Crude oil and NGL extraction data

Richard Heede
Climate Mitigation Services
File started: 11 January 2005
Last modified: April 2013

Royal Dutch Shell plc, The Netherlands & United Kingdom

Investor-owned

www.shell.com Den Haag & London

Production / Extraction data

Crude Oil & NGL

Year	Company 1	Company 2	Company 3	Company 4	Subtotal	Company 1	Company 2	Company 3	Company 4	Total
	Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Million bbl /yr	Million bbl /yr	Million tonnes/yr	Million bbl /yr	Million bbl /yr
	Royal Dutch Shell plc	Royal Dutch Shell plc				Royal Dutch Shell plc	Royal Dutch Shell plc	Royal Dutch Company	Shell Union, Shell Oil (US)	Total
1890		Telaga Said, Dutch	Telaga Said, Dutch	Pangkalan Brandan	Pangkalan Brandan	Royal Dutch	Royal Dutch			Royal Dutch
1891		million liter /yr	thousand bbl /d	million cases /yr	thousand bbl /d	thousand bbl /d	Million bbl /yr			Million bbl /yr
1892		15	0.258			0.26	0.1			0.1
1893		30	0.517	0.24	0.16	0.67	0.2			0.2
1894		76	1.310	0.96	0.63	1.94	0.7			0.7
1895	Howarth data	100	1.723	1.34	0.87	2.59	0.9			0.9
1896	not used	136	2.344	1.85	1.21	3.55	1.3			1.3
1897	thousand bbl /d	360	6.204	4.57	2.98	9.18	3.4			3
1898	0.13	430	7.410	Perlak 1900-07	Perlak	7.41	2.7			3
1899	2.57	135	2.326	thousand tonnes/yr	thousand bbl /d	2.33	0.8			1
1900	5.00	100	1.723	8	0.15	1.87	0.7	Shell logo 1900		1
1901	Telaga Said	36	0.620	150	3.01	3.63	1.3			1
1902	thousand tonnes/yr	30	0.517	163	3.26	3.78	1.4			1
1903	14	22	0.379	195	3.92	4.30	1.6			2
1904	14	15	0.258	201	4.04	4.30	1.6			2
1905	12			189	3.80	3.80	1.4			1
1906	11		Perlak + Roumania	669	13.43	13.43	4.9			5
1907	10		Perlak + Roumania	917	18.42	18.42	6.7			7
1908			Roumania only	710	14.26	14.26	5.2			5
1909			Roumania only	840	16.87	16.87	6.2	Shell logo 1909		6
1910			Roumania only	1,070	21.49	21.49	7.8			8
1911	US operations:		Roumania only	1,060	21.29	21.29	7.8			8
1912	million bbl / yr		Royal Dutch Shell	2,337	46.93	46.93	17.1			17
1913	0.72		Royal Dutch Shell	3,780	75.91	75.91	27.7			28
1914	4.70		Roumania only	1,260	25.30	25.30	9.2			9
1915			Royal Dutch Shell	775	15.57	15.57	5.7			6
1916	total RDS		Royal Dutch Shell	4,734	95.07	95.07	34.7			35
1917			Royal Dutch Shell	4,822	96.83	96.83	35.3			35
1918		US operations:					16.9		US operations:	17
1919		thousand bb/d					30.0		million bbl /yr	30
1920		24.70					43.9		9.0	44
1921		34.74					54.4		12.7	54
1922		44.78					65.7		16.3	66
1923		54.82					107.2	Million *tonnes*	20.0	107
1924		64.86					98.1	13.44	23.7	98
1925	273.0	74.90			99.65		94.1	12.89	27.3	94
1926					Annual oil from		103.7	14.22	35.6	104
1927					daily prod'n		124.1	17.00	36.6	124
1928					in Column D		161.1	22.06	47.8	161
1929	486.0				177.39		Above data	24.30	46.8	177
1930	466.5				170.27		1918-28 from	23.98	34.6	170
1931							columns AC - AH	20.53		150
1932								20.99	Wolverine Petr.	153
1933								21.95	million bbl /yr	160
1934								24.08	0.50	176
1935								26.62		194
1936								28.17		206
1937								31.99		234
1938								29.92		218
1939								22.14		162
1940								23.25		170
1941							Estimated:	24.41		178
1942								25.63		187
1943								26.91	US operations:	196
1944								28.26	*Not* added to Sum	206
1945								29.59	69.3	216
1946	630.0				Annual oil from	230		32.70	65.2	239
1947	753.0				daily prod'n	275		40.09	71.4	293
1948								48.03	78.6	351

Shell logo 1930

FINANCIAL AND OPERATIONAL HIGHLIGHTS

	2008	2007	2006	2005	2004
Segment earnings ($ million)					
Exploration & Production	20,235	14,686	14,544	13,577	9,522
Gas & Power	5,328	2,781	2,633	1,378	1,774
Oil Sands	941	582	651	661	301
Total Upstream earnings ($ million)	26,504	18,049	17,828	15,616	11,597
Upstream net cash from operating activities [A] ($ million)	35,460	25,832	26,429	22,115	18,978
Crude oil production (thousand b/d)	1,693	1,818	1,948	1,998	2,173
Natural gas production available for sale (million scf/d)	8,569	8,214	8,368	8,263	8,808
Mined Oil Sands production (thousand b/d)	78	81	82	95	80
Total production (thousand boe/d) [B]	3,248	3,315	3,473	3,518	3,772
Equity LNG sales volume (million tonnes)	13.1	13.2	12.1	10.7	10.2
Oil Sands sales volumes (thousand b/d)	114	125	133	143	127

Shell (2009) Five-Year Fact Book, page 31.

(Oil & NGL continued)

	Gross prod'n	Net production	gross over net
1954	1,430	1,246	14.8%
1955	1,555	1,361	14.3%
1956	1,725	1,508	14.4%
1957	1,895	1,652	14.7%
1958	1,782	1,556	14.5%
1959	2,012	1,752	14.8%
1960	2,021	1,759	14.9%
1961	2,055	1,783	15.3%
1962	2,244	1,947	15.3%
1963	2,305	1,999	15.3%
1964	2,537	2,215	14.5%
1965	2,722	2,395	13.7%
1966	2,981	2,648	12.6%
1967	3,120	2,724	
1968	3,332	2,909	
1969	3,775	3,296	
1970	4,198	3,665	
1971	6,188	5,403	
1972	6,410	5,597	
1973	6,745	5,889	
1974	5,941	5,187	
1975	3,988	3,482	
1976	3,802	3,319	
1977	3,676	3,209	
1978	3,427	2,992	
1979	3,259	2,845	
1980		1,352	
1981		1,260	
1982		1,366	
1983		1,497	
1984		1,609	
1985		1,639	
1986		1,803	
1987		1,766	
1988			
1989			
1990			
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999	2,255		
2000	2,262	246.6	
2001	2,211	206.8	
2002	2,359		
2003	2,379		
2004	2,253		
2005	2,093		
2006	2,030		
2007	1,899		
2008	1,771		
2009	1,661		
2010	1,691		

base: net prod'n:

1954-1966 ave: 14.5%

Corresponding net %: 87.31%

based on ESTIMATED net production

1967-1979 net production estimated from net of gross 1954-1966 (cell G89)

Total production PRIOR to net of gross for 1967-979: 21,119 million bbl

Total production AFTER net of gross for 1967-979: 18,439 million bbl

Reduction: 2,680 million bbl

Reduct'n 1967-79: 12.7%

Red'n 1892-2010: 4.5%

1949	324	70.1	324
1950	367	72.2	367
1951	429	86.2	429
1952	466	96.1	466
1953	481	104.3	481
1954	455	97.7	455
1955	497		497
1956	550		550
1957	603		603
1958	568		568
1959	639		639
1960	642		642
1961	651		651
1962	711		711
1963	730		730
1964	808		808
1965	874		874
1966	967		967
1967	994		994
1968	1,062		1,062
1969	1,203		1,203
1970	1,338		1,338
1971	1,972		1,972
1972	2,043		2,043
1973	2,149		2,149
1974	1,893		1,893
1975	1,271		1,271
1976	1,212		1,212
1977	1,171		1,171
1978	1,092		1,092
1979	1,039		1,039
1980	493		493
1981	460		460
1982	499		499
1983	546		546
1984	587		587
1985	598		598
1986	658		658
1987	645		645
1988	645		645
1989	676		676
1990	692		725
1991	760		794
1992	750		789
1993	747		789
1994	767		829
1995	790		860
1996	843		907
1997	850		916
1998	859		917
1999	823		890
2000	826		916
2001	807		883
2002	861		861
2003	868		868
2004	822		822
2005	764		764
2006	741		741
2007	693		693
2008	646		646
2009	606		606
2010	617		617

See cell comments for background on discontinuity

Oil & Gas Journal OGJ100

1985-1998

Enterprise Oil UK
33.2
33.9
39.3
41.8
61.9
70.1
63.6
65.7
58.4
66.7
90.0
75.5
Acquired 2002

Shell logo 1955

Shell logo 1961

Total	na	na	na	na	na	52,156	700	4,622	misc	56,962

Natural gas extraction data

Richard Heede
Climate Mitigation Services
File started: 11 January 2005
Last modified: April 2013

Royal Dutch/Shell Group, The Netherlands & United Kingdom

Investor-owned

www.shell.com Den Haag & London

Production / Extraction data

Natural Gas

	Company 1	Company 2	Company 3	Company 4	Subtotal	Company 1	Company 2	Company 3	Company 4	Total
	Million cf/d	Million cf/d	Million cf/d	Million cf/d	Million cf/d	Billion cf/yr	Billion cf/yr	Billion cf/yr	Billion cf/yr	Billion cf/yr
	Royal Dutch/Shell Group 1954-					Royal Dutch/Shell Group 1987-2008				**Total**
1890										
1891										
1892										
1893		1901, oil:	45.00	thousand tons						
1894										
1895										
1896										
1897										
1898										
1899										
1900										
1901										
1902		Joint Shell & Royal Dutch production reporting as of agreement, Jun1902?								
1903										
1904										
1905										
1906										
1907		Shell Transport and Royal Dutch "amalgamation" takes effect in Jan1907.								
1908										
1909						Thermal cracking adopted in 1909				
1910										
1911										
1912										
1913										
1914										
1915										
1916										
1917										
1918										
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1941										
1942										
1943										
1944										
1945										
1946										
1947										
1948										

	Estimate of wasted gas		
	(equiv Bcf/yr)		
	280 cf/bbl		
1909	1.7		
1910	2.2		
1911	2.2		
1912	4.8		
1913	7.8		
1914	2.6		
1915	1.6		
1916	9.7		
1917	9.9		
1918	4.7		
1919	8.4		
1920	12.3		
1921	15.2		
1922	18.4		
1923	30.0		
1924	27.5		
1925	26.3		
1926	29.0		
1927	34.7		
1928	45.1		
1929	49.7		
1930	47.7	estimated	51
1931	42.0	estimated	55
1932	42.9	estimated	59
1933	44.9	estimated	64
1934	49.2	estimated	69
Total wasted gas, not added to gas production	**570.5**	estimated	74
		estimated	80
		estimated	86
		estimated	93
		estimated	100
		estimated	108
		estimated	116
		estimated	125
		estimated	135
		estimated	145
		estimated	156
		estimated	168
		estimated	181
		estimated	195

Royal Dutch
Bcf/yr

In 1917, Shell Transport director Robt Waley Cohen hired a chemical engineer Harry Ricardo, through whose research on improved fuel (originally for WW1 military tank engines) was told that petrol from Borneo was superior. Yet this fuel's specific gravity was deemed "too high for commercial use" and burned as waste fuel. According to Howarth (p. 142), the quantity was on the order of "scores of thousands of barrels" per year. This was a significant share of Shell's total Bornean production (which CMS has not quantified). The larger significance, of course, is that early oil production involved tremendous waste, spilled fuel, blowouts that total up to a million barrels, gas emissions from thermal cracking units, inefficient equipment, etc. While the project has sought to quantify the amounts of net oil and gas produced, enormous quantities of fossil fuels and emissions of both carbon dioxide and methane were routine and NOT quantified in either this global inventory or in the emissions databases (e.g., ORNL's CDIAC fossil fuel emissions 1750-present).

Howarth also discusses another pervasive practice (p. 145): the early thermal cracking units (subjecting crude oil to heat under pressure would improve the yield of the valueable lighter hydrocarbon fractions) would also drive off hydrocarbon gases -- ~10 cubic meters per barrel of oil according to Howarth -- only some of which was used in the refinery and the rest burned as waste. 10 m^3 = 353.15 cf; assuming that every barrel produced is refined, and 80 percent of the gas is wasted, this means ~280 cf per bbl; with Shell's crude oil production in 1925 equal to 100 million bbl, this means 28 Bcf in combusted waste gas. Clearly, producers would soon start to pay attention to this wasted opportunity to convert waste into a useful product, but not until the oil companies started researching petrochemicals in the late 1920s and 1930s. J.B.A. Kessler, who joined the board of directors of Shell Transport in 1928 and supported Waley Cohen's efforts, pointed out that it seemed "logical that we should turn all this energy that is going to waste at present into something that we can put into packages and sell. If we had a lot of gas in a very thickly populated area we might make electricity and sell it, but what can we do with the waste gas we have in the United States, the East Indies, Venezuela, Romania, and so on? The only thing we can do is to make something we can ship."

Howarth (1997) "A Century in Oil: The Shell Transport and Trading Company 1897-1997," p. 145.

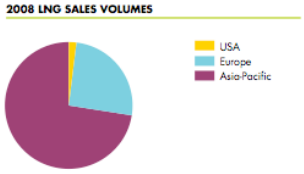
(Natural Gas continued)

Shell Sustainability Report 2010, page 32.

	2010 GHG	2010 CO2e
	million tonnes	million tonnes
CO2	72.00	72.00
CH4	0.14	2.86
N2O	0.00	0.62
HFCs	0.00	0.03
Flaring	10.30	10.30
Total		85.81

	R	S	V	W	X	Z	AA
1949						estimated	210
1950						estimated	226
1951						estimated	244
1952						estimated	263
1953						estimated	283
1954			1.03	305			305
1955				315			315
1956				336			336
1957				347			347
1958				349			349
1959				384			384
1960				454			454
1961				491			491
1962				578			578
1963	1,786	"natural gas sales"	1,786				652
1964	2,010	"natural gas sales"	2,010				734
1965	2,149	"natural gas sales"	2,149				784
1966	2,462	"natural gas sales"	2,462				899
1967	2,890	"natural gas sales"	2,890				1,055
1968	3,467	"natural gas sales"	3,467				1,265
1969	4,224	"natural gas sales"	4,224				1,542
1970	4,961	"natural gas sales"	4,961				1,811
1971	5,345	"natural gas sales"	5,345				1,951
1972	5,933	"natural gas sales"	5,933				2,166
1973	6,351	"natural gas sales"	6,351				2,318
1974	6,787	"natural gas sales"	6,787				2,477
1975	6,621	"natural gas sales"	6,621				2,417
1976	6,714	"natural gas sales"	6,714				2,451
1977	6,674	"natural gas sales"	6,674				2,436
1978	6,439	"natural gas sales"	6,439				2,350
1979	6,516	"natural gas sales"	6,516				2,378
1980	6,257	interpolated	6,257			*interpolated*	2,284
1981	5,998	interpolated	5,998	Shell plus associated companies:		*interpolated*	2,189
1982	5,739	interpolated	5,739	1,205	819		2,024
1983	5,480		5,480	1,220	860		2,080
1984	5,723		5,723	1,315	841		2,156
1985	6,137		6,137	1,378	914		2,292
1986	6,205		6,205	1,462	841		2,303
1987	6,538		6,538	1,535	852		2,387
1988				2,209			2,209
1989				2,142	Enterprise Oil UK		2,142
1990				2,294	56.5		2,351
1991				2,512	65.8		2,578
1992				2,309	81.5		2,391
1993				2,399	94.0		2,493
1994				2,359	88.8		2,448
1995				2,440	92.1		2,532
1996				2,988	102.1		3,090
1997				2,862	86.0		2,948
1998				2,798	74.1		2,872
1999	7,835		7,835	2,860	67.2		2,927
2000	8,096	167.7	8,264	2,955	61.2		3,016
2001	8,902	180.8	9,083	3,249	66.0		3,315
2002	9,286		9,286	3,389	Acquired 2002		3,389
2003	8,849		8,849	3,230			3,230
2004	8,808	"gas available for sale"	8,818	3,215		excludes LNG sales	3,215
2005	8,263	(excludes own use, flared, vented CO2)	8,274	3,016		excludes LNG sales	3,016
2006	8,368		8,380	3,054		excludes LNG sales	3,054
2007	8,214	"gas available for sale"	8,227	2,998		excludes LNG sales	2,998
2008	8,569	(excludes own use, flared, vented CO2)	8,582	3,128		excludes LNG sales	3,128
2009	8,483			3,096			3,096
2010	9,305			3,396			3,396
Total	**na**	**na**	**na**	**76,573**	**6,062**		**120,080**

Shell LNG sales
million tonnes/yr
10.2
10.7
12.1
13.2
13.1



Additional data

Richard Heede
Climate Mitigation Services
File started: 11 January 2005
Last modified: October 2012

Shell production data 1918-1928, 2008-2010, and environmental data

Summing Shell & Royal Dutch crude oil production data

From Peter Roderick, Aug06, Guildhall Library, London

1918	1918	1919	1919	1920	1920
tons	bbl	tons	bbl	tons	bbl
1,706,675	12,261,960	2,092,917	15,036,995	2,284,136	16,674,193
71,366	512,744	84,342	605,973	144,412	1,037,558
277,300	1,992,319	231,179	1,660,953	148,901	1,069,810
300,140	2,156,418	238,632	1,714,501	327,891	2,393,604
		38,869	279,262	US	17,520,000
			2,888,000	Mexico	4,266,000
			6,703,295	78,570	573,561
			853,000	49,500	355,643
		42,500	305,350		
Total bbl:	16,923,441	Total bbl:	30,047,330	Total bbl:	43,890,369

1921	1921	1922	1922	1923	1923
tons	bbl	tons	bbl	tons	bbl
2,295,538	16,757,427	8,999,345	65,695,219	14,686,031	107,208,026
199,858	1,435,921				
181,231	1,302,092				
333,645	2,435,609				
US	17,520,000				
Mexico	12,863,000				
241,130	1,760,249				
51,970	373,389				
Total bbl:	54,447,687	Total bbl:	65,695,219	Total bbl:	107,208,026

1924	1924	1925	1925	1926	1926
tonnes	bbl	tonnes	bbl	tonnes	bbl
13,442,138	98,127,607	12,890,131	94,097,956	2,875,185	20,988,851
				711,637	5,194,950
				171,918	1,255,001
				632,202	4,542,186
				2,317,006	16,914,144
				3,475,661	25,372,325
				851,735	6,217,666
				1,318,590	9,625,707
				1,803,789	13,167,660
				59,638	435,357
Total bbl:	98,127,607	Total bbl:	94,097,956	Total bbl:	103,713,847
million tonnes	13.44	million tonnes	12.89	million tonnes	14.22

	1927	1927	1928	1928
	tonnes	bbl	tonnes	bbl
Dutch East Indies	3,448,116	25,171,247	3,971,045	28,988,629
Sarawak	711,756	5,195,819	751,092	5,482,972
Egypt	183,284	1,337,973	268,461	1,959,765
Romania	593,828	4,334,944	705,854	5,152,734
rox	2,694,312	19,668,478	3,890,767	28,402,599
spc	3,203,719	23,387,149	3,812,233	27,829,301
Mexico	594,753	4,341,697	528,979	3,861,547
Mexico	987,528	7,208,954	893,681	6,523,871
Venezuela	1,535,856	11,211,749		-
Venezuela	2,961,857	21,621,556	7,125,339	52,014,975
Trinidad	65,841	480,639	65,187	475,865
Argentina	17,701	129,217	50,773	370,643
	Total bbl:	124,089,422	Total bbl:	161,062,900
	million tonnes	17.00	million tonnes	22.06

CRUDE OIL AND NATURAL GAS LIQUIDS PRODUCTION [A] — THOUSAND B/D

	2010		2009		2008	
	Shell subsidiaries	Shell share of equity-accounted investments	Shell subsidiaries	Shell share of equity-accounted investments	Shell subsidiaries	Shell share of equity-accounted investments
Europe						
Denmark	98	–	107	–	114	–
Germany	3	–	3	–	3	–
Italy	33	–	30	–	32	–
The Netherlands	–	5	–	5	–	5
Norway	48	–	62	–	67	–
UK	98	–	110	–	154	–
Total Europe	280	5	312	5	370	5
Asia						
Brunei	3	77	2	76	1	80
China	4	–	11	–	14	–
Iran	2	–	5	–	10	–
Malaysia	40	–	39	–	38	–
Oman	199	–	195	–	192	–
Philippines	4	–	4	–	5	–
Russia	–	117	–	106	–	70
Syria	19	–	22	–	22	–
United Arab Emirates	–	135	–	127	–	146
Others	–	1	–	1	–	1
Total Asia	271	330	278	310	282	297
Oceania						
Australia	18	29	18	35	17	39
New Zealand	12	–	12	–	12	–
Total Oceania	30	29	30	35	29	39
Africa						
Cameroon	10	–	12	–	13	–
Egypt	10	–	12	–	9	–
Gabon	34	–	29	–	30	–
Nigeria	302	–	231	–	266	–
Total Africa	356	–	284	–	318	–
North America						
Canada	20	–	20	–	46[B]	–
USA	163	74	195	78	190	82
Total North America	183	74	215	78	236	82
South America						
Brazil	53	–	24	–	23	–
Others	1	7	1	9	1	11
Total South America	54	7	25	9	24	11
Total	1,174	445	1,144	437	1,259	434

[A] Includes natural gas liquids. Royalty purchases are excluded. Reflects 100% of production attributable to subsidiaries; except in respect of PSCs, where the figures shown represent the entitlement of the subsidiaries concerned under those contracts.

[B] Includes bitumen production.

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KEY STATISTICS — $ MILLION

	2010	2009	2008
Revenue (including inter-segment sales)	336,216	250,362	412,813
Segment earnings [A]	2,950	258	5,309
Including:			
Production and manufacturing expenses	10,592	11,829	12,225
Selling, distribution and administrative expenses	13,716	14,505	14,451
Depreciation, depletion and amortisation	4,254	4,399	3,574
Share of earnings of equity-accounted investments [A]	948	661	834
Net capital investment [B]	2,358	6,232	3,104
Refinery availability (%)	92	93	91
Chemical plant availability (%)	94	92	94
Refinery processing intake (thousand b/d)	3,197	3,067	3,388
Oil products sales volumes (thousand b/d)	6,460	6,156	6,568
Chemicals sales volumes (thousand tonnes)	20,653	18,311	20,327

[A] With effect from 2010, Downstream segment earnings are presented on a current cost of supplies basis. See Notes 2 and 7 to the "Consolidated Financial Statements" for further information. Comparative information is consistently presented.

[B] See Note 7 to the "Consolidated Financial Statements".

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(Natural gas continued)

ENVIRONMENTAL DATA

	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
Direct greenhouse gas emissions (GHGs) [A]										
Total GHGs (million tonnes CO_2 equivalent)	75	69	75	82	88	93	101	102	96	93
Carbon dioxide (CO_2) (million tonnes)	72	66	72	79	85	89	96	97	92	87
Methane (CH_4) (thousand tonnes)	136	127	126	119	124	173	192	187	196	261
Nitrous oxide (N_2O) (thousand tonnes)	2	2	2	2	2	2	2	3	4	3
Hydrofluorocarbons (HFCs) (tonnes)	24	25	23	28	24	20	13	9	11	4
Flaring [B]										
Flaring (Upstream) (million tonnes CO_2 equivalent)	10.3	7.8	8.8	9.7	14.3	20.8	24.6	24.1	20.6	28.9
Flaring (Upstream) (million tonnes hydrocarbon flared)	3.5	2.6	2.8	3.4	4.8	7.0	8.1	8.1	6.8	9.5
Energy intensity										
Upstream excluding Oil Sands (gigajoules per tonne production) [C]	0.81	0.83	0.79	0.81	0.80	0.73	0.71	0.72	0.75	0.69
Oil Sands (gigajoules per tonne production) [D]	6.9	6.8	6.8	5.8	5.3	5.2	5.8	10.0	n/c	n/c

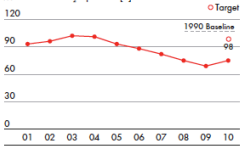
Comparing Shell Scope 1, Flaring, and Oil & NatGas production emissions

Source		Production	MtCO2e	Percent of total
Scope 1			75.0	23.8%
Flaring			10.3	3.3%
Oil & NGL product emissions (million		617	229.3	72.9%
Natural gas product emissions (Bcf)		3,396	-	0.0%
	Total		314.6	100.0%

Oil NGL coefficent	0.3714	MtCO2/million bbl
Gas coefficient	-	MtCO2/Bcf

DIRECT GREENHOUSE GAS EMISSIONS

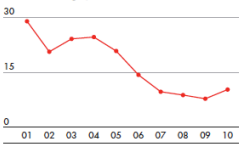
Million tonnes CO_2 equivalent [A]



[A] Target and baseline adjusted to reflect portfolio changes

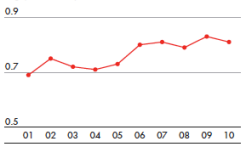
FLARING – UPSTREAM

Million tonnes CO_2 equivalent



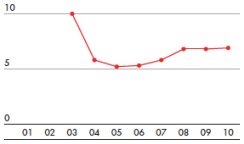
ENERGY INTENSITY – UPSTREAM (EXCLUDING OIL SANDS)

Gigajoules/tonne production



ENERGY INTENSITY – OIL SANDS

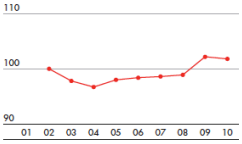
Gigajoules/tonne production [B]



[B] Includes mining and upgrading operations

ENERGY INTENSITY – REFINERIES

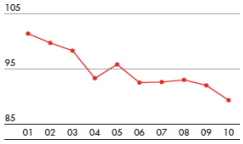
Refinery Energy Index [C]



[C] Indexed to 2002; based on 2006 Solomon EII℠ methodology

ENERGY INTENSITY – CHEMICAL PLANTS

Chemicals Energy Index



Shell Sustainability Report 2010, page 29.

NATURAL GAS PRODUCTION [A] — MILLION SCF/DAY

	2010 Shell subsidiaries	2010 Shell share of equity-accounted investments	2009 Shell subsidiaries	2009 Shell share of equity-accounted investments	2008 Shell subsidiaries	2008 Shell share of equity-accounted investments
Europe						
Denmark	328	–	335	–	406	–
Germany	267	–	311	–	333	–
Italy	38	–	31	–	29	–
The Netherlands	–	1,997	–	1,639	–	1,741
Norway	643	–	593	–	492	–
UK	541	–	561	–	678	–
Total Europe	1,817	1,997	1,831	1,639	1,938	1,741
Asia						
Brunei	55	497	44	473	51	499
China	253	–	257	–	231	–
Malaysia	807	–	886	–	874	–
Pakistan	96	–	92	–	86	–
Philippines	110	–	121	–	113	–
Russia	–	359	–	192	–	–
Syria	3	–	4	–	6	–
Total Asia	1,324	856	1,404	665	1,361	499
Oceania						
Australia	404	204	383	216	345	215
New Zealand	202	–	218	–	216	–
Total Oceania	606	204	601	216	561	215
Africa						
Egypt	137	–	163	–	145	–
Nigeria	587	–	292	–	552	–
Total Africa	724	–	455	–	697	–
North America						
Canada	563	–	530	–	406	–
USA	1,149	4	1,055	6	1,048	5
Total North America	1,712	4	1,585	6	1,454	5
South America						
Argentina	52	–	63	–	65	–
Brazil	9	–	18	–	33	–
Total South America	61	–	81	–	98	–
Total	6,244	3,061	5,957	2,526	6,109	2,460

[A] Reflects 100% of production attributable to subsidiaries; except in respect of PSCs, where the figures shown represent the entitlement of the companies concerned under those contracts.

SYNTHETIC CRUDE OIL PRODUCTION — THOUSAND B/D

	2010 Shell subsidiaries	2009 Shell subsidiaries
North America – Canada	72	80

BITUMEN PRODUCTION — THOUSAND B/D

	2010 Shell subsidiaries	2009 Shell subsidiaries
North America – Canada	18	19

MINED OIL SANDS PRODUCTION — THOUSAND B/D

	2008
Athabasca Oil Sands project after royalties	78

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	2010	2009	2008
	million SCF/day	million SCF/day	million SCF/day
Shell subsidiaries	6,244	5,957	6,109
Shell equity share	3,061	2,526	2,460
total	9,305	8,483	8,569
total per year (Bc	3,396	3,096	3,128

Shell CDP 2012	MtCO2e
Scope 1: CO2	70.700
Scope 1: CH4	2.800
Scope 1: N2O	0.440
Scope 1: HFCs	0.028
Scope 1: total	73.968
Use of products	570.000
Total	643.968
Percent Scope 1	11.5%

Sources of Scope 3 emissions	metric tonnes CO2e
Use of sold products	570000000

	2010	2009	2008
	k bbl /day	k bbl /day	k bbl /day
Shell subsidiaries	1,174	1,144	1,259
Shell equity share	445	437	434
Synthetic crude	72	80	78
total	1,691	1,661	1,771
total per year (million bbl)	617.22	606.27	646.42

Royal Dutch Shell submission to Carbon Disclosure Project for 2012, section 15.1: Scope 3 emissions. In tonnes CO2e.

Cell: K15
Comment: Rick Heede:
Royal Dutch Petroleum and Shell Transport agreed to an alliance in 1907. Royal Dutch moved its headquartes to Curacao during World War 2. Howarth, Stephen (1997) "A Century in Oil: The Shell Transport and trading Company 1897-1997" does not report on oil production by its sister company Royal Dutch.

Cell: AD16
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Netherlands India, Sarawak, Egypt, and Romania (Astra), respectively in 1918, shown in yellow cells.

Cell: AF16
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Netherlands India, Sarawak, Egypt, Romania (Astra), Romania (Baicoi), North America (Mid-continent), North America (California), Mexico, and Venezuela, respectively, in 1919, shown in yellow cells.

Cell: AH16
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Dutch East Indies, Sarawak, Egypt, Romania (Astra), North America (Mid-continent + California: 35,000 + 13,000 bbl per day totals 17,520,000 bbl/yr), Mexico, Venezuela, and Trinidad, respectively, in 1920 and/or 1921 (the annual reports are not clear aboutthe actual reporting years), shown in yellow cells. The data is reported in differing units (imperial tons, metric tonnes, and barrels); CMS has applied the appropriate conversion factors in each case.

Cell: J17
Comment: Rick Heede:
Sum of working columns F plus I (thousand bbl per day from Telaga Said (1892-1904) and Pangkalan (1893-1897) / Perlak (1900-1904 / Royal Dutch annual reports for 1912, 1913, and 1917 (data for 1915-1917). All summed to thousand bbl per day in column "I" and in million bbl per year in this column.

Cell: S20
Comment: Rick Heede:
Howarth, p. 47, "the minimum annual supply had not reached 50,000 tons." CMS assumes 45,000 tons. This equals 330,000 bbl. Since this refers only to East Indies supply contracts, CMS does not use this as a company production statistic.

Cell: D25
Comment: Rick Heede:
"Royal Dutch wells began to produce ... Shell's Sanga Sanga well began to run dry ... at Balik Papan (Borneo), Mark Abrahams struck oil again, at 750 feet. Production multiplied more than eight-fold, to 130 barrels a day -- equivalent to to 200,0000 cases annually." Note: 1 case = 2 tins @ 5 gallons. Source: Howarth (1997) A Century in Oil, p. 46.

Cell: D27
Comment: Rick Heede:
Howarth, p. 55: "By mid-1900 the new wells were producing a respectable 5,000 barrels a day, with production continuing to rise steadily."

Cell: U29
Comment: Rick Heede:
See Howarth, p. 64. Presumably only linked for purposes of transport and non-competition in Asia ...

Cell: AD30
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Dutch East Indies, Sarawak, Egypt, Romania (Astra), North America (Mid-continent + California: 35,000 + 13,000 bbl per day totals 17,520,000 bbl/yr), Mexico, Venezuela, and Trinidad, respectively, in 1920 and/or 1921 (the annual reports are not clear aboutthe actual reporting years), shown in yellow cells. The data is reported in differing units (imperial tons, metric tonnes, and barrels); CMS has applied the appropriate conversion factors in each case.

Cell: W34
Comment: Rick Heede:
Howarth, pp. 69-76.

Cell: F35
Comment: Rick Heede:
Natural gas SALES for 1975 and 1976 from Royal Dutch Petroleum Company (1977) Annual Report 1976, p. 22. Gas production is not reported.

Cell: Y36
Comment: Rick Heede:
Howarth, p. 145, reports wasted gas from thermal cracking dominant at Shell refineries from 1909 through at least the mid-1930s. CMS assumes 80 percent of the gas produced is not utilized, 10 cubic meters per barrel refined = 10 * 35.3 cf/m3 * 0.8 = 280 cf per bbl.

Cell: G39
Comment: Rick Heede:
Royal Dutch Shell crude oil production is reported for 1912 and 1913 for its fields in Netherlands India, Russia (four regional companies, e.g., Caspian, Grozny, North Caucasian, New Schibayeff), Egypt, US (Roxanna in Texas, and California Oilfields Ltd), Roumania (Astra Roumana), and Sarawak. Notes from Peter Roderick, Nov06. CMS adds annual production given in tons and bbl per year. 1912 total = 2.336787 million tons (assumed tonnes); 1913 = 3.78043 million tons.

Cell: D40
Comment: Rick Heede:
Howarth, p. 93: Shell purchased California Oilfield Ltd in 1913; Shell's North American production rose from 723,000 bbl in 1913 to 4.7 milllion bbl in 1914. No mention of global production between 1900 and at least 1914, except for occasional reference to individual fields. In 1914, Shell finally struck paydirt in Mexico with a gusher producing 100,000 bbl per day. However, a few months later, the U.S. invaded Mexico, President Huerta was expelled from office, the country descended into chaos, and the oil camps were abandoned. Howarth, p. 95.

Cell: AH44
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Dutch East Indies, Sarawak, Egypt, Romania (Astra), North America (Roxana Petrol Corp = 2,317,606 tonnes plus Shell of California = 3,475,661), Mexico, and Venezuela, respectively, in 1926, shown in yellow cells. The data is reported in differing units (imperial tons, metric tonnes); CMS has applied the appropriate conversion factors in each case.

Cell: J45
Comment: Rick Heede:
Crude oil production for the Shell and Royal Dutch amalgamation from annual reports for 1918 through 1928 (courtesy Peter Roderick, Guildford Library, London, Aug06). Production is reported in various units shown at the right of this worksheet, columns AC through AH, for each year. CMS uses appropriate conversion units for imperial tons metric tonnes for each regional reporting standard. Sums are shown in barrels per year and million tonnes per year.

Cell: E47
Comment: Rick Heede:
Partial, but the preponderance of US producing properties Shell owned in the US (California's Signal Hill and Roxana in Texas. Other properties were acquired in Oklahoma (1921), no production data reported. Howarth, p. 125. Shows California and Roxana in 1920 (16.5 and 8.2 thousand bbl per day) and 1925 (53.5 and 21.4 thousand bbl per day).

Cell: D52
Comment: Rick Heede:
Howarth, p. 151, shows production data for 1925 and 1929.

Cell: L53
Comment: Rick Heede:
Shell Union Oil Corporation (New York), annual reports for 1926 through 1930. Shell Union is assumed here to be accounts for Shell's US operations only. For 1930, in which year we have crude oil production from a Royal Dutch Petroleum annual report, we do NOT add US Shell and Royal Dutch, but instead use the US oil production data as a percentage of Royal Dutch's global production and on the basis of this quantitative relation extrapolate backwards to 1926. Note: For obvious reasons, this is a preliminary estimate in lieu of having global oil production data for both Shell and Royal Dutch Petroleum. No natural gas production is mentioned in the Shell Union reports.

Cell: D57
Comment: Rick Heede:
While Howarth's history of Shell Transport and Trading offers scant production data, it does (p. 157) give Shell's 1930 production as 466,500 bbl per day (and world production of 3.86 million bbl per day).
Howarth, Stephen (1997) "A Century in Oil: The Shell Transport and Trading Company 1897-1997," Weidenfeld & Nicolson, London, 397 pp.

Cell: K57
Comment: Rick Heede:
Oil production data for 1930-1931 from Royal Dutch Petroleum (1932) Annual Report, p. 12. Note: this report also noted that the company's managing director (August Kessler) "put forward a proposal ... to create along practical lines a sort of international organization to to prevent the various producers from continuing to produce so disjointedly." p. 11. As Yergin notes in "The Prize" (pp. 265-269), this "As Is" memoranda that attempted to restrain and stabilize production ran afoul of antitrust laws and competitive drives and collapsed in the mid-1930s.

Cell: AA57
Comment: Rick Heede:
Royal Dutch natural gas production data is not publicly available and we assume a 7.17 percent annual growth rate (average rate from 1954-1962) in estimated production from 1930 to 1953. At this rate total natural gas production is nearly equal to the gas wasted in refineries (calculated in column Y). This estimated production or marketed natural gas 1930-1953 will be revised if we locate published production data, or Royal Dutch Shell corrects the estimate with documented production data.

Cell: L59
Comment: Rick Heede:
Oil production by subsidiaries of Shell US are shown in Beaton (1957, p. 784). Wolverine Petroleum, for example, totals 496,000 bbl in 1934; the company was "dissolved" in 1938; the company's production in 1924 totaled 1.83 million bbl. Comar Oil Copany, Roxana Petroleum, and Shell Pacific are all detailed in this table. All this production is incorporated in Shell and Royal Dutch for the years covered, 1912-1955.

Cell: AE59
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Dutch East Indies, Sarawak, Egypt, Romania (Astra), North America (Roxana Petrol Corp = 2,694,312 tonnes plus Shell of California = 3,203,719 tonnes), Mexico (Corona and Aguila), Venezuela (Caribbean and Venezuelan concessions), Trinidad, and Argentina, respectively, in 1927, shown in yellow cells. The data is reported in metric tonnes; total in 1927 = 16,998,551 tonnes.

Cell: AG59
Comment: Rick Heede:
Shell Transport and Royal Dutch crude oil produced in Dutch East Indies, Sarawak, Egypt, Romania (Astra), North America (Shell Petroleum Corp, frmly Roxana Petrol Corp = 3,890,767 tonnes plus Shell Oil Company, frmly Shell of California = 3,812,233 tonnes), Mexico (Corona and Aguila), Venezuela (Caribbean and Venezuelan concessions), Trinidad, and Argentina, respectively, in 1927, shown in yellow cells. The data is reported in metric tonnes; total in 1928 = 22,063,411 tonnes.

Cell: K60
Comment: Rick Heede:
Oil production data for 1933-1934 from Royal Dutch Petroleum (1935) Annual Report, p. 9. .

Cell: K62
Comment: Rick Heede:
Oil production data for 1935-1936 from Royal Dutch Petroleum (1937) Annual Report, p. 11.

Cell: K64
Comment: Rick Heede:
Oil production data for 1937-1938 from Royal Dutch Petroleum (1939) Annual Report, p. 9.

Cell: J68
Comment: Rick Heede:
Oil production data for 1944, although very incomplete, is from Royal Dutch Petroleum (1945) Annual Report, pp. 6-10. Royal Dutch producing assets were either substantially destroyed or in enemy hands during the war. But we can piece together an estimate of 1944 production if we (a) use reported production in Iraq (1.212 million tonnes) and restored Roumanian production ("77 percent of pre-war production," or 1.167 million tonnes), and (b) assume that 1939-1944 production in Allied areas remained at 1938 levels: Egypt = 0.226 Mt, Venezuela = 11.31 Mt, US = 7.68 Mt, Argentina = 0.544 Mt. (c) Far Eastern production are assumed destroyed or in Japanese hands, Mexican assets have been appropriated by the Govt, and the minor German Reich production (0.01 Mt) has, of course, been appropriated by the Nazis. Production in Iraq has increased during the war (from 0.978 Mt in 1938 to 1.212 Mt in 1944). Total estimated Royal Dutch oil production for 1939 through 1944: 22.139 million tonnes. The resulting estimated Royal Dutch production in 1944 may be conservative given likely increased production in the US. We add 5 percent growth per year1940-1944.

Cell: K71
Comment: Rick Heede:
Oil production data for 1944, although very incomplete, is from Royal Dutch Petroleum (1945) Annual Report, pp. 6-10. Royal Dutch producing assets were either substantially destroyed or in eneemy hands during the war. But we can piece together an estimate of 1944 production if we (a) use reported production in Iraq (1.212 million tonnes) and restored Roumanian production ("77 percent of pre-war production," or 1.167 million tonnes), and (b) assume that 1939-1944 production in Allied areas remained at 1938 levels: Egypt = 0.226 Mt, Venezuela = 11.31 Mt, US = 7.68 Mt, Argentina = 0.544 Mt. (c) Far Eastern production are assumed destroyed or in Japanese hands, Mexican assets have been appropriated by the Govt, and the minor German Reich production (0.01 Mt) has, of course, been appropriated by the Nazis. Production in Iraq has increased during the war (from 0.978 Mt in 1938 to 1.212 Mt in 1944). Total estimated Royal Dutch oil production for 1939 through 1944: 22.139 million tonnes. The resulting estimated Royal Dutch production in 1944 may be conservative given likely increased production in the US.

Cell: K72
Comment: Rick Heede:
Oil production data for 1945 from Royal Dutch Petroleum (1946) Annual Report, p. 8. Note: The Annual reports for 1939 through 1944.

Cell: L72
Comment: Rick Heede:
Shell Oil Company, Annual report for 1949, with "net crude oil produced" for 1945-1949. CMS has only a copy of the title page and the table of statistics (p.20), and neither makes it clear that this is reporting on US operations only, which we can only surmise since reported quantities are a small fraction of those reported in Royal Dutch Shell annual reports for the same years (see column I). These production quantities are entered here, but assumed to be included in Royal Dutch Shell annual production and are NOT added to "Sum Production" (column M).

Cell: D73
Comment: Rick Heede:
Howarth, A Century in Oil, p. 223.

Cell: K74
Comment: Rick Heede:

Oil production data for 1947 and 1948 is from Royal Dutch Petroleum (1949) Annual Report, p. 9.
World production in 1948 totalled 488.97 million tonnes (of which US productoin was 292.5 Mt, or 59.8 percent); Royal Dutch equalled 9.8 percent of world total; p. 8.

Cell: I76
Comment: Rick Heede:
Oil production data for 1949 and 1950 is from Royal Dutch Petroleum (1951) Annual Report, p. 13. Original data reported in million bbl/yr: "Production of crude oil and natural gasoline, Royal Dutch/Shell Group of Companies, gross production" including 60.1 million bbl (1949) and 87.7 million bbl (1950) of "crude oil received under long-term contracts" which are subtracted from production reported here: 383.7 million bbl (Mbbl) less 60.1Mbbl = 323.6 Mbbl in 1949; 454.3 Mbbl less 87.7 Mbbl = 366.6 million bbl in 1950.

Cell: L77
Comment: Rick Heede:
Shell Oil Company, Annual report for 1954, with "net crude oil produced" for 1950-1954. CMS has only a copy of the title page and the table of statistics (p.26), and neither makes it clear that this reporting on US operations only, which we can only surmise since reported quantities are a small fraction of those reported in Royal Dutch Shell annual reports for the same years (see column I).
These production quantities are entered here, but assumed to be included in Royal Dutch Shell annual production and are NOT added to "Sum Production" (column M).

Cell: I78
Comment: Rick Heede:
Oil production data for 1951 and 1952 is from Royal Dutch Petroleum (1953) Annual Report, p. 6-7. We report only gross production of crude oil, not oil received under long-term contracts. 1952 production is taken from the 1954 annual report, since 1952 production wsa lowered from 471.8 to 465.5 million bbl.

Cell: I80
Comment: Rick Heede:
Oil production data for 1950 to 1953 is from Royal Dutch Petroleum (1955) Annual Report, p. 14.

Cell: E81
Comment: Rick Heede:
Crude oil production (both gross and net are listed here) for 1954 through 1962 from Royal Dutch Petroleum Company (1963) Annual Report 1962, p. 51. Per our protocol, we use data of net crude oil production as raw input to the calculation of carbon combusted into carbon dioxide. Also, Royal Dutch reports significant quantities (100.4 million bbl in 1954 and rising to 233.6 million bbl in 1962) of "quantities received under special supply contracts," which we do NOT include.
This presumably refers to Shell's contract with Gulf Oil in which "Gulf would produce, Shell would transport, refine, and market". Howarth, (1997) A Century in Oil, p.224. Oil came from Gul'f Persian Gulf operations at a time when Shell could not fill its own demand. This agreement had been signed in 1948, when Shell's Asian production had not yet been fully restored. Shell. of course, had other producing properties.

Cell: W81
Comment: Rick Heede:
Natural gas SALES for 1954 through 1962 from Royal Dutch Petroleum Company (1963) Annual Report 1962, p. 51. Note: gas production data is unavailable, nor are data on gas purchases reported. Original data in billion cubic feet per year.

Cell: E90
Comment: Rick Heede:
Crude oil production (both gross and net are listed here) for 1963 through 1966 from Royal Dutch Petroleum Company (1967) Annual Report 1966, p. 71. Per our protocol, we use data of net crude oil production as raw input to the calculation of carbon combusted into carbon dioxide. Also, Royal Dutch reports significant quantities (256.2 million bbl in 1963 and rising to 314.3 million bbl in 1966) of "quantities received under special supply contracts," which we do NOT include. See cell note 1954 re: Gulf production agreement and 50:50 profit sharing.

Cell: R90
Comment: Rick Heede:
Natural gas SALES for 1963 through 1966 from Royal Dutch Petroleum Company (1967) Annual Report 1966, p. 27. Note: neither gas production nor gas purchase data are reported. Original data in million cubic feet per day.

Cell: D94
Comment: Rick Heede:
Crude oil production for 1967 through 1970 from Royal Dutch Petroleum Company (1971) Annual Report 1970, p. 34. Per our protocol, we use data of net crude oil production as raw input to the calculation of carbon combusted into carbon dioxide. However, Royal Dutch does not report net production for 1967 to 1970, and we use gross production. Also, Royal Dutch reports significant quantities (329.2 million bbl in 1967 and rising to 342.0 million bbl in 1970) of "quantities received under special supply contracts," which we do NOT include.

Cell: E94
Comment: Rick Heede:
We have ESTIMATED net production by multiplying reported gross production for 1967-1979 (Shell only reported gross) by the average net of gross for the period 1954-1966 when both net and gross was reported. This factor is 87.31 percent, calculated in cell G89.

Cell: R94
Comment: Rick Heede:
Natural gas SALES for 1967 through 1970 from Royal Dutch (1971) Annual Report, p. 34.

Cell: AE96
Comment: Rick Heede:
Shell SustRpt 2010, page 29: "Greenhouse gas emissions The direct greenhouse gas (GHG) emissions from facilities we operate were 75 million tonnes on a CO2-equivalent basis in 2010, a 9% increase on 2009. The main reason for this rise was increased production across the company, including higher production in Nigeria due to an improved security situation. Around 60% of our GHG emissions came from the refineries and chemical plants in our Downstream business. The production of oil and gas in our Upstream business accounted for around 35% of our GHG emissions, and our shipping activities for the remaining 5%. We continue to work on improving operational performance and energy efficiency to reduce GHG emissions. In 2010, we met the voluntary target we set in 1998 for our direct GHG emissions from facilities we operate to be at least 5% lower than our comparable 1990 level. Shell's GHG emissions in 2010 were around 25% lower than our comparable 1990 level. The indirect GHG emissions from our purchases of energy (electricity, heat and steam) were 10 million tonnes on a CO2?equivalent basis in 2010, 11% higher than in 2009. We estimate that the CO2 emissions from the use of the products we made were around 670 million tonnes in 2010."

Cell: AE97
Comment: Rick Heede:
SustRpt 2010, page 20: "In 2010, the flaring – or burning off – of natural gas in our Upstream business rose by 32% compared to 2009, to 10.3 million tonnes of CO2 equivalent. This was mainly due to increased oil production in Nigeria and the start of our contract in Iraq. Flaring made up nearly 14% of our total direct GHG emissions in 2010. Around 20% was operational flaring for safety reasons and during the start-up of Upstream facilities. We aim to minimise this operational flaring. The remaining 80% was continuous flaring from facilities where there is no infrastructure to capture the gas produced with oil, known as associated gas. Around 80% of this continuous flaring takes place in Nigeria where the security situation and a lack of funding from the government partner has previously slowed progress on projects to capture the associated gas (pages 18–19). Around 10% of the continuous flaring came from the Majnoon field in Iraq where we became the operator in 2010. We expect that flaring in Iraq will rise in future years as production increases and before equipment to capture the associated gas can be installed (page 17). When we acquire or become the operator of an existing facility that is already flaring or venting (releasing gas into the atmosphere) it takes time before these activities can be stopped."

Cell: D98
Comment: Rick Heede:
Crude oil production for 1971 through 1974 from Royal Dutch Petroleum Company (1975) Annual Report 1971, p. 15. Per our protocol, we use data of net crude oil production as raw input to the calculation of carbon combusted into carbon dioxide. However, Royal Dutch does not report net production for 1970 through 1974, and we use gross production. Furthermore, Royal Dutch does NOT report quantities of crude oil or products purchased from other producers or refiners. See 1954 cell note.

Cell: R98
Comment: Rick Heede:

Natural gas SALES for 1971 through 1974 from Royal Dutch (1975) Annual Report, p. 22.

Cell: D102
Comment: Rick Heede:
Crude oil supply, which appears to mean gross supply (both gross production and "local puchases", for 1975 and 1976 from Royal Dutch Petroleum Company (1977) Annual Report 1976, p. 16. Per our protocol, we use data of net crude oil production as raw input to the calculation of carbon combusted into carbon dioxide. However, Royal Dutch does not report net production for 1975-76, and we use gross production minus "local purchases": 291.3 million bbl in 1975 (798 kbb/d) and 339.4 million bbl in 1976 (930 kbbld).

Cell: D104
Comment: Rick Heede:
Crude oil supply for 1977-1979 from Royal Dutch/Shell Group (1980) Annual Report, five-year operational comparisons, p. 20. Shell does not report net production, and we subtract "local purchases" from total supply:
1977: 4,847 - 1,171 = 3,676;
1978: 4,714 - 1,287 = 3,427;
1979: 4,555 - 1,296 = 3,259 kbbld.
Note: Oil companies typically report on oil and natural gas reserves, often unaudited. Shell's reserve report for 1979, for example, shows oil production at (426) million barrels plus (76) Mbbl from "group share of developed and undeveloped reserves of associated companies." Total reported crude oil production is thus 502 million bbl. It is not clear why production reported in this table (p. 57) differs from production reported at p. 20: 3,259 kbbld = 1.190 billion bbl (after subtracting "local purchases"). This 688 million bbl cannot be explained by adding NGL production (which is not detailed in this annnual report).

Cell: R104
Comment: Rick Heede:
Natural gas SALES for 1977-1979 from Royal Dutch/Shell Group (1980) Annual Report, five-year operational comparisons, p. 20.

Cell: E107
Comment: Rick Heede:
"Net equity crude oil production" — including natural gas liquids, and excluding royalty purchases — from the reserves of crude oil and natural gas liquids ..., including the Group share of associated companies." Royal Dutch/Shell Group (1985) SEC Form 20-F, p. 14.
RDSG annual reports for 1980-1995 appear not to have published crude oil supply data (substituting "production" in their reserve statements, which may underreport actual production). Net equity production as reported here also appear incongruous with previous annual reports and crude oil supplies (production less "local purchases"). See notes under 1970, 1974, 1976, and 1979 for details.
Note 1: the discontinuity between gross production in 1979 (from Shell annual report for 1979) and net production in 1980 (SEC Form 20-F) is very large and is not explained by royalty payments to host governments and other usual differences between gross and net. Net production in the SEC filing also includes natural gas liquids.
Note 2: Shell's reported daily net production on page 14 (SEC Form 20-F) agrees with data in the same report's Reserve table (pp. G29-G30) once group share of associated companies is added in (40 to 44 million bbl/yr).

Cell: W109
Comment: Rick Heede:
Natural gas production from Royal Dutch Petroleum Company (1985) SEC Form 20F for Royal Dutch Shell Group of Companies changes to "proved developed and undeveloped reserves" of natural gas. Group share of associated companies is shown in the next column for the same years.

Cell: E112
Comment: Rick Heede:
"Net equity crude oil production" — including natural gas liquids, and excluding royalty purchases — from the reserves of crude oil and natural gas liquids ..., including the Group share of associated companies." Royal Dutch/Shell Group (1988) SEC Form 20-F, p. 12, includes data for oil, natural gas, and coal from 1983-1987 (we use 1985-1987 here).

Cell: W112
Comment: Rick Heede:
"Natural gas production" for 1985-1987 from Natural Gas Reserves Table in Royal Dutch Petroleum (1988) SEC Form 20F, pp. G29-G31. First column of data lists production by Group companies; second column lists production by associated companies.

Cell: R114
Comment: Rick Heede:
"Natural gas sales from Group companies plus Group share of associated companies' production, plus royalty purchases" for 1983-1987 in Royal Dutch Petroleum (1988) SEC Form 20F, p. 13. Sales data is entered for comparative reasons. We use gas production for 1985-1987 from the Natural Gas Reserves table at pp. G29-G31 (see Bcf column at right).

Cell: W115
Comment: Rick Heede:
The data source for Shell natural gas production has been lost, but is presumably Oil & Gas Journal.

Cell: D126
Comment: Rick Heede:
Production data 1999-2003 from Shell (2004) Financial and Operational Information 1999-2003, p. 44. Note: includes re-stated data from 1999-2002, thus differs somewhat from Oil & Gas Journal Data Book and Energy Intelligence (2003) Top 100 (for which production in 2000 = 2,284 and 2001 = 2,234 kbbld.

Cell: R126
Comment: Rick Heede:
Production data 1999-2003 from Shell (2004) Financial and Operational Information 1999-2003, p. 44. Note: includes re-stated data from 1999-2002, thus differs somewhat from Oil & Gas Journal Data Book and Energy Intelligence (2003) Top 100 (in which production in 2000 = 8,212 and 2001 = 9,009 million cf/d).

Cell: E127
Comment: Rick Heede:
Cells in light blue are "derived data" in this case from production by an acquired company (Enterprise), for which production data is given in million bbls/yr. Ditto for gas in 2000-2001, gas production in billion cf/yr.

Cell: J127
Comment: Rick Heede:
Oil production data from Oil & Gas Journal (2002) OGJ100, p. 88. Data in million bbl/yr. Note: RDSG acquired Enterprise Oil PLC (UK), with substantial North Sea oil and gas production, in 2002.

Cell: X127
Comment: Rick Heede:
Oil production data from Oil & Gas Journal (2002) OGJ100, p. 88. Data in billion cf/yr.
Note: RDSG acquired Enterprise Oil PLC (UK), with substantial North Sea oil and gas production, in 2002.

Cell: D136
Comment: Rick Heede:
AR 2010 pg 31 (pdf pg 33); total crude oil and nat gas liquids, Shell subsidiares + Shell share of equity-accounted investments; note slightly lower reported production for 2008

Cell: AI139
Comment: Rick Heede:
Shell CDP rpt 2012: Total Scope 1: 74.0 MtCO2e, Scope 2: 10.0 MtCO2e. Scope 1: Downstream: 39.80 MtCO2e, Upstream (other than flaring): 20.60 MtCO2e Upstream flaring: 10.00 MtCO2e, Shipping: 3.20 MtCO2e, Other: 0.30 MtCO2e. CO2: 70.70 MtCO2 CH4: 2.80 MtCO2e N2O: 0.44 MtCO2e, HCFs: 0.028 MtCO2e. Also 240 TWh of fuel (of which 195.6 TWh of "own fuel"), plus 13.0 TWh of electricity, plus 17.6 TWh of steam. Scope 3 "use of products sold:" 570 MtCO2. Sum of Scope 1 plus products sold: 644 MtCO2e, of which Scope 1 is 11.49 percent.