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)

Table A-1. Rey Source Cate			Appro			Approach 2					
CRF Source/Sink Categories	Greenhouse Gas	Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF	Level Without LULUCF	Trend Without LULUCF	Level With LULUCF	Trend With LULUCF	Quala	2018 Emissions (MMT CO₂ Eq.)
Energy											
1.A.3.b CO₂ 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 CO₂ Emissions from Stationary Combustion - Gas - Commercial	CO ₂	•	•	•	•	•	•	•	•		192.6
1.A.3.a CO₂ Emissions from Mobile Combustion: Aviation	CO ₂	•	•	•	•	•		•			173.9
1.A.5 CO₂ Emissions from Non-Energy Use of Fuels	CO ₂	•	•	•	•	•	•	•	•		134.5

1.A.4.a CO ₂ Emissions from Stationary Combustion - Oil - Commercial	CO₂	•	•	•	•					63.9
1.A.4.b CO ₂ Emissions from Stationary Combustion - Oil - Residential	CO ₂	•	•	•	•	•	•		•	62.2
1.A.2 CO₂ 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 CO₂ 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 CO₂ 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	CH₄	•	•	•	•	•	•	•	•	139.7
1.B.1 Fugitive Emissions from Coal Mining	CH₄	•	•	•	•	•	•	•	•	52.7
1.B.2 CH ₄ Emissions from Petroleum Systems	CH₄	•	•	•	•	•	•	•	•	36.6
1.B.2 CH ₄ Emissions from Abandoned Oil and Gas Wells	CH₄					•		•		7.0
1.A.4.b CH₄ Emissions from Stationary Combustion - Residential	CH₄					•	•	•	•	4.5
1.A.3.e CH ₄ Emissions from Mobile Combustion: Other	CH₄						•		•	1.7
1.A.1 N₂O Emissions from Stationary Combustion - Coal - Electricity Generation	N₂O					•				20.3
1.A.3.b N ₂ O Emissions from Mobile Combustion: Road	N₂O	•	•	•	•		•		•	10.4
1.A.2 N₂O Emissions from Stationary Combustion - Industrial	N₂O					•				2.7
Industrial Processes and Pr	oduct 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	CH₄	•	•	•	•	•		•		171.7
3.B.1 CH ₄ Emissions from Manure Management: Cattle	CH₄	•	•	•	•	•	•		•	35.7
3.D.1 Direct N₂O Emissions from Agricultural Soil Management	N₂O	•		•		•		•		285.7
3.D.2 Indirect N₂O Emissions from Applied Nitrogen	N ₂ O	•	•	•	•	•	•	•	•	52.5
3.B.4 CH₄ 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	e, and Forestry									
Net CO ₂ Emissions from Land Converted to Settlements	CO ₂			•	•			•	•	79.3
Net CO₂ Emissions from Land Converted to Cropland	CO ₂			•				•		55.3
Net CO ₂ Emissions from Grassland Remaining Grassland	CO ₂							•	•	11.2
Net CO₂ 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	CH₄		•				11.3
N₂O Emissions from Forest Fires	N₂O		•				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 O alikaki a asika sia							

^a Qualitative criteria.

6

12

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.

Direct

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

	Direct				
	Greenhouse	2018 Emissions	Key	ID	Level in which
CRF Source Categories	Gas	(MMT CO ₂ Eq.)	Category?	Criteria ^a	year(s)? ^b
Energy					
1.A.3.b CO ₂ Emissions from Mobile	CO ₂	1,499.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
Combustion: Road					
1.A.1 CO ₂ Emissions from Stationary	CO_2	1,152.9	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Coal - Electricity Generation					
1.A.1 CO ₂ Emissions from Stationary	CO ₂	577.4	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Gas - Electricity Generation					
1.A.2 CO ₂ Emissions from Stationary	CO_2	514.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Gas - Industrial					
1.A.2 CO ₂ Emissions from Stationary	CO_2	282.1	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Oil - Industrial					
1.A.4.b CO ₂ Emissions from Stationary	CO ₂	273.7	•	$L_1T_1L_2T_2$	1990, 2018
Combustion - Gas - Residential					
1.A.4.a CO ₂ Emissions from Stationary	CO_2	192.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Gas - Commercial					
1.A.3.a CO ₂ Emissions from Mobile	CO_2	173.9	•	$L_1 T_1 L_2$	1990, 2018
Combustion: Aviation					
1.A.5 CO ₂ Emissions from Non-Energy Use of	CO ₂	134.5	•	$L_1 T_1 L_2 T_2$	1990, 2018
Fuels					
1.A.4.a CO ₂ Emissions from Stationary	CO_2	63.9	•	$L_1 T_1$	1990 ₁ , 2018 ₁
Combustion - Oil - Commercial					
1.A.4.b CO ₂ Emissions from Stationary	CO_2	62.2	•	$L_1 T_1 L_2 T_2$	1990, 2018₁
Combustion - Oil - Residential					
1.A.2 CO ₂ Emissions from Stationary	CO_2	49.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Coal - Industrial					
1.A.3.e CO ₂ Emissions from Mobile	CO_2	49.2	•	$L_1 T_1$	1990 ₁ , 2018 ₁
Combustion: Other					
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	CO_2	38.9	•	L_1	1990 ₁ , 2018 ₁
Combustion: Railways					
1.A.3.d CO ₂ Emissions from Mobile	CO_2	36.5	•	$L_1 T_1$	1990 ₁ , 2018 ₁
Combustion: Marine					
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	CO_2	34.3	•	$L_1 T_1$	1990 ₁ , 2018 ₁
Combustion - Oil - U.S. Territories					
1.A.1 CO ₂ Emissions from Stationary	CO_2	22.2	•	$L_1 T_1 L_2 T_2$	1990
Combustion - Oil - Electricity Generation					
5.C.1 CO ₂ Emissions from Incineration of	CO_2	11.1			
Waste					

1.A.5 CO ₂ Emissions from Stationary	CO_2	4.0			
Combustion - Coal - U.S. Territories				_	
1.A.5 CO ₂ Emissions from Stationary	CO_2	3.0	•	T ₂	
Combustion - Gas - U.S. Territories	00	4.0		_	
1.A.4.a CO ₂ Emissions from Stationary	CO ₂	1.8	•	T ₁	
Combustion - Coal - Commercial	00	0.4			
1.A.1 CO ₂ Emissions from Stationary	CO ₂	0.4			
Combustion - Geothermal Energy	00				
1.B.2 CO ₂ Emissions from Abandoned Oil and	CO ₂	+			
Gas Wells	60	0.0		-	
1.A.4.b CO ₂ Emissions from Stationary	CO ₂	0.0	•	T ₂	
Combustion - Coal - Residential	CII	120.7			1000 2010
1.B.2 CH ₄ Emissions from Natural Gas Systems	CH₄	139.7	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
1.B.1 Fugitive Emissions from Coal Mining	CH₄	52.7	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
1.B.2 CH ₄ Emissions from Petroleum Systems	CH₄	36.6	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
1.B.2 CH ₄ Emissions from Abandoned Oil and	CH₄	7.0	•	L ₂	1990 ₂ , 2018 ₂
Gas Wells	011	6.0			
1.B.1 Fugitive Emissions from Abandoned	CH₄	6.2			
Underground Coal Mines	011	4.5			1000 2010
1.A.4.b CH ₄ Emissions from Stationary	CH₄	4.5	•	$L_2 T_2$	1990 ₂ , 2018 ₂
Combustion - Residential	011	4 =		-	
1.A.3.e CH ₄ Emissions from Mobile	CH ₄	1.7	•	T ₂	
Combustion: Other	011	4.6			
1.A.2 CH ₄ Emissions from Stationary	CH ₄	1.6			
Combustion - Industrial	011	4.0			
1.A.4.a CH ₄ Emissions from Stationary	CH₄	1.3			
Combustion - Commercial	011	4.0			
1.A.3.b CH ₄ Emissions from Mobile	CH ₄	1.0			
Combustion: Road	CII	4.0			
1.A.1 CH ₄ Emissions from Stationary	CH₄	1.0			
Combustion - Gas - Electricity Generation	CII	0.2			
1.A.3.d CH ₄ Emissions from Mobile	CH ₄	0.3			
Combustion: Marine	CII	0.2			
1.A.1 CH ₄ Emissions from Stationary	CH ₄	0.2			
Combustion - Coal - Electricity Generation	CII	0.1			
1.A.3.c CH ₄ Emissions from Mobile	CH ₄	0.1			
Combustion: Railways	CH	0.1			
1.A.5 CH ₄ Emissions from Stationary	CH₄	0.1			
Combustion - U.S. Territories	CII				
1.A.3.a CH₄ Emissions from Mobile Combustion: Aviation	CH₄	+			
	CII				
1.A.1 CH ₄ Emissions from Stationary	CH₄	+			
Combustion - Oil - Electricity Generation	CH				
1.A.1 CH ₄ Emissions from Stationary	CH ₄	+			
Combustion - Wood - Electricity Generation 5.C.1 CH ₄ Emissions from Incineration of	CH ₄				
Waste	СП4	+			
1.A.1 N₂O Emissions from Stationary	N_2O	20.3		L_2	1990 ₂ , 2018 ₂
Combustion - Coal - Electricity Generation	N ₂ O	20.3	·	L2	19902, 20102
1.A.3.b N ₂ O Emissions from Mobile	N_2O	10.4	•	L ₁ T ₁ T ₂	1990₁
Combustion: Road	N ₂ O	10.4	·	L1 11 12	19901
1.A.1 N₂O Emissions from Stationary	N_2O	4.1			
Combustion - Gas - Electricity Generation	IN2∪	4.1			
1.A.2 N₂O Emissions from Stationary	N_2O	2.7	•	L_2	1990₂
Combustion - Industrial	INZO	۷.1	•	∟ 2	19902
Compaction industrial					

1.A.3.e N₂O Emissions from Mobile Combustion: Other	N_2O	2.5			
1.A.3.a N ₂ O Emissions from Mobile	N_2O	1.6			
Combustion: Aviation 1.A.4.b N₂O Emissions from Stationary	N ₂ O	0.9			
Combustion - Residential 1.A.3.d N₂O Emissions from Mobile	N_2O	0.5			
Combustion: Marine 1.A.4.a N₂O Emissions from Stationary	N ₂ O	0.4			
Combustion - Commercial					
5.C.1 N_2O Emissions from Incineration of Waste	N ₂ O	0.3			
1.A.3.c N ₂ O Emissions from Mobile	N_2O	0.3			
Combustion: Railways		0.4			
1.A.5 N₂O Emissions from Stationary Combustion - U.S. Territories	N ₂ O	0.1			
1.B.2 N₂O Emissions from Petroleum Systems	N_2O	0.1			
1.A.1 N ₂ O Emissions from Stationary	N_2O	+			
Combustion - Wood - Electricity Generation					
1.B.2 N₂O Emissions from Natural Gas Systems	N_2O	+			
1.A.1 N₂O Emissions from Stationary	N_2O	+			
Combustion - Oil - Electricity Generation					
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	CO ₂	42.7	•	$L_1 T_1 L_2 T_2$	1990, 2018
Production & Metallurgical Coke Production					
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	CO ₂	29.4	•	L ₁ T ₁	1990 ₁ , 2018 ₁
Production					
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	CO_2	4.5			
Consumption					
2.B.10 CO ₂ Emissions from Urea Consumption	CO_2	3.6			
for Non-Ag Purposes					
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	CO ₂	1.6			
Production					
2.C.3 CO ₂ Emissions from Aluminum	CO ₂	1.5			
Production					
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	CO_2	0.9			
Production	60	0.6			
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	CO ₂	+			
Production and Processing	<u> </u>				
2.B.8 CH ₄ Emissions from Petrochemical	CH ₄	0.3			
Production					

2.C.2 CH ₄ Emissions from Ferroalloy	CH ₄	+			
Production 2.B.5 CH ₄ Emissions from Silicon Carbide	CH ₄	+			
Production and Consumption					
2.C.1 CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	+			
2.B.3 N₂O Emissions from Adipic Acid	N_2O	10.3			
Production	N. O	0.2			
2.B.2 N₂O Emissions from Nitric Acid Production	N_2O	9.3			
2.G N ₂ O Emissions from Product Uses	N_2O	4.2			
2.B.4 N ₂ O Emissions from Caprolactam,	N ₂ O	1.4			
Glyoxal, and Glyoxylic Acid Production	1.20	_, ,			
2.E N₂O Emissions from Electronics Industry	N_2O	0.3			
2.F.1 Emissions from Substitutes for Ozone	HFCs, PFCs	128.9	•	$L_1 T_1 L_2 T_2$	2018
Depleting Substances: Refrigeration and Air Conditioning					
2.F.4 Emissions from Substitutes for Ozone	HFCs, PFCs	19.2	•	$T_1 T_2$	
Depleting Substances: Aerosols					
2.F.2 Emissions from Substitutes for Ozone	HFCs, PFCs	11.8	•	T ₁	
Depleting Substances: Foam Blowing Agents					
2.F.3 Emissions from Substitutes for Ozone	HFCs, PFCs	2.6	•	T ₂	
Depleting Substances: Fire Protection				_	
2.F.5 Emissions from Substitutes for Ozone	HFCs, PFCs	2.0	•	T ₂	
Depleting Substances: Solvents	HICMAD	4.0			
2.E PFC, HFC, SF ₆ , and NF ₃ Emissions from	HiGWP	4.8			
Electronics Industry 2.G SF ₆ Emissions from Electrical Transmission	SF ₆	4.1	•	$L_1 T_1 T_2$	1990₁
and Distribution	31 6	4.1	•	L1 11 12	13301
2.B.9 HFC-23 Emissions from HCFC-22	HFCs	3.3	•	$L_1 T_1 T_2$	1990₁
Production	111 03	3.3		21 11 12	1330
2.C.3 PFC Emissions from Aluminum	PFC	1.6	•	L ₁ T ₁	1990₁
Production					
2.C.4 SF ₆ Emissions from Magnesium	SF_6	1.1			
Production and Processing					
2.C.4 HFC-134a Emissions from Magnesium	HFCs	0.1			
Production and Processing					
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	CH ₄	171.7	•	$L_1 T_1 L_2$	1990, 2018
Fermentation: Cattle	CII	25.7			2010
3.B.1 CH ₄ Emissions from Manure	CH₄	35.7	•	$L_1 T_1 L_2 T_2$	2018
Management: Cattle 3.B.4 CH ₄ Emissions from Manure	CH ₄	26.0	•	L ₁	2018₁
Management: Other Livestock	CI 14	20.0	•	L1	20101
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	CH ₄	5.8		- 2 · 2	10002, 10102
Fermentation: Other Livestock					
3.F CH ₄ Emissions from Field Burning of	CH ₄	0.4			
Agricultural Residues					
3.D.1 Direct N₂O Emissions from Agricultural	N_2O	285.7	•	$L_1 L_2$	1990, 2018
Soil Management					
3.D.2 Indirect N₂O Emissions from Applied	N_2O	52.5	•	$L_1 T_1 L_2 T_2$	1990, 2018
Nitrogen					

3.B.1 N₂O Emissions from Manure Management: Cattle	N ₂ O	15.4			
3.B.4 N₂O Emissions from Manure	N_2O	4.1			
Management: Other Livestock					
3.F N₂O Emissions from Field Burning of	N_2O	0.2			
Agricultural Residues					
Waste					
5.A CH ₄ Emissions from Landfills	CH₄	110.6	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
5.D CH₄ Emissions from Wastewater	CH ₄	14.2			
Treatment					
5.B CH₄ Emissions from Composting	CH ₄	2.5			
5.D N₂O Emissions from Wastewater	N_2O	5.0			
Treatment					
5.B N ₂ O Emissions from Composting	N_2O	2.2			

^{1 +} Does not exceed 0.05 MMT CO₂ Eq.

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

	Direct				Level in
	Greenhouse	2018 Emissions	Key	ID	which
CRF Source/Sink Categories	Gas	(MMT CO ₂ Eq.)	Category?	Criteria ^a	year(s)? ^b
Energy					
1.A.3.b CO ₂ Emissions from Mobile	CO ₂	1,499.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion: Road					
1.A.1 CO ₂ Emissions from Stationary	CO_2	1,152.9	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Coal - Electricity Generation					
1.A.1 CO ₂ Emissions from Stationary	CO_2	577.4	•	$L_1 T_1 L_2 T_2$	1990₁, 2018
Combustion - Gas - Electricity Generation					
1.A.2 CO ₂ Emissions from Stationary	CO ₂	514.8	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Gas - Industrial					
1.A.2 CO ₂ Emissions from Stationary	CO ₂	282.1	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Oil - Industrial					
1.A.4.b CO ₂ Emissions from Stationary	CO ₂	273.7	•	$L_1 T_1 L_2$	1990, 2018
Combustion - Gas - Residential		400.6			1000 2010
1.A.4.a CO ₂ Emissions from Stationary	CO ₂	192.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
Combustion - Gas - Commercial	60	472.0			1000 2010
1.A.3.a CO ₂ Emissions from Mobile	CO ₂	173.9	•	$L_1 T_1 L_2$	1990, 2018
Combustion: Aviation	60	124 5	_		1000 2010
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	CO ₂	63.9	•	L ₁ T ₁	1000 2019
Combustion - Oil - Commercial	CO_2	03.9	•	L1 11	1990₁, 2018₁
1.A.4.b CO ₂ Emissions from Stationary	CO ₂	62.2	•	L ₁ T ₁ T ₂	1990 ₁ , 2018 ₁
Combustion - Oil - Residential	CO ₂	02.2	· ·	L1 1 12	19901, 20101
1.A.2 CO ₂ Emissions from Stationary	CO ₂	49.8	•	L ₁ T ₁ L ₂ T ₂	1990, 2018 ₁
Combustion - Coal - Industrial	202	73.0	-	-1 11 -2 12	1550, 20101
1.A.3.e CO ₂ Emissions from Mobile	CO_2	49.2	•	L ₁ T ₁	1990 ₁ , 2018 ₁
Combustion: Other	202	.3.2		-1 11	13301, 20101
3333510111 041101					

^{2 &}lt;sup>a</sup> 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., L₂ designates a source is a key category for an Approach 2 level assessment).

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

1.B.2 CO ₂ Emissions from Petroleum	CO ₂	39.4	•	L ₁ T ₁ L ₂ T ₂	2018
Systems 1.A.3.c CO ₂ Emissions from Mobile Combustion: Railways	CO ₂	38.9	•	L ₁	1990₁, 2018₁
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	CH₄	139.7	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
1.B.1 Fugitive Emissions from Coal Mining	CH₄	52.7	•	$L_1 T_1 L_2 T_2$	1990, 2018₁
1.B.2 CH ₄ Emissions from Petroleum Systems	CH₄	36.6	•	$L_1 T_1 L_2 T_2$	1990, 2018
1.B.2 CH ₄ Emissions from Abandoned Oil	CH ₄	7.0	•	L_2	1990 ₂ , 2018 ₂
and Gas Wells					
1.B.1 Fugitive Emissions from Abandoned Underground Coal Mines	CH₄	6.2			
1.A.4.b CH ₄ Emissions from Stationary Combustion - Residential	CH ₄	4.5	•	L ₂ T ₂	1990₂
1.A.3.e CH ₄ Emissions from Mobile Combustion: Other	CH ₄	1.7	•	T ₂	
1.A.2 CH₄ Emissions from Stationary Combustion - Industrial	CH ₄	1.6			
1.A.4.a CH ₄ Emissions from Stationary Combustion - Commercial	CH₄	1.3			
1.A.3.b CH ₄ Emissions from Mobile Combustion: Road	CH₄	1.0			
1.A.1 CH ₄ Emissions from Stationary Combustion - Gas - Electricity Generation	CH₄	1.0			
1.A.3.d CH ₄ Emissions from Mobile Combustion: Marine	CH₄	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	CH₄	0.1			

1.A.3.a CH ₄ Emissions from Mobile Combustion: Aviation	CH₄	+			
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 N₂O Emissions from Stationary Combustion - Coal - Electricity Generation	N_2O	20.3			
1.A.3.b N₂O Emissions from Mobile Combustion: Road	N_2O	10.4	•	$L_1 T_1 T_2$	1990₁
1.A.1 N₂O Emissions from Stationary Combustion - Gas - Electricity Generation	N_2O	4.1			
1.A.2 N₂O Emissions from Stationary Combustion - Industrial	N ₂ O	2.7			
1.A.3.e N₂O Emissions from Mobile Combustion: Other	N_2O	2.5			
1.A.3.a N₂O Emissions from Mobile Combustion: Aviation	N_2O	1.6			
1.A.4.b N₂O Emissions from Stationary Combustion - Residential	N_2O	0.9			
1.A.3.d N₂O Emissions from Mobile Combustion: Marine	N_2O	0.5			
1.A.4.a N₂O Emissions from Stationary Combustion - Commercial	N_2O	0.4			
5.C.1 N ₂ O Emissions from Incineration of Waste	N_2O	0.3			
1.A.3.c N₂O Emissions from Mobile Combustion: Railways	N_2O	0.3			
1.A.5 N₂O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1			
1.B.2 N₂O Emissions from Petroleum Systems	N_2O	0.1			
1.A.1 N₂O Emissions from Stationary Combustion - Wood - Electricity Generation	N_2O	+			
1.B.2 N ₂ O Emissions from Natural Gas Systems	N_2O	+			
1.A.1 N ₂ O 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	CO_2	3.6			
Consumption for Non-Ag Purposes					
2.C.2 CO₂ Emissions from Ferroalloy	CO_2	2.1			
Production					
2.B.7 CO ₂ Emissions from Soda Ash	CO ₂	1.7			
Production 2.B.6 CO ₂ Emissions from Titanium Dioxide	CO_2	1.6			
Production	CO ₂	1.0			
2.C.3 CO ₂ Emissions from Aluminum	CO ₂	1.5			
Production	2				
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	CO_2	0.9			
Production					
2.C.5 CO ₂ Emissions from Lead Production	CO_2	0.6			
2.B.5 CO ₂ Emissions from Silicon Carbide	CO ₂	0.2			
Production and Consumption	60				
2.C.4 CO ₂ Emissions from Magnesium	CO ₂	+			
Production and Processing 2.B.8 CH ₄ Emissions from Petrochemical	CH₄	0.3			
Production	C114	0.5			
2.C.2 CH ₄ Emissions from Ferroalloy	CH ₄	+			
Production					
2.B.5 CH ₄ Emissions from Silicon Carbide	CH ₄	+			
Production and Consumption					
2.C.1 CH ₄ Emissions from Iron and Steel	CH₄	+			
Production & Metallurgical Coke					
Production	N O	10.3			
2.B.3 N₂O Emissions from Adipic Acid Production	N_2O	10.5			
2.B.2 N ₂ O Emissions from Nitric Acid	N_2O	9.3			
Production	1.72.0				
2.G N₂O Emissions from Product Uses	N_2O	4.2			
2.B.4 N₂O Emissions from Caprolactam,	N_2O	1.4			
Glyoxal, and Glyoxylic Acid Production					
2.E N₂O Emissions from Electronics Industry	N_2O	0.3			
2.F.1 Emissions from Substitutes for Ozone	HFCs, PFCs	128.9	•	$L_1 T_1 L_2 T_2$	2018
Depleting Substances: Refrigeration and					
Air Conditioning 2.F.4 Emissions from Substitutes for Ozone	HFCs, PFCs	19.2		тт	
Depleting Substances: Aerosols	nrcs, rrcs	19.2	•	$T_1 T_2$	
2.F.2 Emissions from Substitutes for Ozone	HFCs, PFCs	11.8	•	T ₁	
Depleting Substances: Foam Blowing	55, 55			.,	
Agents					
2.F.3 Emissions from Substitutes for Ozone	HFCs, PFCs	2.6			
Depleting Substances: Fire Protection					
2.F.5 Emissions from Substitutes for Ozone	HFCs, PFCs	2.0			
Depleting Substances: Solvents	11:07:12	4.0			
2.E PFC, HFC, SF ₆ , and NF ₃ Emissions from	HiGWP	4.8			
Electronics Industry					

2.G SF ₆ Emissions from Electrical Transmission and Distribution	SF ₆	4.1	•	$L_1T_1T_2$	1990₁
2.B.9 HFC-23 Emissions from HCFC-22 Production	HFCs	3.3	•	$L_1T_1T_2$	19901
2.C.3 PFC Emissions from Aluminum	PFC	1.6	•	T ₁	
Production		1.0		.,	
2.C.4 SF ₆ Emissions from Magnesium	SF ₆	1.1			
Production and Processing	- 0				
2.C.4 HFC-134a Emissions from Magnesium	HFCs	0.1			
Production and Processing					
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	CH ₄	171.7	•	$L_1 T_1 L_2$	1990, 2018
Fermentation: Cattle					
3.B.1 CH ₄ Emissions from Manure	CH ₄	35.7	•	$L_1 T_1 T_2$	20181
Management: Cattle					
3.B.4 CH ₄ Emissions from Manure	CH ₄	26.0	•	L_1	20181
Management: Other Livestock					
3.C CH ₄ Emissions from Rice Cultivation	CH ₄	13.3			
3.A.4 CH ₄ Emissions from Enteric	CH ₄	5.8			
Fermentation: Other Livestock					
3.F CH₄ Emissions from Field Burning of	CH ₄	0.4			
Agricultural Residues					
3.D.1 Direct N₂O Emissions from Agricultural	N_2O	285.7	•	$L_1 L_2$	1990, 2018
Soil Management					
3.D.2 Indirect N₂O Emissions from Applied	N ₂ O	52.5	•	$L_1 T_1 L_2 T_2$	1990, 2018
Nitrogen					
3.B.1 N₂O Emissions from Manure	N_2O	15.4			
Management: Cattle	N 0	4.4			
3.B.4 N ₂ O Emissions from Manure	N ₂ O	4.1			
Management: Other Livestock	N.O	0.2			
3.F N₂O 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	CH ₄	14.2	•	L1 11 L2 12	1550, 2018
Treatment	СП4	14.2			
5.B CH ₄ Emissions from Composting	CH ₄	2.5			
5.D N ₂ O Emissions from Wastewater	N ₂ O	5.0			
Treatment	11/20	5.0			
5.B N ₂ O Emissions from Composting	N_2O	2.2			
Land Use, Land Use Change, and Forestry	20				
4.E.2 Net CO ₂ Emissions from Land	CO ₂	79.3	•	L ₁ T ₁ L ₂ T ₂	1990, 2018
Converted to Settlements	202	73.3		21 11 22 12	1330, 2010
4.B.2 Net CO ₂ Emissions from Land	CO ₂	55.3	•	L ₁ L ₂	1990, 2018
Converted to Cropland	332	33.3		-1 -2	1000, 1010
4.C.1 Net CO ₂ Emissions from Grassland	CO ₂	11.2	•	$L_2 T_2$	1990 ₂ , 2018 ₂
Remaining Grassland	<u>L</u>			2 - 2	
4.D.2 Net CO ₂ Emissions from Land	CO ₂	(+)			
Converted to Wetlands					
4.D.1 Net CO ₂ Emissions from Coastal	CO ₂	(+)			
Wetlands Remaining Coastal Wetlands					
4.B.1 Net CO ₂ Emissions from Cropland	CO_2	(+)	•	$L_1T_1L_2T_2$	1990, 2018₂
Remaining Cropland					

4.C.2 Net CO ₂ Emissions from Land	CO_2	(+)	•	$L_1T_1L_2T_2$	2018
Converted to Grassland					
4.A.2 Net CO ₂ Emissions from Land	CO ₂	(+)	•	$L_1 L_2$	1990, 2018
Converted to Forest Land					
4.E.1 Net CO ₂ Emissions from Settlements	CO ₂	(+)	•	$L_1 T_1 L_2 T_2$	1990, 2018
Remaining Settlements					
4.A.1 Net CO₂ Emissions from Forest Land	CO ₂	(+)	•	$L_1 T_1 L_2 T_2$	1990, 2018
Remaining Forest Land					
4.A.1 CH₄ Emissions from Forest Fires	CH ₄	11.3	•	T ₁	
4.D.1 CH₄ Emissions from Coastal Wetlands	CH ₄	3.6			
Remaining Coastal Wetlands					
4.C.1 CH ₄ Emissions from Grass Fires	CH ₄	0.3			
4.D.2 CH₄ Emissions from Land Converted to	CH ₄	+			
Coastal Wetlands					
4.A.4 CH₄ Emissions from Drained Organic	CH ₄	+			
Soils					
4.D.1 CH₄ Emissions from Peatlands	CH ₄	+			
Remaining Peatlands					
4.A.1 N₂O Emissions from Forest Fires	N_2O	7.5	•	T ₁	
4.E.1 N₂O Emissions from Settlement Soils	N_2O	2.4			
4.A.1 N ₂ O Emissions from Forest Soils	N_2O	0.5			
4.C.1 N ₂ O Emissions from Grass Fires	N_2O	0.3			
4.D.1 N ₂ O Emissions from Coastal Wetlands	N_2O	0.1			
Remaining Coastal Wetlands					
4.A.4 N ₂ O Emissions from Drained Organic	N_2O	0.1			
Soils					
4.D.1 N₂O Emissions from Peatlands	N_2O	+			
Remaining Peatlands					
L Doos not avecod 0.05 MMT.CO. Fa					

^{1 +} Does not exceed 0.05 MMT CO₂ 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., L₂ designates a source is a

4 key category for an Approach 2 level assessment).

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

a key category for the Approach 2 assessment only in 1990).

^c Emissions from these sources not included in emission totals.

9 d This source category was excluded from the analysis.

10 Note: Parentheses indicate negative values (or sequestration).

Evaluation of Key Categories

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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 CO_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

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

	Direct	,	Approach 1				
	Greenhouse	1990 Estimate	Level	Cumulativ		Level	
CRF Source Categories	Gas	(MMT CO ₂ Eq.)	Assessment	e Total	Uncertainty ^a	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 N₂O Emissions from Agricultural Soil Management	N ₂ O	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	CO ₂	175.4	0.03	0.72	5%	0.001
Combustion - Gas - Electricity Generation	202	2731.	0.00	o =	3,0	0.002
3.A.1 CH ₄ Emissions from Enteric Fermentation: Cattle	CH₄	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 N₂O Emissions from Applied Nitrogen	N ₂ O	43.4	0.01	0.91	151%	0.010
1.A.3.b N₂O Emissions from Mobile Combustion: Road	N ₂ O	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 ₂ O Emissions from Stationary Combustion - Coal - Electricity	N ₂ O	20.1	<0.01	0.96	48%	0.001
Generation						
3.B.4 CH ₄ Emissions from Manure	CH ₄	19.3	<0.01	0.96	20%	0.001
Management: Other Livestock						
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 CH₄ Emissions from Wastewater Treatment	CH₄	15.3	<0.01	0.97	28%	0.001
2.B.3 N ₂ O 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 N₂O 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 N₂O 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	CH₄	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	CH₄	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 ₂ O 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 N₂O Emissions from Wastewater Treatment	N₂O	3.4	<0.01	0.99	109%	0.001
1.A.2 N ₂ O Emissions from Stationary Combustion - Industrial	N₂O	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 ₂ O 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 ₂ O Emissions from Mobile Combustion: Other	N_2O	1.8	<0.01	1.00	61%	<0.001
1.A.3.a N₂O Emissions from Mobile Combustion: Aviation	N_2O	1.7	<0.01	1.00	66%	<0.001
2.B.4 N₂O 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 N₂O 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 N₂O 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 ₂ O Emissions from Incineration of Waste	N_2O	0.5	<0.01	1.00	334%	<0.001
1.A.4.a N₂O 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 ₂ O Emissions from Composting	N_2O	0.3	<0.01	1.00	50%	< 0.001
1.A.1 N₂O Emissions from Stationary Combustion - Gas - Electricity Generation	N ₂ O	0.3	<0.01	1.00	48%	<0.001
1.A.1 CH ₄ Emissions from Stationary Combustion - Coal - Electricity Generation	CH₄	0.3	<0.01	1.00	9%	<0.001

1.A.3.c N ₂ O 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	HFCs, PFCs	0.2	<0.01	1.00	13%	<0.001
Ozone Depleting Substances: Aerosols 3.F N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
1.A.1 CH₄ Emissions from Stationary Combustion - Gas - Electricity Generation	CH ₄	0.1	<0.01	1.00	2%	<0.001
1.A.1 N ₂ O Emissions from Stationary Combustion - Oil - Electricity Generation	N ₂ O	0.1	<0.01	1.00	10%	<0.001
1.A.5 N₂O 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	CH₄	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 N₂O 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	CH₄	+	<0.01	1.00	19%	<0.001
2.C.2 CH₄ Emissions from Ferroalloy Production	CH ₄	+	<0.01	1.00	12%	<0.001
1.A.1 CH₄ 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 N₂O 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 ₂ O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N₂O Emissions from Stationary Combustion - Wood - Electricity Generation	N₂O	+	<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	CH₄	+	<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	CO_2	0.0	<0.01	1.00	17%	<0.001
Combustion - Gas - U.S. Territories 2.F.3 Emissions from Substitutes for	HFCs, PFCs	0.0	<0.01	1.00	18%	<0.001
Ozone Depleting Substances: Fire						
Protection						
2.F.5 Emissions from Substitutes for	HFCs, PFCs	0.0	< 0.01	1.00	22%	< 0.001
Ozone Depleting Substances: Solvents						
2.C.4 HFC-134a Emissions from	HFCs	0.0	< 0.01	1.00	21%	< 0.001
Magnesium Production and Processing						

⁺ Does not exceed 0.05 MMT CO₂ Eq. NE (Not Estimated)

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

	Direct		Approach 1			Approach 2
	Greenhouse	1990 Estimate	Level	Cumulative		Level
CRF Source/Sink Categories	Gas	(MMT CO ₂ Eq.)	Assessment	Total	Uncertainty ^a	Assessment
1.A.1 CO ₂ Emissions from Stationary	CO ₂	1,546.5	0.20	0.20	10%	0.020
Combustion - Coal - Electricity Generation						
1.A.3.b CO ₂ Emissions from Mobile	CO ₂	1,163.9	0.15	0.36	6%	0.010
Combustion: Road						
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 ₂ O Emissions from Agricultural Soil Management	N ₂ O	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 CH₄ Emissions from Natural Gas Systems	CH₄	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 CO₂ 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 CO₂ 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	CO₂	104.7	0.01	0.83	18%	0.002
1.A.1 CO₂ Emissions from Stationary Combustion - Oil - Electricity Generation	CO ₂	97.5	0.01	0.84	8%	0.001

¹ 2 3 4 5 6 7

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.

1.A.4.b CO ₂ Emissions from Stationary	CO ₂	97.4	0.01	0.86	6%	0.001
Combustion - Oil - Residential	011	0.0 5	0.04	0.07	4.70/	0.003
1.B.1 Fugitive Emissions from Coal Mining	CH₄	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	CO ₂	62.9	0.01	0.89	33%	0.003
to Settlements	CO2	02.3	0.01	0.03	3370	0.003
4.B.2 Net CO ₂ Emissions from Land	CO ₂	54.1	0.01	0.89	98%	0.007
Converted to Cropland						
1.A.3.d CO ₂ Emissions from Mobile	CO ₂	46.3	0.01	0.90	6%	<0.001
Combustion: Marine						
1.B.2 CH ₄ Emissions from Petroleum Systems	CH₄	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 N₂O Emissions from Applied	N ₂ O	43.4	0.01	0.92	151%	0.009
Nitrogen	11/20	75.7	0.01	0.52	131/0	0.003
1.A.3.b N ₂ O Emissions from Mobile	N ₂ O	37.7	<0.01	0.92	14%	0.001
Combustion: Road						
1.A.3.e CO ₂ Emissions from Mobile	CO ₂	36.0	<0.01	0.93	6%	<0.001
Combustion: Other					5 04	
1.A.3.c CO ₂ Emissions from Mobile	CO ₂	35.5	<0.01	0.93	6%	<0.001
Combustion: Railways 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	CO ₂	32.2	<0.01	0.94	17%	0.001
Systems	332					
1.A.5 CO ₂ Emissions from Stationary	CO ₂	26.9	<0.01	0.95	11%	<0.001
Combustion - Oil - U.S. Territories						
4.B.1 Net CO ₂ Emissions from Cropland	CO ₂	23.2	<0.01	0.95	497%	0.015
Remaining Cropland	CE	23.2	<0.01	0.95	1 = 0/	<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	CO ₂	21.6	<0.01	0.95	5%	<0.001
Production						
2.C.3 PFC Emissions from Aluminum	PFCs	21.5	<0.01	0.96	7%	<0.001
Production						
1.A.1 N₂O Emissions from Stationary	N_2O	20.1	<0.01	0.96	48%	0.001
Combustion - Coal - Electricity Generation 3.B.4 CH ₄ Emissions from Manure	CH ₄	19.3	<0.01	0.96	20%	0.001
Management: Other Livestock	CI14	19.5	\0.01	0.90	2070	0.001
3.B.1 CH ₄ Emissions from Manure	CH ₄	17.9	<0.01	0.97	20%	<0.001
Management: Cattle						
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	CH_4	15.3	<0.01	0.97	28%	0.001
Treatment	N. O	15.2	رم مر دم مر	0.07	Γ0/	~ 0.001
2.B.3 N₂O Emissions from Adipic Acid Production	N_2O	15.2	<0.01	0.97	5%	<0.001
2.B.1 CO ₂ Emissions from Ammonia	CO_2	13.0	<0.01	0.97	5%	<0.001
Production	002				-,-	5.55
2.B.2 N₂O Emissions from Nitric Acid	N_2O	12.1	< 0.01	0.97	5%	< 0.001
Production						
1.A.4.a CO ₂ Emissions from Stationary	CO_2	12.0	<0.01	0.98	15%	<0.001
Combustion - Coal - Commercial	CO	11 7	∠0.01	0.00	20/	∠0.001
2.A.2 CO ₂ Emissions from Lime Production 3.B.1 N ₂ O Emissions from Manure	CO_2 N_2O	11.7 11.2	<0.01 <0.01	0.98 0.98	2% 24%	<0.001 <0.001
Management: Cattle	IN2U	11.4	\U.UI	0.50	∠→/0	VO.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	CH ₄	5.2	<0.01	0.99	230%	0.002
Combustion - Residential	CLI	5.2	<0.01	0.99	26%	<0.001
1.A.3.b CH ₄ Emissions from Mobile Combustion: Road	CH₄	5.2	<0.01	0.99	26%	<0.001
2.C.4 SF ₆ Emissions from Magnesium	SF ₆	5.2	<0.01	0.99	7%	<0.001
Production and Processing	- 0					
3.G CO ₂ Emissions from Liming	CO_2	4.7	< 0.01	0.99	111%	0.001
2.G N₂O 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 ₂ O Emissions from Wastewater Treatment	N_2O	3.4	<0.01	0.99	109%	<0.001
1.A.2 N ₂ O Emissions from Stationary Combustion - Industrial	N_2O	3.1	<0.01	0.99	199%	0.001
1.A.4.b CO₂ Emissions from Stationary Combustion - Coal - Residential	CO ₂	3.0	<0.01	1.00	NE	<0.001
3.B.4 N₂O 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 ₂ O Emissions from Settlement Soils	N ₂ O	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 ₂ O Emissions from Mobile Combustion: Other	N_2O	1.8	<0.01	1.00	61%	<0.001
1.A.3.a N₂O Emissions from Mobile Combustion: Aviation	N_2O	1.7	<0.01	1.00	66%	<0.001
2.B.4 N₂O 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	CH ₄	1.1	<0.01	1.00	139%	<0.001
Combustion - Commercial 1.A.4.b N₂O 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	CO ₂	0.6	<0.01	1.00	19%	<0.001
Combustion - Coal - U.S. Territories	232					
2.C.6 CO ₂ Emissions from Zinc Production	CO_2	0.6	< 0.01	1.00	16%	< 0.001
4.A.1 N ₂ O Emissions from Forest Fires	N_2O	0.6	< 0.01	1.00	12%	< 0.001
1.A.3.d N ₂ O Emissions from Mobile	N ₂ O	0.6	<0.01	1.00	44%	<0.001
Combustion: Marine	1420	0.0	10.01	2.00	1170	10.001
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	CO_2	0.5	<0.01	1.00	NA	< 0.001
Combustion - Geothermal Energy	-					
2.C.5 CO ₂ Emissions from Lead Production	CO_2	0.5	< 0.01	1.00	15%	< 0.001
5.C.1 N ₂ O Emissions from Incineration of	N_2O	0.5	<0.01	1.00	334%	< 0.001
Waste	-					
1.A.4.a N₂O 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 ₂ O Emissions from Composting	N_2O	0.3	< 0.01	1.00	50%	< 0.001
1.A.1 N ₂ O Emissions from Stationary	N ₂ O	0.3	<0.01	1.00	48%	<0.001
Combustion - Gas - Electricity Generation						
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 N₂O 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	HFCs,	0.2	<0.01	1.00	13%	<0.001
Depleting Substances: Aerosols	PFCs					
3.F N ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
4.D.1 N₂O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1	<0.01	1.00	116%	<0.001
4.A.4 N ₂ O 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 ₂ O Emissions from Forest Soils	N_2O	0.1	<0.01	1.00	318%	<0.001
4.C.1 N ₂ O Emissions from Grass Fires	N ₂ O	0.1	<0.01	1.00	146%	<0.001
1.A.1 N ₂ O Emissions from Stationary	N ₂ O	0.1	<0.01	1.00	10%	< 0.001
Combustion - Oil - Electricity Generation						
4.F.4 CH ₄ Emissions from Grass Fires	CH ₄	0.1	<0.01	1.00	146%	<0.001

1.A.5 N ₂ O Emissions from Stationary	N_2O	0.1	<0.01	1.00	198%	<0.001
Combustion - U.S. Territories 1.A.3.c CH ₄ Emissions from Mobile	CH₄	0.1	<0.01	1.00	26%	<0.001
Combustion: Railways	J. 1.4					
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 ₂ O 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	HFCs,	+	< 0.01	1.00	13%	<0.001
Depleting Substances: Refrigeration and Air Conditioning	PFCs					
4.A.4 CH ₄ Emissions from Drained Organic Soils	CH ₄	+	<0.01	1.00	80%	<0.001
1.B.2 N ₂ O 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 ₂ O Emissions from Natural Gas Systems	N ₂ O	+	<0.01	1.00	17%	<0.001
1.A.1 N₂O 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 N₂O 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	HFCs,	0.0	<0.01	1.00	18%	<0.001
Depleting Substances: Fire Protection	PFCs					
2.F.5 Emissions from Substitutes for Ozone	HFCs,	0.0	<0.01	1.00	22%	<0.001
Depleting Substances: Solvents	PFCs					
2.C.4 HFC-134a Emissions from Magnesium	HFCs	0.0	<0.01	1.00	21%	<0.001
Production and Processing						

⁺ Does not exceed 0.05 MMT CO₂ Eq.

⁺ Does not exceed 0
NE (Not Estimated)

^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

Table A-6: 2018 Key Source Category Appro	Direct	5 P · G G G · G · · G · · G · · G · · G · · G · · G · · G · · G · · G · · G · · G	Approach 1			Approach 2
	Greenhouse	2018 Estimate	Level	Cumulative		Level
CRF Source Categories	Gas	(MMT CO ₂ Eq.)	Assessment	Total	Uncertainty ^a	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 ₂ O Emissions from Agricultural Soil Management	N ₂ O	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 N₂O Emissions from Applied Nitrogen	N ₂ O	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	CH ₄	36.6	0.01	0.92	38%	0.002
Systems 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 CO₂ 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 ₂ O Emissions from Stationary Combustion - Coal - Electricity Generation	N ₂ O	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 ₂ O 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 N₂O Emissions from Mobile Combustion: Road	N_2O	10.4	<0.01	0.98	14%	<0.001
2.B.3 N₂O 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 N₂O Emissions from Nitric Acid Production	N₂O	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 CO₂ Emissions from Carbon Dioxide Consumption	CO ₂	4.5	<0.01	0.99	5%	<0.001

2.G N ₂ O Emissions from Product Uses	N_2O	4.2	< 0.01	0.99	24%	< 0.001
3.B.4 N₂O Emissions from Manure	N_2O	4.1	< 0.01	0.99	24%	< 0.001
Management: Other Livestock						
1.A.1 N ₂ O Emissions from Stationary	N_2O	4.1	<0.01	0.99	48%	<0.001
Combustion - Gas - Electricity Generation 2.G SF ₆ Emissions from Electrical	SF ₆	4.1	<0.01	0.99	15%	<0.001
Transmission and Distribution	316	4.1	\0.01	0.55	13/0	\0.001
1.A.5 CO ₂ Emissions from Stationary	CO_2	4.0	< 0.01	0.99	19%	< 0.001
Combustion - Coal - U.S. Territories						
2.B.10 CO ₂ Emissions from Urea	CO ₂	3.6	< 0.01	0.99	12%	< 0.001
Consumption for Non-Ag Purposes						
2.B.9 HFC-23 Emissions from HCFC-22	HFCs	3.3	< 0.01	0.99	10%	< 0.001
Production						
3.G CO ₂ Emissions from Liming	CO ₂	3.1	<0.01	0.99	111%	0.001
1.A.5 CO₂ Emissions from Stationary	CO_2	3.0	<0.01	0.99	17%	< 0.001
Combustion - Gas - U.S. Territories						
1.A.2 N ₂ O Emissions from Stationary	N_2O	2.7	<0.01	0.99	199%	0.001
Combustion - Industrial	1150	2.6	.0.01	0.00	400/	0.004
2.F.3 Emissions from Substitutes for Ozone	HFCs,	2.6	<0.01	0.99	18%	<0.001
Depleting Substances: Fire Protection	PFCs	2.5	~ 0.01	0.99	610/	<0.001
1.A.3.e N ₂ O Emissions from Mobile	N₂O	2.5	<0.01	0.99	61%	<0.001
Combustion: Other	CH₄	2.5	<0.01	0.99	50%	<0.001
5.B CH ₄ Emissions from Composting	N ₂ O	2.2	<0.01	1.00	50%	<0.001
5.B N ₂ O Emissions from Composting		2.2	<0.01	1.00	12%	<0.001
2.C.2 CO ₂ Emissions from Ferroalloy Production	CO ₂	2.1	<0.01	1.00	1270	<0.001
2.F.5 Emissions from Substitutes for Ozone	HFCs,	2.0	< 0.01	1.00	22%	< 0.001
Depleting Substances: Solvents	PFCs					
1.A.4.a CO ₂ Emissions from Stationary	CO_2	1.8	< 0.01	1.00	15%	< 0.001
Combustion - Coal - Commercial						
2.B.7 CO ₂ Emissions from Soda Ash	CO_2	1.7	< 0.01	1.00	9%	< 0.001
Production						
1.A.3.e CH ₄ Emissions from Mobile	CH₄	1.7	<0.01	1.00	52%	< 0.001
Combustion: Other						
1.A.2 CH ₄ Emissions from Stationary	CH₄	1.6	<0.01	1.00	47%	<0.001
Combustion - Industrial					100/	
2.B.6 CO ₂ Emissions from Titanium Dioxide	CO ₂	1.6	<0.01	1.00	13%	<0.001
Production	NI O	1.6	-0.01	1.00	CC0/	10.001
1.A.3.a N ₂ O Emissions from Mobile Combustion: Aviation	N_2O	1.6	<0.01	1.00	66%	<0.001
2.C.3 PFC Emissions from Aluminum	PFCs	1.6	<0.01	1.00	7%	<0.001
Production	FFCS	1.0	\0.01	1.00	7 /0	<0.001
2.C.3 CO ₂ Emissions from Aluminum	CO_2	1.5	<0.01	1.00	2%	< 0.001
Production	202	1.5	10.01	2.00	270	10.001
2.B.4 N₂O Emissions from Caprolactam,	N_2O	1.4	< 0.01	1.00	32%	< 0.001
Glyoxal, and Glyoxylic Acid Production	.120					
1.A.4.a CH ₄ Emissions from Stationary	CH ₄	1.3	< 0.01	1.00	139%	< 0.001
Combustion - Commercial						
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	SF ₆	1.1	< 0.01	1.00	7%	< 0.001
Production and Processing	3 . ₀					
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	CH ₄	1.0	<0.01	1.00	26%	<0.001
Combustion: Road	J. 14			2.00		
1.A.1 CH ₄ Emissions from Stationary	CH ₄	1.0	<0.01	1.00	2%	< 0.001
Combustion - Gas - Electricity Generation	7					
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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 ₂ O 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 ₂ O 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 N₂O Emissions from Stationary Combustion - Commercial	N ₂ O	0.4	<0.01	1.00	175%	<0.001
5.C.1 N₂O Emissions from Incineration of Waste	N ₂ O	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 N₂O Emissions from Mobile Combustion: Railways	N ₂ O	0.3	<0.01	1.00	71%	<0.001
2.E N ₂ O Emissions from Electronics Industry	N ₂ O	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 ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
1.A.5 N₂O 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 N₂O Emissions from Petroleum Systems	N ₂ O	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 CH₄ Emissions from Mobile Combustion: Aviation	CH ₄	+	<0.01	1.00	88%	<0.001
1.A.1 N₂O Emissions from Stationary Combustion - Wood - Electricity Generation	N₂O	+	<0.01	1.00	2%	<0.001
2.C.2 CH ₄ Emissions from Ferroalloy Production	CH₄	+	<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 N₂O Emissions from Natural Gas Systems	N ₂ O	+	<0.01	1.00	17%	<0.001
1.A.1 N₂O Emissions from Stationary Combustion - Oil - Electricity Generation	N ₂ O	+	<0.01	1.00	10%	<0.001
2.C.1 CH₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH ₄	+	<0.01	1.00	19%	<0.001

8

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	CH₄	+	<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	CH₄	+	<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 CO₂ Eq.

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

		2018				
	Direct	Estimate	Approach 1			Approach 2
	Greenhouse	(MMT CO ₂	Level	Cumulative		Level
CRF Source/Sink Categories	Gas	Eq.)	Assessment	Total	Uncertainty ^a	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 N₂O Emissions from Agricultural Soil Management	N ₂ O	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	CH₄	171.7	0.02	0.74	18%	0.004
1.B.2 CH ₄ Emissions from Natural Gas Systems	CH₄	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

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.

4.A.2 Net CO ₂ Emissions from Land Converted to Forest Land	CO ₂	110.6	0.01	0.82	10%	0.001
	CH₄	110.6	0.01	0.84	40%	0.006
5.A CH ₄ Emissions from Landfills 4.E.2 Net CO ₂ Emissions from Land	CO ₂	79.3	0.01	0.85	33%	0.003
Converted to Settlements	CO ₂	73.3	0.01	0.03	3370	0.003
1.A.4.a CO ₂ Emissions from Stationary	CO ₂	63.9	0.01	0.86	6%	<0.001
Combustion - Oil - Commercial	202					5.552
1.A.4.b CO ₂ Emissions from Stationary	CO ₂	62.2	0.01	0.87	6%	<0.001
Combustion - Oil - Residential	_					
4.B.2 Net CO ₂ Emissions from Land	CO ₂	55.3	0.01	0.87	98%	0.007
Converted to Cropland						
1.B.1 Fugitive Emissions from Coal Mining	CH₄	52.7	0.01	0.88	17%	0.001
3.D.2 Indirect N ₂ O Emissions from Applied	N ₂ O	52.5	0.01	0.89	151%	0.010
Nitrogen						
1.A.2 CO ₂ Emissions from Stationary	CO ₂	49.8	0.01	0.89	16%	0.001
Combustion - Coal - Industrial	60	40.2	0.01	0.00	C 0/	10.001
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	CO ₂	42.7	0.01	0.90	18%	0.001
Production & Metallurgical Coke	CO ₂	72.7	0.01	0.50	10/0	0.001
Production						
2.A.1 CO ₂ Emissions from Cement	CO ₂	40.3	0.01	0.91	6%	<0.001
Production						
1.B.2 CO ₂ Emissions from Petroleum	CO ₂	39.4	0.01	0.91	38%	0.002
Systems						
1.A.3.c CO ₂ Emissions from Mobile	CO ₂	38.9	<0.01	0.92	6%	<0.001
Combustion: Railways	CH	36.6	<0.01	0.92	38%	0.002
1.B.2 CH ₄ Emissions from Petroleum Systems	CH₄	30.0	<0.01	0.52	36/0	0.002
1.A.3.d CO ₂ Emissions from Mobile	CO ₂	36.5	<0.01	0.93	6%	<0.001
Combustion: Marine	332					
3.B.1 CH ₄ Emissions from Manure	CH ₄	35.7	< 0.01	0.93	20%	0.001
Management: Cattle						
1.B.2 CO ₂ Emissions from Natural Gas	CO ₂	34.9	<0.01	0.94	17%	0.001
Systems						
1.A.5 CO ₂ Emissions from Stationary	CO ₂	34.3	<0.01	0.94	11%	<0.001
Combustion - Oil - U.S. Territories	60	29.4	<0.01	0.95	5%	<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	CH ₄	26.0	<0.01	0.95	20%	0.001
Management: Other Livestock	C1.14	_0.0	10.02	0.55	20/0	0.002
4.C.2 Net CO ₂ Emissions from Land	CO ₂	24.6	<0.01	0.95	138%	0.004
Converted to Grassland						
1.A.1 CO ₂ Emissions from Stationary	CO ₂	22.2	<0.01	0.95	8%	<0.001
Combustion - Oil - Electricity Generation						
1.A.1 N ₂ O Emissions from Stationary	N_2O	20.3	<0.01	0.96	48%	0.001
Combustion - Coal - Electricity Generation						
2.F.4 Emissions from Substitutes for Ozone	HFCs,	19.2	<0.01	0.96	13%	<0.001
Depleting Substances: Aerosols	PFCs	13.2	10.01	0.50	1370	10.001
4.B.1 Net CO ₂ Emissions from Cropland	CO ₂	16.6	<0.01	0.96	497%	0.011
Remaining Cropland						
3.B.1 N ₂ O Emissions from Manure	N_2O	15.4	<0.01	0.96	24%	<0.001
Management: Cattle	0 1 :	44.5		0.67	2621	0.004
5.D CH ₄ Emissions from Wastewater	CH₄	14.2	<0.01	0.97	28%	0.001
Treatment 2.A.2 CO ₂ Emissions from Lime Production	CO ₂	13.9	<0.01	0.97	2%	<0.001
Z.A.Z CO2 LINISSIONS HOM LIME PRODUCTION	CO ₂	13.5	~U.UI	0.57	2/0	\J.UUI

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	HFCs,	11.8	<0.01	0.97	11%	< 0.001
Depleting Substances: Foam Blowing Agents	PFCs					
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	CO ₂	11.2	<0.01	0.98	1296%	0.019
Remaining Grassland						
5.C.1 CO ₂ Emissions from Incineration of	CO ₂	11.1	<0.01	0.98	28%	<0.001
Waste						
1.A.3.b N ₂ O Emissions from Mobile	N_2O	10.4	< 0.01	0.98	14%	<0.001
Combustion: Road						
2.B.3 N ₂ O Emissions from Adipic Acid	N_2O	10.3	<0.01	0.98	5%	<0.001
Production						
2.A.4 CO ₂ Emissions from Other Process	CO ₂	9.4	<0.01	0.98	15%	<0.001
Uses of Carbonates	N.O	0.2	10.01	0.00	F0/	10.001
2.B.2 N ₂ O Emissions from Nitric Acid	N_2O	9.3	<0.01	0.98	5%	<0.001
Production	N_2O	7.5	<0.01	0.98	12%	<0.001
4.A.1 N ₂ O Emissions from Forest Fires 1.B.2 CH ₄ Emissions from Abandoned Oil	CH ₄	7.0	<0.01	0.98	220%	0.001
and Gas Wells	СП4	7.0	<0.01	0.96	220%	0.002
1.B.1 Fugitive Emissions from Abandoned	CH ₄	6.2	<0.01	0.98	20%	<0.001
Underground Coal Mines	C1 14	0.2	10.02	0.00	2070	10.002
3.A.4 CH ₄ Emissions from Enteric	CH ₄	5.8	< 0.01	0.99	18%	< 0.001
Fermentation: Other Livestock						
5.D N₂O Emissions from Wastewater	N_2O	5.0	<0.01	0.99	109%	0.001
Treatment						
2.E PFC, HFC, SF ₆ , and NF ₃ Emissions from	HiGWP	4.8	<0.01	0.99	6%	<0.001
Electronics Industry						
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	CH ₄	4.5	<0.01	0.99	230%	0.001
Combustion - Residential		4.5	.0.04	0.00	5 0/	.0.004
2.B.10 CO ₂ Emissions from Carbon Dioxide	CO_2	4.5	<0.01	0.99	5%	<0.001
Consumption	60	4.4	-0.01	0.99	77%	<0.001
4.D.1 Net CO ₂ Emissions from Coastal	CO ₂	4.4	<0.01	0.99	17%	<0.001
Wetlands Remaining Coastal Wetlands 2.G N ₂ O Emissions from Product Uses	N_2O	4.2	<0.01	0.99	24%	<0.001
3.B.4 N ₂ O Emissions from Manure	N ₂ O N ₂ O	4.1	<0.01	0.99	24%	<0.001
Management: Other Livestock	N ₂ O	4.1	\0.01	0.99	2470	<0.001
1.A.1 N ₂ O Emissions from Stationary	N_2O	4.1	< 0.01	0.99	48%	< 0.001
Combustion - Gas - Electricity Generation	. 120					
2.G SF ₆ Emissions from Electrical	SF_6	4.1	<0.01	0.99	15%	< 0.001
Transmission and Distribution	· ·					
1.A.5 CO ₂ Emissions from Stationary	CO ₂	4.0	<0.01	0.99	19%	< 0.001
Combustion - Coal - U.S. Territories						
2.B.10 CO ₂ Emissions from Urea	CO_2	3.6	<0.01	0.99	12%	<0.001
Consumption for Non-Ag Purposes						
4.D.1 CH ₄ Emissions from Coastal Wetlands	CH_4	3.6	<0.01	0.99	30%	<0.001
Remaining Coastal Wetlands						
2.B.9 HFC-23 Emissions from HCFC-22	HFCs	3.3	<0.01	0.99	10%	<0.001
Production		2.4	.0.04	0.00	4440/	.0.004
3.G CO ₂ Emissions from Liming	CO₂	3.1	<0.01	0.99	111%	<0.001
1.A.5 CO ₂ Emissions from Stationary	CO ₂	3.0	<0.01	0.99	17%	<0.001
Combustion - Gas - U.S. Territories	N.O	2.7	<0.01	0.99	199%	0.001
1.A.2 N₂O Emissions from Stationary Combustion - Industrial	N ₂ O	۷./	\0.01	0.33	13370	0.001
Combustion - muustilai						

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 ₂ O 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 ₂ O Emissions from Settlement Soils	N_2O	2.4	< 0.01	1.00	54%	< 0.001
5.B N ₂ O 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	CH₄	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 ₂ O 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 N₂O 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 ₂ O 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 ₂ O Emissions from Mobile Combustion: Marine	N_2O	0.5	<0.01	1.00	44%	<0.001
4.A.1 N₂O 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 ₂ O Emissions from Stationary Combustion - Commercial	N_2O	0.4	<0.01	1.00	175%	<0.001
4.C.1 N ₂ O 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 ₂ O	0.3	<0.01	1.00	334%	<0.001

1.A.3.d CH ₄ Emissions from Mobile	CH ₄	0.3	<0.01	1.00	85%	<0.001
Combustion: Marine	J. 14					
2.B.8 CH ₄ Emissions from Petrochemical Production	CH ₄	0.3	<0.01	1.00	57%	<0.001
1.A.3.c N₂O 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 ₂ O 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 ₂ O Emissions from Field Burning of Agricultural Residues	N_2O	0.2	<0.01	1.00	19%	<0.001
4.D.1 N₂O Emissions from Coastal Wetlands Remaining Coastal Wetlands	N_2O	0.1	<0.01	1.00	116%	<0.001
1.A.5 N ₂ O Emissions from Stationary Combustion - U.S. Territories	N_2O	0.1	<0.01	1.00	198%	<0.001
4.A.4 N ₂ O 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 ₂ O 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 ₂ O Emissions from Stationary Combustion - Wood - Electricity Generation	N ₂ O	+	<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 ₂ O Emissions from Natural Gas Systems	N_2O	+	<0.01	1.00	17%	<0.001
1.A.1 N ₂ O 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	CH₄	+	<0.01	1.00	2%	<0.001
2.C.4 CO ₂ Emissions from Magnesium	CO ₂	+	< 0.01	1.00	3%	< 0.001
Production and Processing	CO ₂	'	\0.01	1.00	3/0	\0.001
4.D.1 N₂O 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 CO₂ Eq.

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

-	Direct	1990 Estimate	2018 Estimate	Approach 1	Approach 2	%	
	Greenhouse	(MMT CO ₂	(MMT CO ₂	Trend	Trend	Contribution	Cumulative
CRF Source Categories	Gas	Eq.)	Eq.)	Assessment	Assessment	to Trend	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	CH₄	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

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.

1.A.4.b CO ₂ Emissions from	CO ₂	97.4	62.2	0.01	<0.001	1.7	82
Stationary Combustion - Oil - Residential	CO ₂	37.4	02.2	0.01	\0.001	1.7	02
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 N₂O Emissions from Mobile Combustion: Road	N ₂ O	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 N₂O Emissions from Applied Nitrogen	N ₂ O	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 CH₄ 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 N₂O Emissions from Adipic Acid Production	N₂O	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	SF ₆	5.2	1.1	<0.01	<0.001	0.2	97
Processing 3.B.1 N₂O Emissions from Manure Management: Cattle	N_2O	11.2	15.4	<0.01	<0.001	0.2	97
1.A.1 N ₂ O Emissions from Stationary Combustion - Gas - Electricity Generation	N ₂ O	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 CH₄ Emissions from Rice Cultivation	CH ₄	16.0	13.3	<0.01	<0.001	0.1	98
2.B.2 N₂O Emissions from Nitric Acid Production	N ₂ O	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 N₂O Emissions from Agricultural Soil Management	N₂O	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 ₂ O 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
	66	4.7	2.4	40.01	<0.001	0.1	00
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 N₂O 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	CH₄	7.2	6.2	<0.01	<0.001	0.1	100
3.B.4 N ₂ O 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	CH₄	5.2	4.5	<0.01	<0.001	<0.1	100
1.A.1 CH ₄ Emissions from Stationary Combustion - Gas - Electricity Generation	CH₄	0.1	1.0	<0.01	<0.001	<0.1	100
2.B.10 CO₂ Emissions from Phosphoric Acid Production	CO ₂	1.5	0.9	<0.01	<0.001	<0.1	100
1.A.3.e N ₂ O Emissions from Mobile Combustion: Other	N_2O	1.8	2.5	<0.01	<0.001	<0.1	100
1.A.1 N₂O Emissions from Stationary Combustion - Coal - Electricity Generation	N ₂ O	20.1	20.3	<0.01	<0.001	<0.1	100
1.A.2 N ₂ O Emissions from Stationary Combustion - Industrial	N ₂ O	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 ₂ O Emissions from Caprolactam, Glyoxal, and Glyoxylic Acid Production	N ₂ O	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	CH₄	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 ₂ O Emissions from Electronics Industry	N_2O	+	0.3	<0.01	<0.001	<0.1	100
1.A.3.a N ₂ O 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 N₂O Emissions from Stationary Combustion - Residential	N₂O	1.0	0.9	<0.01	<0.001	<0.1	100

2.G N ₂ O 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 N₂O 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 -	CO ₂	0.5	0.4	<0.01	<0.001	<0.1	100
Geothermal Energy 1.A.4.a CH ₄ Emissions from Stationary Combustion - Commercial	CH₄	1.1	1.3	<0.01	<0.001	<0.1	100
1.A.1 CH ₄ Emissions from Stationary Combustion - Coal -	CH₄	0.3	0.2	<0.01	<0.001	<0.1	100
Electricity Generation 1.A.3.d N₂O 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 ₂ O Emissions from Stationary Combustion - Oil - Electricity Generation	N ₂ O	0.1	+	<0.01	<0.001	<0.1	100
1.B.2 N ₂ O Emissions from	N_2O	+	0.1	<0.01	<0.001	<0.1	100
Petroleum Systems 2.C.5 CO ₂ Emissions from Lead	CO ₂	0.5	0.6	<0.01	<0.001	<0.1	100
Production 3.F CH ₄ Emissions from Field	CH ₄	0.3	0.4	<0.01	<0.001	<0.1	100
Burning of Agricultural Residues 1.A.3.a CH ₄ Emissions from Mobile	CH ₄	0.1	+	<0.01	<0.001	<0.1	100
Combustion: Aviation 1.A.4.a N ₂ O Emissions from Stationary Combustion -	N_2O	0.4	0.4	<0.01	<0.001	<0.1	100
Commercial 1.A.5 N₂O Emissions from Stationary Combustion - U.S.	N_2O	0.1	0.1	<0.01	<0.001	<0.1	100
Territories 1.A.3.c N ₂ O Emissions from Mabile Combustions Pallyays	N_2O	0.3	0.3	<0.01	<0.001	<0.1	100
Mobile Combustion: Railways 2.B.5 CH ₄ Emissions from Silicon Carbide Production and	CH₄	+	+	<0.01	<0.001	<0.1	100
Consumption 1.A.1 N ₂ O Emissions from Stationary Combustion - Wood -	N_2O	+	+	<0.01	<0.001	<0.1	100
Electricity Generation 3.F N ₂ O Emissions from Field	N_2O	0.2	0.2	<0.01	<0.001	<0.1	100
Burning of Agricultural Residues 1.A.1 CH ₄ Emissions from Stationary Combustion - Oil -	CH₄	+	+	<0.01	<0.001	<0.1	100
Electricity Generation 2.C.1 CH ₄ Emissions from Iron and Steel Production & Metallurgical Coke Production	CH₄	+	+	<0.01	<0.001	<0.1	100

1.A.5 CH ₄ Emissions from Stationary Combustion - U.S. Territories	CH₄	+	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 N₂O Emissions from Natural Gas Systems	N ₂ O	+	+	<0.01	<0.001	<0.1	100
2.C.2 CH₄ 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	CH₄	+	+	<0.01	<0.001	<0.1	100
1.B.2 CO₂ Emissions from Abandoned Oil and Gas Wells	CO_2	+	+	<0.01	<0.001	<0.1	100
5.C.1 CH₄ Emissions from Incineration of Waste	CH ₄	+	+	<0.01	<0.001	<0.1	100
2.C.4 CO₂ Emissions from Magnesium Production and Processing	CO ₂	+	+	<0.01	<0.001	<0.1	100

⁺ Does not exceed 0.05 MMT CO₂ 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

	Direct	1990 Estimate					
CDF Carrier /Circle Catagories	Greenhouse Gas	(MMT CO₂ Eq.)	(MMT CO₂ Eq.)	Trend Assessment		Contribution to Trend	Cumulative
CRF Source/Sink Categories							
1.A.1 CO ₂ Emissions from Stationary Combustion - Coal - Electricity Generation	CO₂	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 CO₂ Emissions from Stationary Combustion - Coal - Industrial	CO ₂	155.2	49.8	0.01	0.002	4.4	55
4.A.1 Net CO₂ 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 CO₂ 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	CH₄	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 N₂O Emissions from Mobile Combustion: Road	N ₂ O	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 CO₂ 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	CH ₄	158.4	171.7	<0.01	<0.001	0.3	94
Fermentation: Cattle 3.D.2 Indirect N ₂ O Emissions from	N ₂ O	43.4	52.5	<0.01	0.002	0.3	94
Applied Nitrogen 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 ₂ O Emissions from Forest Fires	N ₂ O	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 N₂O Emissions from Adipic Acid Production	N ₂ O	15.2	10.3	<0.01	<0.001	0.2	97
3.D.1 Direct N₂O 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 ₂ O Emissions from Manure Management: Cattle	N_2O	11.2	15.4	<0.01	<0.001	0.2	97
1.A.1 N₂O Emissions from Stationary Combustion - Gas - Electricity Generation	N ₂ O	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 ₂ O 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
-	CH₄	0.4	2.5	<0.01	<0.001	0.1	99
5.B CH ₄ Emissions from Composting							
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 N₂O Emissions from	N_2O	0.3	2.2	<0.01	<0.001	0.1	99
Composting							
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	CH₄	15.3	14.2	< 0.01	< 0.001	0.1	99
Wastewater Treatment						-	
5.D N₂O Emissions from Wastewater Treatment	N_2O	3.4	5.0	<0.01	<0.001	0.1	99
1.B.1 Fugitive Emissions from	CH ₄	7.2	6.2	<0.01	<0.001	<0.1	99
Abandoned Underground Coal Mines	CI 14	7.2	0.2	10.01	\0.001	10.1	33
3.B.4 N ₂ O 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	CH₄	0.1	1.0	<0.01	<0.001	<0.1	100
1.A.4.b CH ₄ Emissions from	CH ₄	5.2	4.5	<0.01	<0.001	<0.1	100
Stationary Combustion - Residential	CH4	3.2	4.5	V0.01	V0.001	10.1	100
2.B.10 CO ₂ Emissions from	CO ₂	1.5	0.9	<0.01	<0.001	<0.1	100
Phosphoric Acid Production							
1.A.3.e N ₂ O Emissions from Mobile Combustion: Other	N_2O	1.8	2.5	<0.01	<0.001	<0.1	100
1.A.2 N ₂ O 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 N₂O Emissions from Stationary Combustion - Coal - Electricity Generation	N ₂ O	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 N₂O 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 ₂ O 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 N₂O 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 CH₄ 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 ₂ O Emissions from Grass Fires	N_2O	0.1	0.3	<0.01	<0.001	<0.1	100
2.E N ₂ O 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 N₂O Emissions from Mobile Combustion: Aviation	N_2O	1.7	1.6	<0.01	<0.001	<0.1	100
2.B.5 CO₂ 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 ₂ O Emissions from Stationary Combustion - Residential	N ₂ O	1.0	0.9	<0.01	<0.001	<0.1	100
5.C.1 N ₂ O 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 ₂ O 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	CH₄	0.3	0.2	<0.01	<0.001	<0.1	100
1.A.3.d N ₂ O 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	CH₄	3.4	3.6	<0.01	<0.001	<0.1	100

2.B.8 CH ₄ Emissions from	CH ₄	0.2	0.3	<0.01	<0.001	<0.1	100
Petrochemical Production 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 N₂O Emissions from Stationary Combustion - Oil -	N_2O	0.1	+	<0.01	<0.001	<0.1	100
Electricity Generation 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 ₂ O 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 N₂O Emissions from Stationary Combustion - U.S. Territories	N ₂ O	0.1	0.1	<0.01	<0.001	<0.1	100
1.A.4.a N₂O Emissions from Stationary Combustion - Commercial	N ₂ O	0.4	0.4	<0.01	<0.001	<0.1	100
1.A.3.c N₂O 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 ₂ O Emissions from Stationary Combustion - Wood - Electricity Generation	N ₂ O	+	+	<0.01	<0.001	<0.1	100
3.F N₂O 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	CH₄	+	+	<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 CH₄ 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 N₂O 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 ₂ O 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

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Processing

Wetlands

Organic Soils

4.D.1 N₂O Emissions from Coastal Wetlands Remaining Coastal

Abandoned Oil and Gas Wells

Converted to Coastal Wetlands

4.A.4 CH₄ Emissions from Drained

4.D.1 N₂O Emissions from Peatlands

4.D.2 CH₄ Emissions from Land

1.B.2 CO₂ Emissions from

Remaining Peatlands

5.C.1 CH₄ Emissions from

Incineration of Waste 2.C.4 CO₂ Emissions from

Magnesium Production and

+ Does not exceed 0.05 MMT CO₂ Eq.

 N_2O

 CO_2

CH₄

 CH_4

 N_2O

 CH_4

 CO_2

0.1

0.1

< 0.01

< 0.01

< 0.01

< 0.01

< 0.01

< 0.01

< 0.01

<0.001

<0.001

<0.001

< 0.001

<0.001

<0.001

<0.001

< 0.1

< 0.1

< 0.1

<0.1

< 0.1

< 0.1

< 0.1

100

100

100

100

100

100

100