

Oil and natural gas extraction data

Richard Heede
 Climate Mitigation Services
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Statoil, Norway

www.statoil.com Oslo

yellow column indicates original reported units **67% State-owned**

Production / Extraction data

Year	Crude Oil & NGL			Natural Gas		
	Net production	Net production	Net production	Net production	Net production	Net production
	Million bbl /yr	Million bbl /yr	Million bbl /yr	Bcf/yr	Bcf/yr	Billion cf/yr

1972-2010

Operations in 30 countries

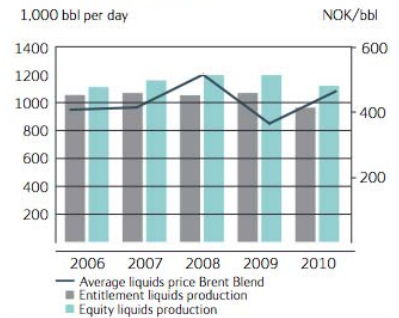


Statoil's Gullfaks platform

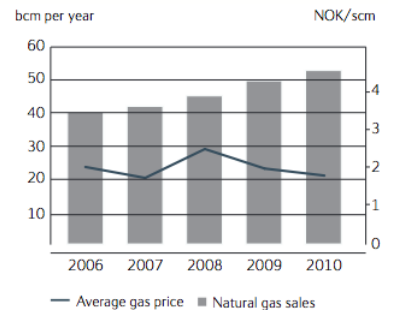
15	1950
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70	2005
71	2006
72	2007
73	2008
74	2009
75	2010

Year	Norsk Hydro		Statoil		%	Norsk Hydro		Statoil		%
	% of NCS prod'n 1971 to 1986	OGJ100 1987-2010	Hydro plus Statoil	million bbl /yr		% of NCS prod'n 1977 to 1986	OGJ100 1987-2007	Hydro plus Statoil	Bcf/yr	
1972	8.0%	0	Saga Petroleum	0	0%	15	15	0%		
1973	8.0%	1		1	0%	75	75	0%		
1974	8.0%	1	Statoil	1	0%	102	10	4%		
1975	8.0%	6	% of NCS prod'n 1979 to 1986	6	0%	115	24	8%		
1976	8.0%	8	OGJ100	8	0%	106	35	12%		
1977	8.0%	8	1987-2007	8	0%	93	45	16%		
1978	7.5%	10		10	0%	83	56	20%		
1979	7.0%	10	6	16	4%	83	73	24%		
1980	6.5%	13	15	28	8%	74	74	24%		
1981	6.0%	11	22	34	12%	64	74	24%		
1982	5.5%	11	31	42	16%	137	102	4%		
1983	5.0%	12	48	60	20%	116	99	4%		
1984	4.5%	12	95	108	24%	114	104	4%		
1985	4.0%	12	105	117	24%	82	110	8%		
1986	3.5%	12	115	126	24%	71	141	21%		
1987	3.0%	9	125	133	24%	69	141	21%		
1988		14	128	142		69	176	25%		
1989		29	126	155		69	177	25%		
1990		34	124	158		85	177	25%		
1991		42	157	200		77	177	25%		
1992		48	176	224		104	247	35%		
1993		55	177	232		111	539	650		
1994		70	192	262		116	830	946		
1995		76	182	258		150	886	1,036		
1996		81	169	250		182	514	696		
1997		79	150	229		191	538	729		
1998		78	168	246		227	657	884		
1999		97	262	359		275	700	975		
2000		119	275	394		312	781	1,093		
2001		120	268	388		337	953	1,290		
2002		135	271	406		380	953	1,333		
2003		143	271	414		Sold to Statoil	1,352	1,352		
2004		153	265	418		Statoil AnnRpt	1,469	1,469		
2005		146	256	402		Statoil AnnRpt	1,519	1,519		
2006		141	244	385		Statoil AnnRpt	1,509	1,509		
2007		Acq. by Statoil	391	391						
2008		Statoil AnnRpt	386	386						
2009		Statoil AnnRpt	381	381						
2010		Statoil AnnRpt	352	352						

Oil production/price

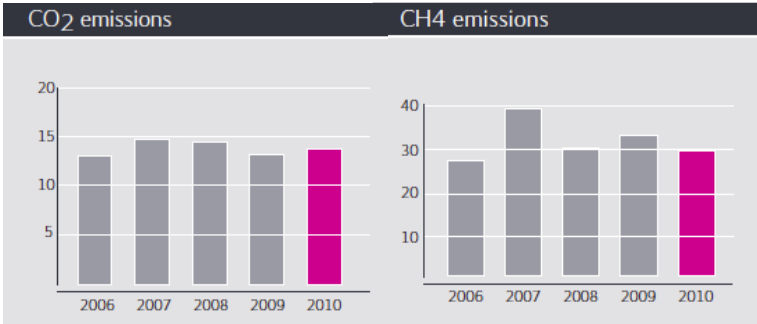


Gas production/price



Total	1,797	5,934	7,731	3,205	15,064	19,079
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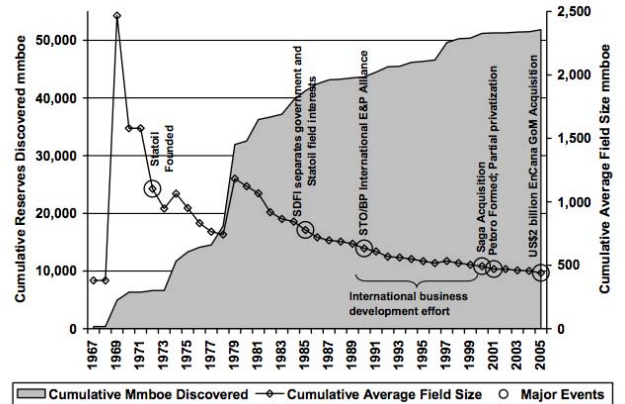
	Q	R	S	T	U	V	W	X	Y	Z	AA
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Statoil Factbook 2010, page 51.

Statoil Factbook 2010, page 52.

CUMULATIVE RESERVE DISCOVERY HISTORY IN NORWAY



Gordon & Stenvoll (2007) Statoil: A Study in Political Entrepreneurship, Fig. 1.

Download data from www.statoil.com

For the year ended 31 December				
Entitlement production	2010	2009	2008	
Norway				
Crude oil (mmbbls) ¹	256	279	302	
Natural gas (bcf)	1,370	1,367	1,348	
Natural gas (bcm)	38.8	38.7	38.2	
Combined oil and gas (mmboe)	500	523	542	
Eurasia excluding Norway				
Crude oil (mmbbls) ¹	18	19	n/a	
Natural gas (bcf)	51	49	n/a	
Natural gas (bcm)	1.4	1.4	n/a	
Combined oil and gas (mmboe)	27	28	n/a	
Africa				
Crude oil (mmbbls) ¹	53	63	n/a	
Natural gas (bcf)	41	54	n/a	
Natural gas (bcm)	1.2	1.5	n/a	
Combined oil and gas (mmboe)	60	73	n/a	
America				
Crude oil (mmbbls) ¹	26	20	n/a	
Natural gas (bcf)	47	48	n/a	
Natural gas (bcm)	1.3	1.4	n/a	
Combined oil and gas (mmboe)	34	29	n/a	
Outside Norway				
Crude oil (mmbbls) ¹	n/a	n/a	85	
Natural gas (bcf)	n/a	n/a	121	
Natural gas (bcm)	n/a	n/a	3.4	
Combined oil and gas (mmboe)	n/a	n/a	106	
Total				
Crude oil (mmbbls) ¹	352	381	386	
Natural gas (bcf)	1,509	1,519	1,469	
Natural gas (bcm)	42.8	43.0	41.6	
Combined oil and gas (mmboe)	621	652	648	

¹) Crude oil includes natural gas liquids (NGL), condensate and bitumen. NGL includes both LPG and naphta.

Sales Volumes	Year ended		
	2010	2009	2008
Statoil: ⁽¹⁾			
Crude oil (mmbbls) ⁽²⁾	354	381	372
Natural gas (bcf)	1472	1462	1387
Natural gas (bcm) ⁽³⁾	41.7	41.4	39.3
Combined oil and gas (mmboe)	616	642	619
Third party volumes: ⁽⁴⁾			
Crude oil (mmbbls) ⁽²⁾	310	257	242
Natural gas (bcf)	247	192	127
Natural gas (bcm) ⁽³⁾	7.0	5.4	3.6
Combined oil and gas (mmboe)	354	291	265
SDFI assets owned by the Norwegian State:			
Crude oil (mmbbls) ⁽²⁾	172	200	213
Natural gas (bcf)	1,610	1,431	1,440
Natural gas (bcm) ⁽³⁾	45.6	40.5	40.8
Combined oil and gas (mmboe)	458	455	470
Total			
Crude oil (mmbbls) ⁽²⁾	835	838	827
Natural gas (bcf)	3,329	3,085	2,955
Natural gas (bcm) ⁽³⁾	94.3	87.4	83.7
Combined oil and gas (mmboe)	1428	1388	1353

in the table above are based on include NGL and condensate. All (GCV) of 40 MJ/scm. crude oil include both volumes



Norway's gas transport system, Statoil Factbook 2010, page 41.

Alternate production estimate for 2008

	Thousand bbl /d	Million bbl /yr	Million cf/d	Bcf/yr
2008	1,199	438	4,647	1,696

Source: Hults, & Thurber, 2012, Introduction, Table 1.1, page 24, in Victor et al, eds, 2012, Oil and Governance. Table 1.1 is based on information from Wood Mackenzie's Pathfinder Database; www.woodmacresearch.com

Background data on oil and gas production, Norwegian Continental Shelf 1971-2010

Figures below from : Norwegian Petroleum Directorate (2012) Facts 2012, www.npd.no

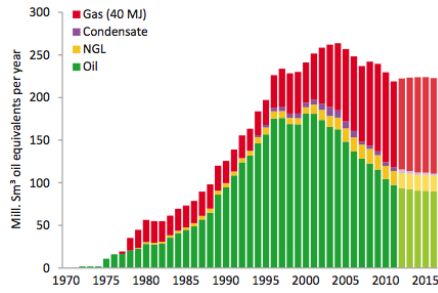


Figure 3.7 Historical production of oil and gas and production forecast for the coming years

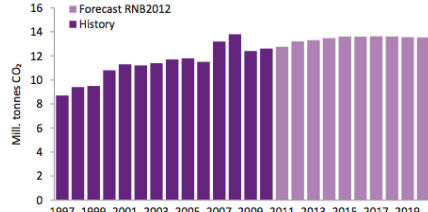


Figure 9.3 Emissions of CO₂ from the Norwegian petroleum sector

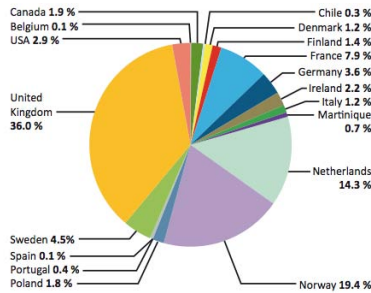


Figure 6.5 Deliveries of Norwegian crude oil distributed by receiving country, 2011

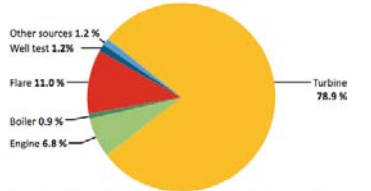
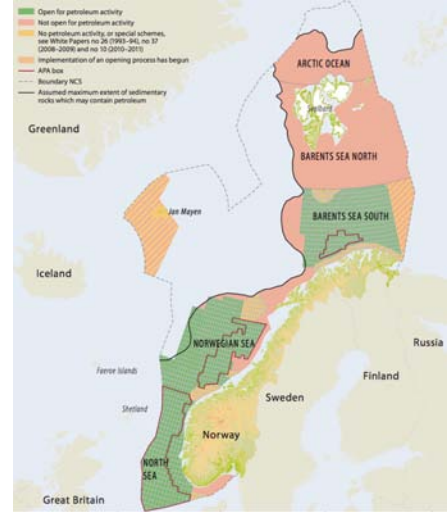


Figure 9.2 CO₂ emissions from petroleum activities 2010, by source (Source: Norwegian Petroleum Directorate)



Norwegian Petroleum Directorate (2012) Facts 2012, www.npd.no

Note on flaring

Norwegian Petroleum Directorate

Total Oil & Gas production, Norwegian Continental Shelf

factpages.npd.nefactpages/
Accessed April 2013

1 cubic meter = 35.314667 cf
1 m³ (oil) = 6.289 bbl

Percent by Norsk Hydro and Statoil

Year	Oil million m ³	Gas Bcm	NGL million m ³	Condensate million m ³	Oil equiv. million m ³	Oil equiv. Million BOE	Oil + cond. + NGL Million bbl	Gas Bcf	Percent by Norsk Hydro and Statoil	
									Oil + cond. + NGL Statoil+Hydro %	Gas Statoil+Hydro %
									"F" / "AK"	"J" / "AL"
1971	0.36	-	-	-	0.36	2	2	-		
1972	1.93	-	-	-	1.93	12	12	-	8.0%	
1973	1.87	-	-	-	1.87	12	12	-	8.0%	
1974	2.01	-	-	-	2.01	13	13	-	8.0%	
1975	11.00	-	-	-	11.00	69	69	-	8.0%	
1976	16.23	-	-	-	16.23	102	102	-	8.0%	
1977	16.64	2.65	-	0.00	19.30	121	105	94	8.0%	16.0%
1978	20.64	14.20	-	0.02	34.87	219	130	501	7.5%	15.0%
1979	22.48	20.67	1.13	0.04	44.32	279	149	730	11.0%	15.3%
1980	28.22	25.09	2.44	0.05	55.80	351	193	886	14.5%	15.7%
1981	27.48	24.95	2.17	0.05	54.65	344	187	881	18.0%	16.0%
1982	28.53	23.96	2.29	0.04	54.82	345	194	846	21.5%	16.3%
1983	35.65	23.61	2.68	0.04	61.98	390	241	834	25.0%	16.7%
1984	41.09	25.96	2.64	0.06	69.76	439	275	917	39.1%	17.0%
1985	44.76	26.19	2.97	0.08	73.99	465	301	925	38.9%	16.0%
1986	48.77	26.09	3.85	0.06	78.77	495	331	921	38.1%	15.0%
1987	56.96	28.15	4.12	0.05	89.28	561	384	994	34.7%	24.1%
1988	64.72	28.33	4.85	0.05	97.95	616	438	1,000	32.5%	21.4%
1989	85.98	28.74	4.90	0.05	119.67	753	572	1,015	27.1%	21.5%
1990	94.54	25.48	5.01	0.05	125.08	787	626	900	25.3%	21.3%
1991	108.51	25.03	4.90	0.06	138.49	871	714	884	28.0%	24.0%
1992	124.00	25.83	4.96	0.05	154.85	974	811	912	27.6%	23.0%
1993	131.84	24.80	5.52	0.47	162.64	1,023	867	876	26.8%	28.0%
1994	146.28	26.84	7.12	2.40	182.65	1,149	980	948	26.7%	27.6%
1995	156.78	27.81	7.94	3.18	195.71	1,231	1,056	982	24.4%	25.8%
1996	175.50	37.41	8.23	3.78	224.92	1,415	1,179	1,321	21.2%	26.6%
1997	175.91	42.95	8.07	5.38	232.31	1,461	1,191	1,517	19.2%	42.8%
1998	168.74	44.19	7.39	5.05	225.37	1,417	1,139	1,561	21.6%	60.6%
1999	168.69	48.48	6.99	5.51	229.67	1,444	1,140	1,712	31.5%	60.5%
2000	181.18	49.79	7.23	5.41	243.61	1,532	1,219	1,758	32.3%	39.6%
2001	180.88	54.04	10.92	5.67	251.51	1,582	1,242	1,908	31.2%	38.2%
2002	173.65	65.59	11.80	7.32	258.36	1,625	1,212	2,316	33.5%	38.2%
2003	165.48	73.71	12.88	10.32	262.38	1,650	1,187	2,603	34.9%	37.5%
2004	162.78	78.59	13.58	8.67	263.63	1,658	1,164	2,776	35.9%	39.4%
2005	148.14	85.09	15.73	7.95	256.91	1,616	1,081	3,005	37.2%	42.9%
2006	136.58	87.94	16.67	7.63	248.82	1,565	1,012	3,106	38.1%	42.9%
2007	128.28	89.70	16.61	3.13	237.71	1,495	931	3,168	42.0%	42.7%
2008	122.66	99.33	16.93	3.91	242.84	1,527	902	3,508	42.8%	41.9%
2009	115.45	103.75	16.93	4.42	240.55	1,513	860	3,664	44.3%	41.5%
2010	104.35	107.25	15.48	4.12	231.20	1,454	780	3,788	45.2%	39.8%
2011	97.50	101.37	16.29	4.55	219.71	1,382	744	3,580		
2012	89.20	114.57	17.71	4.55	226.03	1,422	701	4,046		
1971-2012	3,812	1,738	289	104	5,943	37,379	26,447	61,382		

Cell: H9**Comment:** Rick Heede:

Statoil was incorporated as a limited liability company under the name Den Norske Stats Oljeselskap AS on 18 September 1972. As a company wholly owned by the Norwegian State, Statoil's role was to be the government's commercial instrument in the development of the oil and gas industry in Norway. In 2001, the company became a public limited company listed on the Oslo and New York stock exchanges, and it changed its name to Statoil ASA. On 1 October 2007, the oil and gas division of Norsk Hydro ASA was merged with Statoil, and the company was given the temporary name of StatoilHydro. On 1 November 2009, the company changed its name back to Statoil.

Source: [www.statoil.com: history](http://www.statoil.com/history)

With the Ekofisk discovery in 1969, the Norwegian oil adventure really began. Production from the field started on 15 June 1971, and in the following years a number of major discoveries were made. Exploration in the 1970s was confined to the area south of the 62nd parallel. The shelf was gradually opened, and only a restricted number of blocks were awarded in each licensing round. Foreign companies dominated exploration off Norway in the initial phase, and were responsible for developing the country's first oil and gas fields. Statoil was created in 1972, and the principle of 50 percent state participation in each production licence was established. This rule was later changed so that the Storting (parliament) can evaluate whether the level of state participation should be lower or higher, depending on circumstances.

From 1 January 1985, the State's participation in petroleum operations was reorganised. The State's participation was split in two, one linked to the company and the other becoming part of the State's Direct Financial Interest (SDFI) in petroleum operations. SDFI is an arrangement in which the State owns interests in a number of oil and gas fields, pipelines and onshore facilities. Each government take is decided when production licences are awarded and the size varies from field to field. As one of several owners, the State pays its share of investments and costs, and receives a corresponding share of the income from the production licence. The Storting resolved in the spring of 2001 that 21.5 percent of the SDFI's assets could be sold. 15 percent was sold to Statoil and 6.5 percent was sold to other licensees. The sale of SDFI shares to Statoil was seen as an important element on the way to a successful listing and privatisation of Statoil. Statoil was listed in June the same year, and now operates on the same terms as every other player on the NCS. Petoro was established in May 2001 as a state-owned limited company to manage the SDFI on behalf of the State. At the end of 2006, 52 fields were in production on the NCS. In 2006, these fields produced 2.8 million barrels of oil (including NGL and condensate) per day and 88 billion standard cubic metres (scm) of gas. www.regjeringen.no/en/dep/oed/Subject/Oil-and-Gas/Norways-oil-history-in-5-minutes.html

Cell: M9**Comment:** Rick Heede:

World Bank, 2008b, page 200L "Statoil (then StatoilHydro) is an integrated oil and gas company organized as a public limited liability company. In a 2001 decision the Storting (Norwegian Congress) required that the Norwegian state must continue to own two-thirds of StatoilHydro. Currently the Norwegian government owns 62.5% of Statoil, which ownership interest is managed by the Ministry of Petroleum and Energy. The government plans to increase its ownership interest to 67% over time."

World Bank (2008b) A Citizen's Guide to National Oil Companies, Part B: Data Directory, World Bank, Washington, & Center for Energy Economics, Bureau of Economic Geology Jackson School of Geosciences University of Texas, Austin, 764 pp.

Cell: W18**Comment:** Rick Heede:

Gordon, Richard, & Thomas Stenvoll (2007) "Statoil: Lessons from a study of political entrepreneurship," in: The Changing Role of National Oil Companies in International Energy Markets, James Baker III Institute for Public Policy, Rice University, 2 March 2007.

Cell: AJ28**Comment:** Rick Heede:

In Figure 9.2, flaring is 11 percent of ~13 million tonnes CO₂. This is contrary to the vision for Norwegian petroleum development as stated by the Norwegian Parliament in 1971: Thurber & Istad (p. 642) "Ten Commandments for the Norwegian oil sector," by Storting, 1971, one of which is "The flaring of gas not to be allowed except for short testing periods."

Cell: AK32**Comment:** Rick Heede:

Quest Offshore Resources, Inc., www.questoffshore.com/Home/ConversionCalculator/

Cell: D33**Comment:** Rick Heede:

Norsk Hydro annual reports 1983-1990 show reams of charted data, but typically aggregates oil and gas in TOE accompanied by no specifics. Oil and gas production (data in TOE) and a chart in the 1987 report (p. 38) showing oil vs gas.

We have estimated Hydro's oil production from its approximate "equity shares of NCS (Norwegian Continental Shelf) production" 1971 to 1986 -- from ~8 percent and declining to ~3.5 percent in 1986 (see percentages in column C). Approximated from Thurber & Tangen Istad, 2012, Figure 14.2 (citing Norwegian Petroleum Directorate data).

This should be viewed as provisional until actual production data is found.

Thurber, Mark C., & Benedicte Tangen Istad (2012) "Norway's evolving champion: Statoil and politics of state enterprise," in Victor et al, eds, Oil & Governance, pp. 599-654.

Cell: B37**Comment:** Rick Heede:

The Norwegian government increased its stake in Norsk Hydro to 51 percent at the end of 1970, and it was thought that Hydro would become Norway's primary oil company. Instead the new administration decided to create a wholly-owned state enterprise -- Statoil, in 1972. The government also directed the remaining private Norwegian oil interests to merge in what became Saga Petroleum, which was acquired by Norsk Hydro in 1999 (although Elf Acquitaine also bid for the privately-held company).

Cell: E37**Comment:** Rick Heede:

The Norwegian government directed the remaining private Norwegian oil interests (after having created Statoil and invested in Norsk Hydro) to merge into what became Saga Petroleum in ~1972, which was acquired by Norsk Hydro in 1999 (although Elf Acquitaine also bid for the privately-held company).

We do not have a complete record of Saga's oil and gas production, but Oil & Gas Journal OGJ 100, Sep1993, shows 1992 oil production of 29.5 million bbl, 23.3 million bbl in 1991; gas production totaled 17.1 Bcf in 1992, and 12.4 Bcf in 1991. Inasmuch as our protocol attributes previous oil and gas production to the acquiring entity, it is safe to suggest that Statoil's total undercounts production by a 200-300 million bbl or more.

Cell: AN38**Comment:** Rick Heede:

These percentages are calculated by CMS for 1972-1983.

Cell: H39**Comment:** Rick Heede:

According to the Norwegian Petroleum Directorate, natural gas production started in 1977. We have roughly estimated the gas production by both Norsk Hydro and Statoil for 1977 to the Oil & Gas Journal estimates (starting in 1987). WE do not, however, have production data from either Hydro or Statoil for these years, and the allocation between companies may be inaccurate. However, the sum of both companies' production (column J) is considerably below the percentage of total NCS production attributed to Hydro + Statoil (based on O&G estimates); see the calculations in column AO on page 3.

Also see details in the oil production calculations for Hydro (1971-1986) and Statoil (1979-1983) in cell notes D33 and E41, respectively.

Cell: I39**Comment:** Rick Heede:

See comment in cell note H39.

Cell: E41**Comment:** Rick Heede:

We do not have Statoil equity production data for 1979 to 1986, and approximate production from its equity percentage share of NCS and total NCS production. We have estimated Statoil's oil production from its approximate "equity shares of NCS (Norwegian Continental Shelf) production" 1979 to 1986 -- from ~4 percent and increasing to ~16 percent in 1983 (see percentages in column C). Approximated from Thurber & Tangen Istad, 2012, Figure 14.2 (citing Norwegian Petroleum Directorate data). This should be viewed as provisional until actual production data is found, or provided by Statoil. Thurber, Mark C., & Benedicte Tangen Istad (2012) "Norway's evolving champion: Statoil and politics of state enterprise," in Victor et al, eds, Oil & Governance, pp. 599-654.

Cell: A043**Comment:** Rick Heede:

These percentages are calculated by CMS for 1977-1986.

Cell: E50**Comment:** Rick Heede:

Ambiguous data in Statoil's annual report for 1984. Mentions production by field (but no equity production data), "Statoil's total access to crude increased in 1984 ... exceeded 13 million tonnes" p. 12 (but does not define access), etc. Takes the datum cited for "access" to crude oil of 13 million tonnes @ 7.33 bbl per tonne = 94.9 million bbl.

Cell: E51**Comment:** Rick Heede:

CMS interpolated for 1985-1986 and 1989.

Cell: B56**Comment:** Rick Heede:

Statoil joined forces with BP from 1990 to 1999 to explore and produce oil and gas internationally, in Kazakhstan, Azerbaijan, Vietnam, China, Angola, Nigeria, and Algeria; assets in Kazakhstan and Vietnam were later sold. Statoil is one the most internationalized of state-owned National Oil Companies. Thurber and Tangen Istad, 2012, page 622.

Cell: I63**Comment:** Rick Heede:

Estimate not available from OGJ100. CMS interpolates.

Cell: B67**Comment:** Rick Heede:

While Statoil was partially privatized in 2001, Thurber and Tangen Istad believe the Norwegian government will retain "more than two-thirds stake in Statoil for the foreseeable future." (2012, page 603.)

Cell: D73**Comment:** Rick Heede (Jan10):

Hydro (previously Norsk Hydro) sold its oil & gas assets to StatOil as of October 2007.

Cell: E74**Comment:** Rick Heede:

AR 2010 online <http://www.statoil.com/AnnualReport2010/en/OurOperations/ProductionVolumesAndPriceInformation/Pages/EntitlementProduction.aspx>; updated 2008 production

Cell: I74**Comment:** Rick Heede:

AR 2010 online, link in oil comment, 2008 value consistent

Cell: T74**Comment:** Rick Heede:

Statoil "working interest liquids production in 2008" at 1,199 thousand bbl per day. Victor, Hults, & Thurber, 2012, Introduction, Table 1.1, page 24, in Victor et al, eds, 2012, Oil and Governance. Table 1.1 is based on information from Wood Mackenzie's Pathfinder Database; www.woodmacresearch.com

Cell: V74**Comment:** Rick Heede:

Statoil "working interest natural gas production in 2008" at 4,647 thousand cf per day. Victor, Hults, & Thurber, 2012.

Cell: A079**Comment:** Rick Heede:

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