Royal Dutch Shell, Netherlands (acq. BG Feb 2016)

Entity emissions from combustion, venting, flaring, and fugitive methane

Richard Heede
Climate Accountability Institute

24-Jul-19

Entity emi

						1850s										1860s										1870s						1870s						1880s				
				Emission factors		1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884
Entity CO2 emissions				kg CO2/tCO2																																											
Oil & NGLs: Shell	MtCO2	linked																																													
Oil & NGLs: BG																																															
Oil & NGLs: RDS + BG																																															
Natural Gas: Shell	MtCO2	linked																																													
Natural Gas: BG																																															
Natural Gas: RDS + BG																																															
Coal	MtCO2	linked																																													
Combustion total	MtCO2	sum				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Oil & NGLs: Venting	MtCO2	calculated		3.83	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Oil & NGLs: Flaring	MtCO2	calculated		15.94	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Own fuel use	MtCO2	calculated		57.26	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Natural Gas: Venting	MtCO2	calculated		28.53	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Natural Gas: Flaring	MtCO2	calculated		1.74	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Venting & Flaring total	MtCO2	sum				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Cement	MtCO2	linked																																													
Total CO2 emissions	MtCO2	sum			row 18+24+26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Entity methane emissions				kg CH4/tCO2																																											
Methane: Oil & NGLs	MtCH4	calculated		1.92	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Methane: Natural Gas	MtCH4	calculated		9.88	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Methane: Coal	MtCH4	calculated		4.03	linked	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Total methane emissions	MtCH4	sum				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Entity methane emissions				GWP																																											
Methane: Oil & NGLs	MtCO2e	calculated		28		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Methane: Natural Gas	MtCO2e	calculated		28		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Methane: Coal	MtCO2e	calculated		28		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Total methane emissions	MtCO2e	sum		(per IPCC AR5)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
Total attributed emissions	MtCO2e	sum				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
CDIAC CO2 emissions	MtCO2	Converted to CO2:	4,595			198	198	209	216	253	260	278	282	286	304	333	348	352	377	410	436	447	476	491	520	539	575	638	674	638	689	700	711	718	769	865	890	938	997	1,008
Oil, Natural Gas, Coal, Flaring, & Cement	Mt Carbon	Sum 1751-1849:	1,254			54	54	57	59	69	71	76	77	78	83	91	95	96	103	112	119	122	130	134	142	147	157	174	184	174	188	191	194	196	210	236	243	256	272	275
Entity percent of total CO2 emissions	Percent					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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CDIAC/EDGAR methane	Tg CH4	(MtCH4)														2.22	2.35	2.34	2.51	2.73	2.89	3.04	3.26	3.22	3.34	3.41	3.80	4.13	4.41	4.3	4.4	4.5	4.6	4.6	4.8	5.3	5.7	6.1	6.5	6.5
Entity percent of total methane emissions	Percent															-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Stern, D.I., & R.K. Kaufmann (1998) "Annual Estimates of Global Anthropogenic Methane Emissions: 1860-1994," in Trends Online: A Compendium of Data on Global Change, CDIAC, ONRL, http://cdiac.esd.ornl.gov/trends/meth/ch4.htm#flaring.
European Commission's Joint Research Centre (2011) "Global Emissions EDGAR v4.2: Methane Emissions," Emission Database for Global Atmospheric Research (EDGAR), Nov11; edgar.jrc.ec.europa.eu/overview.php?v=42

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	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD
10						1890s									
11	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
15								0.0	0.1	0.3	0.4	0.5	1.2	1.0	0.3
17								0	0	0	0	0	1	1	0
24								0	0	0	0	0	1	1	0
26								0	0	0	0	0	0	0	0
27								0	0	0	0	0	0	0	0
28								-	-	-	-	-	-	-	-
29								-	-	-	-	-	-	-	-
30								-	-	-	-	-	-	-	-
31								0	0	0	0	0	0	0	0
35								0	0	0	0	0	1	1	0
39								0	0	0	0	0	0	0	0
40								-	-	-	-	-	-	-	-
41								-	-	-	-	-	-	-	-
42								0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45								0	0	0	0	0	0	0	0
46								-	-	-	-	-	-	-	-
47								-	-	-	-	-	-	-	-
48								0	0	0	0	0	0	0	0
51								0	0	0	0	1	1	1	0
54	1,019	1,033	1,081	1,198	1,198	1,304	1,359	1,370	1,356	1,403	1,488	1,535	1,612	1,700	1,861
55	278	282	295	327	327	356	371	374	370	383	406	419	440	464	508
57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.02%	0.03%	0.08%	0.06%	0.02%
60	6.4	6.4	6.8	7.4	7.5	8.0	8.3	8.4	8.2	8.5	9.0	9.3	9.7	10.2	11.2
62	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN
10			1900s						1900s	
11	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
15	0.3	0	1	1	1	1	2	2	2	2
17	0	0	1	1	1	1	2	2	2	2
24	0	0	1	1	1	1	2	2	2	2
26	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0
28	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-
31	0	0	0	0	0	0	0	0	0	0
35	0	1	1	1	1	1	2	3	2	2
39	0	0	0	0	0	0	0	0	0	0
40	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-
42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0	0	0	0	0	0	0	0	0	0
46	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-
48	0	0	0	0	0	0	0	0	0	0
51	0	1	1	1	1	1	2	3	2	2
54	1,957	2,026	2,074	2,261	2,286	2,433	2,594	2,869	2,744	2,876
55	534	553	566	617	624	664	708	783	749	785
57	0.01%	0.02%	0.03%	0.03%	0.03%	0.02%	0.07%	0.09%	0.07%	0.08%
60	11.8	12.1	12.4	13.6	13.7	14.4	15.5	17.1	16.3	17.0
62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD
10							1910s								1920s	
11	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
15	3	3	6	10	3	2	13	13	6	11	16	20	24	40	36	35
17	3	3	6	10	3	2	13	13	6	11	16	20	24	40	36	35
24	3	3	6	10	3	2	13	13	6	11	16	20	24	40	36	35
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
35	3	3	6	10	3	2	13	13	6	11	17	21	25	41	37	36
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	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	0.1	0.1	0.1
45	0	0	0	1	0	0	1	1	0	1	1	1	1	2	2	2
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	0	0	0	1	0	0	1	1	0	1	1	1	1	2	2	2
51	3	3	7	11	4	2	14	14	7	12	18	22	26	43	39	38
54	3,001	3,060	3,221	3,459	3,115	3,071	3,298	3,503	3,430	2,953	3,415	2,942	3,096	3,554	3,525	3,573
55	819	835	879	944	850	838	900	956	936	806	932	803	845	970	962	975
57	0.10%	0.10%	0.20%	0.30%	0.11%	0.07%	0.40%	0.38%	0.19%	0.39%	0.49%	0.70%	0.80%	1.14%	1.05%	1.00%
60	17.8	18.1	19.1	20.4	18.4	18.1	19.5	20.6	20.3	17.9	20.6	17.7	19.0	21.3	21.1	21.2
62	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

ve methane

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	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	DO	DP	DQ
					1930s					1930s					1940s										1950s										1960s				
	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	1962	1963	1964
	39	46	60	66	63	56	57	60	65	72	76	87	81	60	63	66	69	73	77	80	89	109	130	120	136	159	173	179	169	185	204	224	211	238	238	242	264	271	300
	39	46	60	66	63	56	57	60	65	72	76	87	81	60	63	66	69	73	77	80	89	109	130	120	136	159	173	179	169	185	204	224	211	238	238	242	264	271	300
					3	3	3	3	4	4	4	5	5	5	6	6	7	7	8	8	9	10	10	11	12	13	14	15	16	17	18	19	19	21	24	26	31	35	39
																																						2	2
					3	3	3	3	4	4	4	5	5	5	6	6	7	7	8	8	9	10	10	11	12	13	14	15	16	17	18	19	19	21	24	26	31	37	42
	39	46	60	66	66	59	60	63	69	76	81	91	86	65	69	72	76	80	84	89	98	118	141	131	148	172	187	194	185	201	222	243	230	258	263	268	295	308	342
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	4	3	4	4	4	4	4	5
	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
	-	-	-	-	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	1	1	1	1	1	1	1	1	1
	-	-	-	-	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
	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	4	5	5	5	5	6	6	6	6	7	7	8	9	10
	39	47	61	67	67	60	61	64	71	78	83	93	88	67	71	74	78	82	87	91	100	121	144	135	152	177	192	199	190	206	228	249	235	265	270	275	303	317	352
	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	1	1	1
	-	-	-	-	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
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1
	2	2	3	4	3	3	3	3	4	4	4	5	4	3	3	4	4	4	4	4	5	6	7	6	7	9	9	10	9	10	11	12	11	13	13	13	14	15	16
	-	-	-	-	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	4	4	4	5	5	5	5	5	6	7	7	9	10	12
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	2	3	4	4	4	4	4	5	5	5	6	6	5	5	5	6	6	6	7	7	9	10	10	11	12	13	14	14	15	16	17	17	18	20	20	23	25	28
	41	49	64	71	72	64	65	69	75	83	88	99	94	72	76	80	84	88	93	98	107	130	154	144	163	189	205	212	204	221	244	266	252	283	289	295	326	342	379
	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	8,986	9,407	9,453	9,842	10,376	10,974
	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	2,452	2,567	2,580	2,686	2,832	2,995
	1.09%	1.21%	1.56%	1.60%	1.75%	1.74%	1.98%	1.97%	1.98%	2.07%	1.99%	2.11%	2.10%	1.54%	1.48%	1.52%	1.59%	1.61%	1.71%	2.14%	2.21%	2.38%	2.68%	2.59%	2.54%	2.73%	2.91%	2.94%	2.78%	2.76%	2.86%	2.99%	2.76%	2.94%	2.87%	2.91%	3.08%	3.05%	3.20%
	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	37.7	39.7	40.9	42.7	44.6	44.3	45.1	47.1	49.4
	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02

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Entity emissions from combustion

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Climate Ac

Royal Dutch Shell, Netherlands (acq. BG Feb 2016)

	1960s					1970s										1980s										1990s						1990s							
	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	FA	FB	FC	FD
	1965	1966	1967	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	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
																																		Coal interests sold to Anglo American, July 2000					
	325	359	369	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	293	308	319	337	340	341	330	340	328	320	323
																								0	6	8	8	7	7	9	8	8	8	9	9	9	10	16	16
	325	359	369	394	447	497	732	759	798	703	472	450	435	406	386	183	171	185	203	218	222	244	239	240	257	277	303	300	300	317	327	345	349	350	340	349	338	335	338
	42	48	56	68	82	97	104	116	124	132	129	131	130	126	127	122	117	108	111	115	122	123	128	118	114	126	138	128	133	131	135	165	158	153	156	161	177	181	173
	3	3	3	4	4	5	6	8	9	10	12	13	15	14	13	14	15	15	15	16	17	18	18	17	17	17	17	18	22	25	23	23	23	23	23	23	24	28	34
	45	51	60	71	86	101	110	124	132	143	141	144	145	139	140	136	132	123	126	131	140	141	146	135	131	143	155	146	155	156	158	188	181	177	180	185	202	210	207
															19	25	32	38	43	49	49	60	57	64	70	66	62	57	53	49	38	39	42	30	36				
	369	410	429	466	533	598	843	882	931	846	613	594	580	545	545	344	334	346	372	398	411	445	443	439	459	486	519	504	508	521	523	572	571	557	556	534	540	545	545
	1	1	1	2	2	2	3	3	3	3	2	2	2	2	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
	5	6	6	6	7	8	12	12	13	11	8	7	7	6	6	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	5	6	6	5	6	5	5	5
	3	3	3	4	5	6	6	7	8	8	8	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8	9	8	9	9	9	11	10	10	10	11	12	12	12
	1	1	2	2	2	3	3	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6
	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
	10	12	13	14	16	19	24	26	27	26	22	21	21	20	20	16	15	14	15	16	17	17	17	17	17	18	20	19	20	20	20	23	23	22	22	23	24	25	25
	380	421	441	480	550	617	867	908	958	872	635	615	601	565	565	360	349	361	387	414	428	462	460	456	475	504	539	522	528	541	543	596	594	579	578	557	564	570	570
																										80	86	82	85	86	86	98	96	94	95	93	98	101	100
	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	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	2	1	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
	1	1	1	1	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	3	3
	17	19	20	21	24	27	39	41	43	38	25	24	23	22	21	10	9	10	11	12	12	13	13	13	14	15	16	16	16	17	18	19	19	19	18	19	18	18	18
	12	14	16	20	24	28	31	34	37	39	39	40	40	39	39	38	36	34	35	36	39	39	40	37	36	40	43	40	43	43	44	52	50	49	50	51	56	58	57
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	4	4	5	6	6	7	6	7	8	7	7	6	6	6	4	4	5	3	4	-	-	-	-
	30	33	36	41	48	55	70	75	80	77	64	64	64	60	62	50	49	48	51	53	56	59	60	58	58	62	66	63	65	66	66	75	74	71	72	70	74	76	75
	409	455	478	521	598	672	937	983	1,038	950	699	679	665	626	626	410	398	409	437	467	484	521	520	513	533	566	605	586	593	607	609	671	668	650	651	627	638	646	645
	11,467	12,046	12,435	13,064	13,847	14,847	15,411	16,028	16,898	16,928	16,827	17,806	18,356	18,563	19,595	19,385	18,788	18,629	18,550	19,222	19,794	20,397	20,910	21,682	22,155	22,183	22,431	22,193	22,154	22,539	23,012	23,528	23,917	23,983	23,932	24,560	25,139	25,492	26,861
	3,129	3,288	3,394	3,565	3,779	4,052	4,206	4,374	4,612	4,620	4,592	4,859	5,010	5,066	5,348	5,291	5,127	5,084	5,063	5,246	5,402	5,567	5,707	5,917	6,046	6,054	6,122	6,057	6,046	6,151	6,280	6,421	6,527	6,545	6,531	6,703	6,861	6,957	7,331
	3.31%	3.50%	3.55%	3.67%	3.97%	4.16%	5.63%	5.67%	5.67%	5.15%	3.77%	3.46%	3.28%	3.05%	2.88%	1.86%	1.86%	1.94%	2.08%	2.15%	2.16%	2.27%	2.20%	2.10%	2.15%	2.27%	2.40%	2.35%	2.38%	2.40%	2.36%	2.53%	2.48%	2.41%	2.42%	2.27%	2.24%	2.24%	2.12%
	51.3	53.4	54.7	57.2	60.6	60.3	60.6	62.7	66.6	66.2	65.5	69.8	70.3	72.0	73.3	72.0	68.1	69.1	69.2	70.4	72.9	74.2	75.8	78.6	79.9	80.7	81.2	80.4	78.7	79.1	81.1	83.2	83.7	83.0	82.6	85.4	86.9	88.8	94.5
	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

n, venting, flaring, and fugitive methane

chard Heede
countability Institute
24-Jul-19

Royal Dutch Shell, Netherlands (acq. BG Feb 2016)

2000s						2010s										Cumulative		Entity emissions					to 2015	to 2016	to 2017	to 2018
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	MtCO2e (except where noted)	V	(V = verified)					Cumulative MtCO2e (except where noted)	Cumulative MtCO2e (except where noted)	Cumulative MtCO2e (except where noted)	Cumulative MtCO2e (except where noted)
																		Entity CO2 emissions			kg CO2/tCO2		to 2015	to 2016	to 2017	to 2018
305	284	275	257	240	239	241	226	221	209	201	205	250	247	244		V 22,987		Oil & NGLs: Shell	MtCO2	linked			22,245	22,495	22,742	22,987
17	18	19	24	24	25	24	22	24	26	30	40					V 433		Oil & NGLs: BG	MtCO2				433	433	433	433
323	**302**	**294**	**281**	**265**	**263**	**265**	**248**	**245**	**235**	**231**	**245**	**250**	**247**	**244**		23,419		Oil & NGLs: RDS + BG	MtCO2				22,678	22,927	23,175	23,419
172	161	163	160	167	165	181	175	184	188	181	163	208	208	211		V 7,934		Natural Gas: Shell	MtCO2	linked			7,307	7,515	7,723	7,934
38	43	51	47	52	54	55	56	57	52	45	48					V 1,209		Natural Gas: BG	MtCO2				1,209	1,209	1,209	1,209
210	204	214	207	219	219	237	231	241	239	226	211	208	208	211		9,142		Natural Gas: RDS + BG	MtCO2				8,516	8,724	8,932	9,142
																V 978		Coal	MtCO2	linked			978	978	978	978
533	506	508	489	483	483	502	479	486	474	457	456	457	456	455		33,540	V	Combustion total	MtCO2	sum			32,172	32,629	33,085	33,540
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		90		Oil & NGLs: Venting	MtCO2	calculated	3.83	linked	87	88	89	90
5	5	5	4	4	4	4	4	4	4	4	4	4	4	4		373		Oil & NGLs: Flaring	MtCO2	calculated	15.94	linked	362	366	370	373
12	12	12	12	13	13	14	13	14	14	13	12	12	12	12		524		Own fuel use	MtCO2	calculated	57.26	linked	488	500	511	524
6	6	6	6	6	6	7	7	7	7	6	6	6	6	6		261		Natural Gas: Venting	MtCO2	calculated	28.53	linked	243	249	255	261
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		16		Natural Gas: Flaring	MtCO2	calculated	1.74	linked	15	15	16	16
25	24	25	24	24	24	26	25	26	26	24	23	23	23.11	23		1,263	V	Venting & Flaring total	MtCO2	sum			1,194	1,217	1,240	1,263
																-		Cement	MtCO2	linked						
558	530	533	512	508	507	528	504	512	500	481	479	481	479	478		V 34,803		Total CO2 emissions	MtCO2	sum	row 18+24+26		33,366	33,846	34,325	34,803
100	97	100	96	99	99	106	102	106	104	99	95	94	94	95		sum of scope 1 CO2 & CH4		(for UCS carbon intensity project, Jan17)								
																		Entity methane emissions			kg CH4/tCO2					
1	1	1	1	1	1	1	0	0	0	0	0	0	0	0		45		Methane: Oil & NGLs	MtCH4	calculated	1.92	linked	44	44	45	45
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		90		Methane: Natural Gas	MtCH4	calculated	9.88	linked	84	88	90	90
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		4		Methane: Coal	MtCH4	calculated	4.03	linked	4	4	4	4
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		V 139	V	Total methane emissions	MtCH4	sum			132	137	139	139
																		Entity methane emissions			GWP					
17	16	16	15	14	14	14	13	13	13	12	13	13	13	13		1,261		Methane: Oil & NGLs	MtCO2e	calculated	28		1,221	1,235	1,248	1,261
58	56	59	57	60	61	65	64	67	66	62	58	57	58	58		2,529		Methane: Natural Gas	MtCO2e	calculated	28		2,355	2,413	2,470	2,529
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		111		Methane: Coal	MtCO2e	calculated	28		111	111	111	111
76	73	75	73	75	75	80	77	80	79	75	72	71	70.9	71		3,901		Total methane emissions	MtCO2e	sum	per IPCC SAR)		3,687	3,758	3,829	3,901
633	603	608	585	582	582	607	582	592	578	556	551	551	550	550		V 38,704	V	Total attributed emissions	MtCO2e	sum			37,053	37,605	38,154	38,704
28,193	29,253	30,288	30,882	31,881	31,525	33,068	34,359	34,921	35,213	35,511	35,465	35,677	36,155	37,131		V 1,611,433		CDIAC CO2 emissions	MtCO2				1,502,470	1,538,147	1,574,302	1,611,433
7,694	7,983	8,266	8,428	8,701	8,603	9,025	9,377	9,530	9,610	9,691	9,679	9,737	9,867	10,134		V 439,779		Oil, Natural Gas, Coal, Flaring, & Cement	Mt Carbon							
1.98%	1.81%	1.76%	1.66%	1.59%	1.61%	1.60%	1.47%	1.47%	1.42%	1.35%	1.35%	1.35%				2.16%		Entity percent of total CO2 emissions	Percent				2.22%	2.20%	2.18%	2.16%
99.3	103.4	107.4	110.2	115.4	113.2	120.9										5,459		CDIAC/EDGAR methane	Tg CH4				5,459	5,459	5,459	5,459
0.03	0.03	0.02	0.02	0.02	0.02	0.02										2.55%		Entity percent of total CH4 emissions	Percent							

2.55%