Emissions

Summary of emissions from identified oil & NGL production

Richard Heede
Climate Accountability Institute
15-Oct-14

	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
				1870s										1880s									
	CO2 per million bbl produced (MtCO2/Mbbl):															0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
1	Abu Dhabi National Oil (ADNOC), UAE																						
2	Anadarko, USA																						
3	Apache, USA																						
4	Bahrain Petroleum Corporation																						
5	BG Group (British Gas), UK																						
6	BHP Billiton, Australia																						
7	BP, UK																						
8	Canadian Natural Resources, Canada																						
9	Chevron, USA																						
10	CNOOC (China National Offshore Oil), China																						
11	ConocoPhillips, USA																						
12	Devon Energy, USA																						
13	Ecopetrol, Colombia																						
14	Egyptian General Petroleum, Egypt																						
15	EnCana, Canada																						
16	ENI, Italy																						
17	ExxonMobil, USA																	0.03	0.07	0.11	0.16	0.21	0.31
18	Former Soviet Union (FSU)																						
19	Gazprom, Russian Federation																						
20	Hess, USA																						
21	Husky, Canada																						
22	Iraq National Oil Company, Iraq																						
23	Kuwait Petroleum Corp., Kuwait																						
24	Libya National Oil Corp., Libya																						
25	Lukoil, Russian Federation																						
26	Marathon, USA																						
27	Murphy Oil, USA																						
28	Nexen, Canada (acq. by CNOOC)																						
29	National Iranian Oil Company (NIOC), Iran																						
30	Nigerian National Petroleum, Nigeria																						
31	Occidental, USA																						
32	Oil and Natural Gas Corporation, India																						
33	OMV Group, Austria																						
34	Pertamina, Indonesia																						
35	PetroChina (CNPC), China																						
36	Petroleo Brasileiro (Petrobras), Brazil																						
37	Petroleos de Venezuela, Venezuela																						
38	Petroleos Mexicanos (PEMEX), Mexico																						
39	Petroleum Development Oman, Oman																						
40	Petronas, Malaysia																						
41	Polish Oil & Gas, Poland																						
42	Qatar Petroleum, Qatar																						
43	Repsol, Spain																						
44	Rosneft, Russian Federation																						
45	Royal Dutch Shell plc, The Netherlands																						
46	Saudi Aramco, Saudi Arabia																						
47	Sinopec, China																						
48	Sonangol, Angola																						
49	Sonatrach, Algeria																						
50	Statoil, Norway																						
51	Suncor / Petro-Canada, Canada																						
52	Syrian Petroleum, Syria																						
53	Talisman, Canada																						
54	Total, France																						
55	Yukos, Russian Federation																						
	Emissions from identified oil prod'n (MtCO2/yr)																	0.0	0.1	0.1	0.2	0.2	0.3
	Emissions from identified oil prod'n (MtC/yr)																	0.0	0.0	0.0	0.0	0.1	0.1
	CDIAC emissions from annual oil prod'n (MtCO2/yr)			4	4	4	4	4	4	4	7	7	11	11	15	15	11	15	15	18	18	18	22
	CDIAC emissions from annual oil prod'n (MtC/yr)	CDIAC 1870-2010		1	1	1	1	1	1	1	2	2	3	3	4	4	3	4	4	5	5	5	6
				1870: first year of CDIAC liquids																				
	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%	0.2%	0.5%	0.6%	0.9%	1.2%	1.4%
			1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889

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	1890s										1900s										1910s						
	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
	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	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
																							1.6	1.9	2.2	2.4	
																						2.1	2.0	2.4	1.6	1.5	
	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
		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	3	3	6	10	3	2	13	
	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
	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
	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
	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
	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%
	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

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	1910s			1920s										1930s										1940s			
	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
	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
	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
	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
								0.3	0.5	0.7	9	10	11	11	11	11	11	11	12	12	12	11	11	12	16	15	16
	8	10	12	14	14	16	21	28	28	32	33	36	41	42	41	51	66	80	86	93	107	100	110	102	113	83	112
																					7	8	8	9	10	11	
												1	2	2	2	2	2	2	2	2	3	3	3	2	2	3	3
																					16	17	18	19	20	21	
	13	6	11	16	20	24	40	36	35	39	46	60	66	63	56	57	60	65	72	76	87	81	60	63	66	69	73
																					0.0	0	0	0	0	0	
																	11	15	18	22	26	29	33	37	40	44	
	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
	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
	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
	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
	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%
	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

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	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
	1940s						1950s										1960s											
	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
	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
																			0	1	3	4	5	5	7	8	10	13
		10	11	12	14	12	13	15	16	16	15	17	19	21	23	26	28	30	32	34	36	38	40	42	48	52	50	49
																									1	1	1	1
																										2	13	
	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
	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
	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
																1	1	1	1	1	2	2	2	1	2	3	4	4
							0.01	0.05	0.2	0.4	0.3	0.3	0.4	0.6	0.9	1	2	2	13	17	24	23	22	19	19	22	25	32
	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
							27	34	41	47	54	68	88	108	169	203	237	271	312	366	420	474	508	549	597	644	685	725	780
															11	11	11	11	14	18	24	33	39	38	38	37	36	32
																13	14	14	16	17	18	113	100	122	124	126	137	
			0.22	1	2	4	5	7	9	11	13	15	17	18	20	21	23	24	27	28	31	32	34	34	35	38	41	43
																		0	2	6	12	17	20	24	35	42	85	111
	12	12	12	12	13	11	12	13	13	14	14	14	15	14	14	15	15	16	18	20	24	28	32	32	36	40	46	44
	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
																0	0	1	1	1	2	4	6	4	2	7	15	52
															0.1	8	15	22	30	37	45	52	60	67	74	82	89	79
													1	1	1	1	1	1	3	5	6	8	13	16	16	19	20	19
																26	29	29	32	31	32	34	32	35	42	51	59	62
											0.4	1	1	4	7	9	11	13	12	13	12	13	16	20	22	23	22	23
																39	40	43	44	46	47	46	48	49	49	50	48	
	22	23	24	25	26	27	28	29	30	32	33	34	35	37	38	39	40	43	45	47	48	52	50	56	60	63	66	66
																								1	3	4	4	4
																2	2	2	3	3	3	3	4	4	5	5	5	6
																				0	0	0	1	1	1	1	1	
	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
	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
																0.0	0.0	0.0	0	0	0	0	0	0	0	1	2	1
																0	3	5	6	7	24	25	32	38	43	47	52	41
																												0
																								2	4	7	8	
	48	51	55	59	63	66	70	74	77	81	85	88	92	96	99	103	107	110	114	118	121	125	129	133	136	140	144	147
	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	4,073	4,402	4,799	5,212	5,751	6,345
	147	163	185	203	227	224	269	310	315	335	349	403	450	497	524	578	641	693	766	830	916	995	1,112	1,201	1,310	1,422	1,570	1,732
	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	2,891	3,111	3,312	3,591	3,855	4,166	4,467	4,848	5,214	5,683	6,130	6,738	7,134
	275	275	292	322	364	362	423	479	504	533	557	625	679	714	731	789	849	904	980	1,052	1,137	1,219	1,323	1,423	1,551	1,673	1,839	1,947
	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%	73.2%	75.5%	76.6%	78.1%	78.9%	80.5%	81.7%	84.0%	84.4%	84.4%	85.0%	85.3%	88.9%
	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

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	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED
7			1970s						1980s										1990s								
8	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
10	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	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714
12	14	44	112	112	129	134	118	120	109	92	74	69	67	65	106	147	141	199	221	268	250	243	252	254	250	263	278
14	48	47	45	44	43	42	40	39	38	37	35	34	33	49	48	44	44	43	43	44	44	45	46	43	44	44	71
16														1	1	1	1	1	1	3	5	5	5	7	7	9	7
18	1	1	1	5	5	6	6	5	8	7	7	7	7	7	7	5	6	6	5	5	15	14	14	5	5	14	14
20																	0.3	6	8	8	7	7	9	8	8	8	9
22	20	21	26	26	27	28	30	29	29	27	59	67	34	38	35	35	34	30	39	42	26	41	28	28	29	30	32
24	816	818	768	641	647	669	775	678	560	542	534	511	492	467	440	448	369	351	331	313	301	302	301	291	295	293	313
26																		0.1	0.4	1	1	1	2	2	5	10	10
28	1,386	1,454	1,436	1,066	1,102	1,072	990	990	925	878	626	523	390	341	339	324	301	264	255	258	245	245	280	268	282	290	306
30																	3	3	10	16	22	31	45	52	60	69	71
32	190	187	162	161	160	166	178	176	176	165	163	168	150	147	148	146	155	150	151	149	150	148	146	146	152	165	153
34																	0.2	0.3	18	20	23	28	29	33	32	35	35
36																10	51	55	60	58	59	62	57	79	56	88	66
38	3	2	2	3	23	29	35	38	42	43	48	52	59	63	58	64	61	63	63	64	62	63	63	65	65	61	59
40																9	11	12	14	15	17	21	24	26	29	27	29
42	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
44	953	941	788	694	567	610	574	601	498	262	266	298	319	338	342	345	348	337	322	335	334	332	350	345	337	344	341
46	820	881	922	1,017	1,098	1,166	1,274	1,342	1,626	1,647	1,658	1,668	1,654	1,618	1,672	1,692	1,695	1,646	1,546	1,412							
48																		32	33	32	31	30	30	47	55	63	73
50	31	29	21	21	23	24	24	26	24	24	23	23	23	21	21	19	20	21	23	27	30	29	34	35	32	30	28
52																	7	7	6	6	6	7	8	8	9	9	9
54	120	164	160	184	197	191	208	283	205	82	83	82	99	117	138	170	220	240	168	25	35	43	47	48	49	96	176
56	72	133	277	282	291	267	289	339	237	172	112	112	148	136	164	138	163	216	144	18	142	253	271	271	271	285	244
58	126	132	112	130	150	171	180	189	173	112	113	108	107	103	101	95	114	112	134	145	140	133	135	136	138	143	138
60																									160	163	174
62	44	42	38	36	39	42	41	41	40	39	38	36	35	34	34	30	30	28	27	26	23	21	23	27	25	22	26
64												8	7	7	7	7	6	6	5	4	4	5	7	8	7	8	8
66																-	-	-	-	-	-	-	-	-	-	-	-
68	681	794	816	725	797	767	710	430	227	188	301	332	296	306	278	313	304	400	425	455	468	493	486	490	491	491	503
70	62	70	76	60	70	71	64	133	167	117	105	101	113	122	119	109	118	140	147	154	158	159	157	162	163	173	175
72	52	34	23	19	24	34	44	48	40	36	38	57	42	44	44	41	32	27	30	27	27	31	35	40	43	43	50
74	21	21	21	23	24	27	31	33	25	44	53	65	71	84	86	83	86	92	90	84	76	72	85	95	89	90	79
76																										6	6
78	75	93	95	90	104	117	113	110	114	118	98	99	103	95	98	82	183	191	198	216	182	180	205	203	219	185	178
80																	62	372	376	380	384	394	401	408	427	435	434
82	23	23	24	23	23	22	22	22	25	29	35	45	63	75	80	80	78	84	89	88	89	91	94	97	110	118	136
84	44	46	40	32	248	243	235	256	242	234	212	202	201	189	204	200	217	219	244	272	272	284	301	322	343	379	367
86	68	71	89	109	121	151	180	199	263	313	319	324	329	334	339	344	341	341	358	376	361	362	426	416	445	462	475
88	23	24	24	31	30	28	26	24	23	26	26	31	33	40	45	46	49	50	53	54	56	60	65	69	71	73	72
90			10	12	20	22	26	34	34	32	37	44	54	54	62	65	71	76	88	88	90	87	87	94	88	85	98
92																										1	
94	7	19	43	36	41	37	40	42	39	35	29	26	34	27	27	26	31	33	36	36	39	38	38	40	46	50	63
96	1	1	2	2	3	4	5	6	8	9	10	11	12	13	15	74	78	81	86	87	64	65	77	86	86	93	98
98																		49	45	41	38	35	35	34	33	32	
100	759	798	703	472	450	435	406	386	183	171	185	203	218	222	244	239	240	251	269	295	293	293	308	319	337	340	341
102	84	265	679	567	1,159	1,252	1,128	1,296	1,359	1,365	916	638	581	455	677	588	726	716	921	1,169	1,192	1,154	1,158	1,158	1,172	1,155	1,189
104																										43	
106	2	2	2	2	4	13	9	10	10	9	8	12	14	16	19	25	31	31	33	35	36	35	37	45	49	49	51
108	57	60	57	57	64	70	77	79	73	69	70	69	77	81	86	86	85	97	108	109	105	102	102	104	111	116	112
110	0	0	0	2	3	3	4	6	10	12	15	22	40	43	47	50	53	58	59	74	83	86	97	96	93	85	91
112																14	14	15	14	14	12	13	17	18	26	26	29
114	10	9	10	14	14	15	14	14	13	14	13	14	14	14	16	19	22	28	32	40	39	46	46	48	49	48	47
116																					2	4	7	11	13	17	20
118	168	87	96	80	83	79	79	78	69	41	37	32	34	83	87	133	148	161	143	154	154	155	194	212	194	200	204
120																			241	211	176	149	133	127	125	127	122
122	6,820	7,366	7,719	6,819	7,826	8,049	8,020	8,150	7,661	7,021	6,381	6,127	5,994	5,888	6,273	6,389	6,800	7,349	7,783	7,824	6,445	6,575	6,872	7,012	7,306	7,538	7,775
124	1,861	2,010	2,107	1,861	2,136	2,197	2,189	2,224	2,091	1,916	1,742	1,672	1,636	1,607	1,712	1,744	1,856	2,006	2,124	2,135	1,759	1,794	1,875	1,914	1,994	2,057	2,122
126	7,537	8,211	8,226	7,812	8,479	8,787	8,765	9,322	8,875	8,387	8,047	7,973	8,058	8,010	8,402	8,450	8,838	9,010	9,131	9,545	9,197	9,245	9,329	9,399	9,615	9,893	10,135
128	2,057	2,241	2,245	2,132	2,314	2,398	2,392	2,544	2,422	2,289	2,196	2,176	2,199	2,186	2,293	2,306	2,412	2,459	2,492	2,605	2,510	2,523	2,546	2,565	2,624	2,700	2,766
130	90.5%	89.7%	93.8%	87.3%	92.3%	91.6%	91.5%	87.4%	86.3%	83.7%	79.3%	76.8%	74.4%	73.5%	74.7%	75.6%	76.9%	81.6%	85.2%	82.0%	70.1%	71.1%	73.7%	74.6%	76.0%	76.2%	76.7%
134	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998

Summary of emissions from identified oil & NGL production

CO2 Coefficient 0.371428 Million tonnes CO2 / million barrels

Linked to "Oil Emission Factor Calc"

dataset marker

Richard Heede
Climate Accountability Institute

15-Oct-14

Cumulative emissions

	2000s											2010s							Sum to 2013	Oil & NGL Emissions	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Million tonnes CO_2	CO2 per million bbl produced (MtCO2/Mbbl):	
	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714	0.3714			
	250	258	249	229	251	265	312	332	315	330	289	293	319	339	345				8,562	Abu Dhabi National Oil (ADNOC), UAE	1
	57	48	60	62	55	53	49	32	36	30	32	36	39	43	46				2,574	Anadarko, USA	2
	13	17	21	22	29	33	33	32	36	36	39	47	50	54	56				571	Apache, USA	3
	14	14	24	24	24	5	5	5	5	4	4	4	5	6	6				339	Bahrain Petroleum Corporation	4
	9	9	10	16	16	17	18	19	24	24	25	24	22	24	26				363	BG Group (British Gas), UK	5
	33	33	32	28	23	19	23	21	21	26	29	36	34	32	33				1,330	BHP Billiton, Australia	6
	315	261	262	274	287	343	347	336	327	326	344	322	292	279	273				26,727	BP, UK	7
	12	24	28	29	33	38	42	45	45	43	48	58	45	53	56				631	Canadian Natural Resources, Canada	8
	301	290	288	280	267	272	246	250	242	227	254	261	251	239	235				37,307	Chevron, USA	9
	74	56	62	81	71	70	114	74	80	86	97	123	118	123	121				1,733	CNOOC (China National Offshore Oil), China	10
	153	141	158	158	153	160	193	207	200	193	198	186	117	118	118				9,624	ConocoPhillips, USA	11
	35	41	38	34	31	29	26	24	30	25	27	27	30	35	40				724	Devon Energy, USA	12
	112	48	54	54	73	72	71	43	44	49	58	70	77	80	76				1,683	Ecopetrol, Colombia	13
	61	56	52	52	52	49	48	47	47	49	51	50	50	50	49				2,040	Egyptian General Petroleum, Egypt	14
	32	33	35	36	31	31	31	23	18	18	4	3	3	4	7				542	EnCana, Canada	15
	91	101	116	125	133	140	150	146	138	139	137	135	115	120	113				3,583	ENI, Italy	16
	344	348	347	341	344	353	349	371	363	336	335	328	313	296	299				30,495	ExxonMobil, USA	17
																			35,462	Former Soviet Union (FSU)	18
	71	73	83	102	117	127	112	124	123	117	114	119	180	182	187				2,256	Gazprom, Russian Federation	19
	32	36	41	44	35	33	33	35	37	36	40	42	36	41	33				1,596	Hess, USA	20
	9	16	24	28	29	28	27	34	37	35	29	27	29	28	31				494	Husky, Canada	21
	205	210	196	166	107	165	154	164	171	194	196	196	215	244	249				7,274	Iraq National Oil Company, Iraq	22
	221	285	277	266	270	318	289	260	293	315	273	275	339	373	347				10,381	Kuwait Petroleum Corp., Kuwait	23
	131	140	136	131	141	150	163	172	175	178	170	170	48	141	93				6,062	Libya National Oil Corp., Libya	24
	206	212	201	210	218	235	245	259	263	259	266	261	248	245	247				4,072	Lukoil, Russian Federation	25
	28	28	28	28	26	25	22	30	27	33	35	35	35	44	47				1,973	Marathon, USA	26
	9	9	9	10	11	13	14	12	12	16	18	17	14	15	18				303	Murphy Oil, USA	27
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-	Nexen, Canada (acq. by CNOOC)	28
	466	521	501	468	506	533	527	522	531	529	505	502	485	414	407				24,754	National Iranian Oil Company (NIOC), Iran	29
	173	176	184	172	185	189	214	198	191	176	180	200	207	205	193				6,203	Nigerian National Petroleum, Nigeria	30
	48	54	50	63	67	69	94	53	62	72	75	75	72	75	76				2,669	Occidental, USA	31
	73	71	72	71	75	81	75	80	85	83	92	90	82	82	79				2,973	Oil and Natural Gas Corporation, India	32
	7	7	7	7	11	10	10	23	22	23	23	24	19	22	20				248	OMV Group, Austria	33
	175	172	163	8	18	18	18	18	19	20	24	26	26	27	27				4,998	Pertamina, Indonesia	34
	394	355	315	323	336	332	346	370	378	381	377	388	329	340	347				9,383	PetroChina (CNPC), China	35
	153	179	187	208	231	225	250	260	260	268	286	292	294	288	279				5,570	Petroleo Brasileiro (Petrobras), Brazil	36
	335	373	360	315	278	308	309	296	289	286	271	259	268	268	268				11,079	Petroleos de Venezuela, Venezuela	37
	453	468	483	486	514	519	510	499	471	428	403	400	398	395	391				15,966	Petroleos Mexicanos (PEMEX), Mexico	38
	72	74	74	69	62	58	56	52	49	51	53	53	52	54	53				2,049	Petroleum Development Oman, Oman	39
	85	95	92	116	130	99	100	97	102	105	105	97	111	97	104				2,994	Petronas, Malaysia	40
	1	1	1	1	20	39	58	51	50	49	48	1	1	1	3				326	Polish Oil & Gas, Poland	41
	63	71	72	71	82	94	101	104	109	120	127	145	157	165	167				2,653	Qatar Petroleum, Qatar	42
	61	86	87	79	81	77	72	71	65	60	59	60	20	19	19				2,000	Repsol, Spain	43
	34	36	41	44	55	59	199	216	275	288	296	315	323	332	563				3,420	Rosneft, Russian Federation	44
	330	340	328	320	323	305	284	275	257	240	239	241	226	221	209				21,839	Royal Dutch Shell plc, The Netherlands	45
	1,086	1,163	1,135	1,046	1,242	1,314	1,378	1,355	1,303	1,363	1,225	1,238	1,401	1,471	1,444				44,449	Saudi Aramco, Saudi Arabia	46
	90	92	100	100	101	102	104	106	108	123	122	122	119	122	124				1,677	Sinopec, China	47
	52	52	51	62	62	73	86	98	121	137	132	135	124	127	131				2,040	Sonangol, Angola	48
	104	110	106	115	191	164	183	183	184	186	168	169	173	158	155				4,953	Sonatrach, Algeria	49
	133	146	144	151	154	155	149	143	145	143	142	131	127	131	128				3,259	Statoil, Norway	50
	27	28	27	61	69	62	62	66	69	65	52	70	66	68	72				1,076	Suncor, Canada	51
	46	45	42	43	42	40	38	36	34	33	33	34	30	14	6				1,195	Syrian Petroleum, Syria	52
	21	33	34	37	29	31	34	36	33	30	29	26	24	22	18				510	Talisman, Canada	53
	199	194	197	215	225	238	231	219	220	218	226	222	166	165	158				9,286	Total, France	54
	119	133	157	187	220	219	197												2,645	Yukos, Russian Federation	55
	7,622	7,862	7,842	7,666	8,133	8,457	8,801	8,523	8,540	8,602	8,398	8,459	8,328	8,490	8,592				388,912	Emissions from identified oil prod'n (MtCO2/yr)	
	2,080	2,146	2,140	2,092	2,220	2,308	2,402	2,326	2,331	2,348	2,292	2,308	2,273	2,317	2,345				106,139	Emissions from identified oil prod'n (MtC/yr)	
	10,029	10,399	10,406	10,373	10,842	11,187	11,271	11,319	11,289	11,440	11,198	11,410	11,537	11,689	11,820				507,408	CDIAC emissions from annual oil prod'n (MtCO2/yr)	
	2,737	2,838	2,840	2,831	2,959	3,053	3,076	3,089	3,081	3,122	3,056	3,114	3,149	3,190	3,226				138,477	CDIAC emissions from annual oil prod'n (MtC/yr)	
	76.0%	75.6%	75.4%	73.9%	75.0%	75.6%	78.1%	75.3%	75.6%	75.2%	75.0%	74.1%	72.2%	72.6%	72.7%				76.6%	Percent of CDIAC oil emissions identified	

Total emissions from identified oil & NGL production 1884-2013 (million tonnes CO2) 388,912

Cell: EU2
Comment: Rick Heede:
See worksheet "Oil Emissions Factor Calc" for details.

Cell: EZ126
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 x 2 = 44.0095/12.0107 = 3.664191.

Cell: EZ128
Comment: Rick Heede:
From the associated "Methods" paper: CDIAC's emissions are estimated for each fuel using the following formula: CO2 = (P) (FO) (C).

From crude oil and natural gas liquids production in the global-total accounts2
CO2l = CO2 emissions in 106 metric tons of carbon
Pl = annual production or consumption in 106 tons
FOl = 0.918 ± 3%
Cl = carbon content in tons C per ton fuel = 0.85 ± 1%

From primary and secondary liquid fuel production and trade in the national accounts when non-energy liquid products are specifically subtracted3
CO2l = CO2 emissions in 106 metric tons of carbon
Pl = annual production or consumption in 106 tons
FOl = 0.985 ± 3%
Cl = carbon content in tons C per ton fuel = 0.85 + 1%
± 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 10.3334/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:

Cell: EZ133
Comment: Rick Heede:

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Cell: FA133
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