Emissions

Summary of emissions from identified oil & NGL production

Richard Heede
Climate Mitigation Services
22-May-13

	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 (Texaco, Gulf, Unocal, etc)																						
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																						
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
	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

1870: first year of CDIAC liquids

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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

Summary of emissions from identified oil & NGL production

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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
	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
	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
		10	11	12	14	12	13	15	16	16	15	17	19	21	23	26	28	30	32	34	36	38	40	42
	68	80	94	100	120	119	165	150	131	151	159	200	218	215	247	257	288	304	326	342	387	411	459	499
	141	155	167	178	202	202	241	290	309	325	339	377	412	456	477	506	556	607	661	700	737	813	894	980
	19	22	43	45	49	45	53	61	63	65	68	73	80	85	84	97	102	104	112	120	128	140	149	153
																1	1	1	1	1	2	2	2	1
							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
	146	158	174	193	198	176	214	255	272	284	293	327	361	369	362	381	393	423	466	515	558	606	643	695
						27	34	41	47	54	68	88	108	169	203	237	271	312	366	420	474	508	549	597
															11	11	11	11	14	18	24	33	39	38
																	13	14	14	16	17	18	113	100
			0.22	1	2	4	5	7	9	11	13	15	17	18	20	21	23	24	27	28	31	32	34	34
																		0	2	6	12	17	20	24
	12	12	12	12	13	11	12	13	13	14	14	14	15	14	14	15	15	16	18	20	24	28	32	32
	4	5	5	6	7	7	9	31	2	4	10	44	72	96	110	124	145	163	180	202	232	259	289	352
																0	0	1	1	1	2	4	6	4
															0.1	8	15	22	30	37	45	52	60	67
													1	1	1	1	1	1	3	5	6	8	13	16
																26	29	29	32	31	32	34	32	35
											0.4	1	1	4	7	9	11	13	12	13	12	13	16	20
																	39	40	43	44	46	47	46	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
																								1
																2	2	2	3	3	3	3	4	4
																					0	0	0	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
	0	1	2	3	5	6	7	10	11	11	13	13	13	13	14	15	17	19	21	24	26	30	36	39
																0.0	0.0	0.0	0	0	0	0	0	0
																0	3	5	6	7	24	25	32	38
	48	51	55	59	63	66	70	74	77	81	85	88	92	96	99	103	107	110	114	118	121	125	129	133
	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
	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
	1,008	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
	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
	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%
	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967

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	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX
			1970s										1980s										1990s		
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
	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
	7	8	10	13	14	44	112	112	129	134	118	120	109	92	74	69	67	65	106	147	141	199	221	268	250
	48	52	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	49	48	44	44	43	43	44	44
																		1	1	1	1	1	1	3	5
	1	1	1	1	1	1	1	5	5	6	6	5	8	7	7	7	7	7	7	5	6	6	5	5	15
																					0.3	6	8	8	7
			2	13	20	21	26	26	27	28	30	29	29	27	59	67	34	38	35	35	34	30	39	42	26
	549	606	692	749	816	818	768	641	647	669	775	678	560	542	534	511	492	467	440	448	369	351	331	313	301
																						0.1	0.4	1	1
	1,064	1,155	1,263	1,288	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
																					0	0	6	12	18
	161	169	186	184	190	187	162	161	160	166	178	176	176	165	163	168	150	147	148	146	155	150	151	149	150
																					0.2	0.3	18	20	23
																				10	51	55	60	58	59
	2	3	4	4	3	2	2	3	23	29	35	38	42	43	48	52	59	63	58	64	61	63	63	64	62
																				9	11	12	14	15	17
	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
	760	784	854	891	953	941	788	694	567	610	574	601	498	262	266	298	319	338	342	345	348	337	322	335	334
	644	685	725	780	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	
																					32	33	32	31	
	38	37	36	32	31	29	21	21	23	24	24	26	24	24	23	23	23	21	21	19	20	21	23	27	30
																					7	7	6	6	6
	122	124	126	137	120	164	160	184	197	191	208	283	205	82	83	82	99	117	138	170	220	240	168	25	35
	35	38	41	43	72	133	277	282	291	267	289	339	237	172	112	112	148	136	164	138	163	216	144	18	142
	35	42	85	111	126	132	112	130	150	171	180	189	173	112	113	108	107	103	101	95	114	112	134	145	140
	36	40	46	44	44	42	38	36	39	42	41	41	40	39	38	36	35	34	34	30	30	28	27	26	23
																8	7	7	7	7	6	6	5	4	4
																			3	3	3	3	4	4	5
	385	458	519	615	681	794	816	725	797	767	710	430	227	188	301	332	296	306	278	313	304	400	425	455	468
	2	7	15	52	62	70	76	60	70	71	64	133	167	117	105	101	113	122	119	109	118	140	147	154	158
	74	82	89	79	52	34	23	19	24	34	44	48	40	36	38	57	42	44	44	41	32	27	30	27	27
	16	19	20	19	21	21	21	23	24	27	31	33	25	44	53	65	71	84	86	83	86	92	90	84	76
	42	51	59	62	75	93	95	90	104	117	113	110	114	118	98	99	103	95	98	82	183	191	198	216	182
																					62	372	376	380	384
	22	23	22	23	23	23	24	23	23	22	22	22	25	29	35	45	63	75	80	80	78	84	89	88	89
	49	49	50	48	44	46	40	32	310	304	294	320	302	292	265	252	251	236	255	208	258	259	284	322	321
	60	63	66	66	68	71	89	109	121	151	180	199	263	313	319	324	329	334	339	344	341	341	358	376	361
	3	4	4	4	4	24	24	31	30	28	26	24	23	26	26	31	33	40	45	46	49	50	53	54	56
							10	12	20	22	27	35	35	32	37	45	55	55	63	65	71	76	88	88	90
	5	5	5	6	7	19	43	36	41	37	40	42	39	35	29	26	34	27	27	26	31	33	36	36	39
	1	1	1	1	1	1	2	2	3	4	5	6	8	9	10	11	12	13	15	74	78	81	86	87	64
																							49	45	41
	394	447	497	732	759	798	703	472	450	435	406	386	183	171	185	203	218	222	244	239	240	251	269	295	293
	43	46	53	67	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
	0	1	2	1	2	2	2	2	4	13	9	10	10	9	8	12	14	16	19	25	31	31	33	35	36
	43	47	52	41	57	60	57	57	64	70	77	79	73	69	70	69	77	81	86	86	85	97	108	109	105
				0	0	0	0	2	3	3	4	6	10	12	15	22	40	43	47	50	53	58	59	74	83
																				14	14	15	14	14	12
	2	4	7	8	10	9	10	14	14	15	14	14	13	14	13	14	14	14	16	19	22	28	32	40	39
																									2
	136	140	144	147	168	87	96	80	83	79	79	78	69	41	37	32	34	83	87	133	148	161	143	154	154
																							241	211	176
	4,799	5,212	5,751	6,345	6,801	7,366	7,720	6,820	7,889	8,110	8,080	8,214	7,722	7,080	6,435	6,178	6,045	5,936	6,325	6,400	6,841	7,389	7,823	7,874	6,495
	1,310	1,422	1,570	1,732	1,856	2,010	2,107	1,861	2,153	2,213	2,205	2,242	2,108	1,932	1,756	1,686	1,650	1,620	1,726	1,747	1,867	2,016	2,135	2,149	1,772
	5,683	6,130	6,738	7,134	7,537	8,211	8,226	7,812	8,479	8,787	8,765	9,322	8,875	8,387	8,047	7,973	8,069	8,017	8,409	8,461	8,845	9,021	9,215	9,615	9,201
	1,551	1,673	1,839	1,947	2,057	2,241	2,245	2,132	2,314	2,398	2,392	2,544	2,422	2,289	2,196	2,176	2,202	2,188	2,295	2,309	2,414	2,462	2,515	2,624	2,511
	84.4%	85.0%	85.3%	88.9%	90.2%	89.7%	93.8%	87.3%	93.0%	92.3%	92.2%	88.1%	87.0%	84.4%	80.0%	77.5%	74.9%	74.0%	75.2%	75.6%	77.3%	81.9%	84.9%	81.9%	70.6%
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992

Summary of emissions from identified oil & NGL production

CO2 Coefficient 0.371428 Million tonnes CO2 / million barrels

dataset marker

Richard Heede
Climate Mitigation Services

22-May-13

Linked to "Oil Emission Factor Calc"

Cumulative emissions

	1990s							2000s											Sum to 2010		
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Million tonnes CO_2		Oil & NGL Emissions
	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			CO2 per million bbl produced (MtCO2/Mbbl):
	243	252	254	250	263	278	250	258	249	229	251	265	312	332	315	330	289	293	7,559	y	Abu Dhabi National Oil (ADNOC), UAE
	45	46	43	44	44	71	57	48	60	62	55	53	49	32	36	30	32	36	2,445	y	Anadarko, USA
	5	5	7	7	9	7	13	17	21	22	29	33	33	32	36	36	39	47	412	y	Apache, USA
	14	14	5	5	14	14	14	14	24	24	24	5	5	5	5	4	4	4	323	y	Bahrain Petroleum Corporation
	7	9	8	8	8	9	9	9	10	16	16	17	18	19	24	24	25	24	291	y	BG Group (British Gas), UK
	41	28	28	29	30	32	33	33	32	28	23	19	23	21	21	26	29	36	1,230	y	BHP Billiton, Australia
	302	301	291	295	293	313	315	261	262	274	287	343	347	336	327	326	344	322	25,883	y	BP, UK
	1	2	2	5	10	10	12	24	28	29	33	38	42	45	45	43	48	58	477	y	Canadian Natural Resources, Canada
	245	280	268	282	290	306	301	290	288	280	267	272	246	250	242	227	254	261	36,583	y	Chevron, USA
	23	29	35	41	44	45	48	28	31	40	41	43	87	51	50	57	69	98	897	y	CNOOC (China National Offshore Oil), China
	148	146	146	152	165	153	153	141	158	158	153	160	193	207	200	193	198	186	9,271	y	ConocoPhillips, USA
	28	29	33	32	35	35	35	41	38	34	8	29	26	24	30	25	27	27	596	y	Devon Energy, USA
	62	57	79	56	88	66	112	48	54	54	73	72	71	43	44	49	58	70	1,449	y	Ecopetrol, Colombia
	63	63	65	65	61	59	61	56	52	52	52	49	48	47	47	49	51	50	1,891	y	Egyptian General Petroleum, Egypt
	21	24	26	29	27	29	32	33	35	36	31	31	31	23	18	18	4	3	528	y	EnCana, Canada
	72	78	83	83	88	89	91	101	116	125	133	140	150	146	138	139	137	135	3,236	y	ENI, Italy
	332	350	345	337	344	341	344	348	347	341	344	353	349	371	363	336	335	328	29,587	y	ExxonMobil, USA
																			35,462	y	Former Soviet Union (FSU)
	30	30	47	55	63	73	71	73	83	102	117	127	112	124	123	117	114	119	1,707	y	Gazprom, Russian Federation
	29	34	35	32	30	28	32	36	41	44	35	33	33	35	37	36	40	42	1,486	y	Hess, USA
	7	8	8	9	9	9	9	16	24	28	29	28	27	34	37	35	29	27	407	y	Husky, Canada
	43	47	48	49	96	176	205	210	196	166	107	165	154	164	171	194	196	196	6,567	y	Iraq National Oil Company, Iraq
	253	271	271	271	285	244	221	285	277	266	270	318	289	260	293	315	273	275	9,321	y	Kuwait Petroleum Corp., Kuwait
	133	135	136	138	143	138	131	140	136	131	141	150	163	172	175	178	170	170	5,780	y	Libya National Oil Corp., Libya
				160	163	174	206	212	213	217	218	235	245	259	263	259	266	261	3,352	y	Lukoil, Russian Federation
	21	23	27	25	22	26	28	28	28	28	26	25	22	30	27	33	35	35	1,848	y	Marathon, USA
	5	7	8	7	8	8	9	9	9	10	11	13	14	12	12	16	18	17	256	y	Murphy Oil, USA
	7	15	17	19	25	27	26	29	30	30	30	27	27	23	29	29	28	27	468	y	Nexen, Canada
	493	486	490	491	491	503	466	521	501	468	506	533	527	522	531	529	505	502	23,448	y	National Iranian Oil Company (NIOC), Iran
	159	157	162	163	173	175	173	176	193	165	188	203	205	194	179	171	174	200	5,580	y	Nigerian National Petroleum, Nigeria
	31	35	40	43	43	50	48	54	50	63	67	69	94	53	62	72	75	75	2,446	y	Occidental, USA
	72	85	95	89	90	79	73	71	72	71	75	81	75	80	85	83	92	90	2,729	y	Oil and Natural Gas Corporation, India
					6	6	7	7	7	7	11	10	10	23	22	23	23	24	186	y	OMV Group, Austria
	180	205	203	219	185	178	175	172	163	8	18	18	18	18	19	20	24	26	4,918	y	Pertamina, Indonesia
	394	401	408	427	435	434	394	355	315	323	336	332	346	370	378	381	377	388	8,367	y	PetroChina (CNPC), China
	91	94	97	110	118	136	153	187	193	213	252	248	272	260	277	267	276	278	4,784	y	Petroleo Brasileiro (Petrobras), Brazil
	332	334	317	403	432	448	402	442	443	420	380	419	419	394	394	439	408	403	12,673	y	Petroleos de Venezuela, Venezuela
	362	426	416	445	462	475	453	468	483	486	514	519	510	499	471	428	403	400	14,782	y	Petroleos Mexicanos (PEMEX), Mexico
	60	65	69	71	73	72	72	74	74	69	62	58	56	52	49	51	53	53	1,871	y	Petroleum Development Oman, Oman
	87	87	94	88	85	98	85	95	92	116	130	99	100	97	102	105	105	97	2,689	y	Petronas, Malaysia
						1	1	1	1	1	20	39	58	51	50	49	48	1	320	y	Polish Oil & Gas, Poland
	38	38	40	46	50	63	63	71	70	68	75	84	89	92	90	96	97	115	2,015	y	Qatar Petroleum, Qatar
	65	77	86	86	93	98	61	86	87	79	81	77	72	71	65	60	59	60	1,942	y	Repsol, Spain
	38	35	35	34	33	32	34	36	41	44	55	59	199	216	275	288	296	315	2,201	y	Rosneft, Russian Federation
	293	308	319	337	340	341	330	340	328	320	323	305	284	275	257	240	225	229	21,157	y	Royal Dutch Shell plc, The Netherlands
	1,154	1,158	1,158	1,172	1,155	1,189	1,086	1,163	1,135	1,046	1,242	1,314	1,378	1,355	1,303	1,363	1,225	1,238	40,133	y	Saudi Aramco, Saudi Arabia
							90	92	100	100	101	102	104	106	108	123	122	122	1,269	y	Sinopec, China
	35	37	45	49	49	51	52	52	51	62	62	73	87	99	122	139	135	137	1,669	y	Sonangol, Angola
	102	102	104	111	116	112	104	110	106	115	191	164	183	183	184	186	168	169	4,467	y	Sonatrach, Algeria
	86	97	96	93	85	91	133	146	144	151	154	155	149	143	145	143	142	131	2,872	y	Statoil, Norway
	13	17	18	26	26	29	27	28	27	61	69	62	62	66	69	65	52	70	870	y	Suncor / Petro-Canada, Canada
	46	46	48	49	48	47	46	45	42	43	42	40	38	36	34	33	33	33	1,144	y	Syrian Petroleum, Syria
	4	7	11	13	17	20	21	33	34	37	29	31	34	36	33	30	29	26	446	y	Talisman, Canada
	155	194	212	194	200	204	199	195	197	215	225	238	231	219	220	218	226	222	8,796	y	Total, France
	149	133	127	125	127	122	119	133	157	187	220	219	197						2,645	y	Yukos, Russian Federation
	6,623	6,905	7,006	7,366	7,590	7,813	7,689	7,939	7,950	7,764	8,229	8,595	8,913	8,606	8,631	8,726	8,478	8,550	365,729	y	Emissions from identified oil prod'n (MtCO2/yr)
	1,808	1,884	1,912	2,010	2,071	2,132	2,098	2,167	2,170	2,119	2,246	2,346	2,433	2,349	2,356	2,382	2,314	2,333	99,812	y	Emissions from identified oil prod'n (MtC/yr)
	9,311	9,402	9,483	9,626	9,904	10,095	9,904	10,326	10,359	10,296	10,754	11,092	11,253	11,286	11,264	11,341	11,091	11,430	472,012	y	CDIAC emissions from annual oil prod'n (MtCO2/yr)
	2,541	2,566	2,588	2,627	2,703	2,755	2,703	2,818	2,827	2,810	2,935	3,027	3,071	3,080	3,074	3,095	3,027	3,119	128,817	y	CDIAC emissions from annual oil prod'n (MtC/yr)
	71.1%	73.4%	73.9%	76.5%	76.6%	77.4%	77.6%	76.9%	76.7%	75.4%	76.5%	77.5%	79.2%	76.3%	76.6%	76.9%	76.4%	74.8%	77.5%	y	Percent of CDIAC oil emissions identified

Total emissions from identified oil & NGL production 1884-2010 (million tonnes CO2) 365,729

1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010

Cell: EO2
Comment: Rick Heede:
See worksheet "Oil Emissions Factor Calc" for details.

Cell: ET126
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: EP128
Comment: Rick Heede:
Updated with CDIAC preliminary CO2 emissions (MtC) to 2010 in Dec11.

Cell: ET128
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
CO2I = CO2 emissions in 106 metric tons of carbon
PI = annual production or consumption in 106 tons
FOI = 0.918 ± 3%
CI = 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
CO2I = CO2 emissions in 106 metric tons of carbon
PI = annual production or consumption in 106 tons
FOI = 0.985 ± 3%
CI = 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: ET133
Comment: Rick Heede:

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