

# Oil and natural gas extraction data

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

Copyright Climate Mitigation Services

## Sonatrach, Algeria

www.sonatrach-dz.com Algiers

yellow column indicates original reported units 100% State-owned enterprise

### Production / Extraction data

Year	Crude Oil & NGL			Natural Gas			Background data	
	Net production	Net production	Net production	Net production	Net production	Net production	Gross production	Gross production
	Thousand bbl/d	Million bbl/yr	Million tonnes/yr	Million cf/d	Million SCM/d	Billion cf/yr	Million tons/yr	Million tonnes/yr

- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33
- 34
- 35
- 36
- 37
- 38
- 39
- 40
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59
- 60
- 61
- 62
- 63
- 64
- 65
- 66
- 67
- 68
- 69
- 70
- 71
- 72
- 73
- 74
- 75
- 76
- 77
- 78
- 79

Oil	Million bbl /yr
Sonatrach 1987-2010	8,338
Algeria 1987-2010	13,475
Sonatrach of Algeria %	61.88%

Nations Encycl.  
Sonatrach established in 31Dec1963  
Nationalized in 1971

Marketed gas production underestimates total emissions

Year	Algeria		%	Algeria		%	Sonatrach
	million bbl /yr	million bbl /yr		gross gas prod'n	net gas prod'n		
1950							
1951							
1952							
1953							
1954							
1955							
1956							
1957							
1958							
1959		10	10%	na	na		
1960		68	7	na	na		
1961		121	12	na	9	4	48%
1962		158	16	na	13	7	50%
1963		184	18	na	15	8	52%
1964		204	64	na	29	15	54%
1965		206	67	na	62	34	56%
1966		262	87	na	73	42	58%
1967		298	102	na	76	45	60%
1968		331	117	340	94	58	62%
1969	thousand bbl /day	345	125	350	106	67	64%
1970		379	141	379	102	67	66%
1971		290	111	260	105	71	68%
1972		391	153	350	120	83	70%
1973		404	163	409	168	120	72%
1974		373	154	700	199	146	74%
1975		366	155	740	337	254	76%
1976		401	174	863	351	272	78%
1977		428	189	interpolated	366	291	80%
1978		458	207	interpolated	381	311	82%
1979		458	212	interpolated	396	331	84%
1980		417	197	479	411	352	86%
1981		384	185	489	772	676	88%
1982		381	188	499	942	843	90%
1983		371	187	509	1,314	1,203	92%
1984		407	208	51%	1,360	1,272	94%
1985		416	218	52%	1,360	1,299	96%
1986		435	232	53%	1,330	1,284	97%
1987		438	231	OGJ100 1987-2010	1,525	1,472	97%
1988		429	228	53%	1,635	1,542	94%
1989		451	261	58%	1,709	2,317	136%
1990		480	291	OGJ Sonatrach of	1,788	1,588	89%
1991		478	293	Algeria 1987-2010	2,164	1,618	75%
1992		490	282	61.88%	2,197	1,837	84%
1993		479	275		2,086	1,787	86%
1994		473	274		1,986	1,779	90%
1995		477	279		2,236	1,834	82%
1996		503	299		2,376	2,020	85%
1997		518	311		2,643	2,097	79%
1998		512	301		2,796	2,066	74%
1999		506	280		3,054	2,127	70%
2000		523	296		3,136	2,311	74%
2001		553	286		2,972	2,311	78%
2002		591	310		2,991	2,653	89%
2003		652	513		3,212	2,839	88%
2004		674	441		3,217	2,980	93%
2005		714	493		3,613	3,180	88%
2006		719	492		3,539	3,287	93%
2007		718	495		3,548	3,310	93%
2008		714	501		3,649	3,300	90%
2009		697	453		3,405	2,940	86%
2010		686	456		3,465	2,980	86%
<b>Total</b>	na	<b>22,422</b>	<b>12,026</b>	na	na	<b>65,327</b>	na na



Year	Algeria crude 1970-1980	Algeria NGL 1970-1980
1970	1,029	9
1971	785	9
1972	1,062	9
1973	1,097	9
1974	1,009	12
1975	983	20
1976	1,075	24
1977	1,152	19
1978	1,231	25
1979	1,224	30
1980	1,106	36

OGJ100 1987-2010  
OGJ Sonatrach of Algeria 1987-2010  
83.63%



80	<b>Alternate production estimate for 2008</b>													
81					Thousand bbl /d		Million bbl /yr		Million cf/d		Bcf/yr			
82					1,201		438		6,658		2,430			

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



**US Energy Information Administration, International Energy Statistics**

www.eia.gov/emeu/internationalenergy.html

Vented & Flared of

	Algeria	Algeria	Algeria	Algeria	Algeria	Algeria				
	Oil, NGPL, other k bbl per day	Oil, NGPL, other million bbl per yr	Updated April 2013	Gross NatGas Prod Bcf per year	Prod Market Gas Bcf per year	Reinjected NatGas Bcf per year	%	Vented & Flared Bcf per year	Dry NatGas Prod Bcf per year	
90										
91										
92										
93	1980	1,142	417	NA	NA	NA	NA	343	411	
94	1981	1,051	384	NA	NA	NA	NA	238	772	
95	1982	1,045	381	NA	NA	NA	NA	170	942	
96	1983	1,017	371	NA	NA	NA	NA	154	1,314	
97	1984	1,114	407	NA	NA	NA	NA	129	1,360	
98	1985	1,141	416	NA	NA	NA	NA	160	1,360	
99	1986	1,192	435	NA	NA	NA	NA	199	1,330	
100	1987	1,201	438	NA	NA	NA	NA	222	1,525	
101	1988	1,175	429	NA	NA	NA	NA	212	1,635	
102	1989	1,236	451	NA	NA	NA	NA	216	1,709	
103	1990	1,315	480	4,471	1,788	2,235	5%	236	1,787	
104	1991	1,310	478	4,458	2,164	2,135	4%	159	1,933	
105	1992	1,342	490	4,486	2,197	2,148	3%	141	1,971	
106	1993	1,312	479	4,723	2,086	2,399	5%	237	1,902	
107	1994	1,295	473	4,701	1,986	2,472	5%	243	1,807	
108	1995	1,307	477	4,864	2,236	2,377	5%	251	2,052	
109	1996	1,377	503	4,903	2,376	2,283	5%	244	2,194	
110	1997	1,419	518	5,259	2,643	2,371	5%	245	2,433	
111	1998	1,401	512	5,299	2,796	2,259	5%	245	2,604	
112	1999	1,387	506	5,347	3,054	2,055	4%	238	2,876	
113	2000	1,434	523	5,757	3,136	2,382	4%	239	2,940	
114	2001	1,515	553	5,668	2,972	2,552	3%	144	2,787	
115	2002	1,619	591	5,672	2,991	2,533	3%	148	2,799	
116	2003	1,786	652	5,820	3,212	2,467	2%	141	2,850	
117	2004	1,847	674	6,078	3,217	2,741	2%	120	2,830	
118	2005	1,957	714	6,597	3,613	2,861	2%	106	3,151	
119	2006	1,969	719	6,837	3,539	3,182	2%	117	3,079	
120	2007	1,968	718	6,999	3,548	3,286	2%	165	2,996	
121	2008	1,955	714	7,105	3,649	3,281	2%	175	3,055	
122	2009	1,910	697	6,954	3,405	3,355	3%	194	2,876	
123	2010	1,880	686	6,788	3,465	3,146	3%	177	2,988	
124	2011	1,862	680	6,714	3,453	3,134	2%	127	2,923	
125	2012	1,874	684							
126				1990-2011 totals	125,500	63,525	57,655	3.3%	4,090	56,832

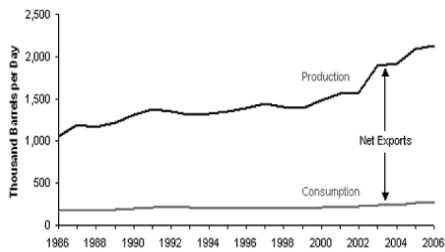
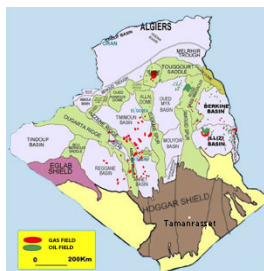
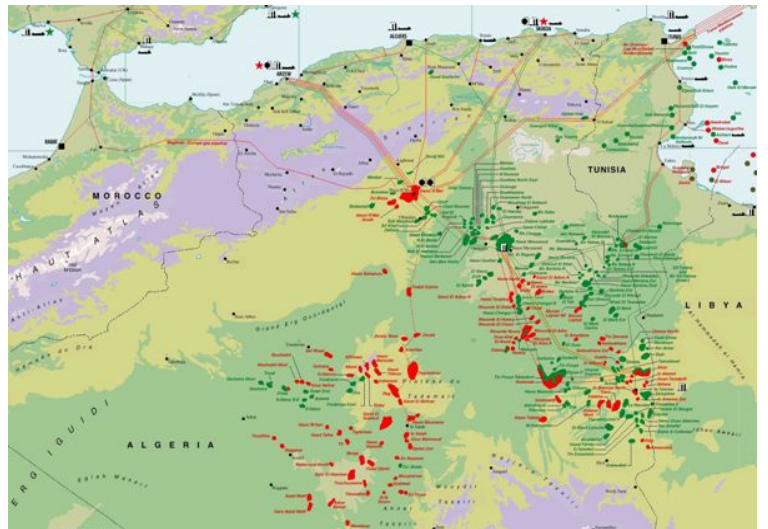


Figure 1.2 Algerian crude oil production and consumption.  
 Source: http://www.eia.doe.gov. EIA Algeria Country Analysis 2007

Ariweriokuma (2009) The Political Economy of Oil and Gas in Africa, page 3.



Sonatrach.-dz.com: Algérie : un riche potentiel pétrolier et gazier



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

Wiki: "Sonatrach (Société Nationale pour la Recherche, la Production, le Transport, la Transformation, et la Commercialisation des Hydrocarbures s.p.a.) is an Algerian government-owned company formed to exploit the hydrocarbon resources of the country. Its diversified activities cover all aspects of production: exploration, extraction, transport, and refining. It has diversified into petrochemistry and the desalination of seawater. Founded 31 December 1963. 120,000 employees, net income \$175 billion in 2002, 30% of Algeria's GDP, operates the largest oil field in Algeria, Hassi Messaoud, which produced around 440,000 bbl/d (70,000 m<sup>3</sup>/d) of crude in 2006, Hassi R'Mel field (north of Hassi Messaoud, south of Algiers), which produces around 180,000 bbl/d (29,000 m<sup>3</sup>/d) of crude, produces (as of 2002) 206 million tep, including 11.7 % (24 million tep) for the domestic market."

Sonatrach was founded in December 31, 1963. At the time, however, the Algerian state held only 4.5% of the exploration perimeters, while French interests were as high as 67.5%. After the Arab-Israeli War in June 1967, Algeria decided to nationalize the refining and distribution activities of Mobil and Esso, and Sonatrach signed an agreement with Getty Oil on October 19, 1968 receiving 51% of Getty Oil's interests. It gained control over all Algerian petrochemical resources following President Houari Boumedienne's nationalisation of all French oil and gas holdings beginning on February 24, 1971. The old concession system was replaced by a seizure of a 51% share of French petroleum companies. Only Total agreed to continue its activities; the other companies left Algeria. Beginning on December 10, 1979, a conference on the exploitation of petroleum recommended increasing participation in the research efforts by foreign companies and countries. By a decree published in the Journal Officiel on May 17, 1980, Sonatrach was divided into four enterprises. From 1986, it became possible for foreign hydrocarbon companies to do business in Algeria within a partnership with Sonatrach (this process was simplified in 1991). The Sonatrach-Gaz de France accord, signed on January 12, 1989, allowed the state to set a compromise price of about \$2.30 per million BTUs. A total of 9.5 billion cubic meters of natural gas were delivered annually until 1990, and Sonatrach recovered 850 million francs in arrears, since the accord applied retroactively beginning on November 1, 1987. In March 2005, the Algerian parliament adopted the hydrocarbon reform bill, encouraging international oil company (IOC) investment in the hydrocarbon sector, which Sonatrach previously dominated. However, 2006 amendments to the hydrocarbon bill created a windfall tax on IOC profits when oil prices top \$30 per barrel. This tax reached up to 50% on some contracts. In addition, the amendments gave Sonatrach rights to a 51% or higher participation option on each newly discovered project.

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

CMS attributes 93.9 percent of total Algerian gas production to Sonatrach for 1980-1986. Actual production estimates by Oil & Gas Journal O&GJ100 are used for 1987-2004.

**Cell: H12****Comment:** Rick Heede:

We use O&GJ data for Sonatrach. Energy Intelligence data show higher production for 2000 and 2001 of 488 and 485 million bbl per year (1.336 and 1.330 million bbl per day), respectively, compared to O&GJ's 296 and 286 million bbl.

**Cell: I16****Comment:** Rick Heede:

Oil was discovered at Edjeleh and Hassi Messaoud in 1956 and at Al-Gassi in 1959; by 1969, the Franco-Algeria Cooperative Association (ASCOOP), a petroleum development company, had discovered eight major fields. The Société Nationale pour la Recherche, la Production, le Transport, la Transformation et la Commercialisation des Hydrocarbures (Sonatrach), founded in 1964 as the state-owned petroleum company, handles the distribution and transport of oil. On 24 February 1971, President Boumedienne announced the Algerian takeover of controlling interest in all French oil company subsidiaries and the nationalization of all pipelines and natural gas deposits. Holdings of all other foreign petroleum interests in Algeria were nationalized by the end of 1971. Subsequent agreements have generally treated foreign companies as minority partners in Algerian state enterprises. Contracts for sales of natural gas to Western Europe and the United States increased spectacularly in the 1970s but decreased in the 1980s as world energy prices fell, pushing Algeria into severe debt. By 1991, Sonatrach was reversing its monopolistic policy, and forming joint ventures for new exploration contracts. The company plans to invest \$20 billion through 2004 to develop Algeria's oil and gas fields, focusing on wet gas field development, enhanced oil recovery techniques, pipeline expansion, exploration, and dry gas field development. In April 2000 Sonatrach announced a \$500 million joint venture with Amerada Hess to develop the el-Gassi, el-Agreb, and Zotti oilfields, with the goal of increasing production to 45,000 barrels per day by the end of 2003. [www.nationsencyclopedia.com/Africa/Algeria-ENERGY-AND-POWER.html](http://www.nationsencyclopedia.com/Africa/Algeria-ENERGY-AND-POWER.html)

**Cell: L21****Comment:** Rick Heede (Jan10):

Gas production and thus combustion (& venting, flaring, etc) is greatly underestimated by this methodology, inasmuch as gross production was 3+ times as high as marketed production (in 1969-1972); much of this may have been re-injected for EOR, some vented or flared, some company use, etc.

**Cell: E25****Comment:** Rick Heede:

U.S. Bureau of Mines, Minerals Yearbook, various years, data for 1959-1969.

**Cell: I26****Comment:** Rick Heede: U.S. Bureau of Mines, Minerals Yearbook 1964, page 348, marketed production 1960-1964.**Cell: J27****Comment:** Rick Heede:

As explained in cell note F30, we do not have detailed Sonatrach production data for oil or natural gas, and rely on Oil & Gas Journal production estimates attributed to Sonatrach for 1987 to 2010. We use Sonatrach of total Algerian gas production in 1987 (97 percent) and reduce this percentage by 1 percent per annum back to 1964. This will be revised in Sonatrach or independent experts make detailed production records available.

**Cell: B29****Comment:** Rick Heede:

Algeria achieved political independence from France on 5 July 1962. Sonatrach was founded in 1963 as a joint stock company "that, in theory, allowed the firm some semblance of independence. In reality, Sonatrach was conceived as an instrument by which the state would exert central control over the industry -- the very status it has today."

Entelis, John P. (2012) "Sonatrach: the political economy of an Algerian state institution," in Victor et al, eds, Oil and Governance, pp. 557-598, at page 561.

**Cell: F30****Comment:** Rick Heede:

Since Sonatrach's creation as a state-owned "joint stock company" in 1963 (with all shares owned by the government), Algeria oil and gas sectors have continued to rely on IOC involvement, technology, capital, and expertise. We do not have access to Sonatrach's own equity production, and rely on Oil & Gas Journal for Sonatrach production data from 1987 to 2010. While we could, in the absence of publicly available records, apply the percent of Algerian production allocated to Sonatrach by O&GJ 1987-2010 (61.9 percent; see cell H58), this would likely overestimate Sonatrach's equity production. Instead we take the 1987 percentage Sonatrach of total Algerian oil production (53 percent) and reduce this percentage by 1 percent per annum back to 1964 (then 31 percent). It is hoped this allocation method approximates Sonatrach's equity production, but will be revised if Sonatrach makes its production data public, or some better methodology comes to light, such as the details of production sharing agreements (PSAs) or other contractual details.

Both BP (then British Petroleum) and Total SA (then CFP) have operated in Algeria since 1956 and 1952, respectively. ENI entered Algeria in 1981 (Eni Algeria), BHP in 1989, Maersk in 1990, Anadarko in 1991, ConocoPhillips in 1993, Hess in 2000, and Statoil in 2003. While weakly indicative of equity production by each entity, using Table 13.1 in Entelis, 2012, IOCs represented \$11.82 billion worth of oil and gas production in 2005, and Sonatrach \$24.0 billion (Algeria's Naftec and Naftel are not estimated); Sonatrach is thus 67 percent of the partial total; this financial information is not detailed, may include royalty payments taxes, and other fees, and thus a poor guide to relative oil and gas production shares. However, this 67 percent share is close to O&GJ's estimate of 69 percent of Algeria's oil production allocated to Sonatrach.

Entelis, John P. (2012) "Sonatrach: the political economy of an Algerian state institution," in Victor et al, eds, Oil and Governance, pp. 557-598; at page 572.

For the years 1987-2010 we use O&GJ100 data for Sonatrach.

Aissaoui, Ali (2001) Algeria: The Political Economy of Oil and Gas, Oxford University Press.

Marcel, Valerie (2006) Oil Titans: National Oil Companies in the Middle East, Chatham House, London, Brookings Institution Press, Washington, 322 pp.

**Cell:** G30

**Comment:** Rick Heede:  
See cell note at F30.

**Cell:** I30

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

**Cell:** D34

**Comment:** Rick Heede:  
Energy Information Administration International Energy Annual 2003, Table G.1 World Production of Crude Oil, Lease Condensate, & NGPL, 1980-2010.  
Also Table 4.1c World Crude Oil Production (Including Lease Condensate), 1970-1979 (detailed in Columns L and M).

**Cell:** I34

**Comment:** Rick Heede: U.S. Bureau of Mines, Minerals Yearbook 1970, page 764, gross and marketed production 1968-1970.

**Cell:** B37

**Comment:** Rick Heede:  
Under President Boumediene, Algeria fully nationalized the oil and gas sector.  
Entelis, John P. (2012) "Sonatrach: the political economy of an Algerian state institution," in Victor et al, eds, Oil and Governance, pp. 557-598. At page 561.

**Cell:** I38

**Comment:** Rick Heede: U.S. Bureau of Mines Minerals Yearbook 1974, page 887, reports both gross and marketed production for 1972-1973.

**Cell:** I40

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

**Cell:** D46

**Comment:** Rick Heede:  
Energy Information Administration, International Energy Annual 2006 Table 2.2 World Crude Oil including Lease Condensate Production, 1980-2010 (Thousand Barrels per Day), for Algeria.

**Cell:** I46

**Comment:** Rick Heede:  
Energy Information Administration, International Energy Annual 2006 Table 2.4 World Dry Natural Gas Production, 1980-2006 (Trillion Cubic Feet), for Algeria.

**Cell:** J53

**Comment:** Rick Heede:  
Oil & Gas Journal OGJ100 data for 1987-2010.  
Entelis, 2012, page 566, cites Standard & Poor's 2009 estimates for Algerian natural gas production: 1986 (1,289 Bcf), 1990 (1,737 Bcf), 1996 (2,327 Bcf), and 2006 (2,966 Bcf).  
Hults & Thurber (also in Victor et al, Oil & Governance) cite Wood Mackenzie's "working interest production for Sonatrach of 2,430 Bcf in 2005; in comparison, O&GJ's estimate is 3,180 Bcf. See page 2 below for Wood Mackenzie attributed oil and natural gas production.

**Cell:** F69

**Comment:** Rick Heede:  
Anomalously high, but as estimated in Oil & Gas Journal OGJ100, 19Sep05, for Sonatrach in 2003.

**Cell:** B72

**Comment:** Rick Heede:  
An amendment to Algerian law passed in 2006 requires Sonatrach to hold at minimum a 51 percent stake in production sharing agreements (PSAs), rather than the optional 20 to 30 percent in the original 2005 law.

**Cell:** F74

**Comment:** Rick Heede:  
OGJ100 6Sep10 pg 69; updated 2008 production; OGJ 3 Oct 2011 pg 49; "estimated."

**Cell:** J74

**Comment:** Rick Heede:  
OGJ100 6Sep10 pg 69; 2008 value consistent; OGJ 3 Oct 2011 pg 49; "estimated."

**Cell:** F83

**Comment:** Rick Heede:  
Sonatrach "working interest liquids production in 2008" at 1,201 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](http://www.woodmacresearch.com)

**Cell:** J83

**Comment:** Rick Heede:  
Sonatrach "working interest natural gas production in 2008" at 6,658 thousand cf per day. Victor, Hults, & Thurber, 2012.

**Cell:** B145

**Comment:** Rick Heede:  
Ariweriokuma, Soala (2009) The Political Economy of Oil and Gas in Africa: The Case of Nigeria, Routledge, 384 pp.