

Oil and natural gas extraction data

Richard Heede
Climate Mitigation Services
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Petronas, Malaysia

www.petronas.com.my Kuala Lumpur

yellow column indicates original reported units

SOE (wholly owned)

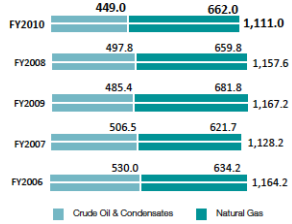
Production / Extraction data

Year	Crude Oil & NGL			Natural Gas			Background data	
	Net production	Net production	Net production	Net production	Net production	Net 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
		Petronas				Petronas		

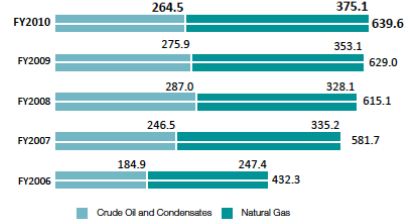
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PETRONAS' Share of Malaysia's Production
In '000 boe per day



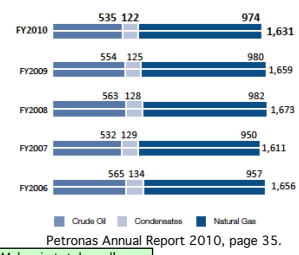
PETRONAS' International Oil and Gas Production
In '000 boe per day



Petronas Annual Report 2010, page 36.

Petronas Annual Report 2010, page 38.

Malaysia's Average Production
In '000 boe per day



Petronas Annual Report 2010, page 35.

Estimated, % of Malaysia total prod'n

OGJ100 1987-2005



Petronas, 1987-05	24,413
Malaysia, 1987-05	23,347
Petronas/Malaysi	104.6%

EI Oil prod'n	24,413
thousand bbl /d	
2000-2001	529
	67.4

2010 AR	2010 AR
Bcf/y	Malaysia prodn
1,931	k bbl / day
2,096	699
2,212	661
2,218	691
2,271	679
	657

OGJ100	2010 AR
million bbl /yr	Malaysia prodn
255.2	k BOE/d
241.3	957
252.4	950
177.2	982
163.9	980
	974

Entitlement Oil+Gas	1,681
	1,624
Percent Oil in 2016	37.2%

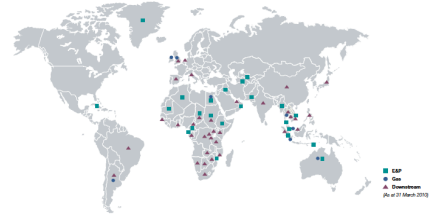
Year	Malaysia million bbl /yr
1950	1.7
1951	1.5
1952	1.1
1953	0.9
1954	0.9
1955	0.4
1956	0.3
1957	0.3
1958	1.6
1959	3.3
1960	18
1961	69
1962	25.2
1963	93
1964	33.9
1965	91
1966	81
1967	29.5
1968	32
1969	89%
1970	89%
1971	89%
1972	89%
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2016	89%
2017	89%
2018	89%

Year	Malaysia million bbl /yr	Petronas % of Malaysia	Petronas million bbl /yr	Malaysia Billion cf/yr	Petronas % of Malaysia	Petronas Billion cf/yr
1970	18	6.6				
1971	69	25.2				
1972	93	33.9				
1973	91	33.1				
1974	81	29.5	26		18	
1975	98	35.8	32		21	
1976	165	60.4	54		24	
1977	184	67.0	60		32	
1978	217	79.2	70		41	
1979	283	103.3	92		50	
1980	283	103.3	92		59	
1981	264	96.4	86		65	
1982	306	111.7	99		59	
1983	365	133.2	118		155	
1984	450	164.3	146		340	
1985	450	164.3	146		457	
1986	513	187.2	166		552	
1987	508	185.4	175		568	
1988	551	201.1	191		591	
1989	596	217.5	206		526	
1990	631	230.3	238		570	
1991	658	240.2	238		585	
1992	666	243.1	241		735	
1993	660	240.9	235		732	
1994	674	246.0	234		729	
1995	714	260.8	253		925	
1996	727	265.4	236		1,482	
1997	762	278.1	230		1,760	
1998	820	299.3	263		847	
1999	788	287.6	230		1,825	
2000	756	275.8	255	3,415	1,438	
2001	732	267.2	249	3,400	1,608	
2002	773	282.3	314		1,823	
2003	818	298.5	350		1,893	
2004	792	289.3	267		1,893	
2005	794	290.0	269		1,952	
2006	715	260.9	261	882	1,931	
2007	753	274.8	275	957	2,096	
2008	772	281.9	282	1,010	2,212	
2009	774	282.4	282	1,013	2,218	
2010	714	260.4	260	1,037	2,271	
2011	819	298.9	299	1,258	2,755	
2012	719	262.4	262	1,295	2,836	
2013	768	280.3	280	1,363	2,985	
2014	626		228	1,055	2,311	
2015	605		221	1,019	2,232	
2016	668	Petronas data	244	1,126	2,466	
2017	593	Petronas data	216	1,167	2,556	
2018	594	Petronas data	217	1,092	2,391	

Total	na	8,548	9,187	na	25,136	55,613
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
88																	
89																	
90				Alternate production estimate for 2008													
91				Thousand bbl /d	Million bbl /yr		Million cf/d	Bcf/yr									
92		2008		534	195		4,076	1,488									

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/international/energy.html

Vented & Flared of

Petronas operations

	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia	Malaysia
	Crude oil, condensate, & NGPL	Crude oil, condensate, & NGPL	Prod Marketed Gas	Dry natural gas	Vented & Flared	gross	Reinjected
	k bbl per day	million bbl per yr	Bcf per year	Bcf per year	Bcf per year	%	Bcf per year
105	1980	283.0	103	NA	56	-	NA
106	1981	264.0	96	NA	62	-	NA
107	1982	306.0	112	NA	56	-	NA
108	1983	365.0	133	NA	148	65	NA
109	1984	450.0	164	NA	325	95	NA
110	1985	450.0	164	NA	437	60	NA
111	1986	513.0	187	NA	528	75	NA
112	1987	508.0	185	NA	551	28	NA
113	1988	551.0	201	NA	581	-	NA
114	1989	596.0	218	NA	606	-	NA
115	1990	631.0	230	664	501	32	145
116	1991	658.0	240	759	570	32	138
117	1992	666.0	243	808	637	18	102
118	1993	660.0	241	895	749	32	201
119	1994	674.0	246	938	852	32	180
120	1995	714.5	261	1,036	1,020	34	231
121	1996	727.0	265	1,249	1,166	28	280
122	1997	761.8	278	1,376	1,331	32	321
123	1998	820.1	299	1,391	1,335	39	314
124	1999	788.0	288	1,443	1,335	39	334
125	2000	755.7	276	1,734	1,465	42	370
126	2001	732.2	267	1,825	1,511	42	383
127	2002	773.5	282	1,812	1,601	51	388
128	2003	817.9	299	2,084	1,688	57	266
129	2004	792.5	289	2,057	1,745	53	275
130	2005	794.4	290	2,147	1,977	53	311
131	2006	752.8	275	2,084	2,125	53	325
132	2007	758.4	277	2,281	2,104	46	330
133	2008	759.2	277	2,292	2,151	57	343
134	2009	720.0	263	2,264	2,133	64	339
135	2010	719.4	263	2,347	2,171	42	328
136	2011	655.4	239	2,360	2,180	46	288
137	2012	661.2	241	2,360	2,190	46	305
138	2013	631.8	231		2,292	44	307
139	2014	657.0	240		2,310	53	304
140	2015	712.2	260		2,240	53	297
141	2016	748.9	273		2,214	-	NA
142	2017	733.9	268		2,454	-	NA
143	2018	736.3	269				

Updated June 2019
Crude oil, condensate, & NGPL

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

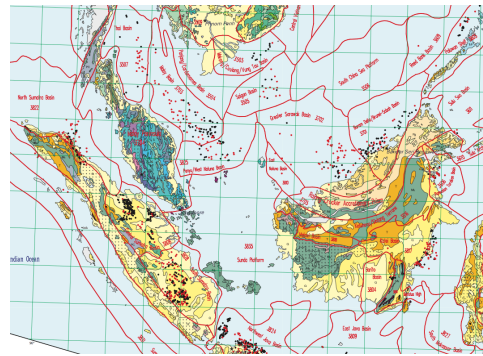
Updated June 2019

Updated June 2019

1990-2011 totals	35,845	32,347	921	2.2%	6,194	41,488
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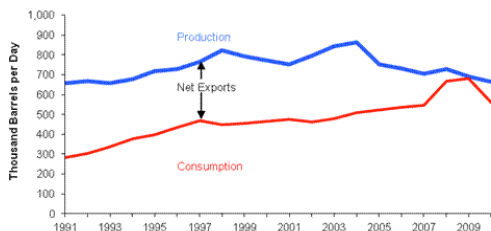


EIA Country Studies, Malaysia



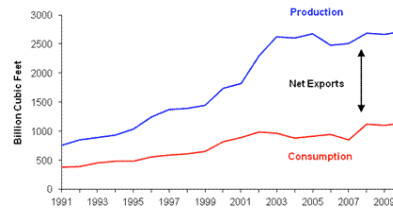
USGS oil and geology provinces of Asia, detail.

Malaysia's Oil Production and Consumption, 1991-2010



EIA Country Studies, Malaysia

Malaysian Natural Gas Production and Consumption, 1991-2010



EIA Country Studies, Malaysia

191	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q																																
192	<h2>INTERNATIONAL E&P OPERATIONS</h2>								<h3>RESERVES (billion barrels of oil equivalent)</h3> <table border="1"> <thead> <tr> <th></th><th>1 January 2010</th><th>+/-</th><th>1 January 2009</th></tr> </thead> <tbody> <tr> <td>Crude Oil & Condensates</td><td>7.9</td><td>2.5%</td><td>7.7</td></tr> <tr> <td>Natural Gas</td><td>10.8</td><td>(0.5%)</td><td>19.0</td></tr> <tr> <td>Coal Seam</td><td>0.4</td><td>11.1%</td><td>0.3</td></tr> <tr> <td>TOTAL RESERVES</td><td>27.1</td><td>0.5%</td><td>27.0</td></tr> <tr> <td>RESERVES REPLACEMENT RATIO (RRR)</td><td>1.1x</td><td></td><td>1.8x</td></tr> </tbody> </table>										1 January 2010	+/-	1 January 2009	Crude Oil & Condensates	7.9	2.5%	7.7	Natural Gas	10.8	(0.5%)	19.0	Coal Seam	0.4	11.1%	0.3	TOTAL RESERVES	27.1	0.5%	27.0	RESERVES REPLACEMENT RATIO (RRR)	1.1x		1.8x								
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193	<p>PETRONAS share of reserves and production</p> <ul style="list-style-type: none"> Iran: current production: 34,000 bpd Sudan: current production: 58,920 bpd Myanmar: current production: 1,020 bpd condensate; 31.2 MMSCFD gas (5,200 boepd) Vietnam: current production: 19,210 bpd <p>2001: 3,248 million BOE 2000: 2,513 million BOE</p> <p>Production '000 boepd Reserves million BOE</p>								<h3>AVERAGE PRODUCTION ('000 barrels of oil equivalent per day)</h3> <table border="1"> <thead> <tr> <th></th><th>FY2010</th><th>+/-</th><th>FY2009</th></tr> </thead> <tbody> <tr> <td>Crude Oil & Condensates</td><td>714</td><td>(0.2%)</td><td>701</td></tr> <tr> <td>Natural Gas</td><td>1,037</td><td>0.3%</td><td>1,035</td></tr> <tr> <td>TOTAL AVERAGE PRODUCTION</td><td>1,751</td><td>(2.5%)</td><td>1,796</td></tr> </tbody> </table>										FY2010	+/-	FY2009	Crude Oil & Condensates	714	(0.2%)	701	Natural Gas	1,037	0.3%	1,035	TOTAL AVERAGE PRODUCTION	1,751	(2.5%)	1,796																
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194	<p>Petronas Financial & Operational Review, 2001.</p>								<p>Petronas Financial & Operational Review, 2010, page 27.</p>																																								
195	<p>Sustained growth in International production</p> <p>Average International Production in '000 barrels of oil equivalent per day</p> <table border="1"> <thead> <tr> <th>Fiscal Year</th><th>Crude Oil & Condensates Production</th><th>Natural Gas Production</th><th>Total</th></tr> </thead> <tbody> <tr> <td>FY2005</td><td>247</td><td>186</td><td>432</td></tr> <tr> <td>FY2006</td><td>335</td><td>247</td><td>582</td></tr> <tr> <td>FY2007</td><td>329</td><td>297</td><td>626</td></tr> <tr> <td>FY2008</td><td>353</td><td>276</td><td>629</td></tr> <tr> <td>FY2009</td><td>375</td><td>265</td><td>640</td></tr> </tbody> </table>								Fiscal Year	Crude Oil & Condensates Production	Natural Gas Production	Total	FY2005	247	186	432	FY2006	335	247	582	FY2007	329	297	626	FY2008	353	276	629	FY2009	375	265	640	<p>Almost two-thirds of international production from Africa</p> <p>Breakdown of International Production by Region</p> <ul style="list-style-type: none"> Africa: 57.7% Middle East & Central Asia: 17.2% South East Asia & Oceania: 25.1% <p>Note: South East Asia excludes Malaysia production</p>																
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202	<p>Sales Volume</p> <p>(Million Metric Tonnes)</p> <p>Indonesia: 1,670 (2007) Malaysia: 860 (2007)</p>								<p>Sales Volume</p> <p>Petrochemicals products (Million Metric Tonnes): FY17: 8.1, FY18: 8.4</p> <p>Petroleum products (Million Barrels): FY17: 253.3, FY18: 252.7</p> <p>Crude oil (Million Barrels): FY17: 144.7, FY18: 142.0</p>																																								
203	<p>Wako, Yoshiaki, 2007</p>								<p>Petronas Group (2019) Financial Results, slide 6</p>																																								
204	<p>Production and Entitlement (kboe/d)</p> <p>FY17: Production 2,320, Entitlement 1,445</p> <p>FY18: Production 2,361, Entitlement 1,411</p>								<p>PETRONAS Group (2019) Financial Results, Q4 & FY2018, slide 5.</p>																																								
205	<table border="1"> <thead> <tr> <th>Products</th><th>FY'17</th><th>FY'18</th></tr> </thead> <tbody> <tr> <td>LNG sales volume (million tonnes)</td><td>30.72</td><td>28.94</td></tr> <tr> <td>Malaysia average sales gas volume (mmscfd)</td><td>2,691</td><td>2,777</td></tr> </tbody> </table>								Products	FY'17	FY'18	LNG sales volume (million tonnes)	30.72	28.94	Malaysia average sales gas volume (mmscfd)	2,691	2,777	<p>Note: kboe x 6 = mmscfd</p>																															
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Cell: I9

Comment: Rick Heede:

Petronas.com: "PETRONAS, the acronym for Petrolim Nasional Berhad, was incorporated on 17 August 1974 under the Companies Act 1965. It is wholly-owned by the Malaysian government and is vested with the entire ownership and control of the petroleum resources in Malaysia through the Petroleum Development Act 1974.
Over the years, PETRONAS has grown to become a fully-integrated oil and gas corporation and is ranked among FORTUNE Global 500's largest corporations in the world. PETRONAS has four subsidiaries listed on the Bursa Malaysia and has ventured globally into more than 32 countries worldwide in its aspiration to be a leading oil and gas multinational of choice.
Petronas is a national oil company with a broad portfolio of investments and production ventures both offshore eastern Malay Peninsula, the South China Sea, and offshore Eastern Malaysia on Borneo. The company has pursued shared production agreements (PSAs) with IOCs rather than nationalization, although the 1974 legislation that established Petronas also made the company the sole custodian of Malaysia's hydrocarbon reserves and the regulator of the national oil and gas sector.
Specific information on Petronas' ownership share or working interest in the many PSAs are not available to us, however, and we base Petronas production on a combination of Oil & Gas Journal estimates and on Petronas annual reports.
Shell and Esso /Exxon had to surrender their concessions in Malaysia and negotiate production sharing agreements, the details of which we do not have access and are not reported by Petronas. Lopez (2012, page 815-ff) reports some contractual information regarding the minority interests taken by Petronas Carigali (the exploration arm of Petronas); the first PSA (with Shell, signed in 1976) accorded a cost recovery of 20 percent (25% for gas), 10 percent royalty, and the 70 percent remainder split 70:30 in Petronas favor. Carigali was typically "grafted on" as a minority partner, with the IOCs (chiefly Shell and Exxon) until the late 1990s when Petronas was able to negotiate more favorable contracts with higher equity participation.
Lopez, Leslie (2012) Petronas: reconciling tensions between company and state, in Victor et al, eds, Oil and Governance, pp. 809-835.
Bowie, Paddy (2001) A Vision Realised: The Transformation of a National Oil Corporation, Orillia Corporation Sdn Bhd, Kuala Lumpur, 425 pp.
von der Mehden, Fred, & Al Troner (2007) "Petronas of Malaysia," 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: M9

Comment: Rick Heede:

Petronas was founded on 17Aug1974. Wholly owned by the Government of Malaysia, the corporation is vested with the entire oil and gas resources in Malaysia. Wiki, Apr12.
Petronas has, since its founding, pursued a strategy of signing production sharing agreements rather than outright nationalization.
See Lopez, 2012, for Petronas history. Lopez, Leslie (2012) Petronas: reconciling tensions between company and state, in Victor et al, eds, Oil and Governance, pp. 809-835.

Cell: E12

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 gross production (before royalty production is netted out). More often, however, oil companies report production net of royalty production. Crude production includes natural gas liquids (NGL) unless noted.

Cell: I12

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: E25

Comment: Rick Heede:

US Bureau of Mines (1971) International Petroleum Encyclopedia, p. 37, shows oil production for 1959-1969, in million bbl per year.

Cell: D34

Comment: Rick Heede:

Energy Information Administration International Energy Statistics, World Production of Crude Oil, Lease Condensate, & NGL, 1980-2010.
EIA, Crude Oil production (excluding NGL, and other liquids), for 1970-1980.

Cell: E36

Comment: Rick Heede:

EIA annual oil, condensate, and NGLs for 1980-2010 converted to million bbl per year.

Cell: F38

Comment: Rick Heede:

See cell H62 for calculation of Petronas' average oil production of Malaysia's total from 1987 to 2010 (90.35 percent). While international oil companies produce oil in Malaysia, Petronas also produces oil outside the country. This percentage is applied to total Malaysian oil production for 1974 (when Petronas was established) to 1986. After 1986 we use Oil & Gas Journal estimates of Petronas production

Cell: B40

Comment: Rick Heede:

Petronas was formed on 17 August 1974 as a national oil company whollyowned by the government of Malaysia.

Cell: I40

Comment: Rick Heede:

U.S. Bureau of Mines (1976) Minerals Yearbook 1976, Natural gas, Koelling, Gordon W.; Fanelli, Leonard L. pp. 847-888. Table 26, page 888. Data for 1974-1976. Gas data not available for 1977-1979.

Cell: D46

Comment: Rick Heede (Jan10):

Energy Information Administration International Energy Statistics for 1980 to 2005, Crude Oil, Lease Condensate, & NGLs,(Thousand Barrels per Day) for Malaysia. Details reproduced on page 2.

Cell: F53

Comment: Rick Heede:

Petronas oil production 1987-2005 from Oil & Gas Journal, OGJ1000, various years.

Cell: G53

Comment: Rick Heede:

This is the calculated percentage of Petronas' oil production of Malaysia's total production (EIA data). However, this is not a significant indicator in Petronas' case inasmuch as the company produces ~40 percent of its oil abroad in Kazakhstan, Iran, and Iraq, Sudan, and elsewhere.

Cell: J64

Comment: Rick Heede:

Discontinuity in OGJ100 reports not explained.

Cell: D72

Comment: Rick Heede:

2010 AR pdf pg 36 shows Petronas domestic production of oil & condensates for 2006-2010 in k bbl /d. (see pg 35 for Malaysia's prodn, also shown in column M at right.).
CMS adds international oil production (incl condensates) from Petronas Annual Report 2010, page 38. International production has risen from 27.1 percent of total in FY2006 to 36.5 percent in FY2010.
2010 crude + condensates: 449.0 k bbl /d (domestic) + 264.5 k bbl /d (international) = 713.5 k bbl /d = 260.4 million bbl.

Cell: F72

Comment: Rick Heede:

CMS cites Petronas AnnRpt data for 2006-2010. Estimates for 1987-2005 are from OGJ 100, various years.
Petronas AnnRpt 2010 page 35 states that Petronas produces 68.2 percent of Malaysian total oil in FY2010 (and 70.4 percent in 2009).
CMS has not adjusted prior years' OGJ estimates, since we do not have supporting data.
Note also that the production data for 2008 cited in Hulst & Thurber, 2012, (see blow, page 2) for "working interest production" is 195 million bbl. Compare Petronas' own production report of 282 million bbl. We do not have access to the Hulst & Thurber cited data from Wood Mackenzie, and can only assume it includes Petronas domestic and foreign production, as well as crude plus NGLs, but we cannot confirm this.

Cell: H72

Comment: Rick Heede:

2010 AR pdf pg 36 shows Petronas domestic production of natural gas for 2006-2010 in k BOE/day.

CMS adds international oil production (incl condensates) from Petronas Annual Report 2010, page 38.
 2010 natural gas: 662 k BOE /d (domestic) + 375.1 k BOE /d (international) = 1,037 k BOE /d = 2,271 Bcf. CMS uses 6,000 cf per bbl.

Cell: P72

Comment: Rick Heede:
 2010 AR pdf pg 35; average production per day, thousand boe per day

Cell: F73

Comment: Rick Heede:
 World Bank, 2008b page 95, reports Petronas oil production as 1,682,000 bbl per day (614 million bbl) in 2007. "For the fiscal year ended 3/31/07 Petronas reported proven domestic reserves of 5.4 million barrels of oil and 86 TCF of gas reserves which represents 100% of Malaysia's reserves. Petronas reported domestic production of 1.1 MMBOE/D for 2007 down 3% from 2006. 55% of its domestic production is natural gas. Petronas accounts for 77% of Malaysia's oil production and 65% of its gas production. Foreign and private companies operate pursuant to production sharing contracts (PSAs) negotiated and administered by Petronas. ExxonMobil is the largest oil producer of the private/foreign companies. Exploration activities are currently focusing on offshore deepwater prospects. Petronas is a net exporter of oil and gas focusing on Asian markets. For fiscal 2007, Petronas reported international reserves of 2.6 million barrels of oil and 22 TCF of gas representing 33% and 20% of the company's oil and gas reserves respectively. International production for fiscal 2007 was 582 MBOE/D up 35% from 2006. International production accounts for 34% of Petronas' total production. Petronas operates in more than 20 countries including Vietnam, Myanmar, Indonesia, Sudan, Iran, Chad, Egypt, Pakistan, Thailand, Russia, India and Turkmenistan. Most international investment is carried out by Petronas Carigali and has an upstream focus."
 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.
 The World Bank reported production (Petronas data) conflicts with Petronas' reported production in its annual reports. CMS relies on Petronas data. Note also that the WB data conflicts with Wood Mackenzie "working interest production" for 2008 (195 million bbl); see cell E84 for details.

Cell: J73

Comment: Rick Heede:
 World Bank, 2008b, page 95, reports Petronas gas production as 1.3 Tcf (domestic) and 709 Bcf (international).

Cell: M73

Comment: Rick Heede:
 AR2010 pdf pg 35; thousand boe per day "Malaysia average production," crude oil+condensates. Petronas prodn on pdf pg 36, listed in column D.

Cell: O75

Comment: Rick Heede:
 Oil & Gas Journal OGJ100 3Oct2011, page 48, for 2009-2010.
 CMS note: OGJ apparently only shows Petronas domestic production and ignores substantial international production.

Cell: D76

Comment: Rick Heede:
 Higher LNG sales volume of 26.1 million tonnes, with 22.8 million tonnes contributed by the PETRONAS LNG Complex and 1.9 million tonnes contributed by Egyptian LNG, while an additional 1.4 million tonnes were from trading activities. Produced 9.7 million tonnes of petrochemical products, a 5% increase from the 9.2 million tonnes produced in the previous year, resulting from the first full-year operation of our Mega Methanol plant as well as improved operational performance. Attained a total production of 1.75 million boe per day, amid a higher contribution from international acreages, which accounted for 639.6 thousand boe per day or 36.5% of the Group's total production. Petronas (2011) Annual report 2010, page 26.
 PETRONAS' share of Malaysia's production for the year, inclusive of PETRONAS Carigali's domestic production, amounted to 1.1 million boe per day or 68.2% of total average national production, a decrease from the previous year's share of 70.4%. This reflected lower production entitlements due to higher cost recovery by Product Sharing Contractors amid lower average oil prices for the year in review. Petronas (2011) Annual report 2010, page 35.
 2010 AR pdf pg 36 shows Petronas domestic production of oil & condensates for 2006-2010 in k bbl /d. (see pg 35 for Malaysia's prodn, also shown in column M at right.). CMS adds international oil production (incl condensates) from Petronas Annual Report 2010, page 38. International production has risen from 27.1 percent of total in FY2006 to 36.5 percent in FY2010. 2010 crude + condensates: 449.0 k bbl /d (domestic) + 264.5 k bbl /d (international) = 713.5 k bbl /d = 260.4 million bbl.

Cell: M80

Comment: Rick Heede:
 Petronas AnnRpt 2015 only provides combined entitlement production of Oil and natural gas. Thus we calculate the oil share of entitlement production in 2016 (from AnnRpt 2017) and apply this factor -- 37.2% -- to 2014 and 2015 combined O&G entitlement production.

Cell: D82

Comment: Rick Heede:
 Petronas AnnRpt 2017, page 8: production 2016 totaled 939 kbpd, of which 668 kbpd entitlement.

Cell: H82

Comment: Rick Heede:
 Petronas AnnRpt 2017, page 8: production 2016 totaled 1,424 kboepd, of which 1,126 kboepd entitlement.

Cell: D84

Comment: Rick Heede:
 PETRONAS Group (2019) Financial Results Announcement, Q4 and Year Ended FY2018, slide 5. [https://www.petronas.com/ws/sites/default/files/downloads/Financial Operational Report Year Ended 31 December 2018 \(FY2018\).pdf](https://www.petronas.com/ws/sites/default/files/downloads/Financial%20Operational%20Report%20Year%20Ended%2031%20December%202018%20(FY2018).pdf)

Cell: H84

Comment: Rick Heede:
 PETRONAS Group (2019) Financial Results Announcement, Q4 and Year Ended FY2018, slide 5. "entitlement natural gas production (1,092 kboepd) converted to Bcf at 6,000 cf per bbl.

Cell: K171

Comment: Rick Heede:
 Source: U.S. Geological Survey (~1997) Maps Showing Geology, Oil and Gas Fields, and Geologic Provinces of the Asia Pacific Region, Compiled by Douglas W. Steinshouer, Jin Qiang, Peter J. McCabe, & Robert T. Ryder, Open- File Report 97-470F, U.S. Dept of Interior, Reston. pubs.usgs.gov/of/1997/ofr-97-470/OF97-470F/aspac.PDF

Cell: D280

Comment: Rick Heede:
 Wako, Yoshiaki (2007) "The Secrets of Petronas' Success," Nippon Oil Research Institute; in: The Changing Role of National Oil Companies in International Energy Markets, Baker Institute for Public Policy, Rice Univ., 2 March.

Cell: P291

Comment: Rick Heede:

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