ANNEX 1 Key Category Analysis

The United States has identified national key categories based on the estimates presented in this report. The *2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* (IPCC 2006) 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 greenhouse gases in terms of the absolute level, the trend, or the uncertainty in emissions and removals." 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. A qualitative review of key categories, along with non-key categories has not identified additional categories to consider as key.

The methodology for conducting a key category analysis, as defined by Volume 1, Chapter 4 of the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC 2006), includes:

- Approach 1 (including both level and trend assessments);
- Approach 2 (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 Land Use, Land-Use Change and Forestry LULUCF); discusses Approach 1, Approach 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. The United States key category analysis generally follows the IPCC suggested aggregation level of analysis, but in some cases does differ by avoiding disaggregating into many smaller categories (i.e., separating pools and subcategories within LULUCF source categories). The UNFCCC common reporting format reporting software generates Table 7, which also identifies key categories using an Approach 1 analysis based on the default disaggregation approach provided in Volume 1, Chapter 4 of the *2006 IPCC Guidelines*.

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 (GWP)-weighted emissions in 2018. The table also indicates the criteria used in identifying these categories (i.e., level, trend, Approach 1, Approach 2, and/or qualitative assessments).

Table A-1: Key Source Categories for the United States (1990 and 2018)

CRF Source/Sink Categories	Greenhouse Gas	Approach 1				Approach 2				Qual[a]	2018 Emissions (MMT 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											
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	•	•	•	•	•	•	•	•		1,499.8
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	•	•	•	•	•	•	•	•		1,152.9
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	•	•	•	•	•	•	•	•		577.4
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	•	•	•	•	•	•	•	•		514.8
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	•	•	•	•	•	•	•	•		282.1
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	•	•	•	•	•	•	•			273.7
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	•	•	•	•	•	•	•	•		192.6
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	•	•	•	•	•		•			173.9
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	•	•	•	•	•	•	•	•		134.5

1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	•	•	•	•						63.9
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	•	•	•	•	•	•		•		62.2
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	•	•	•	•	•	•	•	•		49.8
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	•	•	•	•						49.2
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	•	•	•	•	•	•	•	•		39.4
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	•		•							38.9
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	•	•	•	•						36.5
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	•		•		•					34.9
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	•	•	•	•						34.3
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	•	•	•	•	•	•		•		22.2
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2						•				3.0

1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2		•		•						1.8
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2						•		•		0.0
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	•	•	•	•	•	•	•	•		139.7
1.B.1 Fugitive Emissions from Coal Mining	CH_4	•	•	•	•	•	•	•	•		52.7
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	•	•	•	•	•	•	•	•		36.6
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4					•		•			7.0
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4					•	•	•	•		4.5
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4						•		•		1.7
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O					•					20.3
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	•	•	•	•		•		•		10.4
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O					•					2.7
Industrial Processes and Product Use											
2.C.1 CO_2 Emissions from Iron and Steel Production &	CO_2	•	•	•	•	•	•	•	•		42.7

Metallurgical Coke Production													
2.A.1 CO_2 Emissions from Cement Production	CO_2	•			•								40.3
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	•		•		•		•					29.4
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	•		•		•		•		•			4.1
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	•		•		•		•		•			3.3
2.C.3 PFC Emissions from Aluminum Production	PFCs	•		•				•					1.6
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	•		•		•		•	•	•	•		128.9
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs			•				•			•		19.2
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs			•									11.8
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs							•					2.6
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs							•					2.0
Agriculture													

3.G CO_2 Emissions from Liming	CO_2						•					3.1
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	•	•	•	•	•		•				171.7
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	•	•	•	•	•	•		•			35.7
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	•		•		•		•				285.7
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	•	•	•	•	•	•	•	•			52.5
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	•		•								26.0
3.C CH_4 Emissions from Rice Cultivation	CH_4					•	•					13.3
Waste												
5.A CH_4 Emissions from Landfills	CH_4	•	•	•	•	•	•	•	•			110.6
Land Use, Land Use Change, and Forestry												
Net CO_2 Emissions from Land Converted to Settlements	CO_2			•	•			•	•			79.3
Net CO_2 Emissions from Land Converted to Cropland	CO_2			•				•				55.3
Net CO_2 Emissions from Grassland Remaining Grassland	CO_2							•	•			11.2
Net CO_2 Emissions from Cropland Remaining Cropland	CO_2			•	•			•	•			(16.6)

Net CO_2 Emissions from Land Converted to Grassland	CO_2		•	•		•	•		(24.6)
Net CO_2 Emissions from Land Converted to Forest Land	CO_2		•			•			(110.6)
Net CO_2 Emissions from Settlements Remaining Settlements	CO_2		•	•		•	•		(126.2)
Net CO_2 Emissions from Forest Land Remaining Forest Land	CO_2		•	•		•	•		(663.2)
CH_4 Emissions from Forest Fires	CH_4			•					11.3
N_2O Emissions from Forest Fires	N_2O			•					7.5
Subtotal Without LULUCF									**6,497.7**
Total Emissions Without LULUCF									**6,677.8**
Percent of Total Without LULUCF									**97%**
Subtotal With LULUCF									**5,674.1**
Total Emissions With LULUCF									**5,904.1**
Percent of Total With LULUCF									**96%**

[a] Qualitative criteria.

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 2018) in which each source or sink category reached the threshold for being a key category based on either a Tier 1 or Tier 2 level assessment.

In addition to conducting Approach 1 and 2 level and trend assessments, a qualitative assessment of the source categories, as described in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC 2006), was conducted to capture any key categories that were not identified by either quantitative method. For this Inventory, no additional categories were identified using criteria recommend by IPCC, but EPA continues to update its qualitative assessment on an annual basis.

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

CRF Source Categories	Direct Greenhouse Gas	2018 Emissions (MMT CO_2 Eq.)	Key Category?	ID Criteria[a]	Level in which year(s)?[b]
Energy					
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,499.8	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,152.9	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	577.4	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	514.8	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	282.1	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	273.7	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	192.6	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	173.9	•	L_1 T_1 L_2	1990, 2018
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	134.5	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	63.9	•	L_1 T_1	1990_1, 2018_1
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	62.2	•	L_1 T_1 L_2 T_2	1990, 2018_1
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	49.8	•	L_1 T_1 L_2 T_2	1990, 2018
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	49.2	•	L_1 T_1	1990_1, 2018_1
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	39.4	•	L_1 T_1 L_2 T_2	2018
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	38.9	•	L_1	1990_1, 2018_1
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	36.5	•	L_1 T_1	1990_1, 2018_1
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	34.9	•	L_1 L_2	1990, 2018
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	34.3	•	L_1 T_1	1990_1, 2018_1
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	22.2	•	L_1 T_1 L_2 T_2	1990
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	11.1			

1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	4.0			
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	3.0	•	T_2	
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	1.8	•	T_1	
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4			
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+			
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	0.0	•	T_2	
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	139.7	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.B.1 Fugitive Emissions from Coal Mining	CH_4	52.7	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	36.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	7.0	•	L_2	1990_2, 2018_2
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	6.2			
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	4.5	•	$L_2 T_2$	1990_2, 2018_2
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	1.7	•	T_2	
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.6			
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.3			
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	1.0			
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	1.0			
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.3			
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.2			
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1			
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	0.1			
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	+			
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+			
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+			
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+			
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.3	•	L_2	1990_2, 2018_2
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	10.4	•	$L_1 T_1 T_2$	1990_1
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	4.1			
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	2.7	•	L_2	1990_2

1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	2.5			
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.6			
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	0.9			
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.5			
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4			
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.3			
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3			
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1			
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	0.1			
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+			
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+			
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	+			
1.D.1 International Bunker Fuels[c]	Several	123.3			
Industrial Processes and Product Use					
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	42.7	•	$L_1 T_1 L_2 T_2$	1990, 2018
2.A.1 CO_2 Emissions from Cement Production	CO_2	40.3	•	L_1	1990_1, 2018_1
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	29.4	•	$L_1 T_1$	1990_1, 2018_1
2.A.2 CO_2 Emissions from Lime Production	CO_2	13.9			
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.5			
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	9.4			
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	4.5			
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.6			
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.1			
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.7			
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.6			
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	1.5			
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.3			
2.C.6 CO_2 Emissions from Zinc Production	CO_2	1.0			
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	0.9			
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.6			
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2			
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+			
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.3			

2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+			
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+			
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+			
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	10.3			
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	9.3			
2.G N_2O Emissions from Product Uses	N_2O	4.2			
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.4			
2.E N_2O Emissions from Electronics Industry	N_2O	0.3			
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	128.9	•	$L_1 T_1 L_2 T_2$	2018
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	19.2	•	$T_1 T_2$	
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	11.8	•	T_1	
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	2.6	•	T_2	
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	2.0	•	T_2	
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	4.8			
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	4.1	•	$L_1 T_1 T_2$	1990_1
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	3.3	•	$L_1 T_1 T_2$	1990_1
2.C.3 PFC Emissions from Aluminum Production	PFC	1.6	•	$L_1 T_1$	1990_1
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	1.1			
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.1			
Agriculture					
3.H CO_2 Emissions from Urea Fertilization	CO_2	4.6			
3.G CO_2 Emissions from Liming	CO_2	3.1	•	T_2	
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	171.7	•	$L_1 T_1 L_2$	1990, 2018
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	35.7	•	$L_1 T_1 L_2 T_2$	2018
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	26.0	•	L_1	2018_1
3.C CH_4 Emissions from Rice Cultivation	CH_4	13.3	•	$L_2 T_2$	1990_2, 2018_2
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.8			
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.4			
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	285.7	•	$L_1 L_2$	1990, 2018
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	52.5	•	$L_1 T_1 L_2 T_2$	1990, 2018

3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	15.4			
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	4.1			
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2			
Waste					
5.A CH_4 Emissions from Landfills	CH_4	110.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
5.D CH_4 Emissions from Wastewater Treatment	CH_4	14.2			
5.B CH_4 Emissions from Composting	CH_4	2.5			
5.D N_2O Emissions from Wastewater Treatment	N_2O	5.0			
5.B N_2O Emissions from Composting	N_2O	2.2			

+ Does not exceed 0.05 MMT CO_2 Eq.

[a] For the ID criteria, Q refers to "Qualitative", 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 an Approach 1 or Approach 2 assessment (e.g., L_2 designates a source is a key category for an Approach 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_2 designates a source is a key category for the Approach 2 assessment only in 1990).

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

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

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

CRF Source/Sink Categories	Direct Greenhouse Gas	2018 Emissions (MMT CO_2 Eq.)	Key Category?	ID Criteria[a]	Level in which year(s)?[b]
Energy					
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,499.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,152.9	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	577.4	•	$L_1 T_1 L_2 T_2$	1990_1, 2018
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	514.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	282.1	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	273.7	•	$L_1 T_1 L_2$	1990, 2018
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	192.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	173.9	•	$L_1 T_1 L_2$	1990, 2018
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	134.5	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	63.9	•	$L_1 T_1$	1990_1, 2018_1
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	62.2	•	$L_1 T_1 T_2$	1990_1, 2018_1
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	49.8	•	$L_1 T_1 L_2 T_2$	1990, 2018_1
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	49.2	•	$L_1 T_1$	1990_1, 2018_1

1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	39.4	•	L_1 T_1 L_2 T_2	2018
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	38.9	•	L_1	1990_1, 2018_1
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	36.5	•	L_1 T_1	1990_1, 2018_1
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	34.9	•	L_1	1990_1, 2018_1
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	34.3	•	L_1 T_1	1990_1, 2018_1
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	22.2	•	L_1 T_1 T_2	1990_1, 2018_1
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	11.1			
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	4.0			
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	3.0			
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	1.8	•	T_1	
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4			
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+			
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	0.0	•	T_2	
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	139.7	•	L_1 T_1 L_2 T_2	1990, 2018
1.B.1 Fugitive Emissions from Coal Mining	CH_4	52.7	•	L_1 T_1 L_2 T_2	1990, 2018_1
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	36.6	•	L_1 T_1 L_2 T_2	1990, 2018
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	7.0	•	L_2	1990_2, 2018_2
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	6.2			
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	4.5	•	L_2 T_2	1990_2
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	1.7	•	T_2	
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.6			
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.3			
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	1.0			
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	1.0			
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.3			
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.2			
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1			
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	0.1			

1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	+			
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+			
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+			
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+			
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.3			
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	10.4	•	L_1 T_1 T_2	1990_1
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	4.1			
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	2.7			
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	2.5			
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.6			
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	0.9			
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.5			
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4			
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.3			
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3			
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1			
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	0.1			
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+			
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+			
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	+			
1.D.1 International Bunker Fuels[c]	Several	123.3			
Industrial Processes					
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	42.7	•	L_1 T_1 L_2 T_2	1990, 2018_1
2.A.1 CO_2 Emissions from Cement Production	CO_2	40.3	•	L_1	1990_1, 2018_1
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	29.4	•	L_1 T_1	1990_1, 2018_1
2.A.2 CO_2 Emissions from Lime Production	CO_2	13.9			
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.5			

2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	9.4			
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	4.5			
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.6			
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.1			
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.7			
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.6			
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	1.5			
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.3			
2.C.6 CO_2 Emissions from Zinc Production	CO_2	1.0			
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	0.9			
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.6			
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2			
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+			
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.3			
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+			
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+			
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+			
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	10.3			
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	9.3			
2.G N_2O Emissions from Product Uses	N_2O	4.2			
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.4			
2.E N_2O Emissions from Electronics Industry	N_2O	0.3			
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	128.9	•	$L_1 T_1 L_2 T_2$	2018
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	19.2	•	$T_1 T_2$	
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	11.8	•	T_1	
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	2.6			
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	2.0			
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	4.8			

2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	4.1	•	L_1 T_1 T_2	1990_1
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	3.3	•	L_1 T_1 T_2	1990_1
2.C.3 PFC Emissions from Aluminum Production	PFC	1.6	•	T_1	
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	1.1			
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.1			
Agriculture					
3.H CO_2 Emissions from Urea Fertilization	CO_2	4.6			
3.G CO_2 Emissions from Liming	CO_2	3.1			
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	171.7	•	L_1 T_1 L_2	1990, 2018
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	35.7	•	L_1 T_1 T_2	2018_1
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	26.0	•	L_1	2018_1
3.C CH_4 Emissions from Rice Cultivation	CH_4	13.3			
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.8			
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.4			
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	285.7	•	L_1 L_2	1990, 2018
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	52.5	•	L_1 T_1 L_2 T_2	1990, 2018
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	15.4			
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	4.1			
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2			
Waste					
5.A CH_4 Emissions from Landfills	CH_4	110.6	•	L_1 T_1 L_2 T_2	1990, 2018
5.D CH_4 Emissions from Wastewater Treatment	CH_4	14.2			
5.B CH_4 Emissions from Composting	CH_4	2.5			
5.D N_2O Emissions from Wastewater Treatment	N_2O	5.0			
5.B N_2O Emissions from Composting	N_2O	2.2			
Land Use, Land Use Change, and Forestry					
4.E.2 Net CO_2 Emissions from Land Converted to Settlements	CO_2	79.3	•	L_1 T_1 L_2 T_2	1990, 2018
4.B.2 Net CO_2 Emissions from Land Converted to Cropland	CO_2	55.3	•	L_1 L_2	1990, 2018
4.C.1 Net CO_2 Emissions from Grassland Remaining Grassland	CO_2	11.2	•	L_2 T_2	1990_2, 2018_2
4.D.2 Net CO_2 Emissions from Land Converted to Wetlands	CO_2	(+)			
4.D.1 Net CO_2 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CO_2	(+)			
4.B.1 Net CO_2 Emissions from Cropland Remaining Cropland	CO_2	(+)	•	L_1 T_1 L_2 T_2	1990, 2018_2

4.C.2 Net CO_2 Emissions from Land Converted to Grassland	CO_2	(+)	•	$L_1 T_1 L_2 T_2$	2018
4.A.2 Net CO_2 Emissions from Land Converted to Forest Land	CO_2	(+)	•	$L_1 L_2$	1990, 2018
4.E.1 Net CO_2 Emissions from Settlements Remaining Settlements	CO_2	(+)	•	$L_1 T_1 L_2 T_2$	1990, 2018
4.A.1 Net CO_2 Emissions from Forest Land Remaining Forest Land	CO_2	(+)	•	$L_1 T_1 L_2 T_2$	1990, 2018
4.A.1 CH_4 Emissions from Forest Fires	CH_4	11.3	•	T_1	
4.D.1 CH_4 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CH_4	3.6			
4.C.1 CH_4 Emissions from Grass Fires	CH_4	0.3			
4.D.2 CH_4 Emissions from Land Converted to Coastal Wetlands	CH_4	+			
4.A.4 CH_4 Emissions from Drained Organic Soils	CH_4	+			
4.D.1 CH_4 Emissions from Peatlands Remaining Peatlands	CH_4	+			
4.A.1 N_2O Emissions from Forest Fires	N_2O	7.5	•	T_1	
4.E.1 N_2O Emissions from Settlement Soils	N_2O	2.4			
4.A.1 N_2O Emissions from Forest Soils	N_2O	0.5			
4.C.1 N_2O Emissions from Grass Fires	N_2O	0.3			
4.D.1 N_2O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1			
4.A.4 N_2O Emissions from Drained Organic Soils	N_2O	0.1			
4.D.1 N_2O Emissions from Peatlands Remaining Peatlands	N_2O	+			

+ Does not exceed 0.05 MMT CO_2 Eq.

[a] For the ID criteria, Q refers to "Qualitative," 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 an Approach 1 or Approach 2 assessment (e.g., L_2 designates a source is a key category for an Approach 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 Approach 2 assessment only in 1990).

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

[d] This source category was excluded from the analysis.

Note: Parentheses indicate negative values (or sequestration).

Evaluation of Key Categories

Level Assessment

When using an Approach 1 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 *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC 2006) was designed to establish a general level where the key category analysis covers approximately 90 percent of inventory uncertainty.

Including the Approach 2 provides additional insight into why certain source categories are considered key, and how to prioritize inventory improvements. In the Approach 2, the level assessment for each category from the Approach 1 is multiplied by its percent relative uncertainty. If the uncertainty reported is asymmetrical, the absolute value of the larger uncertainty is used. 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 emission estimate. No uncertainty was associated with CH_4 emissions from waste incineration nor certain F-GHGs, photovoltaics (PV), micro-electro-mechanical systems (MEMS) devices (MEMs), and Heat Transfer Fluids (HTFs) from the Electronics Industry because 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 Approach 2 level assessment may differ from those identified by the Approach 1 assessment. The final set of key categories includes all source and sink categories identified as key by either the Approach 1 or the Approach 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 or sink 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 or sink category. The United States has attempted to define source and sink categories by the conventions that 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 2018 level assessments for both with and without LULUCF sources and sinks, and contain further detail on where each source falls within the analysis. Approach 1 key categories are shaded dark gray. Additional key categories identified by the Approach 2 assessment are shaded light gray.

Trend Assessment

Approach 1 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 Approach 2, the trend assessment for each category from Approach 1 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 Approach 2 trend assessment may differ from those identified by the Approach 1 assessment. The final set of key categories includes all source and sink categories identified as key by either the Approach 1 or the Approach 2 assessment, keeping in mind that the two assessments are not mutually exclusive.

Table A-8 and Table A-9 contain the 1990 through 2018 trend assessment for both with and without LULUCF sources and sinks, and contain further detail on where each source falls within the analysis. Approach 1 key categories are shaded dark gray. Additional key categories identified by the Approach 2 assessment are shaded light gray.

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

CRF Source Categories	Direct Greenhouse Gas	1990 Estimate ($MMT CO_2$ Eq.)	Approach 1 Level Assessment	Cumulative Total	Uncertainty[a]	Approach 2 Level Assessment
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,546.5	0.24	0.24	10%	0.023
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,163.9	0.18	0.42	6%	0.011
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.5	0.06	0.48	7%	0.005

1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	293.3	0.05	0.53	21%	0.009
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	272.5	0.04	0.57	31%	0.013
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	237.8	0.04	0.61	7%	0.003
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	0.03	0.64	6%	0.002
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	183.2	0.03	0.67	17%	0.005
5.A CH_4 Emissions from Landfills	CH_4	179.6	0.03	0.69	40%	0.011
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.4	0.03	0.72	5%	0.001
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	158.4	0.02	0.75	18%	0.004
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.2	0.02	0.77	16%	0.004
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.0	0.02	0.79	7%	0.002
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	119.5	0.02	0.81	38%	0.007
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	104.7	0.02	0.83	18%	0.003
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	0.02	0.84	8%	0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	0.02	0.86	6%	0.001
1.B.1 Fugitive Emissions from Coal Mining	CH_4	96.5	0.01	0.87	17%	0.002
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	74.2	0.01	0.88	6%	0.001
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	46.3	0.01	0.89	6%	<0.001
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	46.2	0.01	0.90	38%	0.003
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	46.1	0.01	0.91	10%	0.001
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	43.4	0.01	0.91	151%	0.010
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	37.7	0.01	0.92	14%	0.001
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	36.0	0.01	0.92	6%	<0.001
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	35.5	0.01	0.93	6%	<0.001
2.A.1 CO_2 Emissions from Cement Production	CO_2	33.5	0.01	0.93	6%	<0.001
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	32.2	<0.01	0.94	17%	0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	26.9	<0.01	0.94	11%	<0.001
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	23.2	<0.01	0.95	15%	0.001
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	21.6	<0.01	0.95	5%	<0.001

2.C.3 PFC Emissions from Aluminum Production	PFCs	21.5	<0.01	0.95	7%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.1	<0.01	0.96	48%	0.001
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	19.3	<0.01	0.96	20%	0.001
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	17.9	<0.01	0.96	20%	0.001
3.C CH_4 Emissions from Rice Cultivation	CH_4	16.0	<0.01	0.97	62%	0.002
5.D CH_4 Emissions from Wastewater Treatment	CH_4	15.3	<0.01	0.97	28%	0.001
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	15.2	<0.01	0.97	5%	<0.001
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.0	<0.01	0.97	5%	<0.001
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	12.1	<0.01	0.97	5%	<0.001
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	<0.01	0.98	15%	<0.001
2.A.2 CO_2 Emissions from Lime Production	CO_2	11.7	<0.01	0.98	2%	<0.001
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	11.2	<0.01	0.98	24%	<0.001
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	9.6	<0.01	0.98	38%	0.001
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	8.0	<0.01	0.98	28%	<0.001
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	7.2	<0.01	0.98	20%	<0.001
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	7.0	<0.01	0.98	52%	0.001
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	6.8	<0.01	0.99	2%	<0.001
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	6.6	<0.01	0.99	220%	0.002
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	6.3	<0.01	0.99	15%	<0.001
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.7	<0.01	0.99	18%	<0.001
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	5.2	<0.01	0.99	230%	0.002
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	5.2	<0.01	0.99	26%	<0.001
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	5.2	<0.01	0.99	7%	<0.001
3.G CO_2 Emissions from Liming	CO_2	4.7	<0.01	0.99	111%	0.001
2.G N_2O Emissions from Product Uses	N_2O	4.2	<0.01	0.99	24%	<0.001
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	<0.01	0.99	12%	<0.001
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	3.6	<0.01	0.99	6%	<0.001
5.D N_2O Emissions from Wastewater Treatment	N_2O	3.4	<0.01	0.99	109%	0.001
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	3.1	<0.01	0.99	199%	0.001

1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	3.0	<0.01	1.00	NE	<0.001
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	2.8	<0.01	1.00	24%	<0.001
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.2	<0.01	1.00	12%	<0.001
3.H CO_2 Emissions from Urea Fertilization	CO_2	2.0	<0.01	1.00	35%	<0.001
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.8	<0.01	1.00	47%	<0.001
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	1.8	<0.01	1.00	61%	<0.001
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.7	<0.01	1.00	66%	<0.001
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.7	<0.01	1.00	32%	<0.001
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.5	<0.01	1.00	5%	<0.001
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	1.5	<0.01	1.00	21%	<0.001
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.5	<0.01	1.00	5%	<0.001
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.4	<0.01	1.00	9%	<0.001
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	<0.01	1.00	13%	<0.001
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.1	<0.01	1.00	139%	<0.001
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	1.0	<0.01	1.00	217%	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	0.6	<0.01	1.00	19%	<0.001
2.C.6 CO_2 Emissions from Zinc Production	CO_2	0.6	<0.01	1.00	16%	<0.001
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	44%	<0.001
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.6	<0.01	1.00	85%	<0.001
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.5	<0.01	1.00	NA	<0.001
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	334%	<0.001
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	175%	<0.001
5.B CH_4 Emissions from Composting	CH_4	0.4	<0.01	1.00	50%	<0.001
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	<0.01	1.00	9%	<0.001
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.3	<0.01	1.00	16%	<0.001
5.B N_2O Emissions from Composting	N_2O	0.3	<0.01	1.00	50%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	0.3	<0.01	1.00	48%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.3	<0.01	1.00	9%	<0.001

1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	<0.01	1.00	71%	<0.001
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.2	<0.01	1.00	57%	<0.001
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	0.2	<0.01	1.00	13%	<0.001
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	0.1	<0.01	1.00	2%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	0.1	<0.01	1.00	10%	<0.001
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	<0.01	1.00	198%	<0.001
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	<0.01	1.00	26%	<0.001
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	0.1	<0.01	1.00	88%	<0.001
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	+	<0.01	1.00	55%	<0.001
2.E N_2O Emissions from Electronics Industry	N_2O	+	<0.01	1.00	0%	<0.001
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	8%	<0.001
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	<0.01	1.00	19%	<0.001
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	<0.01	1.00	12%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	<0.01	1.00	10%	<0.001
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	+	<0.01	1.00	13%	<0.001
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	+	<0.01	1.00	38%	<0.001
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	<0.01	1.00	220%	<0.001
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	+	<0.01	1.00	11%	<0.001
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	<0.01	1.00	2%	<0.001
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	<0.01	1.00	3%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	<0.01	1.00	2%	<0.001
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	<0.01	1.00	NE	<0.001

1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	0.0	<0.01	1.00	17%	<0.001
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	0.0	<0.01	1.00	18%	<0.001
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	0.0	<0.01	1.00	22%	<0.001
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.0	<0.01	1.00	21%	<0.001

+ Does not exceed 0.05 MMT CO_2 Eq.
NE (Not Estimated)
NA (Not Available)
[a] Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive.
Note: LULUCF sources and sinks are not included in this analysis.

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

CRF Source/Sink Categories	Direct Greenhouse Gas	1990 Estimate (MMT CO_2 Eq.)	Approach 1 Level Assessment	Cumulative Total	Uncertainty[a]	Approach 2 Level Assessment
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,546.5	0.20	0.20	10%	0.020
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,163.9	0.15	0.36	6%	0.010
4.A.1 Net CO_2 Emissions from Forest Land Remaining Forest Land	CO_2	733.9	0.10	0.46	28%	0.027
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.5	0.05	0.51	7%	0.004
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	293.3	0.04	0.55	21%	0.008
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	272.5	0.04	0.58	31%	0.011
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	237.8	0.03	0.62	7%	0.002
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	0.02	0.64	6%	0.002
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	183.2	0.02	0.67	17%	0.004
5.A CH_4 Emissions from Landfills	CH_4	179.6	0.02	0.69	40%	0.010
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.4	0.02	0.71	5%	0.001
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	158.4	0.02	0.73	18%	0.004
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.2	0.02	0.75	16%	0.003
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.0	0.02	0.77	7%	0.001
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	119.5	0.02	0.79	38%	0.006
4.E.1 Net CO_2 Emissions from Settlements Remaining Settlements	CO_2	109.6	0.01	0.80	94%	0.014
4.A.2 Net CO_2 Emissions from Land Converted to Forest Land	CO_2	109.4	0.01	0.82	10%	0.001
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	104.7	0.01	0.83	18%	0.002
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	0.01	0.84	8%	0.001

1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	0.01	0.86	6%	0.001
1.B.1 Fugitive Emissions from Coal Mining	CH_4	96.5	0.01	0.87	17%	0.002
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	74.2	0.01	0.88	6%	0.001
4.E.2 Net CO_2 Emissions from Land Converted to Settlements	CO_2	62.9	0.01	0.89	33%	0.003
4.B.2 Net CO_2 Emissions from Land Converted to Cropland	CO_2	54.1	0.01	0.89	98%	0.007
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	46.3	0.01	0.90	6%	<0.001
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	46.2	0.01	0.91	38%	0.002
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	46.1	0.01	0.91	10%	0.001
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	43.4	0.01	0.92	151%	0.009
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	37.7	<0.01	0.92	14%	0.001
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	36.0	<0.01	0.93	6%	<0.001
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	35.5	<0.01	0.93	6%	<0.001
2.A.1 CO_2 Emissions from Cement Production	CO_2	33.5	<0.01	0.94	6%	<0.001
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	32.2	<0.01	0.94	17%	0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	26.9	<0.01	0.95	11%	<0.001
4.B.1 Net CO_2 Emissions from Cropland Remaining Cropland	CO_2	23.2	<0.01	0.95	497%	0.015
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	23.2	<0.01	0.95	15%	<0.001
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	21.6	<0.01	0.95	5%	<0.001
2.C.3 PFC Emissions from Aluminum Production	PFCs	21.5	<0.01	0.96	7%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.1	<0.01	0.96	48%	0.001
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	19.3	<0.01	0.96	20%	0.001
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	17.9	<0.01	0.97	20%	<0.001
3.C CH_4 Emissions from Rice Cultivation	CH_4	16.0	<0.01	0.97	62%	0.001
5.D CH_4 Emissions from Wastewater Treatment	CH_4	15.3	<0.01	0.97	28%	0.001
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	15.2	<0.01	0.97	5%	<0.001
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.0	<0.01	0.97	5%	<0.001
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	12.1	<0.01	0.97	5%	<0.001
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	<0.01	0.98	15%	<0.001
2.A.2 CO_2 Emissions from Lime Production	CO_2	11.7	<0.01	0.98	2%	<0.001
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	11.2	<0.01	0.98	24%	<0.001
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	9.6	<0.01	0.98	38%	<0.001

4.C.1 Net CO_2 Emissions from Grassland Remaining Grassland	CO_2	9.1	<0.01	0.98	1296%	0.016
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	8.0	<0.01	0.98	28%	<0.001
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	7.2	<0.01	0.98	20%	<0.001
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	7.0	<0.01	0.98	52%	<0.001
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	6.8	<0.01	0.99	2%	<0.001
4.C.2 Net CO_2 Emissions from Land Converted to Grassland	CO_2	6.7	<0.01	0.99	138%	0.001
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	6.6	<0.01	0.99	220%	0.002
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	6.3	<0.01	0.99	15%	<0.001
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.7	<0.01	0.99	18%	<0.001
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	5.2	<0.01	0.99	230%	0.002
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	5.2	<0.01	0.99	26%	<0.001
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	5.2	<0.01	0.99	7%	<0.001
3.G CO_2 Emissions from Liming	CO_2	4.7	<0.01	0.99	111%	0.001
2.G N_2O Emissions from Product Uses	N_2O	4.2	<0.01	0.99	24%	<0.001
4.D.1 Net CO_2 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CO_2	4.0	<0.01	0.99	77%	<0.001
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	<0.01	0.99	12%	<0.001
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	3.6	<0.01	0.99	6%	<0.001
4.D.1 CH_4 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CH_4	3.4	<0.01	0.99	30%	<0.001
5.D N_2O Emissions from Wastewater Treatment	N_2O	3.4	<0.01	0.99	109%	<0.001
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	3.1	<0.01	0.99	199%	0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	3.0	<0.01	1.00	NE	<0.001
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	2.8	<0.01	1.00	24%	<0.001
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.2	<0.01	1.00	12%	<0.001
3.H CO_2 Emissions from Urea Fertilization	CO_2	2.0	<0.01	1.00	35%	<0.001
4.E.1 N_2O Emissions from Settlement Soils	N_2O	2.0	<0.01	1.00	54%	<0.001
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.8	<0.01	1.00	47%	<0.001
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	1.8	<0.01	1.00	61%	<0.001
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.7	<0.01	1.00	66%	<0.001
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.7	<0.01	1.00	32%	<0.001
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.5	<0.01	1.00	5%	<0.001
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	1.5	<0.01	1.00	21%	<0.001

2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.5	<0.01	1.00	5%	<0.001
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.4	<0.01	1.00	9%	<0.001
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	<0.01	1.00	13%	<0.001
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.1	<0.01	1.00	139%	<0.001
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	1.0	<0.01	1.00	217%	<0.001
4.A.1 CH_4 Emissions from Forest Fires	CH_4	0.9	<0.01	1.00	15%	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	0.6	<0.01	1.00	19%	<0.001
2.C.6 CO_2 Emissions from Zinc Production	CO_2	0.6	<0.01	1.00	16%	<0.001
4.A.1 N_2O Emissions from Forest Fires	N_2O	0.6	<0.01	1.00	12%	<0.001
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	<0.01	1.00	44%	<0.001
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.6	<0.01	1.00	85%	<0.001
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.5	<0.01	1.00	NA	<0.001
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.5	<0.01	1.00	15%	<0.001
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	334%	<0.001
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	175%	<0.001
5.B CH_4 Emissions from Composting	CH_4	0.4	<0.01	1.00	50%	<0.001
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	<0.01	1.00	9%	<0.001
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.3	<0.01	1.00	16%	<0.001
5.B N_2O Emissions from Composting	N_2O	0.3	<0.01	1.00	50%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	0.3	<0.01	1.00	48%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.3	<0.01	1.00	9%	<0.001
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	<0.01	1.00	71%	<0.001
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.2	<0.01	1.00	57%	<0.001
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	0.2	<0.01	1.00	13%	<0.001
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
4.D.1 N_2O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1	<0.01	1.00	116%	<0.001
4.A.4 N_2O Emissions from Drained Organic Soils	N_2O	0.1	<0.01	1.00	128%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	0.1	<0.01	1.00	2%	<0.001
4.A.1 N_2O Emissions from Forest Soils	N_2O	0.1	<0.01	1.00	318%	<0.001
4.C.1 N_2O Emissions from Grass Fires	N_2O	0.1	<0.01	1.00	146%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	0.1	<0.01	1.00	10%	<0.001
4.F.4 CH_4 Emissions from Grass Fires	CH_4	0.1	<0.01	1.00	146%	<0.001

1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	<0.01	1.00	198%	<0.001
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	<0.01	1.00	26%	<0.001
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	0.1	<0.01	1.00	88%	<0.001
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	+	<0.01	1.00	55%	<0.001
4.D.2 Net CO_2 Emissions from Land Converted to Wetlands	CO_2	+	<0.01	1.00	34%	<0.001
2.E N_2O Emissions from Electronics Industry	N_2O	+	<0.01	1.00	0%	<0.001
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	8%	<0.001
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	<0.01	1.00	19%	<0.001
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	<0.01	1.00	12%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	<0.01	1.00	10%	<0.001
4.D.2 CH_4 Emissions from Land Converted to Coastal Wetlands	CH_4	+	<0.01	1.00	30%	<0.001
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	+	<0.01	1.00	13%	<0.001
4.A.4 CH_4 Emissions from Drained Organic Soils	CH_4	+	<0.01	1.00	80%	<0.001
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	+	<0.01	1.00	38%	<0.001
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	<0.01	1.00	220%	<0.001
4.D.1 CH_4 Emissions from Peatlands Remaining Peatlands	CH_4	+	<0.01	1.00	88%	<0.001
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	+	<0.01	1.00	11%	<0.001
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	<0.01	1.00	2%	<0.001
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	<0.01	1.00	3%	<0.001
4.D.1 N_2O Emissions from Peatlands Remaining Peatlands	N_2O	+	<0.01	1.00	62%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	<0.01	1.00	2%	<0.001
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	<0.01	1.00	NE	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	0.0	<0.01	1.00	17%	<0.001
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	0.0	<0.01	1.00	18%	<0.001
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	0.0	<0.01	1.00	22%	<0.001
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.0	<0.01	1.00	21%	<0.001

1 + Does not exceed 0.05 MMT CO_2 Eq.
2 NE (Not Estimated)

NA (Not Available)

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

Table A-6: 2018 Key Source Category Approach 1 and Approach 2 Analysis—Level Assessment, without LULUCF

CRF Source Categories	Direct Greenhouse Gas	2018 Estimate ($MMT CO_2$ Eq.)	Approach 1 Level Assessment	Cumulative Total	Uncertainty[a]	Approach 2 Level Assessment
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,499.8	0.22	0.22	6%	0.014
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,152.9	0.17	0.40	10%	0.017
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	577.4	0.09	0.48	5%	0.004
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	514.8	0.08	0.56	7%	0.005
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	285.7	0.04	0.60	31%	0.013
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	282.1	0.04	0.65	21%	0.009
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	273.7	0.04	0.69	7%	0.003
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	192.6	0.03	0.72	7%	0.002
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	173.9	0.03	0.74	6%	0.002
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	171.7	0.03	0.77	18%	0.005
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	139.7	0.02	0.79	17%	0.004
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	134.5	0.02	0.81	38%	0.008
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	128.9	0.02	0.83	13%	0.002
5.A CH_4 Emissions from Landfills	CH_4	110.6	0.01656	0.84	40%	0.007
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	63.9	0.01	0.85	6%	0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	62.2	0.01	0.86	6%	0.001
1.B.1 Fugitive Emissions from Coal Mining	CH_4	52.7	0.01	0.87	17%	0.001
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	52.5	0.01	0.88	151%	0.012
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	49.8	0.01	0.89	16%	0.001
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	49.2	0.01	0.89	6%	<0.001
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	42.7	0.01	0.90	18%	0.001
2.A.1 CO_2 Emissions from Cement Production	CO_2	40.3	0.01	0.91	6%	<0.001
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	39.4	0.01	0.91	38%	0.002
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	38.9	0.01	0.92	6%	<0.001

1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	36.6	0.01	0.92	38%	0.002
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	36.5	0.01	0.93	6%	<0.001
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	35.7	0.01	0.93	20%	0.001
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	34.9	0.01	0.94	17%	0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	34.3	0.01	0.94	11%	0.001
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	29.4	<0.01	0.95	5%	<0.001
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	26.0	<0.01	0.95	20%	0.001
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	22.2	<0.01	0.96	8%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.3	<0.01	0.96	48%	0.001
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	19.2	<0.01	0.96	13%	<0.001
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	15.4	<0.01	0.96	24%	0.001
5.D CH_4 Emissions from Wastewater Treatment	CH_4	14.2	<0.01	0.97	28%	0.001
2.A.2 CO_2 Emissions from Lime Production	CO_2	13.9	<0.01	0.97	2%	<0.001
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.5	<0.01	0.97	5%	<0.001
3.C CH_4 Emissions from Rice Cultivation	CH_4	13.3	<0.01	0.97	62%	0.001
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	11.8	<0.01	0.97	11%	<0.001
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	11.1	<0.01	0.98	28%	<0.001
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	10.4	<0.01	0.98	14%	<0.001
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	10.3	<0.01	0.98	5%	<0.001
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	9.4	<0.01	0.98	15%	<0.001
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	9.3	<0.01	0.98	5%	<0.001
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	7.0	<0.01	0.98	220%	0.002
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	6.2	<0.01	0.98	20%	<0.001
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.8	<0.01	0.98	18%	<0.001
5.D N_2O Emissions from Wastewater Treatment	N_2O	5.0	<0.01	0.99	109%	0.001
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	4.8	<0.01	0.99	6%	<0.001
3.H CO_2 Emissions from Urea Fertilization	CO_2	4.6	<0.01	0.99	35%	<0.001
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	4.5	<0.01	0.99	230%	0.002
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	4.5	<0.01	0.99	5%	<0.001

2.G N_2O Emissions from Product Uses	N_2O	4.2	<0.01	0.99	24%	<0.001
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	4.1	<0.01	0.99	24%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	4.1	<0.01	0.99	48%	<0.001
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	4.1	<0.01	0.99	15%	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	4.0	<0.01	0.99	19%	<0.001
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.6	<0.01	0.99	12%	<0.001
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	3.3	<0.01	0.99	10%	<0.001
3.G CO_2 Emissions from Liming	CO_2	3.1	<0.01	0.99	111%	0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	3.0	<0.01	0.99	17%	<0.001
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	2.7	<0.01	0.99	199%	0.001
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	2.6	<0.01	0.99	18%	<0.001
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	2.5	<0.01	0.99	61%	<0.001
5.B CH_4 Emissions from Composting	CH_4	2.5	<0.01	0.99	50%	<0.001
5.B N_2O Emissions from Composting	N_2O	2.2	<0.01	1.00	50%	<0.001
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.1	<0.01	1.00	12%	<0.001
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	2.0	<0.01	1.00	22%	<0.001
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	1.8	<0.01	1.00	15%	<0.001
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.7	<0.01	1.00	9%	<0.001
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	1.7	<0.01	1.00	52%	<0.001
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.6	<0.01	1.00	47%	<0.001
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.6	<0.01	1.00	13%	<0.001
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.6	<0.01	1.00	66%	<0.001
2.C.3 PFC Emissions from Aluminum Production	PFCs	1.6	<0.01	1.00	7%	<0.001
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	1.5	<0.01	1.00	2%	<0.001
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.4	<0.01	1.00	32%	<0.001
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.3	<0.01	1.00	139%	<0.001
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.3	<0.01	1.00	5%	<0.001
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	1.1	<0.01	1.00	7%	<0.001
2.C.6 CO_2 Emissions from Zinc Production	CO_2	1.0	<0.01	1.00	16%	<0.001
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	1.0	<0.01	1.00	26%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	1.0	<0.01	1.00	2%	<0.001

2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	0.9	<0.01	1.00	21%	<0.001
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	0.9	<0.01	1.00	217%	<0.001
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.6	<0.01	1.00	15%	<0.001
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.5	<0.01	1.00	44%	<0.001
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4	<0.01	1.00	NA	<0.001
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.4	<0.01	1.00	16%	<0.001
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	175%	<0.001
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.3	<0.01	1.00	334%	<0.001
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.3	<0.01	1.00	85%	<0.001
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.3	<0.01	1.00	57%	<0.001
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	<0.01	1.00	71%	<0.001
2.E N_2O Emissions from Electronics Industry	N_2O	0.3	<0.01	1.00	0%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.2	<0.01	1.00	9%	<0.001
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2	<0.01	1.00	9%	<0.001
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	<0.01	1.00	198%	<0.001
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.1	<0.01	1.00	21%	<0.001
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	<0.01	1.00	26%	<0.001
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	0.1	<0.01	1.00	38%	<0.001
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	0.1	<0.01	1.00	55%	<0.001
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	+	<0.01	1.00	88%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	<0.01	1.00	2%	<0.001
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	<0.01	1.00	12%	<0.001
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	8%	<0.001
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	+	<0.01	1.00	10%	<0.001
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	<0.01	1.00	19%	<0.001

1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	<0.01	1.00	220%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	<0.01	1.00	10%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	<0.01	1.00	2%	<0.001
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	<0.01	1.00	3%	<0.001
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	<0.01	1.00	NE	<0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	0.0	<0.01	1.00	NE	<0.001

+ Does not exceed 0.05 MMT CO_2 Eq.
NE (Not Estimated)
NA (Not Available)
[a] Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive.
Note: LULUCF sources and sinks are not included in this analysis.

Table A-7: 2018 Key Source Category Approach 1 and Approach 2 Analysis—Level Assessment with LULUCF

CRF Source/Sink Categories	Direct Greenhouse Gas	2018 Estimate (MMT CO_2 Eq.)	Approach 1 Level Assessment	Cumulative Total	Uncertainty[a]	Approach 2 Level Assessment
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,499.8	0.19	0.19	6%	0.012
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,152.9	0.15	0.34	10%	0.014
4.A.1 Net CO_2 Emissions from Forest Land Remaining Forest Land	CO_2	663.2	0.09	0.43	28%	0.023
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	577.4	0.07	0.50	5%	0.004
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	514.8	0.07	0.57	7%	0.005
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	285.7	0.04	0.60	31%	0.011
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	282.1	0.04	0.64	21%	0.008
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	273.7	0.04	0.67	7%	0.002
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	192.6	0.02	0.70	7%	0.002
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	173.9	0.02	0.72	6%	0.001
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	171.7	0.02	0.74	18%	0.004
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	139.7	0.02	0.76	17%	0.003
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	134.5	0.02	0.78	38%	0.007
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	128.9	0.02	0.79	13%	0.002
4.E.1 Net CO_2 Emissions from Settlements Remaining Settlements	CO_2	126.2	0.02	0.81	94%	0.015

4.A.2 Net CO_2 Emissions from Land Converted to Forest Land	CO_2	110.6	0.01	0.82	10%	0.001
5.A CH_4 Emissions from Landfills	CH_4	110.6	0.01	0.84	40%	0.006
4.E.2 Net CO_2 Emissions from Land Converted to Settlements	CO_2	79.3	0.01	0.85	33%	0.003
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	63.9	0.01	0.86	6%	<0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	62.2	0.01	0.87	6%	<0.001
4.B.2 Net CO_2 Emissions from Land Converted to Cropland	CO_2	55.3	0.01	0.87	98%	0.007
1.B.1 Fugitive Emissions from Coal Mining	CH_4	52.7	0.01	0.88	17%	0.001
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	52.5	0.01	0.89	151%	0.010
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	49.8	0.01	0.89	16%	0.001
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	49.2	0.01	0.90	6%	<0.001
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	42.7	0.01	0.90	18%	0.001
2.A.1 CO_2 Emissions from Cement Production	CO_2	40.3	0.01	0.91	6%	<0.001
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	39.4	0.01	0.91	38%	0.002
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	38.9	<0.01	0.92	6%	<0.001
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	36.6	<0.01	0.92	38%	0.002
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	36.5	<0.01	0.93	6%	<0.001
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	35.7	<0.01	0.93	20%	0.001
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	34.9	<0.01	0.94	17%	0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	34.3	<0.01	0.94	11%	<0.001
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	29.4	<0.01	0.95	5%	<0.001
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	26.0	<0.01	0.95	20%	0.001
4.C.2 Net CO_2 Emissions from Land Converted to Grassland	CO_2	24.6	<0.01	0.95	138%	0.004
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	22.2	<0.01	0.95	8%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.3	<0.01	0.96	48%	0.001
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	19.2	<0.01	0.96	13%	<0.001
4.B.1 Net CO_2 Emissions from Cropland Remaining Cropland	CO_2	16.6	<0.01	0.96	497%	0.011
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	15.4	<0.01	0.96	24%	<0.001
5.D CH_4 Emissions from Wastewater Treatment	CH_4	14.2	<0.01	0.97	28%	0.001
2.A.2 CO_2 Emissions from Lime Production	CO_2	13.9	<0.01	0.97	2%	<0.001

2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.5	<0.01	0.97	5%	<0.001
3.C CH_4 Emissions from Rice Cultivation	CH_4	13.3	<0.01	0.97	62%	0.001
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	11.8	<0.01	0.97	11%	<0.001
4.A.1 CH_4 Emissions from Forest Fires	CH_4	11.3	<0.01	0.97	15%	<0.001
4.C.1 Net CO_2 Emissions from Grassland Remaining Grassland	CO_2	11.2	<0.01	0.98	1296%	0.019
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	11.1	<0.01	0.98	28%	<0.001
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	10.4	<0.01	0.98	14%	<0.001
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	10.3	<0.01	0.98	5%	<0.001
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	9.4	<0.01	0.98	15%	<0.001
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	9.3	<0.01	0.98	5%	<0.001
4.A.1 N_2O Emissions from Forest Fires	N_2O	7.5	<0.01	0.98	12%	<0.001
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	7.0	<0.01	0.98	220%	0.002
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	6.2	<0.01	0.98	20%	<0.001
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.8	<0.01	0.99	18%	<0.001
5.D N_2O Emissions from Wastewater Treatment	N_2O	5.0	<0.01	0.99	109%	0.001
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	4.8	<0.01	0.99	6%	<0.001
3.H CO_2 Emissions from Urea Fertilization	CO_2	4.6	<0.01	0.99	35%	<0.001
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	4.5	<0.01	0.99	230%	0.001
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	4.5	<0.01	0.99	5%	<0.001
4.D.1 Net CO_2 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CO_2	4.4	<0.01	0.99	77%	<0.001
2.G N_2O Emissions from Product Uses	N_2O	4.2	<0.01	0.99	24%	<0.001
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	4.1	<0.01	0.99	24%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	4.1	<0.01	0.99	48%	<0.001
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	4.1	<0.01	0.99	15%	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	4.0	<0.01	0.99	19%	<0.001
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.6	<0.01	0.99	12%	<0.001
4.D.1 CH_4 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CH_4	3.6	<0.01	0.99	30%	<0.001
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	3.3	<0.01	0.99	10%	<0.001
3.G CO_2 Emissions from Liming	CO_2	3.1	<0.01	0.99	111%	<0.001
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	3.0	<0.01	0.99	17%	<0.001
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	2.7	<0.01	0.99	199%	0.001

2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	2.6	<0.01	0.99	18%	<0.001
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	2.5	<0.01	0.99	61%	<0.001
5.B CH_4 Emissions from Composting	CH_4	2.5	<0.01	1.00	50%	<0.001
4.E.1 N_2O Emissions from Settlement Soils	N_2O	2.4	<0.01	1.00	54%	<0.001
5.B N_2O Emissions from Composting	N_2O	2.2	<0.01	1.00	50%	<0.001
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.1	<0.01	1.00	12%	<0.001
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	2.0	<0.01	1.00	22%	<0.001
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	1.8	<0.01	1.00	15%	<0.001
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.7	<0.01	1.00	9%	<0.001
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	1.7	<0.01	1.00	52%	<0.001
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.6	<0.01	1.00	47%	<0.001
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.6	<0.01	1.00	13%	<0.001
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.6	<0.01	1.00	66%	<0.001
2.C.3 PFC Emissions from Aluminum Production	PFCs	1.6	<0.01	1.00	7%	<0.001
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	1.5	<0.01	1.00	2%	<0.001
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.4	<0.01	1.00	32%	<0.001
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.3	<0.01	1.00	139%	<0.001
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.3	<0.01	1.00	5%	<0.001
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	1.1	<0.01	1.00	7%	<0.001
2.C.6 CO_2 Emissions from Zinc Production	CO_2	1.0	<0.01	1.00	16%	<0.001
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	1.0	<0.01	1.00	26%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	1.0	<0.01	1.00	2%	<0.001
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	0.9	<0.01	1.00	21%	<0.001
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	0.9	<0.01	1.00	217%	<0.001
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.6	<0.01	1.00	15%	<0.001
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.5	<0.01	1.00	44%	<0.001
4.A.1 N_2O Emissions from Forest Soils	N_2O	0.5	<0.01	1.00	318%	<0.001
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.4	<0.01	1.00	NA	<0.001
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.4	<0.01	1.00	16%	<0.001
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	175%	<0.001
4.C.1 N_2O Emissions from Grass Fires	N_2O	0.3	<0.01	1.00	146%	<0.001
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.3	<0.01	1.00	334%	<0.001

1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.3	<0.01	1.00	85%	<0.001
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.3	<0.01	1.00	57%	<0.001
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	<0.01	1.00	71%	<0.001
4.F.4 CH_4 Emissions from Grass Fires	CH_4	0.3	<0.01	1.00	146%	<0.001
2.E N_2O Emissions from Electronics Industry	N_2O	0.3	<0.01	1.00	0%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.2	<0.01	1.00	9%	<0.001
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.2	<0.01	1.00	9%	<0.001
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
4.D.1 N_2O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1	<0.01	1.00	116%	<0.001
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	<0.01	1.00	198%	<0.001
4.A.4 N_2O Emissions from Drained Organic Soils	N_2O	0.1	<0.01	1.00	128%	<0.001
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.1	<0.01	1.00	21%	<0.001
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	<0.01	1.00	26%	<0.001
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	0.1	<0.01	1.00	38%	<0.001
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	0.1	<0.01	1.00	55%	<0.001
4.D.2 Net CO_2 Emissions from Land Converted to Wetlands	CO_2	+	<0.01	1.00	34%	<0.001
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	+	<0.01	1.00	88%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	<0.01	1.00	2%	<0.001
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	<0.01	1.00	12%	<0.001
4.D.2 CH_4 Emissions from Land Converted to Coastal Wetlands	CH_4	+	<0.01	1.00	30%	<0.001
4.A.4 CH_4 Emissions from Drained Organic Soils	CH_4	+	<0.01	1.00	80%	<0.001
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	<0.01	1.00	8%	<0.001
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	+	<0.01	1.00	10%	<0.001
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	<0.01	1.00	19%	<0.001
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	<0.01	1.00	220%	<0.001
4.D.1 CH_4 Emissions from Peatlands Remaining Peatlands	CH_4	+	<0.01	1.00	88%	<0.001

1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	<0.01	1.00	10%	<0.001
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	<0.01	1.00	2%	<0.001
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	<0.01	1.00	3%	<0.001
4.D.1 N_2O Emissions from Peatlands Remaining Peatlands	N_2O	+	<0.01	1.00	62%	<0.001
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	<0.01	1.00	NE	<0.001
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	0.0	<0.01	1.00	NE	<0.001

+ Does not exceed 0.05 MMT CO_2 Eq.
NE (Not Estimated)
NA (Not Available)
[a] Percent relative uncertainty. If the corresponding uncertainty is asymmetrical, the uncertainty given here is the larger and always positive.

Table A-8: 1990-2018 Key Source Category Approach 1 and 2 Analysis—Trend Assessment, without LULUCF

CRF Source Categories	Direct Greenhouse Gas	1990 Estimate (MMT CO_2 Eq.)	2018 Estimate (MMT CO_2 Eq.)	Approach 1 Trend Assessment	Approach 2 Trend Assessment	% Contribution to Trend	Cumulative Total
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,546.5	1,152.9	0.07	0.006	19.3	19
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.4	577.4	0.06	0.003	16.9	36
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,163.9	1,499.8	0.05	0.003	12.5	49
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	+	128.9	0.02	0.002	5.5	54
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.2	49.8	0.02	0.003	4.8	59
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.5	514.8	0.01	0.001	3.9	63
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	22.2	0.01	0.001	3.4	66
5.A CH_4 Emissions from Landfills	CH_4	179.6	110.6	0.01	0.005	3.2	70
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	104.7	42.7	0.01	0.002	2.8	72
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	183.2	139.7	0.01	0.001	2.2	75
1.B.1 Fugitive Emissions from Coal Mining	CH_4	96.5	52.7	0.01	0.001	2.0	77
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.0	192.6	0.01	<0.001	1.9	78
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	46.1	3.3	0.01	0.001	1.9	80

1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	62.2	0.01	<0.001	1.7	82
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	9.6	39.4	<0.01	0.002	1.3	83
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	37.7	10.4	<0.01	0.001	1.2	85
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	237.8	273.7	<0.01	<0.001	1.2	86
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	293.3	282.1	<0.01	0.001	0.9	87
2.C.3 PFC Emissions from Aluminum Production	PFCs	21.5	1.6	<0.01	<0.001	0.9	88
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	173.9	<0.01	<0.001	0.9	88
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	23.2	4.1	<0.01	<0.001	0.9	89
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	0.2	19.2	<0.01	<0.001	0.8	90
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	17.9	35.7	<0.01	0.001	0.7	91
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	74.2	63.9	<0.01	<0.001	0.6	91
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	36.0	49.2	<0.01	<0.001	0.5	92
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	+	11.8	<0.01	<0.001	0.5	92
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	46.3	36.5	<0.01	<0.001	0.5	93
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	46.2	36.6	<0.01	0.001	0.5	93
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	1.8	<0.01	<0.001	0.5	94
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	119.5	134.5	<0.01	0.001	0.4	94
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	43.4	52.5	<0.01	0.002	0.3	95
3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	158.4	171.7	<0.01	<0.001	0.3	95
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	21.6	29.4	<0.01	<0.001	0.3	95
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	26.9	34.3	<0.01	<0.001	0.3	95
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	19.3	26.0	<0.01	<0.001	0.3	96
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	6.8	1.5	<0.01	<0.001	0.2	96
2.A.1 CO_2 Emissions from Cement Production	CO_2	33.5	40.3	<0.01	<0.001	0.2	96

1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	7.0	1.7	<0.01	<0.001	0.2	96
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	15.2	10.3	<0.01	<0.001	0.2	97
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	5.2	1.0	<0.01	<0.001	0.2	97
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	5.2	1.1	<0.01	<0.001	0.2	97
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	11.2	15.4	<0.01	<0.001	0.2	97
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	0.3	4.1	<0.01	<0.001	0.2	97
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	0.6	4.0	<0.01	<0.001	0.1	97
3.C CH_4 Emissions from Rice Cultivation	CH_4	16.0	13.3	<0.01	<0.001	0.1	98
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	12.1	9.3	<0.01	<0.001	0.1	98
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	3.0	0.0	<0.01	<0.001	0.1	98
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	0.0	3.0	<0.01	<0.001	0.1	98
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	272.5	285.7	<0.01	<0.001	0.1	98
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.5	4.5	<0.01	<0.001	0.1	98
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	6.3	9.4	<0.01	<0.001	0.1	98
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	8.0	11.1	<0.01	<0.001	0.1	99
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	0.0	2.6	<0.01	<0.001	0.1	99
3.H CO_2 Emissions from Urea Fertilization	CO_2	2.0	4.6	<0.01	<0.001	0.1	99
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	35.5	38.9	<0.01	<0.001	0.1	99
5.B CH_4 Emissions from Composting	CH_4	0.4	2.5	<0.01	<0.001	0.1	99
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	0.0	2.0	<0.01	<0.001	0.1	99
5.B N_2O Emissions from Composting	N_2O	0.3	2.2	<0.01	<0.001	0.1	99
2.A.2 CO_2 Emissions from Lime Production	CO_2	11.7	13.9	<0.01	<0.001	0.1	99
5.D CH_4 Emissions from Wastewater Treatment	CH_4	15.3	14.2	<0.01	<0.001	0.1	99
3.G CO_2 Emissions from Liming	CO_2	4.7	3.1	<0.01	<0.001	0.1	99
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	32.2	34.9	<0.01	<0.001	0.1	99

5.D N_2O Emissions from Wastewater Treatment	N_2O	3.4	5.0	<0.01	<0.001	0.1	99
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	7.2	6.2	<0.01	<0.001	0.1	100
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	2.8	4.1	<0.01	<0.001	<0.1	100
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	3.6	4.8	<0.01	<0.001	<0.1	100
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	5.2	4.5	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	0.1	1.0	<0.01	<0.001	<0.1	100
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	1.5	0.9	<0.01	<0.001	<0.1	100
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	1.8	2.5	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.1	20.3	<0.01	<0.001	<0.1	100
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	3.1	2.7	<0.01	<0.001	<0.1	100
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	1.6	<0.01	<0.001	<0.1	100
2.C.6 CO_2 Emissions from Zinc Production	CO_2	0.6	1.0	<0.01	<0.001	<0.1	100
2.A.3 CO_2 Emissions from Glass Production	CO_2	1.5	1.3	<0.01	<0.001	<0.1	100
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.7	1.4	<0.01	<0.001	<0.1	100
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	3.6	<0.01	<0.001	<0.1	100
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.6	0.3	<0.01	<0.001	<0.1	100
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.8	1.6	<0.01	<0.001	<0.1	100
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.4	1.7	<0.01	<0.001	<0.1	100
2.E N_2O Emissions from Electronics Industry	N_2O	+	0.3	<0.01	<0.001	<0.1	100
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.7	1.6	<0.01	<0.001	<0.1	100
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	0.2	<0.01	<0.001	<0.1	100
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	6.6	7.0	<0.01	<0.001	<0.1	100
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	1.0	0.9	<0.01	<0.001	<0.1	100

2.G N_2O Emissions from Product Uses	N_2O	4.2	4.2	<0.01	<0.001	<0.1	100
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.2	2.1	<0.01	<0.001	<0.1	100
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.5	0.3	<0.01	<0.001	<0.1	100
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.5	0.4	<0.01	<0.001	<0.1	100
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.1	1.3	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.3	0.2	<0.01	<0.001	<0.1	100
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	0.5	<0.01	<0.001	<0.1	100
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.7	5.8	<0.01	<0.001	<0.1	100
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.0	0.1	<0.01	<0.001	<0.1	100
2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.2	0.3	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	0.1	+	<0.01	<0.001	<0.1	100
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	+	0.1	<0.01	<0.001	<0.1	100
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.5	0.6	<0.01	<0.001	<0.1	100
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.3	0.4	<0.01	<0.001	<0.1	100
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	0.1	+	<0.01	<0.001	<0.1	100
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	0.4	<0.01	<0.001	<0.1	100
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	0.3	<0.01	<0.001	<0.1	100
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	+	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	+	<0.01	<0.001	<0.1	100
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	0.2	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	+	<0.01	<0.001	<0.1	100
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	+	<0.01	<0.001	<0.1	100

1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	+	0.1	<0.01	<0.001	<0.1	100
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	0.1	<0.01	<0.001	<0.1	100
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	+	<0.01	<0.001	<0.1	100
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	+	<0.01	<0.001	<0.1	100
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.0	13.5	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	+	<0.01	<0.001	<0.1	100
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	+	<0.01	<0.001	<0.1	100
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	+	<0.01	<0.001	<0.1	100
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	+	<0.01	<0.001	<0.1	100

+ Does not exceed 0.05 MMT CO_2 Eq.

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

Table A-9: 1990-2018 Key Source Category Approach 1 and 2 Analysis—Trend Assessment, with LULUCF

CRF Source/Sink Categories	Direct Greenhouse Gas	1990 Estimate (MMT CO_2 Eq.)	2018 Estimate (MMT CO_2 Eq.)	Approach 1 Trend Assessment	Approach 2 Trend Assessment	% Contribution to Trend	Cumulative Total
1.A.1 CO_2 Emissions from Stationary Combustion - Coal - Electricity Generation	CO_2	1,546.5	1,152.9	0.06	0.006	17.7	18
1.A.1 CO_2 Emissions from Stationary Combustion - Gas - Electricity Generation	CO_2	175.4	577.4	0.05	0.003	15.8	33
1.A.3.b CO_2 Emissions from Mobile Combustion: Road	CO_2	1,163.9	1,499.8	0.04	0.002	11.9	45
2.F.1 Emissions from Substitutes for Ozone Depleting Substances: Refrigeration and Air Conditioning	HFCs, PFCs	+	128.9	0.02	0.002	5.1	51
1.A.2 CO_2 Emissions from Stationary Combustion - Coal - Industrial	CO_2	155.2	49.8	0.01	0.002	4.4	55
4.A.1 Net CO_2 Emissions from Forest Land Remaining Forest Land	CO_2	733.9	663.2	0.01	0.003	3.7	59
1.A.2 CO_2 Emissions from Stationary Combustion - Gas - Industrial	CO_2	408.5	514.8	0.01	0.001	3.7	62
1.A.1 CO_2 Emissions from Stationary Combustion - Oil - Electricity Generation	CO_2	97.5	22.2	0.01	0.001	3.1	66
5.A CH_4 Emissions from Landfills	CH_4	179.6	110.6	0.01	0.004	3.0	69
2.C.1 CO_2 Emissions from Iron and Steel Production & Metallurgical Coke Production	CO_2	104.7	42.7	0.01	0.002	2.6	71
1.B.2 CH_4 Emissions from Natural Gas Systems	CH_4	183.2	139.7	0.01	0.001	2.0	73

1.B.1 Fugitive Emissions from Coal Mining	CH_4	96.5	52.7	0.01	0.001	1.9	75
1.A.4.a CO_2 Emissions from Stationary Combustion - Gas - Commercial	CO_2	142.0	192.6	0.01	<0.001	1.8	77
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	46.1	3.3	0.01	0.001	1.8	79
1.A.4.b CO_2 Emissions from Stationary Combustion - Oil - Residential	CO_2	97.4	62.2	0.01	<0.001	1.5	80
1.B.2 CO_2 Emissions from Petroleum Systems	CO_2	9.6	39.4	<0.01	0.001	1.2	81
1.A.3.b N_2O Emissions from Mobile Combustion: Road	N_2O	37.7	10.4	<0.01	0.001	1.1	82
1.A.4.b CO_2 Emissions from Stationary Combustion - Gas - Residential	CO_2	237.8	273.7	<0.01	<0.001	1.1	84
2.C.3 PFC Emissions from Aluminum Production	PFCs	21.5	1.6	<0.01	<0.001	0.8	84
1.A.2 CO_2 Emissions from Stationary Combustion - Oil - Industrial	CO_2	293.3	282.1	<0.01	0.001	0.8	85
2.G SF_6 Emissions from Electrical Transmission and Distribution	SF_6	23.2	4.1	<0.01	<0.001	0.8	86
1.A.3.a CO_2 Emissions from Mobile Combustion: Aviation	CO_2	187.4	173.9	<0.01	<0.001	0.8	87
2.F.4 Emissions from Substitutes for Ozone Depleting Substances: Aerosols	HFCs, PFCs	0.2	19.2	<0.01	<0.001	0.8	88
4.C.2 Net CO_2 Emissions from Land Converted to Grassland	CO_2	6.7	24.6	<0.01	0.003	0.7	88
3.B.1 CH_4 Emissions from Manure Management: Cattle	CH_4	17.9	35.7	<0.01	<0.001	0.7	89
4.E.2 Net CO_2 Emissions from Land Converted to Settlements	CO_2	62.9	79.3	<0.01	0.001	0.6	90
4.E.1 Net CO_2 Emissions from Settlements Remaining Settlements	CO_2	109.6	126.2	<0.01	0.002	0.5	90
1.A.4.a CO_2 Emissions from Stationary Combustion - Oil - Commercial	CO_2	74.2	63.9	<0.01	<0.001	0.5	91
1.A.3.e CO_2 Emissions from Mobile Combustion: Other	CO_2	36.0	49.2	<0.01	<0.001	0.5	91
2.F.2 Emissions from Substitutes for Ozone Depleting Substances: Foam Blowing Agents	HFCs, PFCs	+	11.8	<0.01	<0.001	0.5	92
1.A.3.d CO_2 Emissions from Mobile Combustion: Marine	CO_2	46.3	36.5	<0.01	<0.001	0.4	92
1.A.5 CO_2 Emissions from Non-Energy Use of Fuels	CO_2	119.5	134.5	<0.01	0.001	0.4	92
1.B.2 CH_4 Emissions from Petroleum Systems	CH_4	46.2	36.6	<0.01	0.001	0.4	93
1.A.4.a CO_2 Emissions from Stationary Combustion - Coal - Commercial	CO_2	12.0	1.8	<0.01	<0.001	0.4	93
4.A.1 CH_4 Emissions from Forest Fires	CH_4	0.9	11.3	<0.01	<0.001	0.4	94

3.A.1 CH_4 Emissions from Enteric Fermentation: Cattle	CH_4	158.4	171.7	<0.01	<0.001	0.3	94
3.D.2 Indirect N_2O Emissions from Applied Nitrogen	N_2O	43.4	52.5	<0.01	0.002	0.3	94
4.B.1 Net CO_2 Emissions from Cropland Remaining Cropland	CO_2	23.2	16.6	<0.01	0.005	0.3	95
2.B.8 CO_2 Emissions from Petrochemical Production	CO_2	21.6	29.4	<0.01	<0.001	0.3	95
4.A.1 N_2O Emissions from Forest Fires	N_2O	0.6	7.5	<0.01	<0.001	0.3	95
1.A.5 CO_2 Emissions from Stationary Combustion - Oil - U.S. Territories	CO_2	26.9	34.3	<0.01	<0.001	0.3	95
3.B.4 CH_4 Emissions from Manure Management: Other Livestock	CH_4	19.3	26.0	<0.01	<0.001	0.2	96
2.A.1 CO_2 Emissions from Cement Production	CO_2	33.5	40.3	<0.01	<0.001	0.2	96
2.C.3 CO_2 Emissions from Aluminum Production	CO_2	6.8	1.5	<0.01	<0.001	0.2	96
1.A.3.e CH_4 Emissions from Mobile Combustion: Other	CH_4	7.0	1.7	<0.01	<0.001	0.2	96
2.B.3 N_2O Emissions from Adipic Acid Production	N_2O	15.2	10.3	<0.01	<0.001	0.2	97
3.D.1 Direct N_2O Emissions from Agricultural Soil Management	N_2O	272.5	285.7	<0.01	<0.001	0.2	97
1.A.3.b CH_4 Emissions from Mobile Combustion: Road	CH_4	5.2	1.0	<0.01	<0.001	0.2	97
2.C.4 SF_6 Emissions from Magnesium Production and Processing	SF_6	5.2	1.1	<0.01	<0.001	0.2	97
3.B.1 N_2O Emissions from Manure Management: Cattle	N_2O	11.2	15.4	<0.01	<0.001	0.2	97
1.A.1 N_2O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	0.3	4.1	<0.01	<0.001	0.1	97
1.A.5 CO_2 Emissions from Stationary Combustion - Coal - U.S. Territories	CO_2	0.6	4.0	<0.01	<0.001	0.1	98
2.B.2 N_2O Emissions from Nitric Acid Production	N_2O	12.1	9.3	<0.01	<0.001	0.1	98
3.C CH_4 Emissions from Rice Cultivation	CH_4	16.0	13.3	<0.01	<0.001	0.1	98
1.A.4.b CO_2 Emissions from Stationary Combustion - Coal - Residential	CO_2	3.0	0.0	<0.01	<0.001	0.1	98
1.A.5 CO_2 Emissions from Stationary Combustion - Gas - U.S. Territories	CO_2	0.0	3.0	<0.01	<0.001	0.1	98
2.B.10 CO_2 Emissions from Carbon Dioxide Consumption	CO_2	1.5	4.5	<0.01	<0.001	0.1	98
2.A.4 CO_2 Emissions from Other Process Uses of Carbonates	CO_2	6.3	9.4	<0.01	<0.001	0.1	98
5.C.1 CO_2 Emissions from Incineration of Waste	CO_2	8.0	11.1	<0.01	<0.001	0.1	98
2.F.3 Emissions from Substitutes for Ozone Depleting Substances: Fire Protection	HFCs, PFCs	0.0	2.6	<0.01	<0.001	0.1	98

3.H CO_2 Emissions from Urea Fertilization	CO_2	2.0	4.6	<0.01	<0.001	0.1	99
4.A.2 Net CO_2 Emissions from Land Converted to Forest Land	CO_2	109.4	110.6	<0.01	<0.001	0.1	99
1.A.3.c CO_2 Emissions from Mobile Combustion: Railways	CO_2	35.5	38.9	<0.01	<0.001	0.1	99
5.B CH_4 Emissions from Composting	CH_4	0.4	2.5	<0.01	<0.001	0.1	99
2.F.5 Emissions from Substitutes for Ozone Depleting Substances: Solvents	HFCs, PFCs	0.0	2.0	<0.01	<0.001	0.1	99
2.A.2 CO_2 Emissions from Lime Production	CO_2	11.7	13.9	<0.01	<0.001	0.1	99
5.B N_2O Emissions from Composting	N_2O	0.3	2.2	<0.01	<0.001	0.1	99
4.C.1 Net CO_2 Emissions from Grassland Remaining Grassland	CO_2	9.1	11.2	<0.01	0.003	0.1	99
1.B.2 CO_2 Emissions from Natural Gas Systems	CO_2	32.2	34.9	<0.01	<0.001	0.1	99
3.G CO_2 Emissions from Liming	CO_2	4.7	3.1	<0.01	<0.001	0.1	99
5.D CH_4 Emissions from Wastewater Treatment	CH_4	15.3	14.2	<0.01	<0.001	0.1	99
5.D N_2O Emissions from Wastewater Treatment	N_2O	3.4	5.0	<0.01	<0.001	0.1	99
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH_4	7.2	6.2	<0.01	<0.001	<0.1	99
3.B.4 N_2O Emissions from Manure Management: Other Livestock	N_2O	2.8	4.1	<0.01	<0.001	<0.1	100
2.E PFC, HFC, SF_6, and NF_3 Emissions from Electronics Industry	HiGWP	3.6	4.8	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Gas - Electricity Generation	CH_4	0.1	1.0	<0.01	<0.001	<0.1	100
1.A.4.b CH_4 Emissions from Stationary Combustion - Residential	CH_4	5.2	4.5	<0.01	<0.001	<0.1	100
2.B.10 CO_2 Emissions from Phosphoric Acid Production	CO_2	1.5	0.9	<0.01	<0.001	<0.1	100
1.A.3.e N_2O Emissions from Mobile Combustion: Other	N_2O	1.8	2.5	<0.01	<0.001	<0.1	100
1.A.2 N_2O Emissions from Stationary Combustion - Industrial	N_2O	3.1	2.7	<0.01	<0.001	<0.1	100
4.B.2 Net CO_2 Emissions from Land Converted to Cropland	CO_2	54.1	55.3	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.1	20.3	<0.01	<0.001	<0.1	100
2.B.6 CO_2 Emissions from Titanium Dioxide Production	CO_2	1.2	1.6	<0.01	<0.001	<0.1	100
4.A.1 N_2O Emissions from Forest Soils	N_2O	0.1	0.5	<0.01	<0.001	<0.1	100
2.C.6 CO_2 Emissions from Zinc Production	CO_2	0.6	1.0	<0.01	<0.001	<0.1	100
4.E.1 N_2O Emissions from Settlement Soils	N_2O	2.0	2.4	<0.01	<0.001	<0.1	100

2.A.3 CO_2 Emissions from Glass Production	CO_2	1.5	1.3	<0.01	<0.001	<0.1	100
2.B.4 N_2O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N_2O	1.7	1.4	<0.01	<0.001	<0.1	100
2.B.10 CO_2 Emissions from Urea Consumption for Non-Ag Purposes	CO_2	3.8	3.6	<0.01	<0.001	<0.1	100
4.D.1 Net CO_2 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CO_2	4.0	4.4	<0.01	<0.001	<0.1	100
1.A.3.d CH_4 Emissions from Mobile Combustion: Marine	CH_4	0.6	0.3	<0.01	<0.001	<0.1	100
1.A.2 CH_4 Emissions from Stationary Combustion - Industrial	CH_4	1.8	1.6	<0.01	<0.001	<0.1	100
1.B.2 CH_4 Emissions from Abandoned Oil and Gas Wells	CH_4	6.6	7.0	<0.01	<0.001	<0.1	100
2.B.7 CO_2 Emissions from Soda Ash Production	CO_2	1.4	1.7	<0.01	<0.001	<0.1	100
4.C.1 N_2O Emissions from Grass Fires	N_2O	0.1	0.3	<0.01	<0.001	<0.1	100
2.E N_2O Emissions from Electronics Industry	N_2O	+	0.3	<0.01	<0.001	<0.1	100
4.F.4 CH_4 Emissions from Grass Fires	CH_4	0.1	0.3	<0.01	<0.001	<0.1	100
1.A.3.a N_2O Emissions from Mobile Combustion: Aviation	N_2O	1.7	1.6	<0.01	<0.001	<0.1	100
2.B.5 CO_2 Emissions from Silicon Carbide Production and Consumption	CO_2	0.4	0.2	<0.01	<0.001	<0.1	100
1.A.4.b N_2O Emissions from Stationary Combustion - Residential	N_2O	1.0	0.9	<0.01	<0.001	<0.1	100
5.C.1 N_2O Emissions from Incineration of Waste	N_2O	0.5	0.3	<0.01	<0.001	<0.1	100
2.C.2 CO_2 Emissions from Ferroalloy Production	CO_2	2.2	2.1	<0.01	<0.001	<0.1	100
1.A.4.a CH_4 Emissions from Stationary Combustion - Commercial	CH_4	1.1	1.3	<0.01	<0.001	<0.1	100
1.A.1 CO_2 Emissions from Stationary Combustion - Geothermal Energy	CO_2	0.5	0.4	<0.01	<0.001	<0.1	100
2.G N_2O Emissions from Product Uses	N_2O	4.2	4.2	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Coal - Electricity Generation	CH_4	0.3	0.2	<0.01	<0.001	<0.1	100
1.A.3.d N_2O Emissions from Mobile Combustion: Marine	N_2O	0.6	0.5	<0.01	<0.001	<0.1	100
2.C.4 HFC-134a Emissions from Magnesium Production and Processing	HFCs	0.0	0.1	<0.01	<0.001	<0.1	100
4.D.1 CH_4 Emissions from Coastal Wetlands Remaining Coastal Wetlands	CH_4	3.4	3.6	<0.01	<0.001	<0.1	100

2.B.8 CH_4 Emissions from Petrochemical Production	CH_4	0.2	0.3	<0.01	<0.001	<0.1	100
2.B.1 CO_2 Emissions from Ammonia Production	CO_2	13.0	13.5	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Oil - Electricity Generation	N_2O	0.1	+	<0.01	<0.001	<0.1	100
3.A.4 CH_4 Emissions from Enteric Fermentation: Other Livestock	CH_4	5.7	5.8	<0.01	<0.001	<0.1	100
1.B.2 N_2O Emissions from Petroleum Systems	N_2O	+	0.1	<0.01	<0.001	<0.1	100
2.C.5 CO_2 Emissions from Lead Production	CO_2	0.5	0.6	<0.01	<0.001	<0.1	100
3.F CH_4 Emissions from Field Burning of Agricultural Residues	CH_4	0.3	0.4	<0.01	<0.001	<0.1	100
1.A.3.a CH_4 Emissions from Mobile Combustion: Aviation	CH_4	0.1	+	<0.01	<0.001	<0.1	100
1.A.5 N_2O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
1.A.4.a N_2O Emissions from Stationary Combustion - Commercial	N_2O	0.4	0.4	<0.01	<0.001	<0.1	100
1.A.3.c N_2O Emissions from Mobile Combustion: Railways	N_2O	0.3	0.3	<0.01	<0.001	<0.1	100
2.B.5 CH_4 Emissions from Silicon Carbide Production and Consumption	CH_4	+	+	<0.01	<0.001	<0.1	100
1.A.1 N_2O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+	+	<0.01	<0.001	<0.1	100
3.F N_2O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	0.2	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Oil - Electricity Generation	CH_4	+	+	<0.01	<0.001	<0.1	100
2.C.1 CH_4 Emissions from Iron and Steel Production & Metallurgical Coke Production	CH_4	+	+	<0.01	<0.001	<0.1	100
1.A.5 CH_4 Emissions from Stationary Combustion - U.S. Territories	CH_4	+	0.1	<0.01	<0.001	<0.1	100
1.A.3.c CH_4 Emissions from Mobile Combustion: Railways	CH_4	0.1	0.1	<0.01	<0.001	<0.1	100
1.B.2 N_2O Emissions from Natural Gas Systems	N_2O	+	+	<0.01	<0.001	<0.1	100
2.C.2 CH_4 Emissions from Ferroalloy Production	CH_4	+	+	<0.01	<0.001	<0.1	100
4.A.4 N_2O Emissions from Drained Organic Soils	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
4.D.1 CH_4 Emissions from Peatlands Remaining Peatlands	CH_4	+	+	<0.01	<0.001	<0.1	100
1.A.1 CH_4 Emissions from Stationary Combustion - Wood - Electricity Generation	CH_4	+	+	<0.01	<0.001	<0.1	100
4.D.2 Net CO_2 Emissions from Land Converted to Wetlands	CO_2	+	+	<0.01	<0.001	<0.1	100

4.D.1 N_2O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
1.B.2 CO_2 Emissions from Abandoned Oil and Gas Wells	CO_2	+	+	<0.01	<0.001	<0.1	100
4.D.2 CH_4 Emissions from Land Converted to Coastal Wetlands	CH_4	+	+	<0.01	<0.001	<0.1	100
4.A.4 CH_4 Emissions from Drained Organic Soils	CH_4	+	+	<0.01	<0.001	<0.1	100
4.D.1 N_2O Emissions from Peatlands Remaining Peatlands	N_2O	+	+	<0.01	<0.001	<0.1	100
5.C.1 CH_4 Emissions from Incineration of Waste	CH_4	+	+	<0.01	<0.001	<0.1	100
2.C.4 CO_2 Emissions from Magnesium Production and Processing	CO_2	+	+	<0.01	<0.001	<0.1	100

+ Does not exceed 0.05 MMT CO_2 Eq.

References

IPCC (2006) Volume 1, Chapter 4: Methodological Choice and Identification of Key Categories, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. The National Greenhouse Gas Inventories Programme, The Intergovernmental Panel on Climate Change, H.S. Eggleston, L. Buendia, K. Miwa, T Negara, and K. Tanabe (eds.). Hayman, Kanagawa, Japan.