

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1		Emissions		Summary of emissions from identified oil & NGL production																					
2				Richard Heede Climate Accountability Institute 16-Oct-20																					
3				Copyright Climate Accountability Institute																					
4				1870s										1880s											
5		Oil & NGL Emissions	Notes	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	
6		CO2 per million bbl produced (MtCO2/mbb):															0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	
7		1 Abu Dhabi National Oil (ADNOC), UAE																							
8		2 Anadarko, USA																							
9		3 Antero, USA	added June 2019																						
10		4 Apache, USA																							
11		5 Bahrain Petroleum Corporation																							
12		6 BG Group (British Gas), UK																							
13		7 BHP Billiton, Australia																							
14		8 BP, UK																							
15		9 Canadian Natural Resources, Canada																							
16		10 Chesapeake, USA	added May 2019																						
17		11 Chevron, USA																							
18		12 CNOOC (China National Offshore Oil), China																							
19		13 ConocoPhillips, USA																							
20		14 Devon Energy, USA																							
21		15 Ecopetrol, Colombia																							
22		16 Egyptian General Petroleum, Egypt																							
23		17 EnCana, Canada																							
24		18 ENI, Italy																							
25		19 EOG Resources, USA																							
26		20 EQT Corporation, USA																							
27		21 Equinor, Norway																							
28		22 ExxonMobil, USA																							
29		23 Former Soviet Union (FSU)																							
30		24 Gazprom, Russian Federation																							
31		25 Hess, USA																							
32		26 Husky, Canada																							
33		27 Inpex, Japan	added June 2019																						
34		28 Iraq National Oil Company, Iraq																							
35		29 Kuwait Petroleum Corp., Kuwait																							
36		30 Libya National Oil Corp., Libya																							
37		31 Lukoil, Russian Federation																							
38		32 Marathon, USA																							
39		33 Murphy Oil, USA																							
40		34 Nexen, Canada (acq. by CNOOC)																							
41		35 National Iranian Oil Company (NIOC), Iran																							
42		36 Nigerian National Petroleum, Nigeria																							
43		37 Noble Energy, USA	added May 2019																						
44		38 Novatek, Russian Federation	added May 2019																						
45		39 Obedian / PennWest, Canada	added June 2019																						
46		40 Occidental, USA																							
47		41 Oil and Natural Gas Corporation, India																							
48		42 OMV Group, Austria																							
49		43 Pertamina, Indonesia																							
50		44 Petoro, Norway	added June 2019																						
51		45 PetroChina (CNPC), China																							
52		46 Petroleo Brasileiro (Petrobras), Brazil																							
53		47 Petroleos de Venezuela, Venezuela																							
54		48 Petroleos Mexicanos (PEMEX), Mexico																							
55		49 Petroleum Development Oman, Oman																							
56		50 PetroEcuador	added May 2019																						
57		51 Petronas, Malaysia																							
58		52 Pioneer, USA	added June 2019																						
59		53 Polish Oil & Gas, Poland																							
60		54 PTTEP, Thailand	added May 2020																						
61		55 Qatar Petroleum, Qatar																							
62		56 Repsol, Spain																							
63		57 Rosneft, Russian Federation																							
64		58 Royal Dutch Shell plc, The Netherlands																							
65		59 Santos, Australia	added May 2019																						
66		60 Saudi Aramco, Saudi Arabia																							
67		61 Sinopec, China																							
68		62 Sonangol, Angola																							
69		63 Sonatrach, Algeria																							
70		64 Southwestern, USA	added June 2019																						
71		65 Suncor, Canada																							
72		66 Syrian Petroleum, Syria																							
73		67 Talsman, Canada																							
74		68 Total, France																							
75		69 TurkmenGaz, Turkmenistan	added June 2019																						
76		70 Wintershall	added May 2019																						
77		71 Woodside, Australia	added May 2019																						
78		72 YPF, Argentina	added May 2019																						
79		73 Yukos, Russian Federation																							
80		Emissions from identified oil prod'n (MtCO2/yr)																							
81		Emissions from identified oil prod'n (MtC/yr)																							
82		CDIAC emissions from annual oil prod'n (MtCO2/yr)		4	4	4	4	4	4	4	4	7	7	11	11	15	15	11	15	15	18	18	22		
83		CDIAC emissions from annual oil prod'n (MtC/yr)		1	1	1	1	1	1	1	1	2	2	3	3	4	4	3	4	4	5	5	6		
84		Percent of CDIAC oil emissions identified		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%	0.2%	0.5%	0.6%	0.9%	1.2%	1.4%

	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	
1	Summary of emissions from identified oil & NGL production																											
2	Richard Heede Climate Accountability Institute [16-Oct-20]																											
3	Copyright Climate Accountability Institute																											
4																												
5																												
6																												
7	1890s														1900s										1910s			
8	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	
9	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	
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55	0.4	0.6	0.7	0.8	0.9	0.9	1.1	1.3	1	1	1	2	2	2	2	3	3	3	4	4	5	5	6	5	5	7	7	
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127	0.04	0.09	0.26	0.35	0.48	1.2	1.0	0.3	0.3	0.5	0.5	0.6	0.6	0.5	1.8	2	2	2	2	3	3	6	10	3	2	13		
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159																												
160	0.4	0.6	0.7	0.9	1	1	2	3	2	2	2	2	2	3	3	3	5	6	6	6	8	8	14	19	13	13	24	
161																												
162	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.7	0.7	0.5	0.5	0.6	0.7	0.7	0.8	0.8	1.3	1.6	1.5	1.7	2.1	2	4	5	4	3	7	
163																												
164	29	33	33	37	33	40	44	48	48	51	59	66	70	73	84	84	84	103	110	117	125	132	136	150	154	165	176	
165																												
166	8	9	9	10	9	11	12	13	13	14	16	18	19	20	23	23	23	28	30	32	34	36	37	41	42	45	48	
167																												
168	1.4%	1.7%	2.1%	2.4%	3.5%	3.2%	3.6%	5.3%	5.1%	3.4%	2.9%	3.3%	3.5%	3.6%	3.4%	3.6%	5.6%	5.7%	5.0%	5.4%	6.3%	6.3%	10.4%	12.8%	8.6%	7.6%	13.6%	
169																												
170																												
171																												

	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	
1	Summary of emissions from identified oil & NGL production																											
2	Richard Heede Climate Mitigation Services 16-Oct-20																											
3	1910a							1920a							1930a							1940a						
4	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	
5	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	
6																												
7																												
8	3	3	4	6	10	14	17	20	27	34	41	43	42	44	37	29	25	27	29	34	42	41	39	37	37	45	51	
9																												
10	1.2	1.3	1.2	1.5	2	3	6	6	5	20	20	21	24	38	36	37	37	39	45	49	78	89	93	103	103	97	114	
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160	25	21	28	38	47	58	85	90	96	124	148	170	186	200	182	187	200	236	261	284	350	374	371	379	402	383	446	
161																												
162	7	6	8	10	13	16	23	25	26	34	40	46	51	55	50	51	55	64	71	78	95	102	101	103	110	105	122	
163																												
164	198	194	224	286	308	344	407	403	425	436	498	524	586	557	539	517	564	594	645	704	802	784	813	839	865	813	876	
165																												
166	54	53	61	78	84	94	111	110	116	119	136	143	160	152	147	141	154	162	176	192	219	214	222	229	236	222	239	
167																												
168	12.8%	10.6%	12.7%	13.4%	15.1%	16.7%	20.9%	22.3%	22.5%	28.5%	29.8%	32.4%	31.8%	35.9%	33.8%	36.2%	35.5%	39.8%	40.4%	40.4%	43.6%	47.7%	45.6%	45.1%	46.5%	47.1%	50.9%	
169																												
170																												
171																												

	CB	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
1	Summary of emissions from identified oil & NGL production																											
2																												
3																												
4	dataset marker										Richard Heide Climate Accountability Institute 16-Oct-20										Copyright Climate Accountability Institute							
5																												
6																												
7	1940s								1950s								1960s											
8	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
9	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371	0.371
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27	68	80	94	100	120	119	165	150	131	151	159	200	218	215	247	257	288	304	326	342	387	411	459	499	549	606	692	749
28																												
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30																												
31																												
32																												
33	141	155	167	178	202	202	241	290	309	325	339	377	412	456	477	506	556	607	661	700	737	813	894	980	1,064	1,155	1,263	1,288
34																												
35																												
36																												
37	19	22	43	45	49	45	53	61	63	65	68	73	80	85	84	97	102	104	112	120	128	140	149	153	161	169	186	184
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55	146	158	174	193	198	176	214	255	272	284	293	327	361	369	362	381	393	423	466	515	558	606	643	695	760	784	854	891
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80																												
81	4	5	5	6	7	7	9	31	2	4	10	44	72	96	110	124	145	163	180	202	232	259	289	352	385	458	519	615
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127	77	80	89	109	130	120	136	159	173	179	169	185	204	224	211	238	238	242	264	271	300	325	359	369	394	447	497	732
128																												
129																												
130																												
131	0	1	2	3	5	6	7	10	11	11	13	13	13	13	14	15	17	19	21	24	26	30	36	39	43	46	53	67
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160	537	597	677	744	830	823	986	1,135	1,155	1,226	1,277	1,477	1,650	1,820	1,922	2,117	2,350	2,538	2,806	3,042	3,356	3,648	4,111	4,436	4,839	5,253	5,799	6,391
161																												
162	147	163	185	203	227	224	269	310	315	335	349	403	450	497	524	578	641	693	766	830	916	995	1,122	1,211	1,321	1,434	1,583	1,744
163																												
164	1,008	1,008	1,070	1,180	1,334	1,326	1,550	1,755	1,847	1,953	2,041	2,290	2,488	2,616	2,679	2,908	3,123	3,306	3,554	3,808	4,101	4,410	4,749	5,063	5,513	5,965	6,792	7,186
165																												
166	275	275	292	322	364	362	423	479	504	533	557	625	679	714	731	794	852	902	970	1,039	1,119	1,203	1,296	1,382	1,505	1,628	1,853	1,961
167																												
168	53.3%	59.2%	63.2%	63.1%	62.2%	62.0%	63.6%	64.7%	62.6%	62.8%	62.6%	64.5%	66.3%	69.6%	71.7%	72.8%	75.3%	76.8%	79.0%	79.9%	81.8%	82.7%	86.6%	87.6%	87.8%	88.1%	85.4%	88.9%
169																												
170																												
171																												

Oil Emissions

	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	
1	Summary of emissions from identified oil & NGL production																						CO2 Coefficient			0.371428 Million tonnes CO2 / million barrels	
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Comment: Rick Heede:
See worksheet "Oil Emissions Factor Calc" for details.

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Comment: Rick Heede:
CDIAC data in million tonnes of carbon converted to CO2, which is 3.664191 times Carbon if carbon and oxygen isotopes are accounted for, per Kevin Baumert May05, then at World resources Institute: CO2 conversion is, precisely: $C=12.0107 + O=15.9994 \times 2 = 44.0095/12.0107 = 3.664191$.

Cell: EX166

Comment: Rick Heede:
January 2020: Linked to data in GCP / CDIAC Global CO2 1751-2018.xls. Note revisions of previous years for China from 1990-, flaring revisions, and cement corrections to 1930 (previously entered). Sums 1751-2018 verified. Linked to CDIAC global 1751-2018.xls (last updated Jan20).

Cell: FC166

Comment: Rick Heede:
From the associated "Methods" paper: CDIAC's emissions are estimated for each fuel using the following formula: $CO_2 = (P) (FO) (C)$.

From crude oil and natural gas liquids production in the global-total accounts2

CO21 = CO2 emissions in 106 metric tons of carbon

P1 = annual production or consumption in 106 tons

FO1 = $0.918 \pm 3\%$

C1 = carbon content in tons C per ton fuel = $0.85 \pm 1\%$

From primary and secondary liquid fuel production and trade in the national accounts when non-energy liquid products are specifically subtracted3

CO21 = CO2 emissions in 106 metric tons of carbon

P1 = annual production or consumption in 106 tons

FO1 = $0.985 \pm 3\%$

C1 = carbon content in tons C per ton fuel = $0.85 + 1\%$

$\pm 2\%$.

Boden, T.A., G. Marland, and R.J. Andres. 2009. Global, Regional, and National Fossil-Fuel CO2 Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. doi 10.33334/CDIAC/00001.

Jan10: CMS added CDIAC extrapolations for gas emissions from their dataset "Preliminary 2007-08 Global & National Estimates by Extrapolation" (undated) to the main file cited above.vede:

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