

	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN			
1																																									
2	, and fugitive methane					Entity emissions from combustion, venting, flaring, and fugitive methane																																			
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7	Eni SpA, Italy														Eni SpA, Italy																										
8																																									
9																																									
10	1920s						1930s						1940s						1950s																						
11	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961			
12																																									
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19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
31																																									
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33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	3,525	3,573	3,606	3,891	3,906	4,195	3,855	3,441	3,104	3,276	3,565	3,759	4,141	4,430	4,188	4,364	4,760	4,884	4,914	5,097	5,068	4,254	4,536	5,104	5,383	5,199	5,976	6,475	6,577	6,742	6,834	7,490	7,977	8,318	8,538	8,857	9,345	9,366			
49	962	975	984	1,062	1,066	1,145	1,052	939	847	894	973	1,026	1,130	1,209	1,143	1,191	1,299	1,333	1,341	1,391	1,383	1,161	1,238	1,393	1,469	1,419	1,631	1,767	1,795	1,840	1,865	2,044	2,177	2,270	2,330	2,417	2,550	2,556			
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.04%	0.07%	0.09%	0.10%	0.11%	0.12%	0.13%	0.14%	0.16%	0.16%			
51	21.1	21.2	21.2	23.0	22.8	24.4	22.3	19.9	17.9	18.8	20.4	21.0	23.3	24.8	23.4	24.8	26.2	27.0	27.0	27.4	26.9	23.5	24.7	27.6	29.2	28.1	30.4	32.2	32.7	33.1	33.1	35.9	38.4	39.7	40.9	42.7	44.6	44.3			
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ			
1	<b>Entity emissions from combustion, venting, flaring, and fugitive methane</b>																																								
2																																									
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10	<b>1960s</b>									<b>1970s</b>									<b>1980s</b>									<b>1990s</b>													
11	<b>1962</b>	<b>1963</b>	<b>1964</b>	<b>1965</b>	<b>1966</b>	<b>1967</b>	<b>1968</b>	<b>1969</b>	<b>1970</b>	<b>1971</b>	<b>1972</b>	<b>1973</b>	<b>1974</b>	<b>1975</b>	<b>1976</b>	<b>1977</b>	<b>1978</b>	<b>1979</b>	<b>1980</b>	<b>1981</b>	<b>1982</b>	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>			
12																																									
13																																									
14																																									
15	13	17	24	23	22	19	19	22	25	32	39	51	40	39	43	42	48	47	45	32	33	34	39	39	38	47	52	59	65	66	70	72	78	83	83	88	89	91			
16	13	13	14	14	16	17	18	21	23	23	26	28	28	27	27	25	26	26	27	27	26	25	26	26	28	30	33	33	34	35	33	38	43	43	43	44	45	46			
17																																									
18	26	31	38	37	39	36	37	43	48	55	65	78	68	66	70	66	74	73	72	60	60	59	65	65	66	77	85	92	100	101	104	111	121	126	127	131	134	137			
19																																									
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
21	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
22	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	
23	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
25	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6		
26																																									
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29	27	32	40	39	40	38	39	45	51	58	68	82	71	69	73	69	77	76	75	63	62	62	68	68	69	81	89	96	104	106	108	115	126	132	132	137	139	143			
30																																									
31																																									
32																																									
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6			
37																																									
38																																									
39	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	3	3	2	2	2	2	2	2	2	3	3	3	4	4	4	4	4	4	4	4	5	5	5		
40	4	4	4	4	5	5	5	6	6	6	7	8	8	7	8	7	7	7	7	8	7	7	7	7	8	8	9	9	9	10	9	11	12	12	12	12	12	12	13		
41																																									
42	4	5	5	5	6	6	6	7	8	8	9	10	10	9	10	9	10	10	10	9	9	9	9	9	10	11	12	12	13	13	13	14	16	16	16	17	17	18			
43																																									
44																																									
45	31	37	45	44	46	43	45	52	58	66	78	92	81	78	83	78	87	86	85	72	72	71	77	77	79	92	101	108	117	119	121	130	142	148	148	154	157	160			
46																																									
47																																									
48	9,699	10,248	10,781	11,282	11,807	12,184	12,849	13,705	14,840	15,440	16,158	17,016	16,943	16,921	17,819	18,308	18,979	19,485	19,392	18,865	18,725	18,903	19,453	20,146	20,433	21,095	21,902	22,232	22,547	23,032	22,313	22,580	22,742	23,232	23,963	24,103	24,018	24,326			
49	2,647	2,797	2,942	3,079	3,222	3,325	3,507	3,740	4,050	4,214	4,410	4,644	4,624	4,618	4,863	4,996	5,180	5,318	5,292	5,149	5,110	5,159	5,309	5,498	5,576	5,757	5,977	6,067	6,153	6,286	6,089	6,162	6,207	6,340	6,540	6,578	6,555	6,639			
50																																									
51	0.28%	0.31%	0.37%	0.34%	0.34%	0.31%	0.31%	0.33%	0.34%	0.38%	0.42%	0.48%	0.42%	0.41%	0.41%	0.38%	0.41%	0.39%	0.39%	0.33%	0.33%	0.33%	0.35%	0.34%	0.34%	0.38%	0.40%	0.43%	0.46%	0.46%	0.48%	0.51%	0.55%	0.57%	0.55%	0.57%	0.58%	0.59%			
52																																									
53																																									
54	45.1	47.1	49.4	51.3	53.4	54.7	57.2	60.6	66.8	72.3	79.4	88.6	92.3	99.4	112.6	112.5	105.2	117.3	114.8	122.9	119.4	110.5	93.4	92.8	89.4	86.3	87.0	86.8	84.9	92.0	93.2	90.0	89.1	89.9	89.7	90.1	89.9	91.9	89.3	84.0	82.0
55																																									
56	0.34%	0.35%	0.38%	0.36%	0.38%	0.38%	0.38%	0.41%	0.32%	0.32%	0.33%	0.33%	0.31%	0.32%	0.30%	0.28%	0.28%	0.29%	0.32%	0.36%	0.35%	0.35%	0.38%	0.38%	0.40%	0.46%	0.46%	0.47%	0.52%	0.53%	0.52%	0.58%	0.63%	0.65%	0.64%	0.67%	0.73%	0.76%			
57																																									
58																																									
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60																																									
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**Entity emissions from combustion, venting, flaring, and fugitive methane**

Richard Heede  
Climate Accountability Institute  
18-Oct-20

**Eni SpA, Italy**

**to 2015**

	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF																		
1	<b>Entity emissions from combustion, venting, flaring, and fugitive methane</b>																																																	
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9																																																		
10	<b>2000s</b>										<b>2010s</b>										<b>Cumulative</b>																													
11	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>MtCO2e</b>		<b>Entity emissions</b>										<b>Cumulative</b>																
12																							<b>MtCO2e</b>												<b>MtCO2e</b>															
13																							(except where noted)												(V = verified)												(except where noted)			
14																																																		
15	101	116	125	133	140	150	146	138	139	137	135	115	120	113	112	123	119	116	120	<b>V</b>	<b>4,173</b>	<b>Entity CO2 emissions</b>										<b>kg CO2/CO2</b>	<b>to 2015</b>																	
16	51	60	64	68	69	77	77	80	86	85	89	73	80	75	82	91	84	92	90	<b>V</b>	<b>2,630</b>	<b>Oil &amp; NGLs</b>	<b>MtCO2</b>	linked		<b>3,818</b>	<b>Oil &amp; NGLs: Flaring</b>	<b>MtCO2</b>	calculated	<b>15.94</b>	linked	<b>61</b>	<b>Natural Gas</b>	<b>MtCO2</b>	linked		<b>2,363</b>	<b>Coal</b>	<b>MtCO2</b>	linked		<b>-</b>	<b>Combustion total</b>	<b>MtCO2</b>	sum		<b>6,181</b>			
17																																																		
18	153	176	189	201	209	227	224	219	225	222	224	188	200	188	195	214	203	208	210		<b>6,803</b>	<b>Oil &amp; NGLs: Venting</b>	<b>MtCO2</b>	calculated	<b>3.83</b>	linked	<b>15</b>	<b>Natural Gas: Venting</b>	<b>MtCO2</b>	calculated	<b>57.26</b>	linked	<b>135</b>	<b>Natural Gas: Flaring</b>	<b>MtCO2</b>	calculated	<b>28.53</b>	linked	<b>67</b>	<b>Natural Gas: Flaring</b>	<b>MtCO2</b>	calculated	<b>1.74</b>	linked	<b>4</b>	<b>Venting &amp; Flaring total</b>	<b>MtCO2</b>	sum		<b>282</b>
19																																																		
20	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0		<b>16</b>	<b>Cement</b>	<b>MtCO2</b>	linked			<b>Total CO2 emissions</b>	<b>MtCO2</b>	sum	<b>row 18+24+26</b>	<b>6,464</b>																			
21	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		<b>67</b>	<b>Entity methane emissions</b>			<b>kg CH4/CO2</b>																									
22	3	3	4	4	4	4	4	5	5	5	5	4	5	4	5	5	5	5	5		<b>151</b>	<b>Methane: Oil &amp; NGLs</b>	<b>MtCH4</b>	calculated	<b>1.92</b>	linked	<b>7</b>	<b>Methane: Natural Gas</b>	<b>MtCH4</b>	calculated	<b>9.88</b>	linked	<b>23</b>	<b>Methane: Coal</b>	<b>MtCH4</b>	calculated	<b>4.03</b>	linked	<b>-</b>	<b>Total methane emissions</b>	<b>MtCH4</b>	sum		<b>31</b>						
23	1	2	2	2	2	2	2	2	2	2	3	2	2	2	2	3	2	3	3		<b>75</b>	<b>Entity methane emissions</b>			<b>GWP</b>																									
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		<b>5</b>	<b>Methane: Oil &amp; NGLs</b>	<b>MtCO2e</b>	calculated	<b>28</b>		<b>206</b>	<b>Methane: Natural Gas</b>	<b>MtCO2e</b>	calculated	<b>28</b>		<b>654</b>	<b>Methane: Coal</b>	<b>MtCO2e</b>	calculated	<b>28</b>		<b>-</b>	<b>Total methane emissions</b>	<b>MtCO2e</b>	sum	(per IPCC SAR)	<b>859</b>						
25	7	8	8	9	9	10	10	10	10	10	10	9	9	9	9	10	10	10	10		<b>313</b>	<b>Total attributed emissions</b>	<b>MtCO2e</b>	sum		<b>7,323</b>																								
26																																																		
27																																																		
28																																																		
29	159	184	197	210	218	237	233	228	236	232	234	197	209	197	204	225	213	218	220	<b>V</b>	<b>7,115</b>	<b>CDIAC CO2 emissions</b>	<b>MtCO2</b>			<b>1,505,476</b>	<b>Oil, Natural Gas, Coal, Flaring, &amp; Cement</b>	<b>Mt Carbon</b>																						
30																																																		
31																																																		
32																																																		
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		<b>8</b>	<b>Entity percent of total CO2 emissions</b>	<b>Percent</b>			<b>0.44%</b>	<b>Entity percent of total CH4 emissions</b>	<b>Percent</b>			<b>0.43%</b>																			
34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		<b>26</b>	<b>CDIAC/EDGAR methane</b>	<b>Tg CH4</b>			<b>6,610</b>																								
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		<b>-</b>	<b>Entity percent of total CO2 emissions</b>	<b>Percent</b>			<b>0.43%</b>	<b>Entity percent of total CH4 emissions</b>	<b>Percent</b>			<b>0.46%</b>																			
36	0.7	0.8	0.9	0.9	1.0	1.1	1.0	1.1	1.1	1.1	1.1	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	<b>V</b>	<b>34</b>	<b>CDIAC sums December 2019</b>																												
37																																																		
38																																																		
39	5	6	7	7	8	8	8	7	7	7	7	6	6	6	6	7	6	6	6		<b>225</b>	<b>CDIAC sums December 2019</b>																												
40	14	17	18	19	19	21	21	22	24	24	24	20	22	21	23	25	23	26	25		<b>727</b>	<b>CDIAC sums December 2019</b>																												
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		<b>-</b>	<b>CDIAC sums December 2019</b>																												
42	20	23	25	26	27	29	29	30	31	31	32	26	29	27	29	32	30	32	31		<b>952</b>	<b>CDIAC sums December 2019</b>																												
43																																																		
44																																																		
45	179	206	222	236	245	267	263	258	267	263	266	223	238	224	233	257	243	250	252	<b>V</b>	<b>8,067</b>	<b>CDIAC sums December 2019</b>																												
46																																																		
47																																																		
48	25,025	25,235	25,788	27,034	28,308	29,264	30,231	31,135	31,854	31,414	33,018	34,136	34,660	34,825	35,089	35,106	35,251	35,681	36,443	<b>V</b>	<b>1,612,851</b>	<b>CDIAC sums December 2019</b>																												
49	6,830	6,887	7,038	7,378	7,726	7,986	8,250	8,497	8,693	8,573	9,011	9,316	9,459	9,504	9,576	9,581	9,620	9,738	9,946	<b>V</b>	<b>440,166</b>	<b>CDIAC sums December 2019</b>																												
50																																																		
51	0.64%	0.73%	0.77%	0.78%	0.77%	0.81%	0.77%	0.73%	0.74%	0.74%	0.71%	0.58%	0.60%	0.57%	0.58%	0.64%	0.60%	0.61%	0.60%		<b>0.44%</b>	<b>CDIAC sums December 2019</b>																												
52																																																		
53																																																		
54	82.6	83.0	82.8	88.0	91.7	94.7	98.4	99.5	101.2	99.9	105.1	109.5	113.4	115.2	118.2	117.8	118.4	120.0	122.7	<b>V</b>	<b>6,971</b>	<b>CDIAC sums December 2019</b>																												
55																																																		
56	0.85%	0.98%	1.06%	1.05%	1.04%	1.11%	1.06%	1.06%	1.11%	1.11%	1.08%	0.86%	0.90%	0.84%	0.87%	0.97%	0.90%	0.95%	0.92%		<b>0.49%</b>	<b>CDIAC sums December 2019</b>																												
57																																																		
58																																																		
59																																																		
60																																																		
61																																																		

**Cell:** FY48

**Comment:** Rick Heede:

CAI compares entity emissions to the CDIAC / Global Carbon Project ([www.globalcarbonproject.org](http://www.globalcarbonproject.org)) annual estimate of carbon dioxide emissions from fossil fuels and cement production. The CAI Carbon Majors methodology is based on the CDIAC methodology; see: Heede, Richard (2019) Carbon Majors: Accounting for carbon and methane emissions 1854-2010 Methods & Results Report, ISBN 978-3-659-57841-0, Omniscriptum, Riga, 148 pp.  
 Reference of the full global carbon budget 2019: Pierre Friedlingstein, Matthew W. Jones, Michael O'Sullivan, Robbie M. Andrew, Judith Hauck, Glen P. Peters, Wouter Peters, Julia Pongratz, Stephen Sitch, Corinne Le Quéré, Dorothee C. E. Bakker, Josep G. Canadell, Philippe Ciais, Rob Jackson, Peter Anthoni, Leticia Barbero, Ana Bastos, Vladislav Bastrikov, Meike Becker, Laurent Bopp, Erik Buitenhuis, Naveen Chandra, Frédéric Chevallier, Louise P. Chini, Kim I. Currie, Richard A. Feely, Marion Gehlen, Dennis Gilfillan, Thanos Gkritzalis, Daniel S. Gol, Nicolas Gruber, Sören Gutekunst, Ian Harris, Vanessa Haverd, Richard A. Houghton, George Hurtt, Tatiana Ilyina, Atul K. Jain, Emilie Joetzjer, Jed O. Kaplan, Etsushi Kato, Kees Klein Goldewijk, Jan Ivar Korsbakken, Peter Landschützer, Siv K. Lauvset, Nathalie Lefèvre, Andrew Lenton, Sebastian Liener, Danica Lombardozzi, Gregg Marland, Patrick C. McGuire, Joe R. Melton, Nicolas Metz, David R. Munro, Julia E. M. S. Nabel, Shin-Ichiro Nakaoka, Craig Neill, Abdrahman M. Omar, Tsunee Ono, Anna Peregon, Denis Pierrot, Benjamin Poulter, Gregor Rehder, Laure Resplandy, Eddy Robertson, Christian Rödenbeck, Roland Séférian, Jörg Schwinger, Naomi Smith, Pieter P. Tans, Hanqin Tian, Bronte Tilbrook, Francesco N Tubiello, Guido R. van der Werf, Andrew J. Wiltshire, Sönke Zaehele. Global Carbon Budget 2019, Earth Syst. Sci. Data, 2019. <https://doi.org/10.5194/essd-11-1783-2019>  
 See also: Gilfillan, D., Marland, G., Boden, T. and Andres, R.: Global, Regional, and National Fossil-Fuel CO2 Emissions.

**Cell:** FY54

**Comment:** Rick Heede:

This study's total fugitive and vented methane from oil and natural gas systems and coal mining are summed here and compared to CDIAC's estimate for 1860 to 1969 (Stern & Kaufmann, 1998). CAI uses revised data from EDGAR for 1970-2015, with extrapolation by CAI for 2016-2018 (based on growth of emissions from oil, gas, and coal production). There is a non-linearity at 1969/1970 btw datasets.  
 Methane emissions may be revised if a more comprehensive and integrated dataset becomes available.  
 Furthermore, the Stern & Kaufman does not estimate methane emissions from oil (only gas-related CH4). The most recent EDGAR Nov19 datasets aggregate methane emissions from the Oil & Gas sector. CAI disaggregates methane from oil and methane from gas on the basis of an earlier EDGAR dataset 1970-2008 that reports CH4 from oil and gas separately. CAI uses this average allocation of ~695% from gas and ~30.5% from oil to estimate methane emissions from both sectors. This, given the fluctuations of methane emissions -- the proportion from natural gas increases over time (from 50% in 1970 to 76% in 2008) -- this disaggregation is only approximate.

Stern, David I., & Robert K. Kaufmann (1998) "Annual Estimates of Global Anthropogenic Methane Emissions: 1860-1994," in Trends Online: A Compendium of Data on Global Change, Carbon Dioxide Information Analysis Center, Oak Ridge National Lab., U.S. DOE, Oak Ridge, Tenn., U.S.A. <http://cdiac.esd.ornl.gov/trends/meth/ch4.htm#flaring>

Crippa, M., G. Oreggioni, D. Guizzardi, M. Muntean, E. Schaaf, E. Lo Vullo, E. Solazzo, F. Monforti-Ferrario, J.G.J. Olivier, & E. Vignati (2019) Fossil CO2 and GHG emissions of all world countries - 2019 Report, Publications Office of the European Union, Luxembourg. ISBN 978-92-76-11100-9. [https://edgar.jrc.ec.europa.eu/overview.php?vP\\_GHG](https://edgar.jrc.ec.europa.eu/overview.php?vP_GHG)