

Oil & natural gas extraction data

Richard Heede
Climate Mitigation Services
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National Iranian Oil Company, Iran

www.nioc.ir Tehran

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



Production / Extraction data

Year	Crude Oil & NGL			Natural Gas			background data
	Net production Thousand bbl / d	Net production Million bbl / yr	Net production Million bbl / yr	Net production Billion cf/yr	Net production Tcf/yr	Net production Bcf/yr	

NIOC, 100% SOE

Note: EIA data is on total Iranian oil production, whereas Oil & Gas Journal estimates NIOC production. It is unclear if O&G estimates are net of equity and/or royalty production with IOCs (e.g., Total, AGIP, CNOOC, in recent years).

Persia until 1935



NIOC logo 1950s-1970s

Nationalized 1951

Note: gas production is not reduced for re-gasification / EOR, purportedly ~30 percent in 2007 (EIA Country Rpt).

NIOC is encouraged to provide comprehensive data on actual runs to gas plants, total usage, re-injection, and exports.

Also, 0.285 Bcf of flared gas in 2007 is not deducted.



Iranian Oil E & P Co
million long tons / yr

Iranian Oil E & P Co
annual reports

Total Iran
million bbl / yr

Total Iran
annual reports

one long ton	1,016,046,911	tonne
1 bbl	7.33	tonne



Abouzar Production Complex

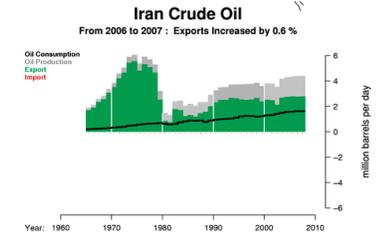


Fire at well # 24



Khark Island Oil Terminal, photo by Abdolreza Mohseni

Year	Total Iran		Estim. NIOC	Iran	Iran	Estim. NIOC	Iranian Oil E & P Co	Total Iran	
	EIA thousand bbl / d	million bbl / yr							gross gas prod'n Bcf/yr
1924									
1925									
1926									
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1960	1,070	391	391	na	36.3	36	100%	51.0	380
1961	1,200	438	438	na	104.2	104	100%	57.1	425
1962	1,330	485	485	na	107.2	107	100%	63.5	473
1963	1,490	544	544	na	108.6	109	100%	70.5	525
1964	1,710	624	624	na	42.1	42	100%	81.1	604
1965	1,910	697	697	na	43.4	43	100%	88.5	659
1966	2,130	777	777	na	49.0	49	100%	98.8	736
1967	2,600	949	949	na	51.8	52	100%	120.9	900
1968	2,840	1,037	1,037	802	55.5	56	100%	132.9	900
1969	3,380	1,234	1,234	893	98.2	98	100%	152.2	1,134
1970	3,830	1,398	1,398	1,094	396.3	396	100%	172.4	1,284
1971	4,540	1,657	1,657	1,305	299	299	100%	204.4	1,522
1972	5,020	1,832	1,832	1,470	448	448	100%	224.6	1,673
1973	5,860	2,139	2,139	1,699	702	702	100%		
1974	6,020	2,197	2,197	1,767	787	787	100%		
1975	5,350	1,953	1,953	1,608	771	771	100%		
1976	5,880	2,146	2,146	1,776	794	794	100%		
1977	5,660	2,066	2,066	interpolated	658	658	100%		
1978	5,240	1,913	1,913	interpolated	522	522	100%		
1979	3,170	1,157	1,157	interpolated	386	386	100%		
1980	1,671	610	610		250	250	100%		
1981	1,389	507	507		210	210	100%		
1982	2,223	811	811		250	250	100%		
1983	2,448	894	894		310	310	100%		
1984	2,184	797	797		476	476	100%		
1985	2,260	825	825		600	600	100%		
1986	2,050	748	748		536	536	100%		
1987	2,318	846	843	OGJ	565	671	OGJ	843	671
1988	2,260	825	820	OGJ	706	620	OGJ	820	620
1989	2,837	1,036	1,076	OGJ	784	647	OGJ	1,076	764
1990	3,123	1,140	1,145	OGJ	837	764	OGJ	1,145	849
1991	3,362	1,227	1,226	OGJ	992	779	OGJ	1,226	779
1992	3,479	1,270	1,261	OGJ	964	941	OGJ	1,261	941
1993	3,595	1,312	1,328	OGJ	1,044	1,018	OGJ	1,328	1,018
1994	3,673	1,341	1,309	OGJ	1,220	995	OGJ	1,309	995
1995	3,703	1,352	1,318	OGJ	1,349	1,128	OGJ	1,318	1,128
1996	3,746	1,367	1,321	OGJ	1,547	1,349	OGJ	1,321	1,349
1997	3,734	1,363	1,322	OGJ	1,787	1,322	OGJ	1,322	3,030
1998	3,709	1,354	1,355	OGJ	1,907	3,441	OGJ	1,355	3,441
1999	3,632	1,326	1,255	OGJ	2,193	3,700	OGJ	1,255	3,700
2000	3,771	1,377	1,402	OGJ	2,299	2,130	OGJ	1,402	2,130
2001	3,804	1,388	1,349	OGJ	2,521	2,330	OGJ	1,349	2,330
2002	3,531	1,289	1,259	OGJ	2,924	2,650	OGJ	1,259	2,650
2003	3,838	1,401	1,362	OGJ	3,140	1,630	OGJ	1,362	1,630
2004	4,106	1,499	1,435	OGJ	3,224	2,599	OGJ	1,435	2,599
2005	4,240	1,548	1,420	OGJ	3,818	3,200	OGJ	1,420	3,200
2006	4,150	1,515	1,405	OGJ	4,425	3,213	OGJ	1,405	3,213
2007	4,036	1,473	1,430	OGJ	4,592	2,970	OGJ	1,430	2,970
2008	4,176	1,524	1,424	OGJ	4,810	3,515	OGJ	1,424	3,515
2009	4,173	1,523	1,464	OGJ	6,206	3,415	OGJ	1,360	3,415
2010	4,248	1,551	1,351	OGJ	6,031	4,840	OGJ	1,351	4,840



From BP data

Total	na	na	63,130	na	na	60,965		
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A B C D E F G H I J K L M N O P Q R S

Alternate production estimate for 2008			
Thousand bbl /d	Million bbl /yr	Million cf/d	Bcf/yr
2008	3,694	1,348	7,840
			2,862

Source: Hulfs, & 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

	2005	2010	2015	2020	2025
Average Crude Oil Production	4,021	4,379	5,316	5,085	4,233
Feed for Refineries	1,598	1,620	2,482	2,524	2,682
Export (including Buyback Scheme)	2,424	2,759	2,833	2,561	1,551

Re-calculate nationalization	Prior to Mar2013	64,266	Re-calculate nationalization	Prior to Mar2013	51,095
	new result	63,130		new result	60,965
	delta	1,136		delta	(9,870)
	Percent	1.8%		Percent	-19.3%

Tanaka, Koichiro (2007) Upstream Development Strategy of the National Iranian Oil Company

US Energy Information Administration, International Energy Statistics

	Iran		Iran		Iran		Iran		Iran	
	Crude oil, condensate, & NGPL k bbl per day	million bbl per yr	Prod Marketed Gas Bcf per year	Dry Natural gas Bcf per year	Vented & Flared Bcf per year	gross %	Reinjected Bcf per year	Gross Prod'n Bcf per year		
1980	1,671	610	NA	250	334		NA	NA		
1981	1,389	507	NA	210	290		NA	NA		
1982	2,223	811	NA	250	503		NA	NA		
1983	2,448	894	NA	310	454		NA	NA		
1984	2,184	797	NA	476	230		NA	NA		
1985	2,260	825	NA	600	208		NA	NA		
1986	2,050	748	NA	536	175		NA	NA		
1987	2,318	846	NA	565	170		NA	NA		
1988	2,260	825	NA	706	141		NA	NA		
1989	2,837	1,036	NA	784	53		NA	NA		
1990	3,123	1,140	837	837	49	3.0%	675	1,642		
1991	3,362	1,227	992	918	388	19.1%	650	2,030		
1992	3,479	1,270	964	883	399	19.4%	692	2,055		
1993	3,595	1,312	1,044	956	305	14.4%	770	2,119		
1994	3,673	1,341	1,220	1,123	314	13.5%	802	2,336		
1995	3,703	1,352	1,349	1,247	410	15.3%	913	2,671		
1996	3,746	1,367	1,547	1,420	417	13.8%	1,045	3,009		
1997	3,734	1,363	1,787	1,660	388	13.3%	742	2,917		
1998	3,709	1,354	1,907	1,766	353	11.2%	883	3,143		
1999	3,632	1,326	2,193	2,041	371	10.2%	1,059	3,623		
2000	3,771	1,377	2,299	2,127	371	9.6%	1,201	3,871		
2001	3,804	1,388	2,521	2,331	261	6.7%	1,144	3,927		
2002	3,531	1,289	2,924	2,649	290	6.8%	1,059	4,273		
2003	3,838	1,401	3,140	2,861	427	9.4%	989	4,556		
2004	4,106	1,499	3,224	2,963	431	9.0%	1,112	4,768		
2005	4,240	1,548	3,818	3,655	424	7.9%	1,112	5,386		
2006	4,150	1,515	4,425	3,836	559	9.4%	941	5,926		
2007	4,036	1,473	4,592	3,952	554	9.0%	1,006	6,152		
2008	4,176	1,524	4,810	4,107	594	9.3%	968	6,372		
2009	4,173	1,523	6,206	4,986	561	7.5%	661	7,428		
2010	4,248	1,551	6,031	5,161	586	7.5%	1,157	7,774		
2011	4,231	1,544	6,078	5,361	588	7.4%	1,249	7,915		
2012	3,543	1,293								
1990-2011 totals			63,908	56,839	9,039	10%	20,831	93,891		

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NIOC notes:

NIOC Oil & Gas Production

Reserves: www.en.nioc.ir / Publications / Fact Book

NIOC Oil and Gas Exploration

Our Operations: Crude Oil



Central Intelligence Agency

Cell: I9**Comment:** Rick Heede:

NIOC at a Glance Since 1951, National Iranian Oil Company (NIOC) has been directing and making policies for exploration, drilling, production, research and development, refining, distribution and export of oil, gas, petroleum products. NIOC, with a vast amount of oil and gas resources, is one of the world's largest oil companies. At the present time, it is estimated that the company holds 137 billion barrels of liquid hydrocarbons and 29 trillion cubic meters of natural gas. www.en.nioc.ir

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

World Bank, 2008b, page 436: "The National Iranian Oil Company is the only NOC operating in the upstream petroleum sector under the responsibility of the Ministry of Petroleum." 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.

Cell: D11**Comment:** Rick Heede:

On this worksheet we report extractive data for each company or state-owned enterprise. Three columns under crude oil and natural gas allow for data reported in one of three formats (e.g., thousand barrels per day, or million barrels per year, or million tonnes per year). Coal is normally reported in U.S. or metric tonnes per year.

Note: the carbon content of the extracted resources is adjusted by a number of factors before emissions estimates are made in the worksheet 1 to the left. Most important is the subtraction of the fraction typically sequestered in petrochemicals and other non-combusted uses such as road oils, waxes, lubricants, greases, etc. See the comment for each extracted resource for detailed discussions of the combusted vs sequestered fractions.

Cell: D12**Comment:** Rick Heede:

NIOC is 100% state-owned, and we assume that all Iranian oil and gas production is attributable to NIOC.

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

Energy Information Administration International Energy Annual 2003, Table 2.4 World Dry Natural Gas Production, 1980-2003: Iran. Data for 1960-1971 from US Bureau of Mines, Minerals Yearbook.

Cell: F18**Comment:** Rick Heede:

We assume that the production reported by Iranian E&P Company (see column L) represents total production in Iran, not the proportion attributable to the government as royalty production. Therefore we attribute 10 percent of Iranian production as royalty production by the Anglo-Persian Oil Company (later British Petroleum); we do not, however, have data on the royalty percentage or details on the crude oil provided the host government.

However, Iranian Exploration and Production Company is a different entity from the Anglo-Persian Oil Company, though we do not have any details on the company, other than the production reports cited at right.

We attribute 100 percent of the nationalized production, starting in May 1951, to the newly-established NIOC, until 1954 when the Iranian Oil Participants Ltd (IOP) agreement, in which a fifty-fifty split was negotiated. NIOC or energy historians may revise this allocation with new information on the production-sharing elements of the agreement; we have found no data on the proportion attributable to NIOC (the fifty-fifty is a profit-sharing agreement).

The founding members of IOP included British Petroleum (40%), Gulf (8%), Royal Dutch Shell (14%), and Compagnie Franaise des Pétroles (later Total S.A., 6%). The four Aramco partners - Standard Oil of California (SoCal, later Chevron) - Standard Oil of New Jersey (later Exxon, then ExxonMobil) - Standard Oil Co. of New York (later Mobil, then ExxonMobil) - Texaco (later Chevron) - each held a 8% stake in the holding company. Wikipedia, viewed March 2013.

NIOC took possession of IOP production in 1974 (see note at B66), and we allocate 10 percent of Iranian oil production to NIOC as of 1974.

Cell: M18**Comment:** Rick Heede:

1 long ton = 1.016054 tonne; 1 tonne = 7.33 bbl.

Cell: L20**Comment:** Rick Heede:

Iranian Oil Exploration and Producing Company & Iranian Oil Refining Company, Review of 1959, p. 14-15, shows annual crude oil production annually from 1928 to 1959, in million long tons per year.

Cell: B24**Comment:** Rick Heede:

"In 1932 the government of Iran, led by Reza Khan Shah -- unilaterally cancelled its contracts with all foreign companies." "A year later, the Iranian government renegotiated a new contract ... with the newly minted Anglo-Persian Oil Company." (Anglo-Iranian Oil Company as of 1935; the future British Petroleum, now BP.) Mahdavi, 2012, page 240.

Mahdavi, Paasha (2012) "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC), in Victor et al, eds, Oil and Governance, pp. 234-279, Cambridge Univ. Press, 1034 pp.

Also see Yergin, 1991, The Prize, pp. 269-271.

Cell: E43**Comment:** Rick Heede:

"Iran withdrew from the final negotiations on "participation" on the grounds that it already "owned" the operating company following the 1951 nationalization." Stevens, 2012, page 181.

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.

Mossadeq, the new Prime Minister, succeeded in canceling Anglo-Iranian Oil Company's (AIOC, later BP) "prior oil concession and fully expropriated its assets. Thus, NIOC came to be nationalized, for the sake of creating revenue for the government and protecting Iran's oil from foreign development." Mahdavi, 2012, page 241.

Mahdavi, Paasha (2012) "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC), in Victor et al, eds, Oil and Governance, pp. 234-279, Cambridge Univ. Press, 1034 pp.

CMS thus attributes 67 percent (May-Dec 1951) of 1951 to NIOC, and 100 percent thereafter.

Cell: J43**Comment:** Rick Heede:

See, for example, www.iranchamber.com/history/oil_nationalization/oil_nationalization.php

Cell: G46**Comment:** Rick Heede:

While ownership over Iranian production is far less than crystal clear -- see cell note at B-66 -- CMS assumes 60 percent allocation to NIOC from 1954 to 1973, and 100 percent from 1974-2010. This may be revised if NIOC provides data on their equity production 1951-2010.

Cell: D50**Comment:** Rick Heede:**Cell:** D52**Comment:** Rick Heede:

Energy Information Administration International Energy Annual 2003, Table G.1 World Production of Crude Oil, NGPL, and Other Liquids, 1980-2003.

Also: Oil production data from EIA (2004) Annual Energy Review 2003, Table 11.5.

Cell: L52**Comment:** Rick Heede:

Iranian Oil Operating Companies, Annual Review for years 1960 through 1972, crude oil production tables. No mention is made of natural gas production (albeit, CMS has partial copies of each year's report).

Annual report courtesy of University of Exeter's Arab World Documentation Unit, www.ex.ac.uk/awdu

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

U.S. Bureau of Mines, Minerals Yearbook 1972, page 846, gross and marketed production 1970.

Cell: I64**Comment:** Rick Heede:

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

Cell: B66**Comment:** Rick Heede:

The proportion of Iranian oil production "owned" by NIOC, whether through concessions, royalties, shared product contracts, and similar joint (or sole) ventures, is not clear from 1954 (the Shah was restored to power in 1953); the Majlis OilGasENI_NorskHydro.xls

approved the creation of an international consortium in 1954 "to explore, produce, refine, and distribute Iranian oil." Consortium included members of the Seven Sisters (Gulf, Exxon, Texaco, Chevron, Shell, Mobil, and BP, plus CFP at 6 percent [now Total]). "The Consortium entered a fifty-fifty contract to split profits from the sale of oil with NIOC." "The nationalization process in 1951 actually allocated reserve rights to NIOC alone where the consortium was granted exploration and production rights but not full ownership." All quotes above from Mahdavi, 2012, pages 241-242.

"Only in 1974 did NIOC gain monopoly control over exploration, production, and operations of Iranian oil fields." Mahdavi, page 242.

Mahdavi, Paasha (2012) "Oil, monarchy, revolution, and theocracy: a study on the National Iranian Oil Company (NIOC), in Victor et al, eds, Oil and Governance, pp. 234-279, Cambridge Univ. Press, 1034 pp.

Cell: I66

Comment: Rick Heede:

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

Cell: L79

Comment: Rick Heede:

Oil & Gas Journal, various years.

Cell: M79

Comment: Rick Heede:

Oil & Gas Journal, various years.

Cell: M92

Comment: Rick Heede:

OGJ100 Sep2002 table shows a large discrepancy in gas production: 10,541 Bcf in 2000, 11,01 Bcf in 2001 (vs the data from EIA showing 2,130 and 2,330 BCF, respectively).

Cell: L101

Comment: Rick Heede:

OGJ100 6Sep2010 pg 69

Cell: M101

Comment: Rick Heede:

OGJ100 6Sep2010 pg 69

Cell: M123

Comment: Rick Heede:

Tanaka, Koichiro (2007) "Upstream Development Strategy of the National Iranian Oil Company (NIOC)," Director JIME Center Institute of Energy Economics, Japan, in: The Changing Role of National Oil Companies in International Energy Markets, James Baker III Institute for Public Policy, Rice University, 1 March 2007.

Cell: B174

Comment: Rick Heede:

NIOC Oil & Gas Production (<http://en.nioc.ir/PortalHome/Default.aspx?CategoryID=95949051-0d6f-4ca9-be99-45b894630ca5&TabNo=3>): Operations / Exploration & Production)

NIOC has successfully increased its production capacity of crude oil to 4.335 million barrels per day from March 2007 to March 2008, compared with 4.275 million barrels per day in the same period last year. This was achieved by implementation of development projects of offshore and onshore oilfields through buyback or its natural resources.

6.1. Production of crude oil and NGL was 4.093 million barrels per day from March 2007 to Mar08, of which 17.6 percent was from offshore oilfields and 82.4 percent from onshore.

6.2. Average production of natural gas from March 2007 to March 2008 was 505.8 million cubic meters per day, having increased by 9 percent compared with the last year, which was 464/2 million cubic meters. Additionally, the average production of gas condensates reached 409.9 thousand barrels per day, having increased 6.9 percent in comparison with last year, which was 383.4 thousand barrels.

6.3. 53 percent of hydrocarbons production from March 2007 to March 2008 was in the form of liquid hydrocarbon and 43.7 percent was in form of natural gas, which shows a 4.7 percent increase in gas proportion in production of hydrocarbons in comparison with the last year. Long-term trends in crude oil production reveal a cumulative crude oil production equal to 2.25 billion barrels over the 30 years before the Islamic Revolution. This value increased to 36.5 billion barrels over the 30 years after the Islamic Revolution. Furthermore, average daily crude oil production was near 2.394 million barrels, while it has been increased to 3.318 million barrels per day over the 30 years after the Islamic Revolution. Another key role that crude oil plays in the economy is export of 2.5 million barrels of crude oil per day, helping to economic development of the country.

Cell: B177

Comment: Rick Heede:

www.en.nioc.ir/ / Publications / Fact Book:

Having 10% and 18% of the world's oil and gas reserves respectively, Iran was the Opec's second largest oil producer in the Iranian year (ending late March 2008). The country also enjoys an outstanding status in meeting the world's energy demands with a production capacity of over 4 million barrels of crude oil per day. It is expected that Iran will supply over 12% of the world's hydrocarbon productions by the next 20 years.

Possessing huge reserves of hydrocarbons, National Iranian Oil Company (NIOC) is considered as one of the world's giant oil companies. For the time being the in place oil and gas of the company are estimated over 137 billion barrels of crude oil and 28 trillion cubic meters of gas. National Iranian Oil Company (NIOC) managed to increase 2,840 million barrels of crude oil, 1,045 billion cubic meters of gas, and 898 million barrels of NGL and condensates to the country's in place reserves by developing its explorations of 5 oil and gas fields in the year ending late March 2008.

Cell: B180

Comment: Rick Heede:

NIOC Oil and Gas Exploration: Exploration operation is a basic and essential activity in National Iranian Oil Company (NIOC). In the Iranian year ending late March 2008, NIOC carried out the drilling operations of 7 wells and testing 6 exploratory wells, and started drilling 5 new exploratory wells using 6.64 drilling rigs. The overall expected + producible in place reserves was 2,841 million barrels of crude oil, 898 million barrels of NGL and condensates, and 1,045 billion cubic meters of dry gas.

This amount was explored in the year ending late March 2008. A comparison of exploration with production of hydrocarbon from 21 March 2007 to 21 March 2008. The total amount of hydrocarbon production (oil, NGL, gas, and condensates) was 2,809.24 million barrels. The total amount of explored producible hydrocarbon (oil, NGL, gas, and condensates) was 5,553.3 million barrels

Cell: B183

Comment: Rick Heede:

Our Operations: Crude Oil

Long-term trends in crude oil production reveal a cumulative crude oil production equal to 2.25 billion barrels over the 30 years before the Islamic Revolution. This value increased to 36.5 billion barrels over the 30 years after the Islamic Revolution. Furthermore, average daily crude oil production was near 2.394 million barrels, while it has been increased to 3.318 million barrels per day over the 30 years after the Islamic Revolution.