

- '		D		L					0					J J		ĸ	L		IVI		N	0					Q	_
-	1					Alte	rnoto i	oroduct	lon or	timate 1	for 200	no				1							Г	Nation	al oil &	nas / M	<i>levico</i>	
2		Thousand bb	al /d	Million b	abl /vr	Alle	anace p	JIOUUCU	1011 65	umate			illion cf/d	Bcf.y	ur.												at Rev 20	19
	2008		257	MINIOTE	1,189							141	3,953		1,443								Ē		oil & NG		tural Gas	<b>"</b>
÷		Source: Hults		rher 20			n Table	11 na	ne 24	in Victor	retal	eds 20			1,110	1							- H		1b		Bcf	
7		Table 1.1 is t																					- F		178		39	0
3											,														177		38	6
)																									185		40	0
)																									192		43	5
																-									238		45	6
2				US Ene	rav Inf	formati	ion Ad	ministr	ration.	. Intern	ationa	l Energ	gy Statist	cs				Updat	ed June	2019					294		46	4
2					- 37					itional/ei			,		Vente	d & Fla	red of								326		45	
1		Mexico		Mex	ico					Mexi			Mexico	Mexic		gross	Mexico		Mexico						396		48	
5		Crude oil,							Pr	od Marke			natural gas	Vented &	Flared		Reiniected		oss Prod	'n					484		60	
5		k bbl per d	lay n	nillion bb	ol per yr					Bcf per	year	Bc	f per year	Bcf per	year	%	Bcf per year	Bo	f per yea	ar					587		73	3
7	1980	2,12	9.0		777						NA		900		156		-	NA							777		88	
3	1981	2,55			932						NA		969		251		-	NA							932		95	
1	1982 1983	3,00 2,95			1,096						NA NA		1,045 1.027		241 166		-	NA NA							1,095 1,069		1,01 1.02	
Ĥ	1984	3,03			1,109						NA		1,002		110		-	NA							1,003		1,02	
2	1985	3,01			1,101						NA		999		108		-	NA							1,063		98	
3	1986	2,78	7.0		1,017	,					NA		886		69		-	NA							1,007		87	1
1	1987	2,88			1,053						NA		898		75		-	NA							1,051		88	
5	1988	2,88			1,052						NA		905		51		-	NA							1,050		89	
2	1989 1990	2,90 2,98			1,060 1,088	2 I					NA 903		866		44 32	2%	-	NA	1	285					1,057 1,073		86 93	
2	1990	2,90			1,145						899		890		32	2%	-			205 283					1,131		93	
5	1992	3,12			1,140						879		879		33	3%	-			260					1,131		91	
5	1993	3,13			1,143						950		923		45	3%	-			324					1,137	1	98	
	1994	3,14	6.4		1,148	3					975		952		43	3%	-		1,	355					1,145		1,03	2
2	1995	3,06			1,118						957		937		72	5%	-			362					1,115		1,03	
3	1996	3,27			1,197	Ž					1,064		1,054		148	9% 13%	-			579					1,194		1,08	
+	1997 1998	3,41 3,49			1,245 1,276	2					1,166 1,266		1,161 1,246		219 241	14%	-		1,	634 744					1,244 1,277		1,09 1,16	
5	1999	3,43			1,221	' I					1,287		1,240		171	10%	-		1.	697					1,223		1,20	9
7	2000	3,44	9.9		1,259						1,314		1,297		165	9%	-		1,	740					1,261		1,17	6
3	2001	3,56			1,299						1,302		1,283		127	8%	-		1,	682					1,302		1,17	0
)	2002	3,58			1,309						1,334		1,319		97	6%	-			686					1,311		1,19	
2	2003	3,78	8.8		1,383	3					1,400		1,384		93	5%	-		1,	733					1,385		1,23	0
2	2004	3,82 3,75			1,396						1,464 1,349		1,449 1,513		56 66	3% 4%	-			780 892					1,398 1.374		1,30 1.56	
2	2005	3,73			1,344						1,349		1,678		99	4%	-			092 117					1,374		1,50	
1	2007	3,47			1,267	;					1,678		1,781		200	8%	-		2,	356					1,270		1,65	5
5	2008	3,15	6.9		1,152	2					1,694		1,773		488	18%	-		2,	652					1,155		1,66	3
5	2009	2,97			1,085						1,722		2,107		381	15%	-			566					1,087		1,85	
7	2010	2,95			1,078						1,799		1,769		223	9%	-			562					1,080		1,80	
5	2011 2012	2,93 2,91			1,071						1,744 1,684		1,686		132	5% 2%	-			407					1,073		1,84 1,79	
2	2012	2,91			1,052						1,004		1,626 1,594		53 52	2%	-		2,	337 325					1,063 1,049		1,79	
ŕ	2014	2,78	8.8		1,018								1,567		114	5%	-		2,	384					1,016		1,81	
2	2015	2,59			946								1,426		220	9%	-			336					944		1,69	
3	2016	2,45			898								1,296		273	13%	30			120					896		1,53	
1	2017 2018	2,23 2.06			814 753								1,115		130	7%	31	98	1,	850					812 755		1,35 1,32	1
2	2010	2,06	4.0		/ 55	, I								_									1		/ 55	1	1,52	01
7		Updated June	e 2019									Updat	ed June 2019	Updated Jur	ne 2019		Updated June 20	19 Unda	ted June 2	2019								
3		Crude oil, cor		e, & NGP	۲L						(		EIA stat to 2															
)																												
)							1990-	2011 to	otals	2	28,643		29,253		3,161	8.0%	-		39,	699								
2													_															
í.													Change 2010/2009															
5		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	(%)		Frequer	nov index (	number of disabling	2000	2001	2002	2003	2004	2005	2006	2007	2008 2	2010	
5	Production (Mbd)																lion of man-hours work	ed)										
7	Liquid hydrocar					3 825	3 760	3 683	3 471	3 157	2 971	2 953	-0.6		Petróleo	os Mexican	05	1.19	1.00	1.17	1.09	1.50	1.06	0.67	0.59	0.47	0.42 0.4	
3	Crude oil	3 012	3 127	3 177	3 371	3 383	3 333	3 256	3 076	2 792	2 601	2 576	-1.0				n and Production	1.66		1.14	1.35	1.67	1.26	0.96	1.22		0.72 0.4	
)	Condensates : Liquids *															x-Refining	Basic Petrochemicals	0.72	0.69 0.50	1.10 1.01	0.63	1.23 0.38	1.16 0.26	0.59			0.32 0.6	
)		438			418	442	426	427	395	366	370	377	2.0			x-Gas and E x-Petrochen		1.06	0.50	0.88	1.13	2.00	1.13	0.07			0.10 0.1 0.45 0.2	9
4	Natural gas (MN						4 818	5 356	6 058	6 919	7 031	7 020	-0.2		Petróle	eos Mexicar	108	1.49		1.79	1.54	1.85	0.71	0.42	0.07	0.12	0.07 0.0	9
1	Crude oil proces Refined product				1 286	1 303 1 587	1 284 1 554	1 284 1 546	1 270 1 512	1 261 1 491	1 295 1 525	1 184 1 416	-8.6 -7.2				nber of lost workdays											1
2	Petrochemicals						1 554	1 546	1 512	1 491	1 525	1 4 16	-7.2		per mi	Illion of mai	n-hours worked)	89	93	96	96	100	67	31	26	27	26 2	
<u>+</u>	Domestic sales	. , 11301		000	10 200	10 / 01	10 000	10 301				10 100	10.0		Perner	<ul> <li>wexican</li> <li>exploration</li> </ul>	os n and Production	117		96 126	96	100	67 78	42	26	41	26 2 44 2	
2	Volume (Mbd)														Pernex	k-Refining		72	50	92	78	89	73	30	15	17	17 3	6
7	Refined product	1 726	1 712	1 658	1 684	1 718	1 771	1 762	1 815	1 826	1 771	1 762	-0.5				Basic Petrochemicals	102	79	48	184	137	56	9	2	44	13 2	
2	LPG	330				328	313	305	300	292	281	288	2.5			k-Petrochen sos Mexicar		111 32	132 52	108 40	146 51	151 53	80 27	40 11	25 2	43	31 1	1
ž.	Motor gasoline				600	636	671	718	760	792	792	802	1.2		Environ	mental prof	ection	32	52	40	51	53	21	- "I	2		3	1
5	Jet fuel	56			54	58	59	61	68	65	55	56	1.6				ions (SOx) (t/Mt)	2.06		1.49	1.65	1.49	1.25	1.48			2.87 2.1	
ī	Diesel	285	276	271	295	303	320	345	358	382	359	371	3.4		Carbo	n dioxide er	missions (CO2) (t/Mt)	133		111	117	112	90	114	124	150	166 15	
2	Fuel oil	492			355	332	341	264	257	220	209	185	-11.5				o water (kg/Mt) dous waste * (%)	17.14 76.50	13.19 77.00	9.16 84.80	7.61 97.99	6.39 98.19	6.35 158.20	6.99 62.59			1.70 8.8 8.28 11	
3	Others	32		31	53	61	66	68	71	76	75	60	-19.6			sal of hazari ge and spill		76.50	11.00	34.00	81.89	30.19	100.20	02.39	102.07 1	40.30 1	11	1
1	Dry gas (MMcfd)					2 756	2 632	2 955	3 064	3 086	3 1 1 9	3 254	4.3		Ever	nts		1 518	1 249	839	791	338	399	404	392	329	216 20	
5	Petrochemicals	(Mt) 3 505					3 795	3 869	4 041	4 191	4 064	4 247	4.5		Volu	me (t)		6 252			9 570	5 488	3 528		14 992	1 970	033 27 97	1
5			Pe	emex (20	011) Sta	atistical	Yearbo	ok, page	e 4.										x (2011)									
7																	www.ri.pemex.c	om/files/o	content/	AE_E_P	Petroleo	os%20M	Mexican	ios_ing_	_2011.pr	df		
3		•					1.0		1.44																			

# 1.1 Summary of selected operating statistics

thousand	barre	ls per	day
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A

 $\frac{102}{103} \frac{1}{105} \frac{$ 

В

C

D

roduction and process											
Total hydrocarbons (Mboed)	4,392	3,965	3,776	3,793	3,722	3,697	3,653	3,538	3,269	3,037	2,73
Crude oil	3,076	2,792	2,601	2,577	2,553	2,548	2,522	2,429	2,267	2,154	1,94
Natural gas <sup>a</sup> (MMcfd)	6,058	6,919	7,031	7,020	6,594	6,385	6,370	6,532	6,401	5,792	5,06
Condensates and gas liquids	395	366	370	377	384	365	360	359	324	305	27
Natural gas processing (MMcfd)	4,283	4,240	4,436	4,472	4,527	4,382	4,404	4,343	4,073	3,672	3,23
Crude oil processing in refineries	1,270	1,261	1,295	1,184	1,167	1,199	1,224	1,155	1,065	933	76
Dry gas production in plants (MMcfd) <sup>b</sup>	3,546	3,461	3,572	3,618	3,692	3,628	3,693	3,640	3,398	3,047	2,66
Refined products and LPG °	1,512	1,491	1,525	1,416	1,379	1,405	1,457	1,385	1,267	1,119	91
Petrochemicals (Mt) d	14,584	14,414	14,526	15,655	15,125	13,475	13,992	14,057	12,585	11,291	9,42

Pemex (2017) Statistical Yearbook, page 4.

К

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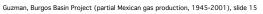
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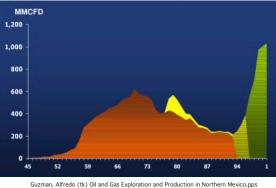
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	A B	С	D	E		F	G	Н		I	J	K	L		M	N O		P	Q	R
216 217 218 219 220 221 222 223 222 223 222 223 222 223 224 225 226 230 231 232 233 234 233 234 233 234 235 236 237 238 239 240 241 242 242 244 245 244 245 244 245 252 254 255 256 257 258 259 266 266							Liquid	d Hydroca	rbons Pr	oduction barrels daily)							Na		Production subic feet daily)	
220 221 222		Total	Total		By type	Crude Oil		By region	(inocound	Natural Gas		Total	Hydrocarbo	By 1 Associated on gas N	lype Nitrogen	Non associated	Marine	By region Southern	Northern	
223 224 225	2006	3,683	Crude 3,256	Heavy 2,244	Light 831	Extralight	Marine 2,680	Southern 491	Northern 84	liquids* 427	2006 2007	5,356 6,058	3,09		0 143	2,266 2,613	1,776 2,150	1,352 1,353	2,228 2,556	
226	2007 <sup>b</sup> 2008	3,471 3,157	3,076 2,792	2,039 1,766	838 815	199 210	2,524 2,246	465 459	87 87	395 366	2008 2009	6,919 7,031	3,69 3,98		629 496	2,599 2,550	2,924 2,894	1,451 1,600	2,544 2,537	
228 229 230	2009	2,971	2,601	1,520	812	270	2,010	498	93	370	January February	7,091 7,009	3,98 3,97		563 525	2,543 2,507	3,033 2,984	1,538 1,531	2,521 2,494	
231 232 233	January February March	3,050 3,027 3,026	2,685 2,663 2,652	1,638 1,623 1,586	815 804 815	231 237 251	2,120 2,100 2,069	475 472 490	90 92 94	366 364 374	March	6,953	3,94	5	485	2,523	2,885	1,551	2,518	
234	April May	3,021 2,991	2,642 2,609	1,558 1,534	820 810	264 265	2,054 2,022	495 493	93 94	379 382	April May June	6,964 7,003 7,121	4,02 3,97 4,05	9	416 474 526	2,521 2,550 2,543	2,909 2,927 3,031	1,544 1,538 1,560	2,511 2,539 2,529	
236 237 238	June	2,882 2,927 2,915	2,519 2,561 2,542	1,447 1,487 1,461	802 806 800	270 268 281	1,928 1,967 1,940	493 498 508	98 97 94	363 366 373	July August	7,055 7,121	4,00 4,03	8	504 527	2,550 2,556	2,936 2,921	1,575 1,657	2,543 2,543	
239 240 241	August September October	2,963	2,599	1,494	822	283	1,994	513	92 92	364 361	September	7,023	4,00		474 566	2,544	2,833	1,667	2,523	
242 243	November December	2,923 2,972	2,553 2,593	1,457	802 827	294 301	1,957 1,983	504 518	92 91	369 380	November December	6,985 6,872	3,90 3,87		488 407	2,588 2,588	2,742 2,619	1,670 1,675	2,573 2,578	
245	2010	2,953 Peme	2,576 ex (2011) Ma	1,422 onthly Petro	834 Ileum Statis	320 tics, Nov11.	1,942	532	102	377	2010	7,020 P	3,86 Pemex (2011)		683 roleum Statis	2,477 stics, Nov11.	2,755	1,765	2,500	
247 248 249														Po	trochem	ical Prov	luction			
250 251 252								Vinyl			Ethylene	High	Low	Linear low	liochem		nd tonnes)			
253 254 255		2006	Tota 10,961		oroethane 353	Ammonia	Benzene 135	chloride 209	Styrene 139	Ethylene	oxide po 361		density lyethylene po 352	density olyethylene 29	Propylene <sup>b</sup>	Toluene 203	Others 6,953			
256 257 258		2007	11,757	7	391 267	760 896	135 118 101	235 157	139 134 120	1,001	301 344	157	277 258	29 81 154	353 329	203 175 153	7,773 7,963			
259 260		2008 2009	11,973		259	790	79	157	91	1,160	280	195	288	206	431	139	7,883			
262		Januar Februa March		3	27 19 28	86 78 78	5 4 11	16 12 16	2 9 13	98 87 108	21 24 30	20 14 14	25 24 27	20 16 25	35 31 39	15 12 14	689 632 729			
264 265 266		April May	1,002 943	3	16 5	66 44	9 10	10 3	7 12	99 86	26 27	15 20 4	20 22	20 5	34 32	12 15	666 662			
267 268 269		June July Augus	954 1,053 t 1,125	3	0 17 30	68 64 65	9 11	0 7 18	11 10 11	90 94 99	19 10 11	4 22 16	23 26 26	26 11 18	32 33 44	16 18 17	658 731 758			
270 271		Septer	mber 1,076	6	30 27 31	65	11	16	7	95	19	16	23	21	43	15	719			
273		Novem	nber 853	3	20 39	55 77	0	13 23	8 1	102 103	35 25	14 24	22 26	24 5	38 38	0	524 553			
275		2010	13,188		306 011) Month	899 Iy Petroleum	118 Statistics, N	187 ov11.	65	1,126 W	372 ww.ri.pemex.o	181 com/files/dcpe	264 e/petro/indicad	196 lor_ingles.pd	384 If	188	8,902			
272 273 274 275 276 277 278 279 280 281 282 283 284 283 284 285 286 287		Guzman,	Burgos Bas	sin Project	(partial Me	exican gas pr	oduction, 1	945-2001),	slide 15											
281 282 283	8	MMCFD	Ú.								т	he His	story	After	the E	Big D	iscov	eries		
284 285 286	- 1989 	200																		
288		000 -								MBOD							1	N2 injection	Cantar declir	rell ine
290 291		800 -									3000									
292 293 294		600 -									2000 -			Offshore Campeche						
295 296 297		400 -		1							1500									
298 299 300	3	200 -		<u> </u>							500	Chiap	pas-Tabasco							
301 302		0 45	52	59	66	73 8	0 87	94	1	BBOE	0 1960	1965	1970	1975 1	1980 1	985 19	90 199	5 2000	2005 2010	0
303 304 305		Guzn	nan, Alfredo (	(tk) Oil and	Gas Explora	tion and Prod	uction in No	rthern Mexico.	.pps	70				7	2.5					-
306 307 308	4	Press (1)	Cartores	Dd Juderer						50				45.8	┫┨┨┨┨				43.5	
309 310 311			Harmasika Col. Obri	non Ja						40										
312 313 314				opoleberripo			,			20	4.79		6.	16.0 33						
315 316			-	Cularan D	urango Zacatecos Sar	Asarapar Luga Potsar				0 <b>1955</b>	1960	1965	1970 1	975 11	980 19	85 199	Source	2000 National Hydro	2005 ocarbon Commissio	ion
317 318 319		Q			Duadalajara Salamarca			0 1 10 0 1 10												
289         290           291         292           293         294           295         296           297         298           298         299           300         301           302         303           303         306           307         308           306         307           308         306           307         311           311         312           313         314           315         316           317         318           319         322           323         324           325         326           327         327					1	Puebe cara Cárdenas Dosofeas	Manara Maria Carriedo													
323 324 325					$\searrow$	-	La Saley D													
326 327		Peme	ex Statistical	Yearbook 2	:011, page	10.														

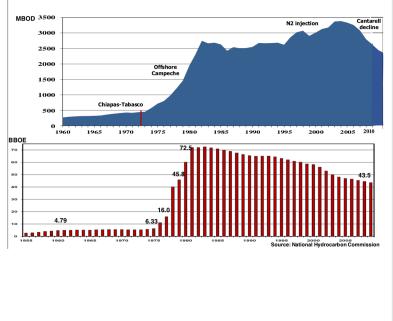
					Vinyl			Ethylene	High	Low	Linear low			
	Total*	Dichloroethane	Ammonia	Benzene	chloride	Styrene	Ethylene	oxide	density	density	density	Propylene <sup>b</sup>	Toluene	Others
									polyethylene	polyethylene	polyethylene			
2006	10,961	353	592	135	209	139	1,128	361	167	352	29	340	203	6,953
2007	11,757	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

# Cell: 19 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 guarter 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 lxtoc I 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 Petroleos Mexicanos at www.pemex.com/index.cfm?action=content&sectionID=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, Petroleos Mexicanos is created."

#### Cell: M9 Comment: Rick Heede

World Bank, 2008b, page 357: "Petroleos 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

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

# Cell: F17 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 netroleum until the late 1950s

In 1938 President Lazaro 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.

wexico'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 Bahia 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 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 annoted 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 Petroleos Mexicanos (1964) Informe del Director General, p. 22.

# Cell: H39

Comment: Rick Heede

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

# Cell: D44 Comment: Rick Heed

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

Note: 1966 production is estimated at 388 kbl/d) use 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 photocopy.

# Cell: D47

Comment: Rick Heede

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

# Cell: H47 Comment: Rick Heede

Natural gas production for 1967 from Petroleos Mexicanos (1968) Petroleum Policy, by Mr. Jesus Reyes Heroles (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 Petroleos Mexicanos (1970) Petroleum Policy, by Mr. Jesus Reyes Heroles (Dir Gen), p. 5-6.

PEMEX

#### Comment: Rick Heede:

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

# Cell: B52 Comment: Rick Heede

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# 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 El (2003) Top 100, p. 198.

Cell: M80

# Comment: Rick Heede:

El (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

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#### Cell: P91 Comment: Rick Heede

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

# Cell: D94 Comment: Rick Heede:

Pemex operating statisitics 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 fpr 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 2017dry natural gas production and wet as processed from 2014 to 2018. 2018: 2.418 Bcf per day. http://www.pemex.com/en/investors/publications/Documents/STATISTICAL-YEARBOOK-2017.pdf

# Comment: Rick Heede:

Perex "working interest liquids production in 2008" at 3,257 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: J105 Comment: Rick Heede: Pemex "working interest natural gas production in 2008" at 3,953 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