

Oil and NGL extraction data

Richard Heede
Climate Mitigation Services
File started: 11 January 2005
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Saudi Aramco, Saudi Arabia

www.saudiaramco.com Dhahran

yellow column indicates original reported units

100% State-owned enterprise

Production / Extraction data

Crude Oil & NGL

Year

Aramco NGL production	Aramco crude oil production	Subtotal Crude + NGL	Aramco NGL production	Aramco crude oil production	Notes	Company 2	Total	Allocation	Total
Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Million bbl /yr	Million bbl /yr	Million bbl /yr	Million bbl /yr	Percent	Million bbl /yr
Arabian American Oil Co 1944-1974; Saudi Aramco 1974-	Saudi Aramco	Saudi Aramco	Saudi Aramco	Saudi Aramco	Saudi Aramco	Saudi Aramco	Arabian Oil Company	Total	Total

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2018

Aramco crude production	Aramco crude & NGL	Aramco crude production	Aramco NGL	Aramco crude production	Notes	Company 2	Total	Allocation	Total
Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Thousand bbl /d	Million bbl /yr	Million bbl /yr	Million bbl /yr	Million bbl /yr	Percent	Million bbl /yr
1	1	0.5	1	0.5			0.5	10.0%	0.0
11	11	3.9	11	3.9			4	10.0%	0.4
14	14	5.1	14	5.1			5	10.0%	0.5
12	12	4.3	12	4.3			4	10.0%	0.4
12	12	4.5	12	4.5			5	10.0%	0.5
13	13	4.9	13	4.9			5	10.0%	0.5
21	21	7.8	21	7.8			8	10.0%	0.8
58	58	21	58	21			21	10.0%	2.1
164	164	60	164	60			60	10.0%	6.0
246	246	90	246	90			90	10.0%	9.0
391	391	143	391	143			143	10.0%	14
477	477	174	477	174			174	10.0%	17
547	547	200	547	200			200	10.0%	20
762	762	278	762	278			278	10.0%	28
827	827	302	827	302			302	10.0%	30
845	845	308	845	308			308	10.0%	31
953	953	348	953	348			348	10.0%	35
965	965	352	965	352			352	10.0%	35
989	989	361	989	361			361	10.0%	36
992	992	362	992	362			362	10.0%	36
1,015	1,015	370	1,015	370			370	10.0%	37
1,095	1,095	400	1,095	400			400	10.0%	40
1,251	1,251	456	1,251	456			456	10.0%	46
1,393	1,393	508	1,393	508			515	10.0%	52
1,521	1,524	555	1,524	555			578	10.0%	58
1,629	1,635	595	1,635	595			645	10.0%	64
1,721	1,732	628	1,732	628			695	10.0%	70
2,025	2,039	739	2,039	739			810	10.0%	81
2,393	2,408	873	2,408	873			921	10.0%	97
2,598	2,618	948	2,618	948			1,057	10.0%	106
2,838	2,876	1,036	2,876	1,036			1,159	10.0%	116
2,993	3,039	1,092	3,039	1,092			1,227	10.0%	123
3,549	3,601	1,295	3,601	1,295			1,440	10.0%	144
4,498	4,550	1,642	4,550	1,642			1,791	10.0%	179
5,749	5,803	2,098	5,803	2,098			2,268	10.0%	227
7,335	7,432	2,677	7,432	2,677			2,856	25.0%	714
8,210	8,347	2,997	8,347	2,997			3,047	60.0%	1,828
8,627	8,698	2,492	8,698	2,492			2,543	60.0%	1,526
8,367	8,552	3,054	8,552	3,054			3,121	100.0%	3,121
9,017	9,236	3,291	9,236	3,291			3,371	100.0%	3,371
8,066	8,319	2,944	8,319	2,944			3,037	100.0%	3,037
9,251	9,560	3,377	9,560	3,377			3,490	100.0%	3,490
9,658	10,027	3,525	10,027	3,525			3,660	100.0%	3,660
9,624	10,072	3,513	10,072	3,513			3,676	100.0%	3,676
6,327	6,757	157	6,757	157			2,466	100.0%	2,466
4,374	4,704	120	4,704	120			1,717	100.0%	1,717
3,933	4,288	130	4,288	130			1,565	100.0%	1,565
3,041	3,357	115	3,357	115			1,225	100.0%	1,225
4,690	4,994	1,712	4,994	1,712			1,823	100.0%	1,823
3,991	4,336	126	4,336	126			1,583	100.0%	1,583
4,942	5,358	152	5,358	152			1,956	100.0%	1,956
4,864	5,284	154	5,284	154			1,929	100.0%	1,929
6,258	6,791	195	6,791	195			2,479	100.0%	2,479
8,053	8,625	209	8,625	209			3,148	100.0%	3,148
8,179	8,789	223	8,789	223			3,208	100.0%	3,208
7,865	8,515	237	8,515	237			3,108	100.0%	3,108
7,855	8,543	251	8,543	251			3,118	100.0%	3,118
7,808	8,539	267	8,539	267			3,117	100.0%	3,117
7,886	8,645	277	8,645	277			3,155	100.0%	3,155
7,752	8,519	280	8,519	280			3,110	100.0%	3,110
8,006	8,771	279	8,771	279			3,201	100.0%	3,201
7,274	8,011	269	8,011	269			2,924	100.0%	2,924
7,800	8,581	285	8,581	285			3,132	100.0%	3,132
7,571	8,372	292	8,372	292			3,056	100.0%	3,056
assumed = 2001	7,593	317	7,593	317			2,817	100.0%	2,817
assumed = 2001	8,905	345	8,905	345			3,345	100.0%	3,345
assumed = 2001	387	315	387	315			3,537	100.0%	3,537
399	400	310	400	310			3,710	100.0%	3,710
395	399	325	399	325			3,649	100.0%	3,649
395	395	314	395	314			3,509	100.0%	3,509
402	402	326	402	326			3,668	100.0%	3,668
410	410	2,888	410	2,888			3,298	100.0%	3,298
445	445	2,887	445	2,887			3,332	100.0%	3,332
9,100	9,100	3,310	9,100	3,310			3,771	100.0%	3,771
9,500	9,500	3,479	9,500	3,479			3,961	100.0%	3,961
3,433	3,433	3,433	3,433	3,433			3,610	100.0%	3,610
3,480	3,480	3,480	3,480	3,480			3,661	100.0%	3,661
3,665	3,665	3,665	3,665	3,665			4,003	100.0%	4,003
3,866	3,866	3,866	3,866	3,866			4,362	100.0%	4,362
3,680	3,680	3,680	3,680	3,680			4,168	100.0%	4,168
3,760	3,760	488	3,760	488			4,248	100.0%	4,248



Add AOC Ltd to ARAMCO
7
22
48
63
810
92
101
110
118
125
131
150
144

Saudi Aramco takes 25% stake in 1973

OGJ100 1987-2010 for comparison
2,284
2,977
3,032
2,950

ARAMCO data Crude only
2,900
2,800
2,900
2,700
2,800
2,800
2,500
2,479
3,000
3,150
3,150
3,250

Alt oil prod'n estimate for 2008
Thousand bbl /d Million bbl /yr
10,669 3,894
Hults, & Thurber, Introduction, Table 1.1, in Victor, 2012, Oil and Governance.
Data from Wood Mackenzie's Pathfinder Database: www.woodmacresearch.com

review this for NGL from both oil and gas operations, less condensate included in oil

Total	na	na	na	8,532	118,392	27,312	33,286	159,885	87.5%	139,834
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Natural gas extraction data

Richard Heede
Climate Mitigation Services
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 Last modified: January 2020

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Saudi Aramco, Saudi Arabia

www.saudiaramco.com Dahran

100% State-owned enterprise

Production / Extraction data

Year	Natural Gas						Background data
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Aramco	Aramco	Subtotal		Aramco	Aramco	Total	Allocation
Million cf/d	Million cf/d	Million cf/d		Billion cf/yr	Billion cf/yr	Billion cf/yr	Percent
Saudi Aramco	Saudi Aramco	Saudi Aramco		Saudi Aramco	Saudi Aramco	Total	

- 17 1935
- 18 1936
- 19 1937
- 20 1938
- 21 1939
- 22 1940
- 23 1941
- 24 1942
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- 28 1946
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- 37 1955
- 38 1956
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- 81 1999
- 82 2000
- 83 2001
- 84 2002
- 85 2003
- 86 2004
- 87 2005
- 88 2006
- 89 2007
- 90 2008
- 91 2009
- 92 2010
- 93 2011
- 94 2012
- 95 2013
- 96 2014
- 97 2015
- 98 2016
- 99 2017
- 100 2018
- 101
- 102 **Total**
- 103

Year	Proxy data (EIA) Saudi NGL prod'n	Subtotal
1970	61	42.7
1971	65	45.5
1972	61	42.7
1973	90	63.0
1974	130	91.0
1975	140	98.0
1976	185	129.5
1977	215	150.5
1978	250	175.0
1979	303	211.9
1980	369	
1981	433	
1982	430	
1983	330	
1984	355	
1985	375	
1986	385	
1987	418	
1988	499	
1989	503	
1990	620	



Aramco gas sales Billion cf/yr
0.0
0.0
0.1
0.1
0.1
0.1
0.1
0.6
0.8
0.8

48.2% gas utiliz.

Est. Saudi Aramco net gas production 1955-2010 Bcf/yr	Percent to Saudi Aramco
0	10.0%
0	10.0%
0	10.0%
0	10.0%
0	10.0%
0	10.0%
0	10.0%
0	10.0%
3	10.0%
4	10.0%
4	10.0%
4	10.0%
5	10.0%
8	10.0%
9	10.0%
10	10.0%
10	10.0%
40	25.0%
131	60.0%
120	60.0%
138	100.0%
159	100.0%
335	100.0%
400	100.0%
450	100.0%
564	100.0%
430	100.0%
418	100.0%
620	100.0%
716	100.0%
890	100.0%

D.G. Schofield loads the first export of Saudi oil. 1939

Saudi Arabia gross gas prod'n Bcf/yr	Saudi Arabia net gas prod'n Bcf/yr	Aramco gas sales in bbl per yr
na	na	-
na	32	11,776
na	36	107,489
na	36	130,682
na	40	140,901
na	45	
574	78	
638	94	
711	80	
938	96	
1,127	99	
1,440	160	
1,671	219	
1,335	200	



Consonance Agreement is signed May 29, 1933.

Year	Consonance EIA over O&G	OGJ 1987-2010 Bcf/yr
1987	946	741
1988	1,028	899
1989	1,052	1,080
1990	1,465	1,401
1991	1,666	1,592
1992	1,745	1,592
1993	1,822	1,592
1994	1,893	1,592
1995	1,915	1,592
1996	2,038	1,592
1997	1,634	1,592
1998	1,685	1,592
1999	1,707	1,592
2000	1,864	1,592
2001	2,002	1,592
2002	2,108	1,592
2003	2,379	2,143
2004	2,676	2,380
2005	2,860	2,873
2006	2,992	3,000
2007	2,930	2,920
2008	3,046	3,030
2009	3,163	2,573
2010	2,510	2,510
2011	2,720	2,720
2012	2,965	2,965
2013	3,000	3,000
2014	2,841	
2015	2,912	
2016	3,915	
2017	4,061	
2018	4,161	

Year	OGJ 1987-2010 Bcf/yr	Aramco raw gas to plants Bcf/day
1987	741	741
1988	899	899
1989	1,080	1,080
1990	1,401	1,135
1991	1,592	1,190
1992	1,592	1,310
1993	1,592	1,307
1994	1,592	1,449
1995	1,592	1,482
1996	1,592	1,507
1997	1,592	1,562
1998	1,592	1,610
1999	1,592	1,617
2000	1,592	1,752
2001	1,592	1,942
2002	2,143	2,143
2003	2,380	2,380
2004	2,873	2,873
2005	2,873	2,873
2006	3,000	3,000
2007	2,920	2,741
2008	3,030	2,778
2009	2,573	3,123
2010	2,510	3,427
2011	2,720	3,049
2012	2,965	3,298
2013	3,000	3,376
2014		3,478
2015		3,543
2016		3,707
2017		3,176
2018		3,249



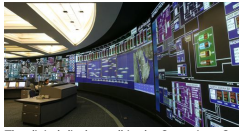
Energy Intelligence Crude oil prod'n 2000 & 2001	Bcf/day
8,602	3.11
8,301	3.26
	3.59
	3.58
	3.97
	4.06

Energy Intelligence million cf/d	million cf/d
4,580	4.28
4,747	4.41
	4.43
	4.80
	5.32

"natural gas supplied" million cf/day	"raw gas processed" million cf per day
7,023	7,998
7,610	8,336
8,556	8,556
9,388	9,388
6,823	9,882
7,349	10,720
7,488	7,488
7,783	11,277
7,979	11,434
8,280	12,033
8,733	12,442

Note: total prodn not 8,700 3,176 Corporate Overview 2019
 8,900 3,249 Corporate Overview 2019

CAI, Apr19: we modified calculation fr research the use of the differential: re-injected, company use, flar 19,800



The digital display wall in the Operations Coordination Center is the largest in the petroleum industry (2005).



11,637.000

US Energy Information Administration, International Energy Statistics

www.eia.gov/emeu/international/energy.html https://www.eia.gov/beta/international/data/

	Saudi Arabia	Saudi Arabia	Updated June 2019	Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia	Vented & Flared of	Vented & Flared of
	Crude oil, condensate, & NGPL	million bbl per yr	gas only	Gross NatGas Prod	Prod Market Gas	Reinjected NatGas	Vented & Flared	Dry NatGas Prod	gross gas prod'n	dry gas production
	k bbl per day			Bcf per year	Bcf per year	Bcf per year	Bcf per year	Bcf per year	%	%
1980	10,269	3,748		NA	NA	-	1,355	334		406%
1981	10,248	3,741		NA	NA	-	903	564		160%
1982	6,913	2,523		NA	NA	-	755	430		176%
1983	5,416	1,977		NA	NA	-	576	418		138%
1984	5,018	1,832		NA	NA	-	525	620		85%
1985	3,763	1,373		NA	NA	-	110	716		15%
1986	5,255	1,918		NA	NA	-	98	890		11%
1987	4,683	1,709		NA	NA	-	71	946		8%
1988	5,585	2,039		NA	NA	-	117	1,028		11%
1989	5,567	2,032		NA	NA	-	138	1,052		13%
1990	7,030	2,566		1,741	1,465		184	1,077	11%	17%
1991	8,795	3,210		2,284	1,666	92	155	1,130	20%	41%
1992	9,045	3,301		2,534	1,745		177	1,201	18%	34%
1993	8,902	3,249		2,377	1,822		205	1,268	15%	28%
1994	9,106	3,324		2,479	1,893		226	1,331	15%	27%
1995	9,237	3,371		2,612	1,915		248	1,343	17%	33%
1996	9,235	3,371		2,742	2,038		265	1,460	16%	30%
1997	9,399	3,431		1,680	1,634		11	1,601	2%	2%
1998	9,469	3,456		1,758	1,685		22	1,653	3%	3%
1999	8,903	3,250		1,719	1,707		2	1,632	1%	1%
2000	9,472	3,457		1,888	1,864		4	1,759	1%	1%
2001	9,152	3,341		2,013	2,002		3	1,896	0%	0%
2002	8,809	3,215		2,120	2,108		3	2,002	0%	0%
2003	10,075	3,677		2,399	2,379		16	2,121	0%	0%
2004	10,791	3,939		2,700	2,676		17	2,319	0%	0%
2005	11,490	4,194		2,873	2,860		6	2,516	0%	0%
2006	11,092	4,049		3,002	2,992		8	2,594	0%	0%
2007	10,742	3,921		3,028	2,930		4	2,628	3%	4%
2008	11,422	4,169		3,145	3,046		6	2,841	3%	3%
2009	10,310	3,763		3,251	3,163		2	2,770	3%	3%
2010	10,900	3,979		3,513	3,424		2	3,096	2%	3%
2011	11,458	4,182		3,706	3,616		89	3,258	2%	3%
2012	11,832	4,319		3,928			0	3,439		
2013	11,693	4,268		4,030			1	3,462		
2014	11,615	4,240		4,122			0	3,547		
2015	12,064	4,403		4,232			-	3,614		
2016	12,379	4,518		NA			-	3,739		
2017	12,081	4,410		NA			-	3,859		
2018	12,395	4,524								
2019										

Updated June 2019
Crude oil, condensate, & NGPL

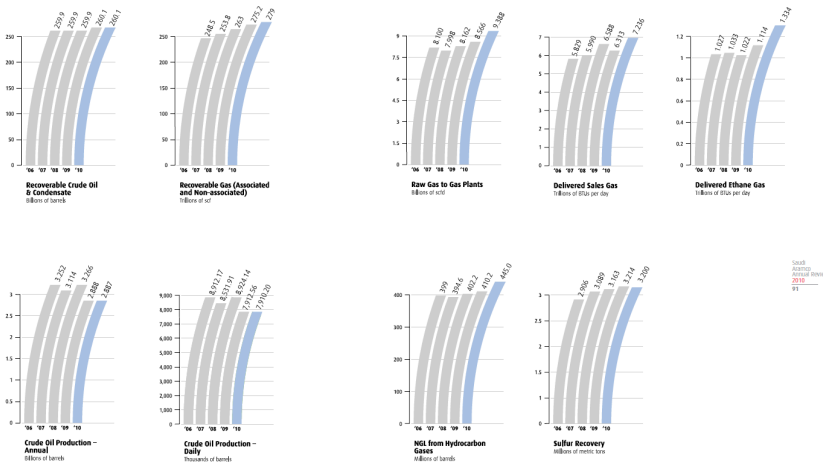
Updated June 2019

Updated June 2019

Updated June 2019
(dry gas, EIA stat to 2017)

1990-2015 totals	71,675	30,138	1,473	3,544	57,560
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Saudi Aramco production data



Saudi Aramco Annual Review 2010, pages 90-91.

SAUDI ARAMCO PRODUCTION, 1996 - 2006
(billions of barrels)

Year	Crude Oil	Refined Products
2006	3.25	0.59
2005	3.31	0.59
2004	3.15	0.57
2003	3.0	0.52
2002	2.5	0.52
2001	2.8	0.50
2000	2.8	0.50
1999	2.7	0.47
1998	2.9	0.47
1997	2.8	0.44
1996	2.9	0.44

SAUDI ARAMCO EXPORTS, 2001 - 2006
(barrels)

Year	Crude Oil	Refined Products	NGL*
2006	2,541,692,569	183,985,356	285,374,991
2005	2,622,997,627	201,589,157	289,485,392
2004	2,479,269,999	191,648,785	273,984,183
2003	2,357,921,983	158,047,102	265,929,431
2002	1,897,875,597	145,084,881	239,265,378
2001	2,178,362,274	169,281,494	230,072,047

*Natural gas liquids comprising propane, butane, condensate and natural gasoline

Crude Oil, Natural Gas & Refined Products

Crude Oil & Refined Products (barrels)	2009	2010
Crude Oil Production, excluding NG blended	2,888,082,578	2,887,223,698
Crude Oil Exports	2,060,741,025	2,020,345,893
Crude Oil Transported Using company or Chartered Vessels	487,631,000	471,324,000
Refined Products Production	496,197,789	499,777,459
Refined Products Exports	149,367,259	133,423,868

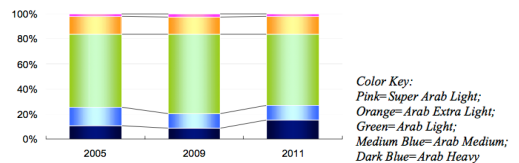
Natural Gas	2009	2010
Feed to Gas Plants (billions SCF/day)	8.556	9.388
Sales Gas (methane) (trillions BTUs/day)	6.313	7.236
Ethane (trillions BTUs/day)	1.114	1.334
Total Delivered Gas	7.427	8.319
Liquids-in-lieu of methane (trillions BTUs daily)	0	0.251

Natural Gas Liquids - Production	2009	2010
NGL Production from Hydrocarbon Gases (barrels)		
Propane	152,261,722	168,512,868
Butane	100,679,040	106,639,505
Condensate	82,839,545	93,969,126
Natural Gasoline	74,467,706	75,924,401
Total NGL Production	410,248,013	445,045,900

Natural Gas Liquids - Produced for Sale	2009	2010
NGL Sales from Hydrocarbon Gases (barrels)		
Propane	137,503,460	157,086,648
Butane	79,748,080	90,267,407
Condensate	8,881,499	11,454,420
Natural Gasoline	51,438,402	57,611,673
Total NGL Exports (excludes sales on behalf of SAMREF and SASREF)	277,571,441	316,420,148

Saudi Aramco Annual Review 2010, page 96.

FIGURE 4: PERCENTAGE SHARE OF EACH SAUDI CRUDE GRADE

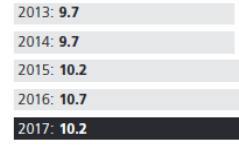


Color Key:
Pink= Super Arab Light;
Orange= Arab Extra Light;
Green= Arab Light;
Medium Blue= Arab Medium;
Dark Blue= Arab Heavy

BP Stat Rev 2018		
Crude oil & NGL		
	thousand bpd	Mb
1970	3,851.1	1,406
1971	4,820.9	1,760
1972	6,070.3	2,216
1973	7,693.2	2,808
1974	8,617.7	3,145
1975	7,216.4	2,634
1976	8,762.2	3,198
1977	9,418.9	3,438
1978	8,554.1	3,122
1979	9,841.6	3,592
1980	10,269.5	3,748
1981	10,256.0	3,743
1982	6,961.0	2,541
1983	4,951.4	1,807
1984	4,534.1	1,655
1985	3,601.0	1,314
1986	5,208.2	1,901
1987	4,450.2	1,624
1988	5,656.1	2,064
1989	5,635.5	2,057
1990	7,105.5	2,594
1991	8,819.8	3,219
1992	9,091.7	3,318
1993	8,892.7	3,246
1994	8,983.0	3,279
1995	8,973.5	3,275
1996	9,086.5	3,317
1997	9,005.3	3,287
1998	9,266.8	3,382
1999	8,523.8	3,111
2000	9,121.2	3,329
2001	8,935.0	3,261
2002	8,206.5	2,995
2003	9,628.2	3,514
2004	10,305.9	3,762
2005	10,838.6	3,956
2006	10,670.8	3,895
2007	10,268.8	3,748
2008	10,664.8	3,893
2009	9,708.9	3,544
2010	9,864.8	3,601
2011	11,079.2	4,044
2012	11,621.8	4,242
2013	11,392.9	4,158
2014	11,518.8	4,204
2015	11,997.9	4,379
2016	12,406.0	4,528
2017	11,892.2	4,341
2018	12,286.8	4,485

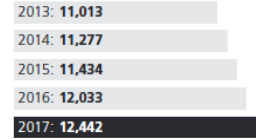
BP Stat Rev 2018		
Natural Gas		
	Bcf/d	Bcf
1970	0.1	54
1971	0.1	45
1972	0.1	51
1973	0.2	60
1974	0.2	76
1975	0.2	91
1976	0.3	98
1977	0.4	138
1978	0.5	190
1979	0.6	234
1980	0.9	325
1981	1.0	380
1982	1.1	403
1983	1.1	394
1984	1.7	609
1985	1.7	631
1986	2.3	845
1987	2.5	899
1988	2.7	974
1989	2.7	1,000
1990	3.1	1,125
1991	3.2	1,180
1992	3.5	1,280
1993	3.7	1,343
1994	3.9	1,435
1995	3.9	1,440
1996	4.1	1,486
1997	4.2	1,521
1998	4.3	1,571
1999	4.2	1,550
2000	4.6	1,667
2001	4.9	1,801
2002	5.2	1,902
2003	5.5	2,015
2004	6.0	2,197
2005	6.5	2,390
2006	6.8	2,465
2007	6.8	2,497
2008	7.4	2,691
2009	7.2	2,632
2010	8.1	2,941
2011	8.5	3,095
2012	9.1	3,323
2013	9.2	3,356
2014	9.4	3,435
2015	9.6	3,504
2016	10.2	3,709
2017	10.6	3,858
2018	10.8	3,959

Daily crude oil production (millions of bpd)

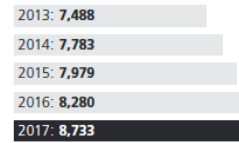


Includes blended condensate and Bahrain's share of the Abu Safah field

Raw gas processed (millions of scfd)



Natural gas supplied (millions of scfd)



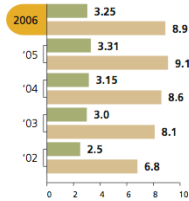
Saudi Aramco (2018) Saudi Aramco annual review 2017, Dhahran, 82 pp.

BP Stat Rev Jun19

BP Stat Rev Jun19

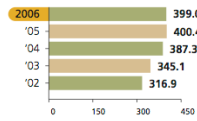
CRUDE OIL PRODUCTION

● ANNUAL (billions of barrels) ● DAILY (millions of barrels)



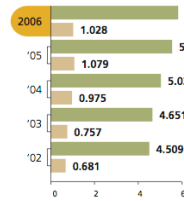
NGL FROM HYDROCARBON GASES

(millions of barrels)



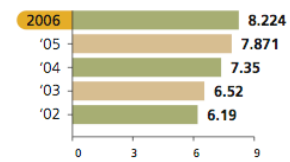
DELIVERED SALES GAS & ETHANE GAS

(trillions of BTUs per day) ● SALES GAS ● ETHANE GAS



RAW GAS TO GAS PLANTS

(billions of scfd)



Main refining projects

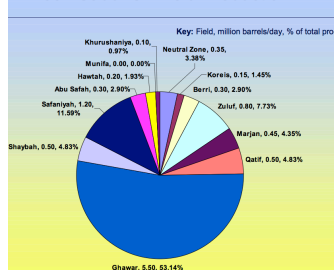
Location	Added capacity	Partner	Status	Start-up
Fujian, China	+160 kb/d	ExxonMobil, Sinopec	Under construction	2008-09
Seosan, ROK	+480 kb/d	S-Oil	BOD approved	2010
Yanbu, KSA	+400 kb/d	ConocoPhillips	MOU signed	2011
Jubail, KSA	+400 kb/d	Total	MOU signed	2011
Port Arthur, US	+325 kb/d	Shell	Planned	2010
Qingdao, China	+200 kb/d	Sinopec, Local gov't	Planned	2012

Refining / petrochemical integration projects

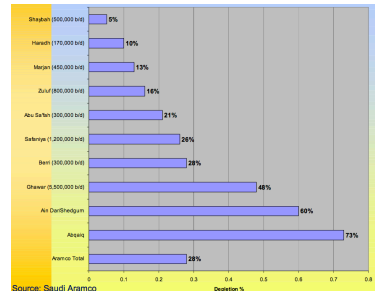
Location	Plants	Partner	Status	Start-up
Rabigh, KSA	Ethane cracker, HOFCC	Sumitomo	Under construction	2008
Ras Tanura, KSA	Ethane cracker, Aromatics	Dow	MOU signed	2012

Kobayashi, 2007, Saudi Aramco's downstream strategies.

2004 Saudi Oil Field Production



Jaffe & Elass, 2007



Source: Saudi Aramco



The Leo Star, a double-hulled supertanker capable of transporting 2 million barrels of crude oil, joins the Vela fleet (2002).



www.saudiaramco.com history, 1974: "Tankers take on crude oil at the Ras Tanura Sea Island Terminal, 1974."

Cell: H9

Comment: Rick Heede:

Wikipedia (viewed Dec2011):

Saudi Aramco, officially the Saudi Arabian Oil Company, is the state-owned national oil company of Saudi Arabia. Saudi Aramco is estimated to be worth \$8 trillion USD, making it the world's most valuable non-publicly listed company. Saudi Aramco has both the largest proven crude oil reserves, at more than 260 billion barrels (41 billion m³), and largest daily oil production.[6] Headquartered in Dhahran, Saudi Arabia, Saudi Aramco operates the world's largest single hydrocarbon network, the Master Gas System. Its yearly production is 7.9 billion barrels (1.26 billion m³), and it managed over 100 oil and gas fields in Saudi Arabia, including 279 trillion scf of natural gas reserves. Saudi Aramco owns the Ghawar Field, the world's largest oil field, and the Shaybah Field, one of the world's largest oil fields.

History The origins of Saudi Aramco can be traced back to May 29, 1933, when the Saudi government granted a concession to Standard Oil of California (Socal) which allowed the company to explore for oil in Saudi Arabia. Socal assigned this concession to a wholly owned subsidiary called California-Arabian Standard Oil Co. (Casoc). In 1936, with the company having no success at locating oil, the Texas Oil Company (Texaco) purchased a 50% stake of the concession.

After four years of fruitless exploration, the first success came with the seventh drill site in Dammam, a few miles north of Dhahran in 1938, a well referred to as Dammam No. 7. This well immediately produced over 1,500 barrels per day (240 m³/d), giving the company confidence to continue. The company name was changed in 1944 from California-Arabian Standard Oil Company to Arabian American Oil Company (or Aramco). In 1948, Socal and Texaco were joined as investors by Standard Oil of New Jersey (Esso) which purchased 30% of the company, and Socony Vacuum (later Mobil) which purchased 10% of the company, leaving Socal and Texaco with 30% each.

In 1950, King Abdul Aziz Ibn Saud threatened to nationalize his country's oil facilities, thus pressuring Aramco to agree to share profits 50/50. A similar process had taken place with American oil companies in Venezuela a few years earlier. The American government granted US Aramco member companies a tax break known as the golden gimmick equivalent to the profits given to Ibn Saud. In the wake of the new arrangement, the company's headquarters were moved from New York to Dhahran.

In 1973, following US support for Israel during the Yom Kippur War, the Saudi Arabian government acquired a 25% share of Aramco, increased the share to 60% by 1974, and finally acquired full control of Aramco by 1980. In November 1988, the company changed its name from Arabian American Oil Company to Saudi Arabian Oil Company (or Saudi Aramco) and officially cut all oil supply to Israel by order of the CEO. In addition, Saudi Aramco has become a fully owned privately held company with no shareholders or partners in business.

http://en.wikipedia.org/wiki/Saudi_Aramco

See also: Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown, in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge University Press, 1034 pp.

Jaffe, Amy Myers, & Jareer Elass (2007) "Case Study on Saudi Aramco," in: The Changing Role of National Oil Companies in International Energy Markets, Baker Institute for Public Policy, Rice University, 2 March 2007.

Jaffe, Amy Myers, & Jareer Elass (2007b) Saudi Aramco: National Flagship with Global Responsibilities, Case Study Series: The Changing Role of National Oil Companies in International Energy Markets, Baker Institute for Public Policy, March, 103 pp.

Cell: N9

Comment: Rick Heede:

100 percent government owned. 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. At page 506.

See also Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown," in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge Univ. Press

Cell: W9

Comment: Rick Heede:

Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown," in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge Univ. Press.

Myers Jaffe, Amy, & Jareer Elass (2007) "Case Study on Saudi Aramco," 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: I12

Comment: Rick Heede:

Total net worldwide crude oil plus natural gas liquids produced by each company or state-owned enterprise. Where data is available, we list net or equity or working interest production.

Crude production includes natural gas liquids (NGL) unless noted.

Cell: V12

Comment: Rick Heede:

Natural gas is typically reported as dry gas; natural gas liquids are reported under crude oil.

Carbon dioxide is normally removed from the gas flow at the production site (see "Vented Carbon Dioxide").

"SCM/d" = standard cubic meters per day. "cf/d" = cubic feet per day.

Net production typically excludes a number of diverted gas streams. Quantities and fractions vary; ExxonMobil's exclusions are probably typical of the industry: "Net production available for sale quantities are the volumes withdrawn from ... natural gas reserves, excluding royalties and volumes due to others when produced, and excluding gas purchased from others, gas consumed in producing operations, field processing plant losses, volumes used for gas lift, gas injections and cycling operations, quantities flared, and volume shrinkage due to the removal of condensate or natural gas liquids production."

ExxonMobil Corporation (2004) 2003 Financial and Operating Review, www.exxonmobil.com, p. 55.

Cell: B17

Comment: Rick Heede:

"On May 29 1933, an oil concession agreement is signed between Saudi Arabia and Standard Oil Company of California (Socal). On November 8, a subsidiary company, California Arabian Standard Oil Company (Casoc) is created to manage the concession." In 1935 the first test well is drilled at Dhahran into the Dammam Dome.

1936: Texas Co. (now Chevron Corporation) acquires a 50% interest in Socal's concession.

1938: "The success of the Saudi Arabian oil enterprise rests on Well No. 7. After five years of fruitless drilling, Well No.7 seems like a dead end. Socal department heads seek advice from renowned geologist Max Steineke. Drawing on years of fieldwork in the Saudi desert and his own encyclopedic knowledge, Steineke tells them to keep drilling. Finally, on March 4, 1938, Dammam No. 7 starts producing 1,585 bpd at a depth of nearly 1¼ kilometers."

1939: "In May, King 'Abd al-'Aziz travels to Ras Tanura for a ceremony to mark the first export of crude oil from Saudi Arabia, loaded onto the D. G. Scofield. The ship, named after a co-founder of Socal, holds just under 1/20th the load of a modern supertanker."

Source: Saudi Aramco "Our History" 1930s.

Cell: T17

Comment: Rick Heede:

EIA data on country-by-country NGL production from 1970-1992 provided by Michael Grillot, Industry Economist, EIA International Energy Statistics Team. The EIA table is based on US Bureau of Mines' Minerals Yearbooks, various years.

Cell: M18

Comment: Rick Heede:

The Saudi government nationalized 25 percent of Aramco in 1973, 60 percent in 1974, and 100 percent in 1980.

Until a clear picture of the Saudi government's contracts, shared production agreements, and other pre-nationalization equity production details and the like come to light, we allocate 10 percent of Aramco production to Saudi Aramco since production began in 1938 to 1972.

Aramco history (www.saudiaramco.com): "The government increases its participation interest in Aramco's crude oil concession rights, production and facilities to 100% (1980), with retroactive financial effect to 1976." CMS attributes 100 percent of production to Saudi Aramco, effective 1976.

Also see: Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown, in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge University Press, 1034 pp.

Cell: U19

Comment: Rick Heede:

CMS uses proxy data -- Saudi production of natural gas liquids (for which we use the EIA dataset 1970-1990 -- to approximate Saudi production of natural gas for 1970 through 1979. Later research, or ARAMCO statistics, may refine this gas production estimate. Meanwhile CMS uses 70 percent of Saudi NGL production (in thousand bbl per day) to estimate Saudi ARAMCO annual production of natural gas 1970-1979 (Bcf/yr). This is thus a mere arithmetic estimate but one that is both quantitatively conservative in order to account for re-injected, flared, or vented gas and reasonably well in agreement with the later gas production data sets based on a fraction of total gas attributed to ARAMCO and actual production estimates by Oil & Gas Journal; see notes below.

Note: Saudi ARAMCO gas production for 1980 - 1986 is based on an estimated fraction of total Saudi natural gas production attributable to ARAMCO (see note below). ARAMCO gas production for 1987-2004 uses Oil & Gas Journal OGI100 production estimates.

Cell: I20

Comment: Rick Heede:

Saudi Aramco annual report 1990 shows crude oil production for 1938-1990 (also shows NGL production 1962-1990, but no raw gas production is shown).

Cell: E29

Comment: Rick Heede:

Stevens reports Aramco production in 1947 at 90,000 bbl per day, to 278,000 bbl per day in 1951, and to 480,000 bbl per day in 1960, citing Darmstadter, 1971, Energy in the World Economy. CMS does not know why the Saudi Aramco dataset differs so strongly from Darmstadter's data.

Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown," in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge Univ. Press, 1034 pp.

Cell: B31

Comment: Rick Heede:

Aramco's history at website: "Crude oil production of 500,000 bpd is achieved early in the year." (1949).

Cell: W34

Comment: Rick Heede:

Reported in 1964 and 1955 annual reports; roughly half of production is re-injected into the Abqaiq reservoir and --half sold (to cement plants and other industrial users).

Cell: Z35

Comment: Rick Heede:

The Saudi government nationalized 25 percent of Aramco in 1973, 60 percent in 1974, and 100 percent in 1980.

Until a clear picture of the Saudi government's contracts, shared production agreements, and other pre-nationalization equity production details and the like come to light, we allocate 10 percent of Aramco production to Saudi Aramco since production began in 1938 to 1972.

Aramco history (www.saudiaramco.com): "The government increases its participation interest in Aramco's crude oil concession rights, production and facilities to 100% (1980), with retroactive financial effect to 1976." CMS attributes 100 percent of production to Saudi Aramco, effective 1976.

Also see: Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown, in Victor et al, eds, Oil and Governance, pp. 173-233, Cambridge University Press, 1034 pp.

Cell: B36

Comment: Rick Heede:
Aramco company history (www.saudiaramco.com): "In May 1954, oil production exceeds 1 million bpd for the first time."

Cell: B40

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "Over the course of 1958, the company averages more than 1 million barrels of oil per day for the first time."

Cell: D41

Comment: Rick Heede:
Aramco (1979) Annual Report for 1978, production summary for 1938-1978: "NGL production from gases associated with crude production began in late 1962."

Cell: U42

Comment: Rick Heede:
ARAMCO annual report 1964, p. 31, shows "sale of ARAMCO ... natural gas in Saudi Arabia in barrels" for 1960-1964.

Cell: K43

Comment: Rick Heede:
Crude oil production for 1961-1973 from Arabian Oil Company Ltd (1974) Facts and Figures.

Cell: D44

Comment: Rick Heede:
Saudi Aramco Annual Report for 1990, statistical data shows NGL production for 1938-1990 and notes that "NGL production from gases associated with crude production began in late 1962."

Cell: F44

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "Cumulative crude oil production reaches 5 billion barrels." (1962)
CMS note: cumulative total in our dataset equals 5.06 billion bbl through June 1962.

Cell: W44

Comment: Rick Heede:
ARAMCO annual Report 1962, p. 13, shows "total energy content of natural gas sold to industries was 605,743 million Btu", which, at 1,037 btu per cf, equals ~600 million cf, or ~0.6 Bcf/yr. The company "utilized 48.2 percent of the gas produced in association with crude oil (an increase of 17.5 percent)."
which, at 5.8 million Btu per bbl oil equiv

Cell: T45

Comment: Rick Heede:
U.S. Bureau of Mines, Minerals Yearbook 1967, page 779, shows marketed natural gas production for 1963-1967. No prior edition listed marketed (or gross) production for Saudi Arabia.

Cell: T46

Comment: Rick Heede: U.S. Bureau of Mines, Minerals Yearbook 1968, page 750, marketed production 1964-1967. Gross production not shown.

Cell: B47

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "The production capacity of the Safaniya field increases by 150,000 bpd to more than 600,000 bpd, a gain that helps the company produce an average of over 2 million bpd, a record high..." (1965)

Cell: B50

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "We become the first company to produce a billion barrels of crude oil in a single year." (1968)

Cell: T50

Comment: Rick Heede: U.S. Bureau of Mines, Minerals Yearbook 1970, page 764, gross and marketed production 1968-1969. (1970 data revised in 1971 Yearbook.)

Cell: T52

Comment: Rick Heede:
U.S. Bureau of Mines, Minerals Yearbook 1972, page 846, gross and marketed production 1970-1971.

Cell: T54

Comment: Rick Heede: U.S. Bureau of Mines Minerals Yearbook 1974, page 887, reports both gross and marketed production for 1972-1973. Footnote to table: Includes half of production for the former Kuwait-Saudi Arabia Neutral Zone.

Cell: B55

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "The Saudi government buys a 25% participation interest in Aramco, increasing it to 60% the following year." (1973)

Cell: T56

Comment: Rick Heede: U.S. Bureau of Mines Minerals Yearbook 1976, page 887, reports both gross and marketed production for 1974-1976.

Cell: U57

Comment: Rick Heede:
"In 1975, the oil ministry decided that the extensive flaring of associated gas should cease." Stevens, page 207.
Stevens, Paul (2012) "Saudi Aramco: the jewel in the crown," in Victor et al. eds, Oil and Governance, pp. 173-233, Cambridge Univ. Press, 1034 pp.
Note: Interesting discussion of pros and cons of increasing gas utilization domestically; some argue that using more gas will allow higher oil exports, which may then force world oil prices lower, thus decreasing revenue. Stevens, page 207.

Cell: B58

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "We become the only company to produce more than 3 billion barrels of oil in a year." (1976)

Cell: I58

Comment: Rick Heede:
U.S. Bureau of Mines estimates differs slightly: 66.4 million bbl of "propane, butane, natural gasolines, and other" and 3,139.7 million bbl of crude oil in 1976. Total of 3,428.0 million bbl in 1977, 3,120.9 million bbl in 1978, 3,579.0 million bbl in 1979, and 3,635.0 million bbl in 1980 (prelim).
U.S. Bureau of Mines, Minerals Yearbook 1980, International Area Report, Saudi Arabia, Peter J. Clarke, Table 1, page 845. Gross and marketed production of natural gas, 1976-1980.

Cell: T58

Comment: Rick Heede:
U.S. Bureau of Mines, Minerals Yearbook 1980, International Area Report, Saudi Arabia, Peter J. Clarke, Table 1, page 845. Gross and marketed production of natural gas, 1976-1980.

Cell: B62

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "The government increases its participation interest in Aramco's crude oil concession rights, production and facilities to 100%, with retroactive financial effect to 1976." (1980)

Cell: J69

Comment: Rick Heede:
Crude oil production listed for 1987-2010 from Oil & Gas Journal O&GJ100, various years. CMS cites Saudia Aramco production for all years available, and shows O&GJ data for comparison.

Cell: W69

Comment: Rick Heede:
Oil & Gas Journal, various years, O&GJ100.

Cell: B70

Comment: Rick Heede:
Aramco history (www.saudiaramco.com): "On November 8, 1988, the Council of Ministers approves a charter for a new national oil enterprise — the Saudi Arabian Oil Company. A Royal Decree issued by King Fahd ratifies that decision, establishing a new company to take over all the responsibilities of Aramco." (1988)

Cell: X70

Comment: Rick Heede:
CMS uses ARAMCO data for 1990 through 2001 on raw gas delivered to gas plants in 1999 and 2001 annual reports.

Cell: L72

Comment: Rick Heede:

ARAMCO data from columns "H" and "I".

Cell: AB72

Comment: Rick Heede:

Saudi Aramco annual report 1999 shows raw gas delivered to gas plants for 1990-1999.
Note: no mention of natural gas in earlier annual reports.

Cell: D73

Comment: Rick Heede:

ARAMCO production of NGLs interpolated for 1991-1993. Data not shown in ARAMCO annual reports.

Cell: I73

Comment: Rick Heede:

Saudi Aramco annual report 1999 shows crude oil production for 1990-1999.

Cell: AA75

Comment: Rick Heede:

Energy Intelligence, Inc. production stats.

Cell: H76

Comment: Rick Heede:

Saudi Aramco Annual Report for 1995.

Cell: K76

Comment: Rick Heede (Jan10):

ARAMCO (2007) Annual Report 2006, "Saudi ARAMCO by the Numbers, page 25. This table is reproduced above. The data is fairly close to OGJ100 data, and does not include production of condensate -- which CMS includes in ARAMCO data in columns "H" and "I", the sum of which CMS reports in the summary column "L".

Cell: H78

Comment: Rick Heede:

Saudi Aramco Annual report for 2000, shows NGL from hydrocarbon gases for 1996-2000.

Cell: L78

Comment: Rick Heede:

CMS uses ARAMCO data for 1996-2006 from their Annual Report 2006, page 25 (see column "K" and table above) -- "crude oil production" plus "refined products."

Cell: H79

Comment: Rick Heede:

Saudi Aramco Annual Report for 2001 "Energy to the World," production and reserves data, "NGL from hydrocarbon gases" data in millions of bbl for 1997-2001.

Cell: I79

Comment: Rick Heede:

Saudi Aramco Annual Report for 2001 "Energy to the World," production and reserves data, "crude oil production" data in millions of bbl for 1997-2001.

Cell: AB79

Comment: Rick Heede:

Saudi Aramco Annual Report for 2001 "Energy to the World," "raw gas to gas plants" in billion of scfd for 1997-2001. Delivered gas sales also shown in trillion Btu per day: 0.718 in 1997, 0.704 in 1998, 0.704 in 1999, 0.689 in 2000, and 0.681 in 2001. CMS reports raw gas to gas plants, insofar as LNG production is not shown; the reported data is gross production, not net, and includes gas used in refineries and processing plants (although does not include, we surmise, re-injected gas. Also, the gas CMS reports is nearly identical to the data reported in Oil & Gas Journal.

Cell: AA82

Comment: Rick Heede:

Oil and gas production for 200-2001 from EI (2003) Top 100, p. 231.

Cell: H84

Comment: Rick Heede:

ARAMCO "NGL from hydrocarbon gases" reported in Annual Reports for 2008 and 2006 (tables reproduced above).

Cell: W84

Comment: Rick Heede (Jan10):

Oil & Gas Journal OGJ100, various years.

Cell: I89

Comment: Rick Heede (Jan10):

ARAMCO (2009) By the Numbers, page 50 (part of the 2008 Annual Report). Shows "crude oil" production (except "NG blended"), which CMS adds as NGL production at left.

Cell: X89

Comment: Rick Heede (Jan10):

ARAMCO (2009) By the Numbers, page 50 (part of the 2008 Annual Report). Shows "raw gas to gas plants" as 7.998 Bcf per day (and 7.023 Bcf/day of delivered gas) in 2007; raw gas 8.336 Bcf (and 7.610 delivered gas) in 2008.

Cell: Y89

Comment: Rick Heede:

In April 2019 CAI modified the calculation from "raw gas processed" to the average of gas supplied and raw gas processed -- only for 2007 onwards; we don't have reliable data prior to 2007. While this may prove too conservative, it allows for accounting for some re-injected gas to maintain reservoir pressures. Future inventors may find a more complete measure of not only sold natural gas but also company use of own gas for refineries and processing plants and pipelines and power generation.

Taking the example of 2017: annual "raw gas processed" totals 4.54 Tcf. "Natural gas supplied" totals 3.19 Tcf. The average of which is 3.86 Tcf. Compare Oil & Gas Journal estimate of 3.64 Tcf. EIA data. BP data shows Saudi Arabia gas production as 10.8 Bcf per day, or 3.94 Tcf/yr.

Cell: AA89

Comment: Rick Heede (Jan10):

ARAMCO (2009) By the Numbers, page 50 (part of the 2008 Annual Report). Shows "raw gas to gas plants" as 7.998 Bcf per day (and 7.023 Bcf/day of delivered gas) in 2007; raw gas 8.336 Bcf (and 7.610 delivered gas) in 2008.

Cell: AB89

Comment: Rick Heede (Jan10):

ARAMCO (2009) By the Numbers, page 50 (part of the 2008 Annual Report). Shows "raw gas to gas plants" as 7.998 Bcf per day (and 7.023 Bcf/day of delivered gas) in 2007; raw gas 8.336 Bcf (and 7.610 delivered gas) in 2008.

Cell: E90

Comment: Rick Heede:

Saudi Aramco "working interest liquids production in 2008" at 10,669 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: V90

Comment: Rick Heede:

Saudi Aramco "working interest natural gas production in 2008" at 6,677 thousand cf 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: B91

Comment: Rick Heede:

Aramco history (www.saudiaramco.com): "We complete a multi-stage, large-scale project spanning our entire business, expanding our production and processing capacity of oil, gas, natural gas liquids, refining and petrochemicals. With this expansion, maximum sustainable crude oil production capacity reaches 12 million bpd, nearly 15% of total global oil demand." (2009)

Cell: I91

Comment: Rick Heede:

AR 2010 modified 080611 pg96; NGL in column H, crude oil production excluding NG blended in column I; report also includes production for sale, Rhea did not use those figures

Cell: J91

Comment: Rick Heede:

Oil & Gas Journal OGJ100, 30Oct2011, page 49. Oil reserves listed as 260.1 billion bbl.

Cell: W91

Comment: Rick Heede:
Oil & Gas Journal OGJ100, 30Oct2011, page 49. Gas reserves listed as 275.2 Tcf.

Cell: AA91

Comment: Rick Heede:
AR 2010 modified 080611 pg 96; "feed to gas plants"

Cell: AB91

Comment: Rick Heede:
Saudi Aramco Annual review 2013, page 60 (2013 in numbers), in "billion of SCFD."

Cell: D93

Comment: Rick Heede
"2015 in numbers," from Annual Report page 94. Crude oil production, 2011-2015.

Cell: H93

Comment: Rick Heede:
"2015 in numbers," from Annual Report page 94. NGL from hydrocarbon gases in million bbl, 2011-2015.

Cell: I93

Comment: Rick Heede:
Saudi Aramco, 2013 In Numbers, crude oil and NGL production 2011-2013, in million bbl per year.

Cell: AA93

Comment: Rick Heede:
Saudi Aramco Annual report 2015, page 94. "Sales gas produced, millio scfd." for 2011-2015.

Cell: AB96

Comment: Rick Heede:
Saudi Aramco Annual report 2015, page 94. "Raw gas processed, billion scfd."

Cell: D98

Comment: Rick Heede:
2016 production (10.3 Mb/day) - projected by Rystad Energy.
Actual: 10.7 Mb/day. Saudi Aramco (2018) Saudi Aramco annual review 2017, Dhahran, 82 pp.

Cell: E98

Comment: Rick Heede:
CAI modifies that calculation in column "D" as follows: Saudi Aramco Performance review 2017, page 76-77 reports "Crude oil production in 2017 at 3,735 Mb (and 3,921 Mb in 2016) including condensate and Bahrain's share of the shared offshore Abu Safah field." Abu Safah reportedly produces 300,000 bpd, or 109.5 Mbp, half of which is allocated to Bahrain. We thus subtract 150 kbpd from Saudi Aramco's annual production.

Cell: F98

Comment: Rick Heede:
Saudi Aramco Performance 2017, page 77, reports NGL production of 1,337 kbpd (and 1,359 kbpd in 2016).

Cell: D99

Comment: Rick Heede:
Saudi Aramco (2018) Saudi Aramco annual review 2017, Dhahran, page 76. Includes blended condensate and Bahrain's share of Abu Safah field. Details on shared production volume are not stated.
Wood Mackenzie: Abu Sa'fah is a super-giant offshore oil field which is situated on the maritime border with Saudi Arabia. The field's production and reserves are split equally between Saudi Arabia and Bahrain. In 1972, Saudi Arabia and Bahrain agreed to share income from the field. Saudi Aramco operates the field on behalf of both countries. A major redevelopment of Abu Sa'fah took place between 2001 and 2004 and the field's capacity was increased.
The National / Business, Bahrain makes biggest oil discovery since 1932, 1 April 2018:
"Most of Bahrain's current oil production, which averages 210,000 barrels per day, comes from the offshore Abu Safah field, which it shares with Saudi Arabia, the world's biggest oil exporter. Bahrain produces around 50,000 bpd from the Bahrain Oil Field, according to the Energy Information Administration."
CAI therefor subtracts 160 kb/day (210 minus 50 kb/d) from Saudi Aramco's production from 2015 to 2017.

Cell: U99

Comment: Rick Heede:
January 2020: Saudi Aramco (2019) Corporate Overview, September, 8 pp. "Gas production: 8.9 Bcfpd (8.7 Bcfpd in 2017). <https://www.saudiaramco.com/-/media/publications/corporate-reports/saudi-aramco-corporate-overview-2019-english.pdf>

Cell: AB99

Comment: Rick Heede:
Saudi Aramco (2018) Saudi Aramco annual review 2017, Dhahran, page 76, shows "raw gas processed" in million scf per day for 2013-2017.

Cell: D100

Comment: Rick Heede:
CAI uses preliminary prodn information as follows (update when full data is reported)
"Saudi Aramco is the world's largest integrated oil & gas company producing one in every eight barrels of crude oil globally. In 2018, the Company produced 13.6 million barrels per day of oil equivalent, including 10.3 million barrels per day of crude oil (including blended condensate)." This excludes NGL and is partial and preliminary.
<https://www.saudiaramco.com/en/investors/investors/reports-and-presentations>
January 2020: Saudi Aramco (2019) Corporate Overview, September, 8 pp. "Crude production in 2018 was 10.3 Mbpd (10.1 Mbpd in 2017); Gas production: 8.9 Bcfpd (8.7 Bcfpd in 2017). Table reproduced below.
<https://www.saudiaramco.com/-/media/publications/corporate-reports/saudi-aramco-corporate-overview-2019-english.pdf>

Cell: F100

Comment: Rick Heede:
Saudi Aramco has not published NGL production data since 2017; we assume NGL production in 2018 equal to 2017.

Cell: AB100

Comment: Rick Heede:
CAI uses preliminary prodn information as follows (update when full data is reported)
"Saudi Aramco is the world's largest integrated oil & gas company producing one in every eight barrels of crude oil globally. In 2018, the Company produced 13.6 million barrels per day of oil equivalent, including 10.3 million barrels per day of crude oil (including blended condensate)."
Thus, assuming SA uses 6,000 cf per boe, $(13.6-10.3)*6000 = 19,800$ kcfpd.
<https://www.saudiaramco.com/en/investors/investors/reports-and-presentations>

Cell: S203

Comment: Rick Heede:
Kobayashi, Yoshikazu (2007) "Saudi Aramco's Downstream Strategies," 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: W203

Comment: Rick Heede:
Jaffe, Amy Myers, & Jareer Ellass (2007) "Case Study on Saudi Aramco," in: The Changing Role of National Oil Companies in International Energy Markets, Baker Institute for Public Policy, Rice University, 2 March 2007.