CO_2	33.3	35.1	<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
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 - Commercial	CH_4	0.9	0.8	<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
N_2O Emissions from Incineration of Waste	N_2O	0.5	0.4	<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
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 - Commercial	N_2O	0.4	0.3	<0.01	<0.001	<0.1	100
N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	0.6	<0.01	<0.001	<0.1	100
Non-CO_2 Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	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
CH_4 Emissions from Mobile Combustion: Aviation	CH_4	0.1	+	<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
CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4	0.4	<0.01	<0.001	<0.1	100
CO_2 Emissions from Lead Production	CO_2	0.5	0.5	<0.01	<0.001	<0.1	100
CH_4 Emissions from Silicon Carbide Production and Consumption	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
CH_4 Emissions from Ferroalloy Production	CH_4	+	+	<0.01	<0.001	<0.1	100
N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
N_2O Emissions from Wetlands Remaining Wetlands	N_2O	+	+	<0.01	<0.001	<0.1	100
CH_4 Emissions from Incineration of Waste	CH_4	+	+	<0.01	<0.001	<0.1	100
CH_4 Emissions from Mobile Combustion: Marine	CH_4	+	+	<0.01	<0.001	<0.1	100

+ Does not exceed 0.05 Tg CO_2 Eq.

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