

Oil and natural gas extraction data

Richard Heede
Climate Mitigation Services
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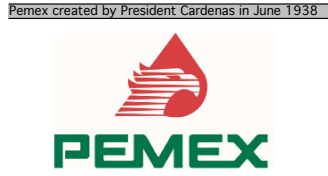
Petróleos Mexicanos (PEMEX)

www.pemex.com Mexico City

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

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 Million cf/d	Net production Million SCM/yr	Net production Billion cf/yr	
1936							
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2015							
2016							
2017							
2018							
Total			47,414			71,165	



million cf/d

20	Burgos Basin gas	7
30	Guzman, Alfredo	11
40	(tk% of Mexico)	15
60	(see chart at right)	22
80		29
90		33
120		44
180	Pemex natural gas	66
240	1959-2010	88

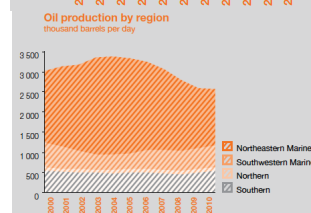
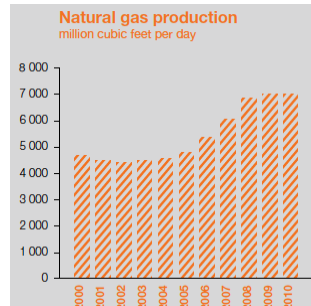


Guzman, Alfredo E (2013) The Petroleum History of Mexico, AAPG Conf., Cartagena, Colombia, Sept.



Pemex Statistical Yearbook 2011, page 1.

million cubic metres/yr
29.11



Energy Intelligence	Energy Intelligence
thousand bbl /day	million cf/day
3,450	4,679
3,560	4,511

Oil & Gas Journal OGI100	
Crude + NGLs	Natural Gas
million bbl	Bcf
950	2,407
949	2,337
921	2,325

Gross gas production including CO2 and nitrogen	
	5.36
	6.06
	6.92
	7.03
	7.02
	6.59
	6.39
	6.37
	6.53
	6.40
	5.79
	5.07
	2.42

Alternate production estimate for 2008

Table with columns: 2008, Thousand bbl/d, Million bbl/yr, Million cf/d, Bcf/yr. Values: 3,257, 1,189, 3,953, 1,443

Source: Huils, & 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

National oil & gas / Mexico

Table with columns: BP Stat Rev 2014, BP Stat Rev 2018. Rows: Crude oil & NGL, Natural Gas. Units: Mb, Bcf.

US Energy Information Administration, International Energy Statistics

Large data table with columns: Year, Mexico Crude oil condensate & NGL, Mexico Dry natural gas, Mexico Vented & Flared, Mexico gross, Mexico Reinjected, Mexico Gross Prod'n. Rows from 1980 to 2018.

Updated June 2019 Crude oil, condensate, & NGL. Updated June 2019 (dry gas, EIA stat to 2017). Updated June 2019. Updated June 2019.

Summary row for 1990-2011 totals: 28,643, 29,253, 3,161, 8.0%, -, 39,699

Table showing Domestic sales Volume (Mbd) from 2000 to 2010. Categories include Refined products, LPG, Motor gasolines, Jet fuel, Diesel, Fuel oil, Others, Dry gas, Petrochemicals.

Table showing Frequency Index and Severity Index from 2000 to 2010. Includes sub-sections for Environmental protection: Sulfur oxide emissions, Carbon dioxide emissions, Total discharges to water, Disposal of hazardous waste, Leakage and spills.

1.1 Summary of selected operating statistics thousand barrels per day

Table showing Production and process from 2007 to 2017. Rows include Total hydrocarbons, Crude oil, Natural gas, Condensates and gas liquids, etc.

Pemex (2017) Statistical Yearbook, page 4.

	Liquid Hydrocarbons Production (thousand barrels daily)									Natural Gas Production (million cubic feet daily)						
	Total	Crude Oil			By region			Natural Gas liquids*	Total	By type			By region			
		Total Crude	Heavy	Light	Extralight	Marine	Southern			Northern	Associated Hydrocarbon gas	Nitrogen	Non associated	Marine	Southern	Northern
2006	3,883	3,256	2,244	831	180	2,680	491	84	427	5,356	3,090	0	2,266	1,776	1,352	2,228
2007	3,471	3,076	2,039	838	199	2,524	465	87	395	6,058	3,302	143	2,613	2,150	1,353	2,556
2008	3,157	2,792	1,766	815	210	2,246	459	87	366	6,919	3,690	629	2,599	2,924	1,451	2,544
2009	2,971	2,601	1,520	812	270	2,010	498	93	370	7,031	3,984	496	2,550	2,894	1,600	2,537
January	3,050	2,685	1,638	815	231	2,120	475	90	368	7,091	3,985	563	2,543	3,033	1,538	2,521
February	3,027	2,663	1,623	804	237	2,100	472	92	364	7,009	3,976	525	2,507	2,984	1,531	2,494
March	3,026	2,632	1,586	815	251	2,089	490	94	374	6,953	3,945	485	2,523	2,885	1,551	2,518
April	3,021	2,642	1,558	820	264	2,054	495	93	379	6,964	4,027	416	2,521	2,909	1,544	2,511
May	2,991	2,609	1,534	810	265	2,022	493	94	382	7,003	3,979	474	2,550	2,927	1,538	2,539
June	2,882	2,519	1,447	802	270	1,928	493	98	363	7,121	4,052	526	2,543	3,031	1,560	2,529
July	2,927	2,561	1,487	806	268	1,967	498	97	366	7,055	4,001	504	2,550	2,936	1,575	2,543
August	2,915	2,542	1,461	800	291	1,940	508	94	373	7,121	4,038	527	2,556	2,921	1,657	2,543
September	2,963	2,599	1,494	822	283	1,994	513	92	384	7,023	4,004	474	2,544	2,833	1,667	2,523
October	2,962	2,602	1,494	818	289	1,996	514	92	361	7,170	4,018	566	2,586	2,915	1,686	2,569
November	2,923	2,553	1,457	802	294	1,957	504	92	369	6,985	3,909	488	2,588	2,742	1,670	2,573
December	2,972	2,593	1,465	827	301	1,983	518	91	380	6,872	3,877	407	2,588	2,619	1,675	2,578
2010	2,853	2,576	1,422	834	320	1,942	532	102	377	7,020	3,860	683	2,477	2,755	1,765	2,500

Pemex (2011) Monthly Petroleum Statistics, Nov 11.

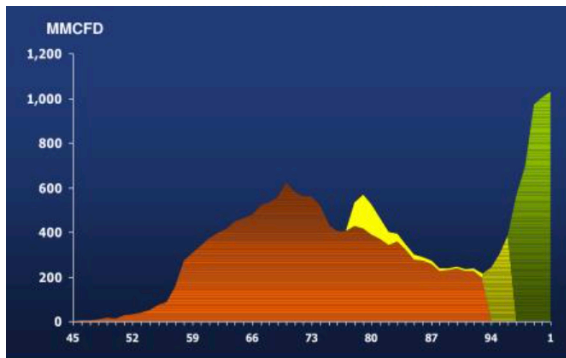
Pemex (2011) Monthly Petroleum Statistics, Nov 11.

	Petrochemical Production (thousand tonnes)													
	Total*	Dichloroethane	Ammonia	Benzene	Vinyl chloride	Styrene	Ethylene	Ethylene oxide	High density polyethylene	Low density polyethylene	Linear low density polyethylene	Propylene ^b	Toluene	Others
2006	10,961	353	592	135	209	139	1,128	361	167	352	29	340	203	6,953
2007	11,757	391	760	118	235	134	1,001	301	157	277	81	353	175	7,773
2008	11,973	267	896	101	157	120	1,062	344	170	258	154	329	153	7,963
2009	11,956	259	790	79	155	91	1,160	280	195	288	206	431	139	7,883
January	1,061	27	86	5	16	2	98	21	20	25	20	35	15	689
February	963	19	78	4	12	9	87	24	14	24	16	31	12	632
March	1,132	28	78	11	16	13	108	30	14	27	25	39	14	729
April	1,002	16	66	9	10	7	99	26	15	20	20	34	12	666
May	943	5	44	10	3	12	86	27	20	22	5	32	15	662
June	954	0	68	8	0	11	90	19	4	23	26	32	16	658
July	1,053	17	64	9	7	10	94	10	22	26	11	33	18	731
August	1,125	30	65	11	18	11	99	11	16	26	18	44	17	758
September	1,076	27	65	11	16	7	95	19	16	23	21	43	15	719
October	879	31	44	1	20	0	98	32	15	25	16	31	6	560
November	853	20	55	0	13	8	102	35	14	22	24	38	0	524
December	915	39	77	0	23	1	103	25	24	26	5	38	0	553
2010	13,188	306	899	118	187	65	1,126	372	181	264	196	384	188	8,902

Pemex (2011) Monthly Petroleum Statistics, Nov 11.

www.ri.pemex.com/files/dcpe/peetro/indicador_ingles.pdf

Guzman, Burgos Basin Project (partial Mexican gas production, 1945-2001), slide 15

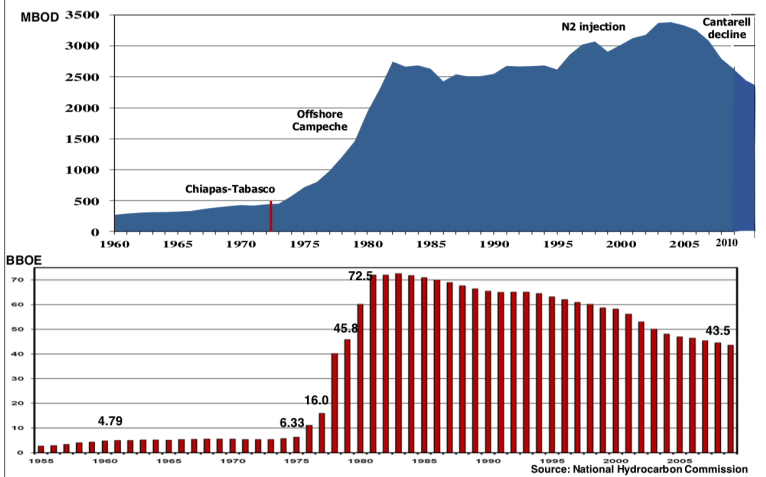


Guzman, Alfredo (tk) Oil and Gas Exploration and Production in Northern Mexico.pps



Pemex Statistical Yearbook 2011, page 10.

The History After the Big Discoveries



Source: National Hydrocarbon Commission

PEMEX

Cell: I9

Comment: Rick Heede:

"Petróleos Mexicanos or Pemex is a Mexican state-owned petroleum company. Pemex has a total asset worth of \$415.75 billion, and is the world's second largest non-publicly listed company by total market value, and Latin America's second largest enterprise by annual revenue as of 2009. However, the majority of its shares are non-publicly listed and under control of the Mexican government. The value of its publicly listed shares totalled \$102 billion in 2010, representing approximately one quarter of the company's total worth.

Asphalt and pitch had been worked in Mexico since the time of the Aztecs. Small quantities of oil were first refined into kerosene around 1876 near Tampico. By 1917 commercial quantities of oil were being extracted and refined by subsidiaries of the British Pearson and American Doheny companies, and had attracted the attention of the Mexican government who then claimed all mineral rights for the state as part of its Constitution.

In 1938, President Lázaro Cárdenas sided with oil workers striking against foreign-owned oil companies for an increase in pay and social services. On March 18, 1938, citing the 27th article of the 1917 constitution, President Cárdenas embarked on the state-expropriation of all resources and facilities, nationalizing the United States and Anglo-Dutch operating companies, creating Pemex. In retaliation, many foreign governments closed their markets to Mexican oil. In spite of the boycott, Pemex developed into one of the largest oil companies in the world and helped Mexico become the fifth-largest oil exporter in the world.

In 1979, Pemex's Ixtoc 1 exploratory oil well in the Bay of Campeche suffered a blowout resulting in one of the largest oil spills in history. Pemex spent \$100 million to clean up the spill and avoided most compensation claims by asserting sovereign immunity as a state-run company.

en.wikipedia.org/wiki/Pemex

See also: History of Petróleos Mexicanos at www.pemex.com/index.cfm?action=content§ionID=112&catID=11682, though uninformative:

"1937: After a series of events that damaged the relationship between employees and companies, a strike broke out against the foreign oil companies paralyzing the country. The Conciliation and Arbitration Board ruled in favor of the workers, but the companies filed a writ of amparo in the Nations Supreme Court of Justice.

1938: As the writ of amparo was rejected, the Supreme Court ratified the judgment rendered by the Federal Conciliation and Arbitration Board in favor of the workers. After the companies' rejection to fulfill the court order, during the afternoon of March 18th, President Lazaro Cardenas del Rio issued an executive order to expropriate the real estate property and the movable property of 17 oil companies in favor of the Nation. On June 7, Petróleos Mexicanos is created."

Cell: M9

Comment: Rick Heede:

World Bank, 2008b, page 357: "Petróleos Mexicanos is a decentralized public entity of the Mexican government. The Mexican government owns 100% of PEMEX. The company is a decentralized entity of the federal government."

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.

See also: Stojanovski, Ognen (2012) "Handcuffed: an assess-ment of Pemex's performance and strategy," pp. 280-333, in Victor et al, eds, Oil and Governance, Cambridge Univ. Press, 1034 pp

Cell: D12

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 production.

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

Cell: H12

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: E15

Comment: Rick Heede:

Petróleos Mexicanos was created by President Lazaro Cardenas in June of 1938.

Cell: E17

Comment: Rick Heede:

The Nations Encyclopedia ("The Encyclopedia of the Nations is a complete source for detailed information about one hundred ninety three countries in the world, information about the United Nations and the associated agencies, and World Leaders."); www.nationsencyclopedia.com/ and specifically; www.country-data.com/cgi-bin/query/r-8749.html

Despite disruption caused by the Revolution, Mexico's oil production peaked in 1921 at 193 million barrels (some 25 percent of world production), largely as a result of increased international demand generated by World War I. During much of the 1920s, Mexico was second only to the United States in petroleum output and led the world in oil exports. By the early 1930s, however, output had fallen to just 20 percent of its 1921 level as a consequence of worldwide economic depression, the lack of new oil discoveries, increased taxation, political instability, and Venezuela's emergence as a more attractive source of petroleum. Production began to recover with the 1932 discovery of the Poza Rica field near Veracruz, which became Mexico's main source of petroleum until the late 1950s.

In 1938 President Lázaro Cárdenas nationalized the petroleum industry, giving the Mexican government a monopoly in the exploration, production, refining, and distribution of oil and natural gas, and in the manufacture and sale of basic petrochemicals. Although Cárdenas offered compensation, United States oil companies pressured the United States government to embargo all imports from Mexico in order to discourage similar nationalizations in other countries. The boycott was in effect briefly, but the United States government soon pressured the oil companies to come to terms with Mexico as a result of President Franklin D. Roosevelt's Good Neighbor Policy and United States security needs arising from World War II. In 1943 Mexico and the oil companies reached a final settlement under which the companies received US\$24 million (a fraction of the book value of the expropriated facilities) as compensation. Nevertheless, the oil nationalization deprived Mexico of foreign capital and expertise for some twenty years.

Mexico's oil output expanded at an average annual rate of 6 percent between 1938 and 1971. Production increased from 44 million barrels in 1938 to 78 million barrels in 1951. Domestic demand progressively exceeded output, and in 1957 Mexico became a net importer of petroleum products. Production rose to 177 million barrels by 1971 with the exploitation of new oil fields in the isthmus of Tehuantepec and natural gas reserves near the northeastern border city of Reynosa, but the gap between domestic demand and production continued to widen.

Extensive oil discoveries in the 1970s increased Mexico's domestic output and export revenues. In 1972 explorers discovered deep oil wells in the states of Chiapas and Campeche that showed huge reservoirs of petroleum extending for 200 kilometers northeast below the Bahía de Campeche, and possibly in the opposite direction toward Guatemala. Almost every drilling operation conducted after 1972 struck oil. In 1973 oil production surpassed the peak of 190 million barrels achieved in the early 1920s. In 1974 Pemex announced additional petroleum discoveries in Veracruz, Baja California Norte, Chiapas, and Tabasco.

By 1975 Mexico's oil output once again exceeded internal demand, providing a margin for export. President López Portillo announced in 1976 that Mexico's proven hydrocarbon reserves had risen to 11 billion barrels. They rose further to 72.5 billion barrels by 1983. López Portillo decided to increase domestic production and use the value of Mexico's petroleum reserves as collateral for massive international loans, most of which went to Pemex. Between 1977 and 1980, the oil company received US\$12.6 billion in international credit, representing 37 percent of Mexico's total foreign debt. It used the money to construct and operate offshore drilling platforms, build onshore processing facilities, enlarge its refineries, engage in further exploration, prove fresh reserves, and purchase capital goods and technical expertise from abroad. These investments helped to increase petroleum output from 400 million barrels in 1977 to 1.1 billion barrels by 1982.

Between 1983 and 1991, Mexico's petroleum exports by volume remained roughly constant at 1.4 million barrels per day (bpd), while total production increased from 2.7 million bpd to 3.1 million bpd."

Cell: H30

Comment: Rick Heede:

Guzman, Alfredo (tk) Oil and Gas Exploration and Production in Northern Mexico, undated; <https://www.slideserve.com/howie/oil-and-gas-exploration-and-production-in-northern-mexico>

Cell: L38

Comment: Rick Heede:

Guzman, Alfredo E (2013) The Petroleum History of Mexico, AAPG Conf., Cartagena, Colombia, Sept.

http://www.searchanddiscovery.com/pdfz/documents/2013/10530guzman/ndx_guzman.pdf.html

Cell: E39

Comment: Rick Heede:

Oil plus NGL production for 1959-1963 from Petróleos Mexicanos (1964) Informe del Director General, p. 22.

Cell: H39

Comment: Rick Heede:

Natural gas production for 1959-1963 from Petróleos Mexicanos (1964) Informe del Director General, p. 22.

Cell: D44

Comment: Rick Heede:

Oil plus NGL production for 1964-1967 from Petróleos Mexicanos (1965) Petroleum Policy, by Mr. Jesus Reyes Heróles (Dir Gen), p. 3.

Note: 1966 production is estimated at 388 kbbl/d, but we adjust this figure downwards based on the next year's annual report that notes 1967 production was 11 percent above 1966 (411 kbbl/d): ie, 1966 = ~372.4 k/bbl/d.

No data given for natural gas production in our photcopy.

Cell: D47

Comment: Rick Heede:

Oil plus NGL production for 1967 from Petróleos Mexicanos (1968) Petroleum Policy, by Mr. Jesus Reyes Heróles (Dir Gen), p. 6.

Cell: H47

Comment: Rick Heede:

Natural gas production for 1967 from Petróleos Mexicanos (1968) Petroleum Policy, by Mr. Jesus Reyes Heróles (Dir Gen), p. 6.

Note: we derive 1966 gas production from this report's increased production of 8.3 percent over 1966.

Cell: E48

Comment: Rick Heede:

Oil plus NGL production for 1969 from Petróleos Mexicanos (1970) Petroleum Policy, by Mr. Jesus Reyes Heróles (Dir Gen), p. 5-6.

Cell: E49

PEMEX

Comment: Rick Heede:

Oil plus NGL production for 1969 from Petroleos Mexicanos (1970) Petroleum Policy, by Mr. Jesus Reyes Heróles (Dir Gen), p. 12.

Cell: B52

Comment: Rick Heede:

Oil plus NGL production for 1972 from Petroleos Mexicanos (1973) Informe del Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 16. Data only given in production units of million cubic metres or oil per year. Using the previous year's annual report plus 3.45 percent increase to calculate 1972 production (= 183.5 million bbl), the datum given of 29.111 million cubic meters of oil produced in 1972, then 1 million cubic metres equals 6.304 bbl.

Cell: L52

Comment: Rick Heede:

Cell: E53

Comment: Rick Heede:

Oil plus NGL production for 1973 from Petroleos Mexicanos (1974) Informe del Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 4.

Cell: E54

Comment: Rick Heede:

Oil plus NGL production for 1974 from Petroleos Mexicanos (1975) Informe del Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 9 and 16.

Cell: E55

Comment: Rick Heede:

Oil plus NGL production for 1975 from Petroleos Mexicanos (1976) Report of the Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 9 and 10.

Cell: D56

Comment: Rick Heede:

Oil plus NGL production for 1976 from Petroleos Mexicanos (1977) Informe del Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 4.

Cell: E58

Comment: Rick Heede:

Oil plus NGL production for 1978 from Petroleos Mexicanos (1979) Informe del Director General, by Ing. Antonio Dovali Jaime (Dir Gen), p. 10.

Cell: E59

Comment: Rick Heede:

Oil plus NGL production for 1979-1980 from Petroleos Mexicanos (1981) Memoria de Labores, p. 73.

Cell: D61

Comment: Rick Heede:

Oil plus NGL production for 1981 from Petroleos Mexicanos (1982) Memoria de Labores, p. 79.

Cell: D80

Comment: Rick Heede:

PEMEX (2011) Statistical Yearbook, page 4. Adds crude oil and natural gas liquids; in 2000: 3.012 + 0.438 million bbl per day; crude oil 87.3 percent of total liquids.

Cell: H80

Comment: Rick Heede:

PEMEX (2011) Statistical Yearbook, page 23.

Cell: L80

Comment: Rick Heede:

Oil and gas data from EI (2003) Top 100, p. 198.

Cell: M80

Comment: Rick Heede:

EI (2003) Top 100, p. 194.

Cell: J84

Comment: Rick Heede:

Pemex data is identical to OGJ100.

Cell: D86

Comment: Rick Heede:

Pemex (2011) Monthly Petroleum Statistics, Nov11. Table reproduced at right, and adds crude oil & NGLs.

Cell: P86

Comment: Rick Heede:

Pemex (2011) Monthly Petroleum Statistics, Nov11.

Cell: H87

Comment: Rick Heede:

Pemex (2018) Statistical Yearbook 2017 shows natural gas processing in million cf per day (we cite as Bcf/day) for 2007-2017. CAI corrected previous entries listing "total hydrocarbons produced / Natural Gas" (which includes CO2 and Nitrogen content), hence we revised this data to show natural gas processed. We do not list "dry gas production," which is lower by approx 0.5-0.6 Bcf/day).

Cell: P91

Comment: Rick Heede:

Pemex Petroleum Statistics, Natural gas production, billion cf per day. 2011-2013. www.ri.pemex.com/index.cfm?action=content§ionID=21&catID=12177

Cell: D94

Comment: Rick Heede:

Pemex operating statistics 2011-2015, crude oil (2.509 Mb/d crude), plus condensate.

Cell: D96

Comment: Rick Heede:

Pemex "Monthly Petroleum Statistics, liquids hydrocarbons Production."

Cell: P96

Comment: Rick Heede:

Pemex "Monthly Petroleum Statistics, Natural Gas Production."

Cell: D97

Comment: Rick Heede:

Pemex oil production by type (heavy, light, extra light, and NGL) to 2018. roughly half is heavy (1.073 Mb in 2018, and NGL 0.238 Mb). <http://www.pemex.com/en/investors/publications/Paginas/petroleum-statistics.aspx>

Cell: H97

Comment: Rick Heede:

Pemex (2019) Monthly Petroleum Statistics for natural gas processing for 2017 and 2018. Sour gas in 2018 is 2.492 Bcf/day, and sweet gas 0.459 Bcf, or 2.95 Bcf/day total. <http://www.pemex.com/en/investors/publications/Paginas/petroleum-statistics.aspxYEARBOOK-2017.pdf>

Cell: P97

Comment: Rick Heede:

Pemex (2018) Statistical Yearbook 2017 dry natural gas production and wet gas processed from 2014 to 2018. 2018: 2.418 Bcf per day. <http://www.pemex.com/en/investors/publications/Documents/STATISTICAL-YEARBOOK-2017.pdf>

Cell: E105

Comment: Rick Heede:

Pemex "working interest liquids production in 2008" at 3,257 thousand bbl per day.

Victor, Huils, & 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: J105

Comment: Rick Heede:

Pemex "working interest natural gas production in 2008" at 3,953 thousand cf per day.

Victor, Huils, & 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