S&P Global
Platts

MEXICO ENERGY MONTHLY

AN ENERGY MARKET FUNDAMENTALS REPORT

Volume 4 / Issue 1 / January 2019

MARKET HIGHLIGHTS

For President Andres Manuel Lopez Obrador's anti-fuel theft strategy to succeed, Mexico requires private investment in fuel storage to sustain pipeline shutdowns amid illegal tapping, according to analysts. In Mexico's Central and Western regions, the country's most vulnerable areas for fuel shortages from supply disruptions, there were only enough inventories in December to supply one and two days of gasoline demand, respectively, data from Mexico's Energy Secretariat (SENER) showed. Retail stations in both regions have run out of inventories since Lopez Obrador implemented a new strategy of shutting down pipelines to fight fuel theft through illegal pipeline tappings. The strategy has been successful, cutting fuel theft down to 3,400 b/d from over 100,000 b/d, according to Lopez Obrador. However, this has resulted in fuel shortages across eight states.
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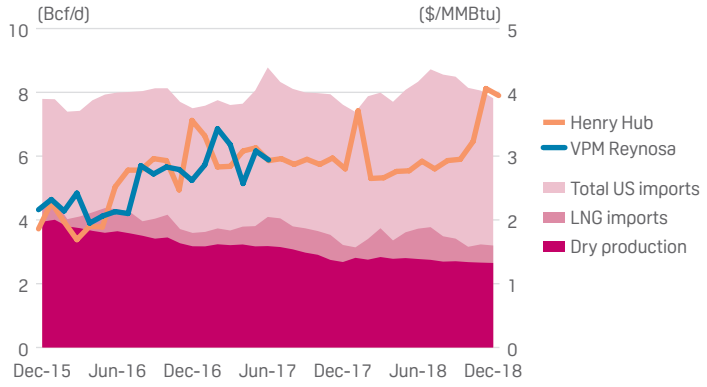
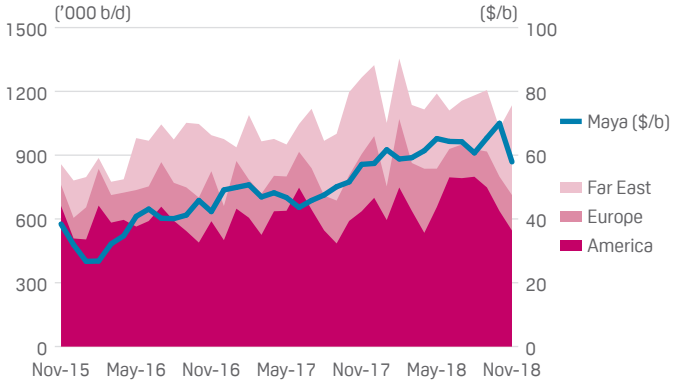
MEXICO NATURAL GAS SUPPLY vs PRICES



Source: S&P Global Platts Analytics

MAYA CRUDE OIL EXPORTS vs PRICE



Source: SENER

MEXICO ENERGY MARKET FUNDAMENTALS AND PRICES

	Nov	Dec	Month chg	Year-to-date 2018	Year-to-date 2017	Year-to-date Chg
Natural gas (Bcf/d)						
Production	2.7	2.7	0.0	2.7	3.1	-0.3
Imports from US	4.8	4.6	-0.2	4.7	4.2	0.5
LNG sendout	0.6	0.6	0.0	0.7	0.7	0.0
Total supply	8.1	7.8	-0.2	8.0	7.9	0.1
Power burn	4.1	3.8	-0.3	4.0	4.0	0.0
Other demand	4.3	4.3	0.0	4.1	3.9	0.2
Total demand	**8.4**	**8.1**	**-0.3**	**8.1**	**7.9**	**0.21**
Natural gas prices ($/MMBtu)						
Henry Hub	4.06	3.95	-0.11	3.12	2.96	0.16
El Paso - Waha Pool	1.67	1.82	0.15	1.95	2.72	-0.76
El Paso Permian	1.80	2.06	0.27	1.94	2.60	-0.65
Houston ShipChl	4.11	3.95	-0.17	3.20	2.98	0.22
TX Eastern S TX	3.99	3.82	-0.17	3.09	2.92	0.17
LNG imports (Bcf)						
Altamira	6.8	7.1	0.3	122.7	95.4	27.3
Costa Azul	0.0	0.0	0.0	6.3	9.5	-3.1
Manzanillo	10.3	10.4	0.1	126.8	137.5	-10.8

	Oct	Nov	Month chg	Year-to-date 2018	Year-to-date 2017	Year-to-date Chg
Crude oil ('000 b/d)*						
Production	1,764	1,717	-47.5	1,841	1,948	-107.5
Total supply	1,764	1,717	-47.5	1,841	1,948	-107.5
Refinery demand	485	511	26.4	615	770	-155.6
Exports	1,135	1,169	34.2	1,202	1,167	35.2
Total demand	**1,619**	**1,680**	**60.6**	**1,817**	**1,937**	**-120.4**

*Crude oil data lagged by one month

Mexico natural gas production likely to continue into 2019

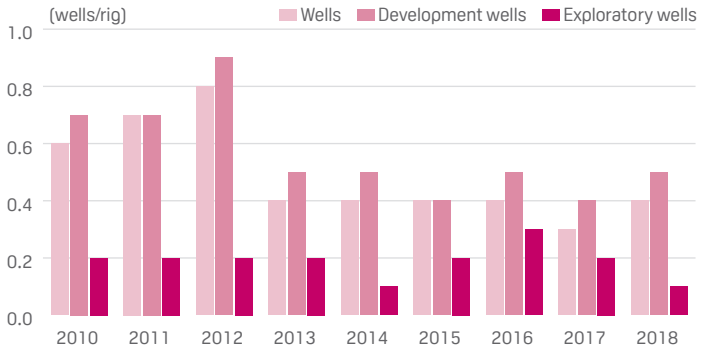
Platts Analytics estimates total natural gas production in Mexico saw a brief spike above 2.8 Bcf/d during the first two days of the year, a 0.2 Bcf/d build over the prior 30-day average. Since then, production estimates have fallen back under 2.7 Bcf/d, down from the highs, but still trending above the December average. Despite this brief glimmer of hope, broader drilling fundamentals across Mexico point to little hope of a reversal of production declines in 2018.

The bump in gas production was primarily observed at the Nuevo Pemex and Cactus gas processing receipt meters on the CENAGAS system, which both process associated gas, primarily from offshore oil wells. Combined, these two facilities delivered nearly 0.9 Bcf/d to CENAGAS on January 2, a build of more than 0.2 Bcf/d over the December average.

Since early 2017, despite a somewhat lackluster pace, Mexico has consistently grown its active drilling fleet and as of November SENER reported that nearly 42 rigs were operational in Mexico, an increase of around 17% from a year ago and more than double early 2017 lows. However, 17 of those rigs were exploratory while only 25 were developmental, indicating that a major portion of the drilling fleet will not add to near-term production growth. The ratio of roughly 1.5 developmental rigs per exploratory rigs is far below historical norms. In 2010, for instance, there were nearly six developmental rigs operating per exploratory rig. Additionally, these new rigs have yet to offset the pace of declines in existing producing wells. SENER data indicate that total producing wells in Mexico fell to around 7,500 in November, down just over 4% from a year ago.

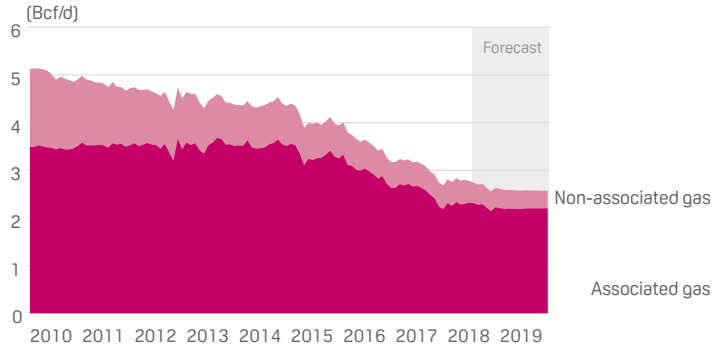
Furthermore, while the efficiency of the rigs currently in operation does appear to be improving compared to 2017, it's still lagging well behind historic averages. In 2018, roughly 13.1 wells were drilled per month with an active fleet of 37 rigs on average, implying that one rig was capable of drilling 0.4 wells per month, a 0.1 well per month (~40%) improvement compared 2017. However, this is well below reported efficiencies in 2012, where wells drilled per rig was averaging 0.8. Specifically, developmental rigs were capable of drilling approximately 0.9 wells per month in 2012, about 40% faster than current drilling rates. By comparison, rigs in the US drilled an average of 0.31 wells per month in 2018, which was a nearly 30% improvement over 2012.

WELLS DRILLED PER RIG



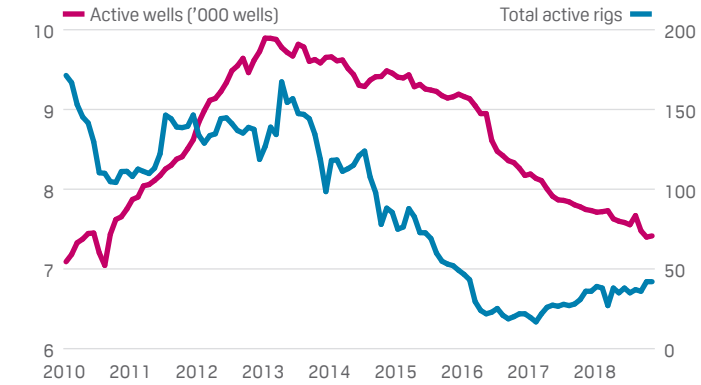
Source: S&P Global Platts Analytics

MEXICO GAS PRODUCTION FORECAST



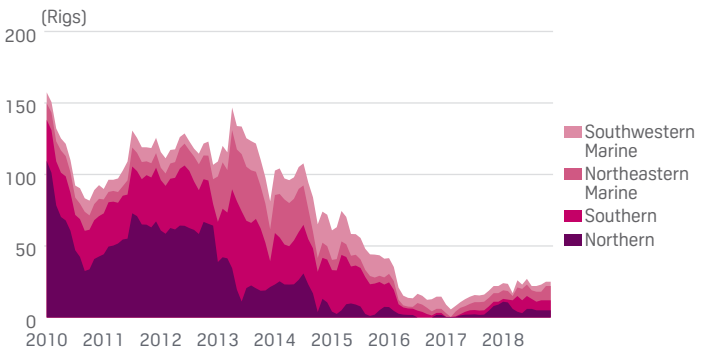
Source: S&P Global Platts Analytics

MEXICO ACTIVE WELLS vs DRILLING ACTIVITY



Source: S&P Global Platts Analytics

ACTIVE RIGS BY REGION



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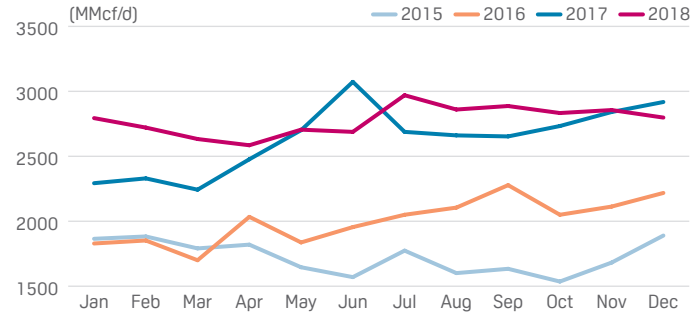
CELLMODEL

MEXICO REGIONAL SUPPLY AND DEMAND (MMcf/d)

	Supply			Change				Demand			Change				Inter-Regional Flows			Change			
	Dec-17	Nov-18	Dec-18	Y/Y	Y/Y %	M/M	M/M %	Dec-17	Nov-18	Dec-18	Y/Y	Y/Y %	M/M	M/M %	Dec-17	Nov-18	Dec-18	Y/Y	Y/Y %	M/M	M/M %
Baja California	435	337	344	-91	-21	7	2	-216	-325	-320	-104	48	5	-1	Regional demand balanced against supply						
Central	No production							-1,606	-1,636	-1,549	57	-4	86	-6	-1,606	-1,636	-1,549	57	-4	86	-6
North	317	466	442	125	40	-24	-5	-803	-765	-771	31	-4	-7	1	-486	-402	-415	71	-15	-13	3
Northeast	4,605	4,617	4,565	-40	-1	-52	-1	-1,687	-1,761	-1,767	-80	5	-6	0	2,918	2,856	2,798	-120	-4	-58	-2
Northwest	149	463	403	254	171	-60	-13	-149	-463	-403	-254	171	60	-15	Regional demand balanced against supply						
Penninsula	No production							-88	-66	-50	38	-43	16	-32	-88	-66	-50	38	-43	16	-32
South	2,101	2,030	2,000	-101	-5	-30	-1	-2,308	-2,258	-2,232	76	-3	26	-1	-207	-228	-232	-24	12	-4	2
West	309	338	332	23	7	-6	-2	-357	-365	-366	-8	2	-1	0	-48	-27	-34	14	-30	-7	20
Total	**7,915**	**8,252**	**8,086**	**171**	**2**	**-166**	**-2**	**-7,214**	**-7,639**	**-7,459**	**-244**	**3**	**180**	**-2**	**701**	**613**	**627**	**-73**	**-10**	**14**	**2**

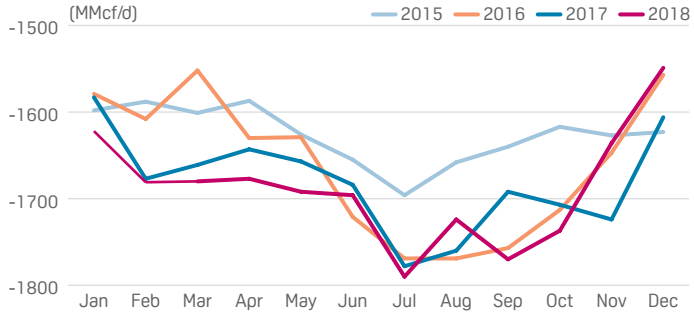
Source: S&P Global Platts Analytics

NORTHEAST MEXICO SD BALANCE



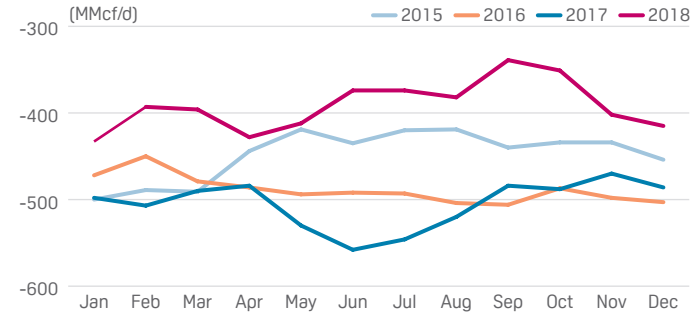
Source: S&P Global Platts Analytics

CENTRAL MEXICO SD BALANCE



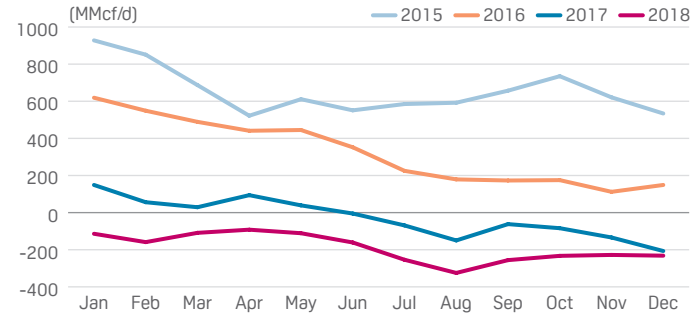
Source: S&P Global Platts Analytics

NORTHERN MEXICO SD BALANCE



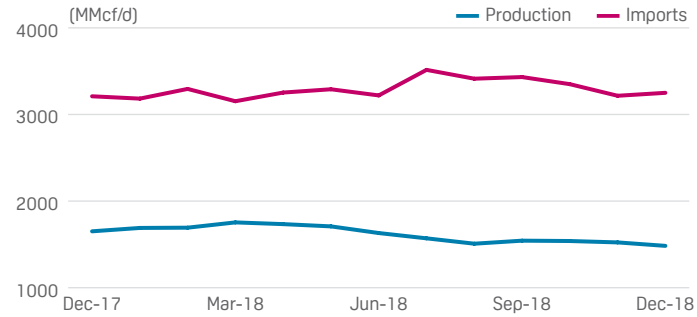
Source: S&P Global Platts Analytics

SOUTHERN MEXICO SD BALANCE



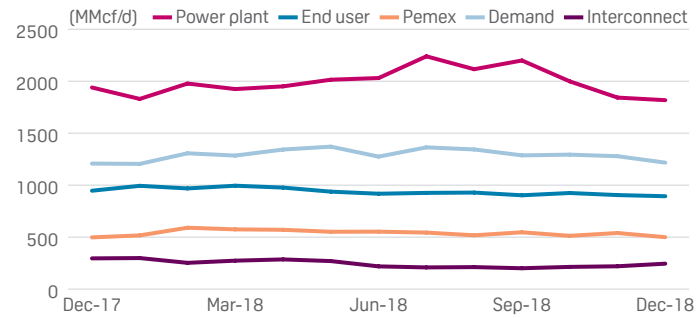
Source: S&P Global Platts Analytics

CENAGAS SAMPLE SUPPLY



Source: S&P Global Platts Analytics

CENAGAS SAMPLE DEMAND



Source: S&P Global Platts Analytics

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CELLMODEL

MEXICAN NATURAL GAS PIPELINES

Source: S&P Global Platts Analytics

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NATURAL GAS LIQUIDS (NGLS)

Gas plant production of NGLs in Mexico declined by 7,000 b/d between October and November 2018, averaging 214,000 b/d in November. Production is 16% lower than at the start of 2018 and 23% lower than the 2017 average, driven by declines in oil and natural gas production in Mexico. Oil and gas production in November fell by 47,500 b/d and 90 MMcf/d, respectively, month over month, according to Pemex data. The Morelos gas processing plant reported just 10,000 b/d of NGL production, down from 40,000 b/d the previous month. The decline was partially offset by increases at the nearby La Cangrejera plant, which reported 18,000 b/d higher NGL production month over month. In 2019, Pemex has stated it will increase crude oil output through new well completions and production from recently-discovered fields. Increased oil and associated gas production from fields in Mexico would stem declines in NGL production. However, the company's limited budget places downside risk on the ability to achieve these plans.

Ethane

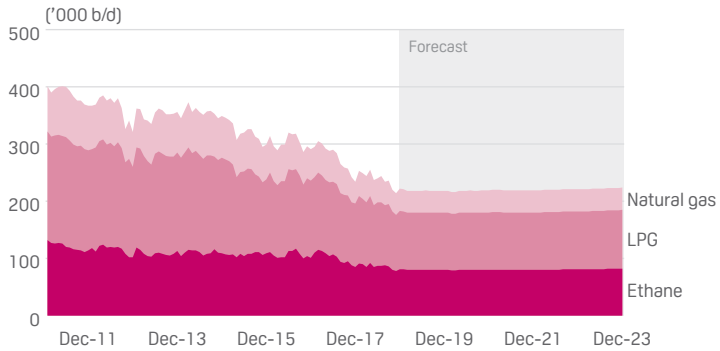
Production of ethane from gas plants fell by 2,000 b/d to 78,000 b/d in November, as imports increased by about 7,000 b/d to more-than offset the production decline. Two deliveries of ethane (about 13,000 b/d over the month) on the vessel Emilius augmented Mexican ethane production in November, according to data from Platts' cFlow. Pemex reported a month-over-month drop in ethylene production of about 3,800 mt, with production totaling 45,900 mt in November, up over 4,100 mt from November 2017. Ethane imports have improved feedstock availability compared to last year; however, continued declines in gas plant production of ethane is expected to limit steam cracker and downstream petrochemical operations. Steam cracker consumption of ethane is forecast to remain flat at about 92,000 b/d through the mid-2020s.

LPG

LPG production from gas plants fell to 98,000 b/d in November, in line with the larger-than-expected declines in crude and natural gas production. Refinery production of LPG increased from 5,000 b/d to 7,000 b/d between October and November, but is still well below historical levels, which averaged 16,000 b/d in 2017. Refinery utilization fell steadily in 2018, reaching a low of 30% in October, according to SENER data, with rates at the Salamanca and Minatitlán refineries falling the most month over month. Pemex recently confirmed to S&P Global Platts that it will restart operations at its Madero refinery in Tamaulipas before the end of the month. While planned utilization rates are unknown, the restart could result in additional LPG volumes being available in the region, which imports about 20,000 b/d off of ships via the LPG terminal in Altamira.

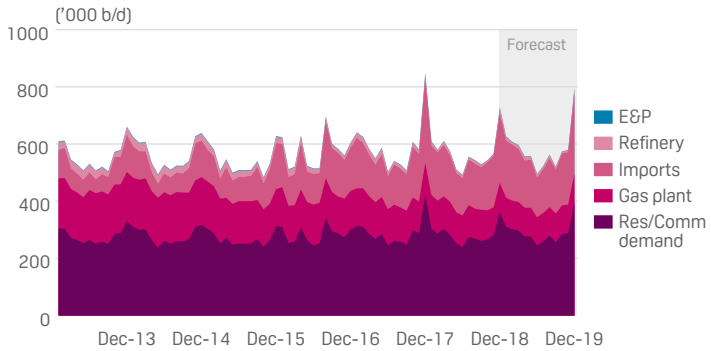
LPG imports were 168,000 b/d in October, the latest month for which SENER data are available. January through October imports averaged about 160,000 b/d, up from 145,000 b/d during the same period in 2017. Over land imports of LPG from the US increased between September and October, the latest month for which data are available from the US Census Bureau. After averaging about 22,000 b/d through much of the middle of the year, imports increased to 33,000 b/d in October. It is typical for imports along these routes to increase in the winter to meet demand in northern Mexican regions which are less well-connected with import terminals on the coasts. Mexico's LPG imports are forecast to continue increasing as falling supply must be augmented to meet residential and commercial demand for the fuel. On an annual average, Platts Analytics forecasts imports will reach 185,000 b/d in the mid-2020s before declining again on increased gas plant production.

MEXICAN GAS PLANT NGL PRODUCTION



Source: S&P Global Platts Analytics

LPG SUPPLY BY SOURCE



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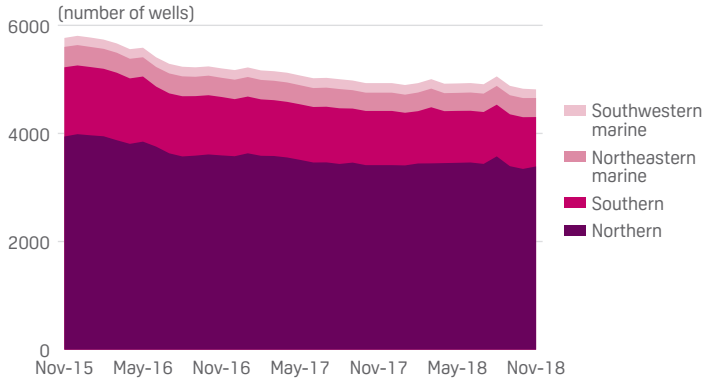
DRILLING AND PRODUCTION

RIG ACTIVITY

	Aug-18	Sep-18	Oct-18	Nov-18	Month change
Development drilled wells	14	3	13	2	-11
Completed wells – gas	-	-	-	-	0

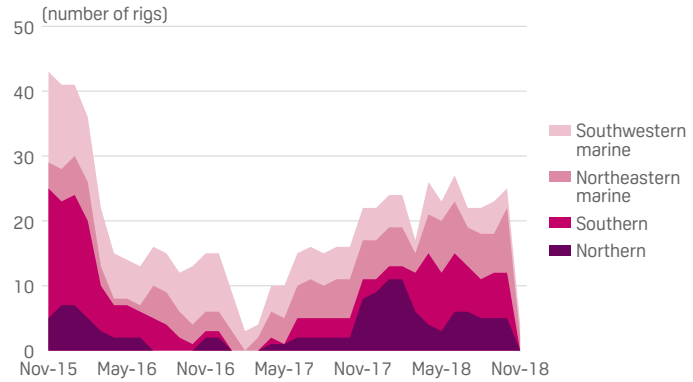
Source: SENER

AVERAGE PRODUCING WELLS BY REGION – OIL AND ASSOCIATED GAS



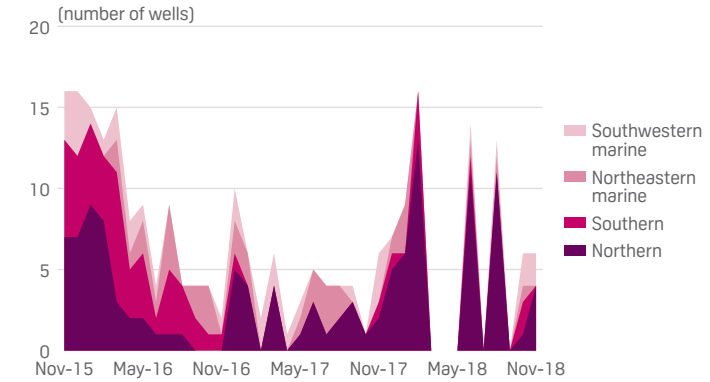
Source: SENER

DEVELOPMENT RIG COUNT BY REGION



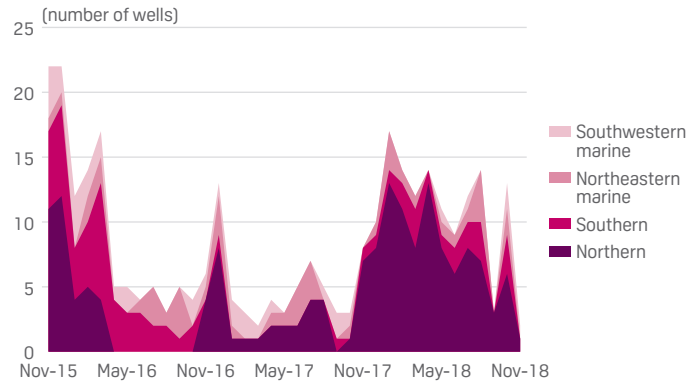
Source: SENER

COMPLETED WELLS BY REGION – OIL



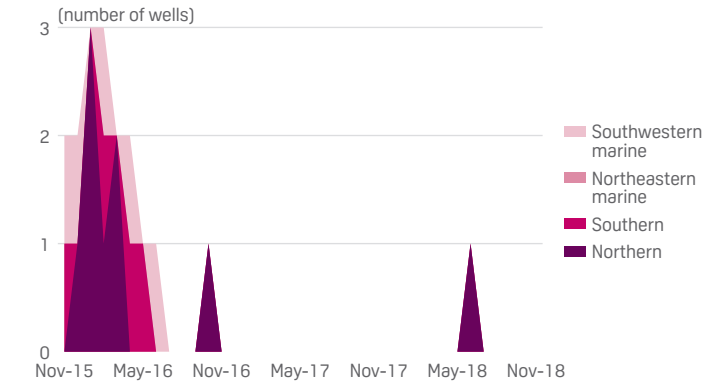
Source: SENER

DEVELOPMENT DRILLED WELLS BY REGION



Source: SENER

COMPLETED WELLS BY REGION – GAS



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DRILLING AND PRODUCTION – CRUDE

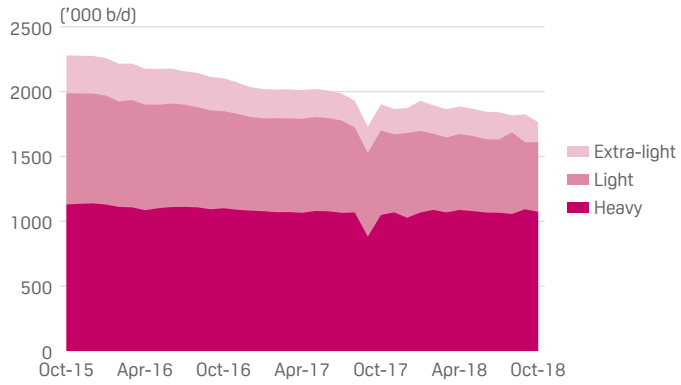
- The new CEO, Octavio Romero Oropeza, said he had learned from officials at Pemex's trading arm PMI that only about half of its fuel purchases are done through contracts, mainly with US refiners. "If we already know we are consuming 700,000 or 800,000 b/d of fuel, why don't we try to reach contracts looking for the best prices in an accurate way?" he asked in a Mexican radio interview Monday. "Why only part of it? Why should we leave so much in hands of the spot market, the free market?" Romero Oropeza said the administration of Manuel Antonio Lopez Obrador will try to buy as much as possible through contracts to get the best prices. "We would only do spot purchases, if we were to do them at all, for an strategic reason," he said. The new Lopez Obrador government will do an analysis of how much fuel is being bought by PMI, what types of fuels and at what prices, Romero Oropeza said. However, putting this strategy into practice may prove difficult. "The problem is the government doesn't really understand how Pemex works, they believe everything is corrupt so they do not consider anything the previous governments did was even okay and so they are trying to change everything to seem revolutionary," a shipbroker in Mexico said. "It's not a plausible decision but considering what this new government has done, it is a possibility even if in the long haul it's worse," they continued.

OIL PRODUCTION ('000 b/d)

	Actuals				Year-to-date change		
	Jul-18	Aug-18	Sep-18	Oct-18	2018	2017	Change
Type							
Light	564	629	517	537	577	722	-145
Heavy	1,066	1,057	1,093	1,073	1,075	1,073	2
Extra-light	211	130	215	154	202	222	-20
Total	**1,840**	**1,816**	**1,825**	**1,764**	**1,853**	**2,017**	**-164**
Region							
Northeastern Marine Region	1,036	1,028	1,068	1,025	1,041	1,036	4
Southwestern Marine Region	484	473	445	430	490	551	-62
Northern Region	227	226	224	221	231	269	-39
Southern Region	93	90	87	89	92	98	-6
Total	**1,840**	**1,816**	**1,825**	**1,764**	**1,853**	**1,955**	**-102**

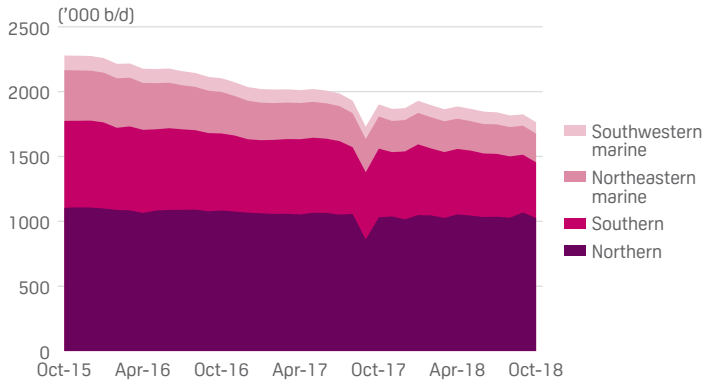
Source: SENER

CRUDE PRODUCTION BY PRODUCT



Source: SENER

CRUDE PRODUCTION BY REGION



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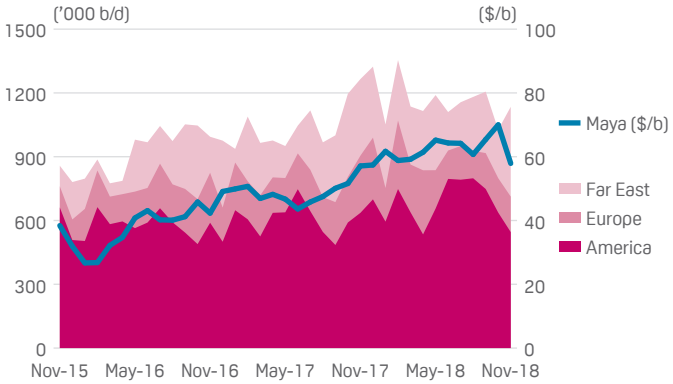
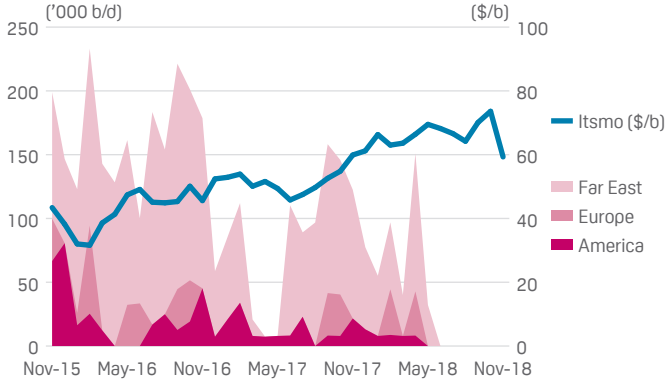
MAYA CRUDE OIL EXPORTS vs PRICE



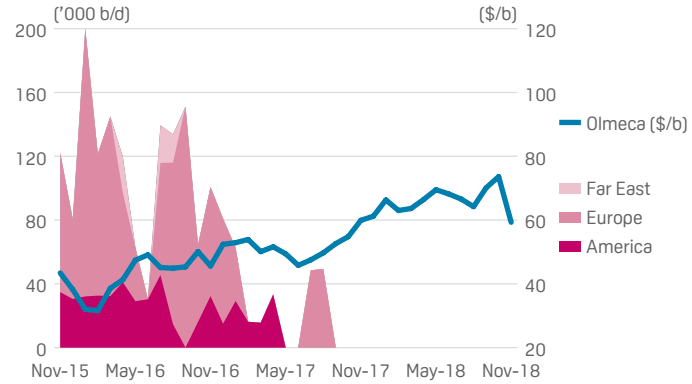
Source: SENER

ITSMO CRUDE OIL EXPORTS vs PRICE



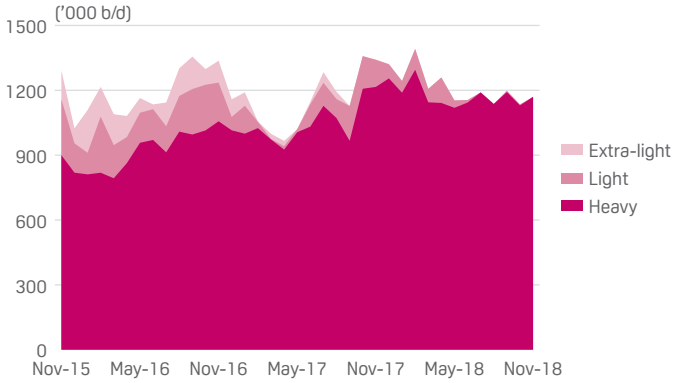
Source: SENER

OLMECA CRUDE OIL EXPORTS vs PRICE



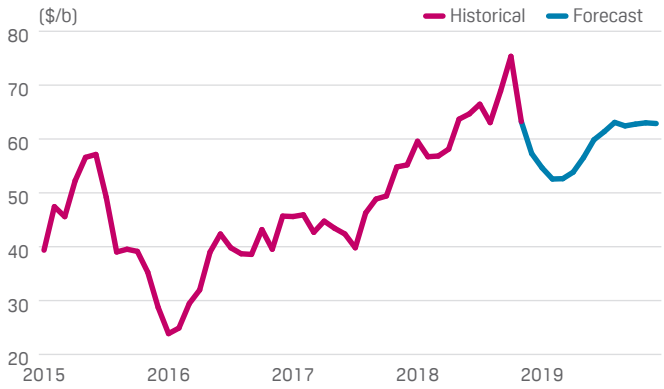
Source: SENER

DISTRIBUTION TO CRUDE OIL EXPORT TERMINALS



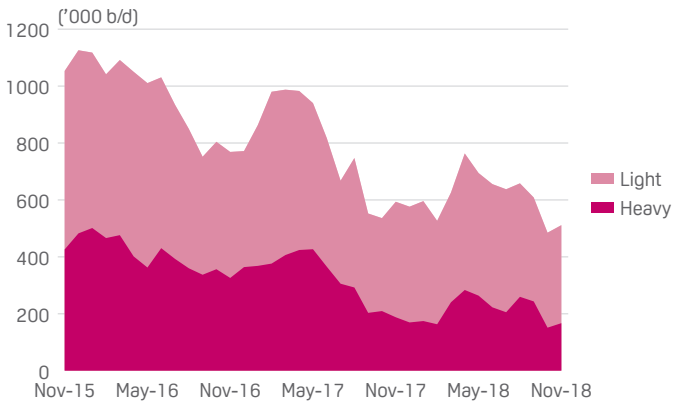
Source: SENER

BENTEK MAYA CRUDE PRICE FORECAST



Source: S&P Global Platts Analytics

DISTRIBUTION TO REFINERIES



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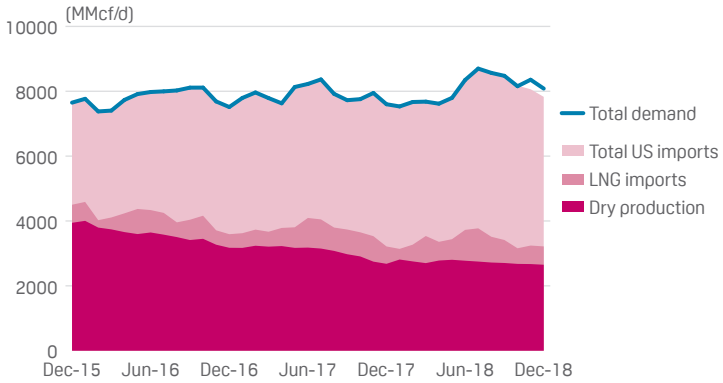
NATURAL GAS

NATURAL GAS SUPPLY AND DEMAND (MMcf/d)

	Actuals				Forecast		Year-to-date change		
	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	2018	2017	Change
Production	2,704	2,676	2,671	2,650	2,612	2,588	2,732	3,060	-328
Imports from US	5,077	5,014	4,821	4,612	5,059	5,100	4,651	4,224	427
LNG sendout	709	481	571	565	374	407	666	664	2
Total supply	**8,490**	**8,171**	**8,063**	**7,828**	**8,046**	**8,095**	**8,049**	**7,948**	**101**
Power burn	4,244	3,796	4,089	3,809	3,481	3,538	3,977	3,982	-5
Other demand	4,248	4,375	4,283	4,290	4,565	4,557	4,120	3,938	182
Total demand	**8,492**	**8,171**	**8,372**	**8,099**	**8,046**	**8,095**	**8,097**	**7,920**	**178**

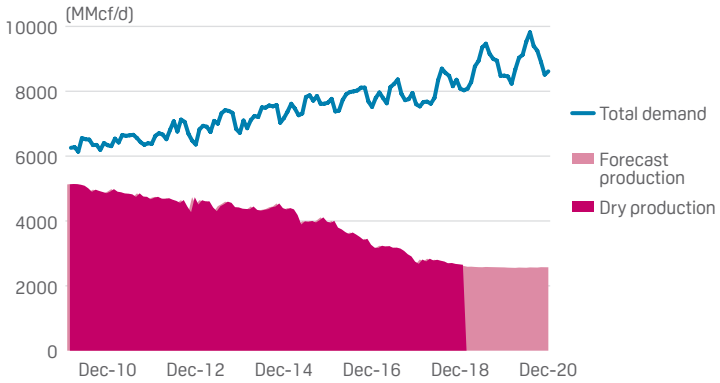
Source: S&P Global Platts Analytics

MEXICAN GAS SUPPLY



Source: S&P Global Platts Analytics

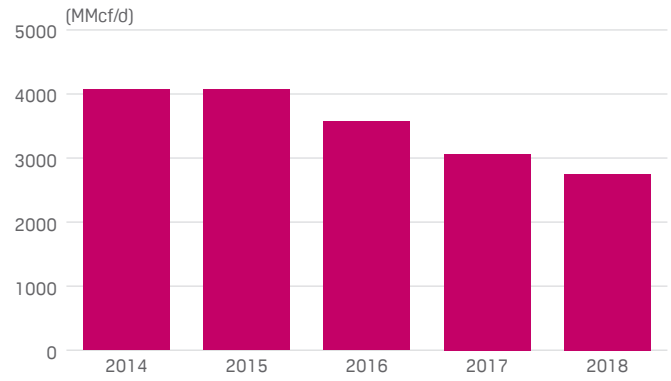
PRODUCTION vs DEMAND FORECAST



Source: S&P Global Platts Analytics

- An interview with Mexico pipeline builder Fermaca indicated that its nearly 1.2 Bcf/d Wahalajara pipeline system, which includes Laguna – Aguascalientes and Villa de Reyes – Aguascalients – Guadalajara pipelines, would be further delayed until May 2019 – an additional six months atop a timeline that was already delayed by roughly one year. Additionally, two Transcanada pipelines (Tuxpan – Tula and Tula – Villa de Reyes) were halted until further notice. And most recently, Mexico's Grupo Carso announced that there would be at least one year of additional delays to its Samalayuca – Sasabe pipeline, which was intended to serve new power demand in the Northwestern state of Sonora. These delays will keep Mexico's Western and Central markets dependent on LNG and fuel oil for at least the near-future and have driven a roughly 250 MMcf/d downward revision to the US pipeline exports to Mexico forecast in 2019.

NATURAL GAS PRODUCTION



Source: S&P Global Platts Analytics

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DELIVERED GAS PRICES

MEXICAN TARIFF ROUTES

Source: S&P Global Platts Analytics

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MEXICO PIPELINE FULLY LOADED TRANSPORTATION ROUTES -$/MMBTU

Supply area	Transportation path	Destination/ Hub	Fully loaded cost	Delivered prices		Delivered change	
				Nov-18	Dec-18	MoM	YoY
El Paso Permian	El Paso CA, North Baja, Gasoducto de Rosarito, TGN	Rosarito	0.7807	2.54	2.85	0.31	-0.41
El Paso Permian/Waha	El Paso AZ, Sierrita	Sasabe	1.0309	2.79	3.10	0.31	-0.41
	El Paso AZ, Sierrita, Sasabe - Guaymas	Guaymas	1.2531	3.01	3.32	0.31	-0.41
	El Paso AZ, Sierrita, Sasabe - Guaymas, Guaymas - El Oro	El Oro	1.5413	3.30	3.61	0.31	-0.41
	West TX Intra, Trans Pecos, Ojinaga - El Encino, El Encino - Topolobampo, Guaymas - El Oro		1.3224	2.97	3.19	0.22	-0.76
	West TX Intra, Roadrunner, Tarahumara, El Encino - Topolobampo, Guaymas - El Oro		1.8686	3.51	3.73	0.22	-0.76
	El Paso AZ, Sierrita, Sasabe - Guaymas, Guaymas - El Oro, El Oro - Mazatlan	Mazatlan	2.4474	4.21	4.51	0.31	-0.41
	West TX Intra, Trans Pecos, Ojinaga - El Encino, El Encino - Topolobampo, El Oro - Mazatlan		1.9402	3.59	3.81	0.22	-0.76
	West TX Intra, Roadrunner, Tarahumara, El Encino - Topolobampo, El Oro - Mazatlan		2.4865	4.13	4.35	0.22	-0.76
El Paso Permian/ Waha/Domestic	West TX Intra, Roadrunner, Tarahumara	El Encino*	0.9816	2.74	3.05	0.31	-0.41
	West TX Intra, Comanche Trail, San Isidro – Samalayuca,Tarahumara		0.7217	2.48	2.79	0.31	-0.41
	West TX Intra, Trans Pecos, Ojinaga - El Encino		0.4353	2.20	2.50	0.31	-0.41
	El Paso TX, Sistrangas -Zone 1:1		0.6704	2.32	2.54	0.22	-0.76
	Monterrey/Reynosa*, SNG -Zone 3:1		0.5506	5.23	5.06	-0.17	0.36
	El Encino*, El Encino - La Laguna	La Laguna	0.2913	3.28	3.48	0.19	-1.00
South Texas/Domestic	TGP, Net Mexico, Los Ramones I, SNG -Zone 3:3	Monterrey/ Reynosa	0.9624	4.93	4.69	-0.24	1.02
	NGPL, Net Mexico, Los Ramones I, SNG -Zone 3:3		0.9025	4.87	4.85	-0.02	1.13
	South TX Intra, Net Mexico, Los Ramones I, SNG -Zone 3:3		1.0051	5.01	4.86	-0.15	1.05
	South TX Intra, Impulsora, Nueva Era		0.6452	4.65	4.50	-0.15	1.05
	South TX Intra, Kinder Morgan Mexico -Mier - Monterrey		0.3386	4.34	4.19	-0.15	1.05
	South TX Intra, SNG -Zone 3:3		0.5742	4.57	4.43	-0.15	1.05
	TGP, SNG -Zone 3:3		0.5316	4.50	4.26	-0.24	1.02
	TETCO, SNG -Zone 3:3		0.5402	4.57	4.32	-0.25	1.01
	Monterrey/Reynosa*, SNG -Zone 3:5	Tuxpan*	0.7647	5.44	5.28	-0.17	0.36

*New CENAGAS tariff rates and zones will take effect October 1, 2018. Current rates on SISTRANGAS are from RES / 2675/2017 and will last from August 1 - September 30, 2018

LNG DELIVERED PRICES

Supply routes		Current market inputs		Estimated delivered market prices			Change (%)	
Export country	Import terminal	Supply price*	Shipping differential	11/1/2018	12/1/2018	1/1/2019	MOM Change	YOY change
Peru LT	Manzanillo	1.97	0.49	2.93	2.46	2.46	0%	-16%
Peru Spot	Manzanillo	8.32	0.49	6.10	8.16	8.82	8%	45%
Sabine Pass	Manzanillo	3.15	0.44	4.12	3.57	3.58	0%	-13%
Australia	Manzanillo	8.43	0.56	6.22	8.33	9.00	8%	48%

*Netback estimate for Peru and Australia

Source: S&P Global Platts Analytics

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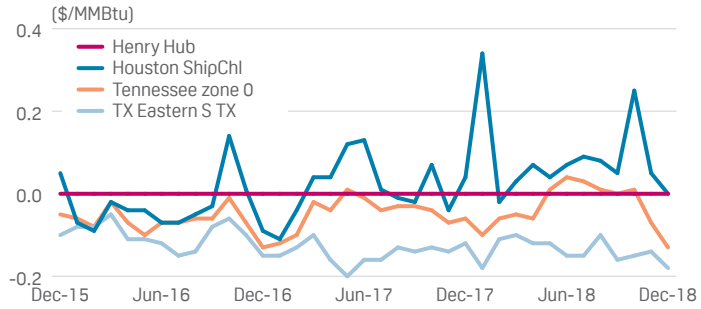
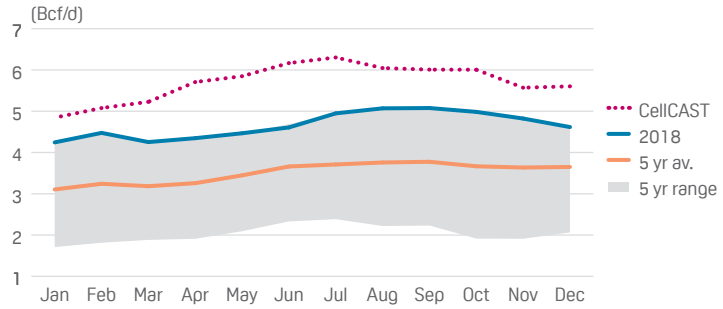
US NATURAL GAS SPOT PRICES



Source: S&P Global Platts Analytics

MEXICO NATURAL GAS PIPELINE IMPORTS



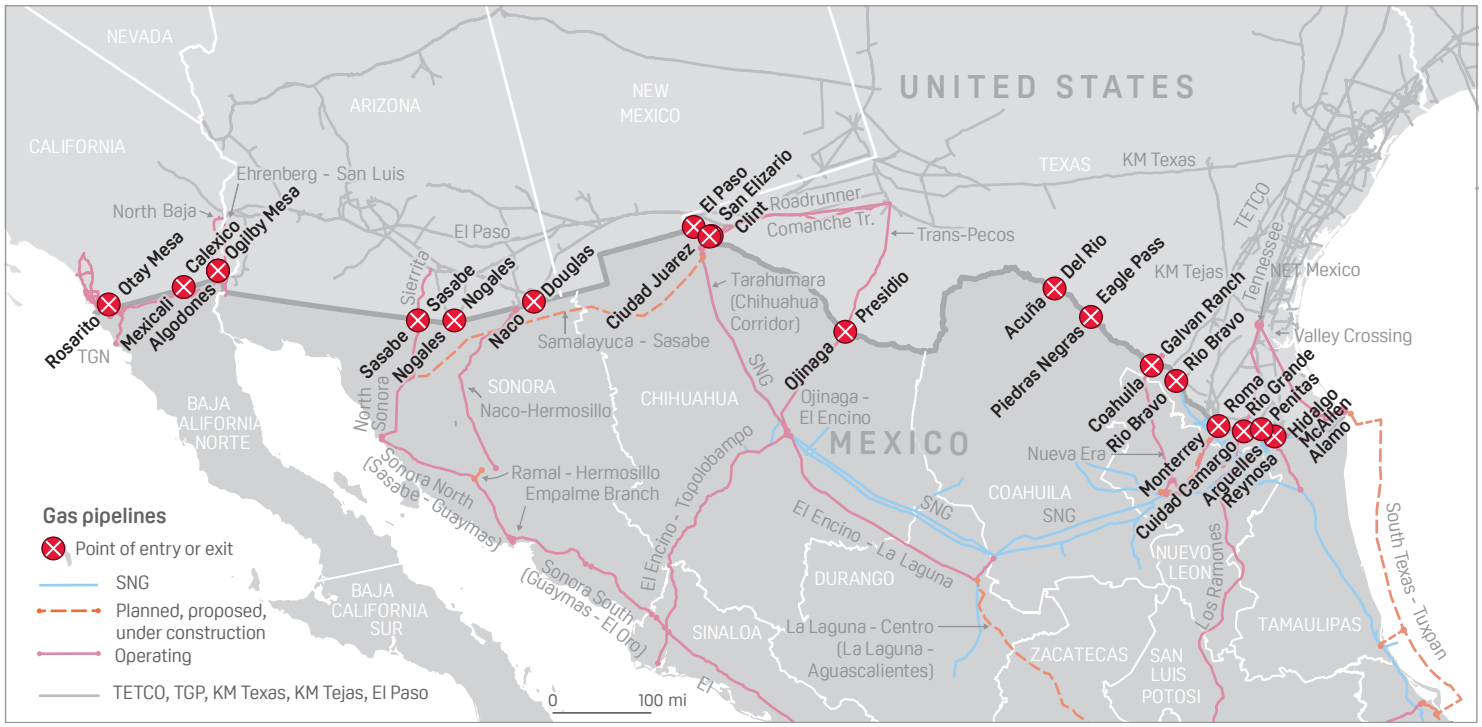
Source: S&P Global Platts Analytics

US NATURAL GAS EXPORTS TO MEXICO BY BORDER CROSSING LOCATION (MMcf/d)

	Oct-18	Nov-18	Dec-18	Monthly chg	YTD avg	YTD last year	Change
US exports by border crossing — Southwest							
North Baja - Ogilby	385	331	335	4	366	327	39
El Paso Willcox - Mexicana de Cobra - Douglas, AZ	81	63	80	18	81	80	1
El Paso Willcox - Monument 90, PEMEX - Douglas, AZ	20	32	25	-7	24	24	-1
El Paso Willcox - Aqua Prieta Pipeline - Douglas, AZ	113	105	75	-29	115	107	8
El Paso Willcox - Pemex - Douglas, AZ	30	1	28	27	37	45	-8
El Paso Sierrita Lateral	151	166	137	-30	129	99	30
Total sample - Southwest	**781**	**697**	**680**	**-17**	**751**	**682**	**69**
Modeled total - Southwest	**753**	**695**	**655**	**-40**	**718**	**656**	**62**
US exports by border crossing - Texas							
El Paso Samalayuca Pipeline - Clint, TX	139	119	137	18	159	223	-64
TGP-Alamo, TX	170	199	188	-11	196	183	13
NET MEXICO interconnect	2,024	1,954	1,805	-150	1,971	1,937	34
TGP Gas Ducto Del Rio	235	279	265	-15	248	224	24
TETCO PEMEX	48	40	4	-36	32	20	11
TGP Net Mexico- Nueces, TX	440	456	453	-3	430	433	-3
NGPL Net Mexico- Nueces, TX	204	161	67	-94	257	247	10
Total sample - Texas	**3,260**	**3,207**	**2,917**	**-290**	**3,293**	**3,268**	**25**
Modeled total - Texas	**4,231**	**4,128**	**3,961**	**-166**	**3,941**	**3,568**	**373**

Source: S&P Global Platts Analytics

MEXICO-UNITED STATES GAS PIPELINE POINTS OF ENTRY/EXIT



Source: S&P Global Platts Analytics

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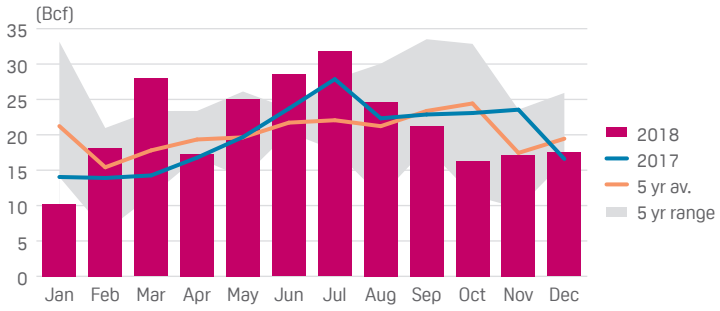
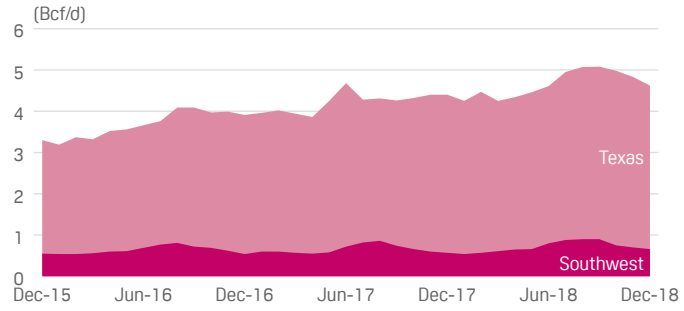
MEXICO LNG IMPORTS



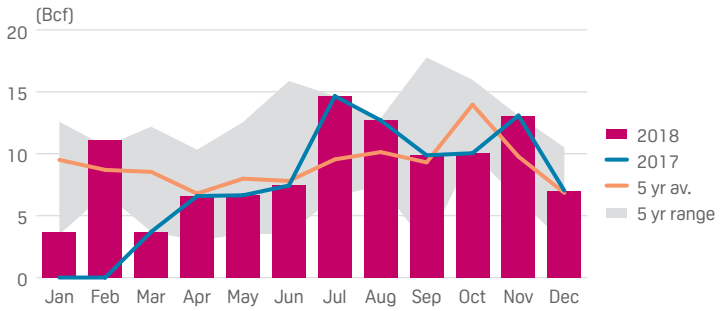
Source: S&P Global Platts Analytics

US PIPELINE EXPORTS TO MEXICO



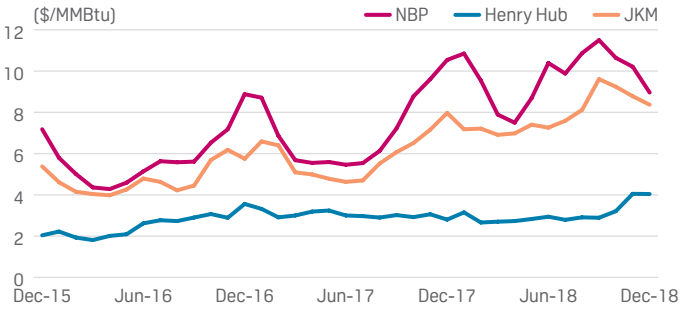
Source: Platts Analytics' Bentek Energy

ALTAMIRA LNG IMPORTS



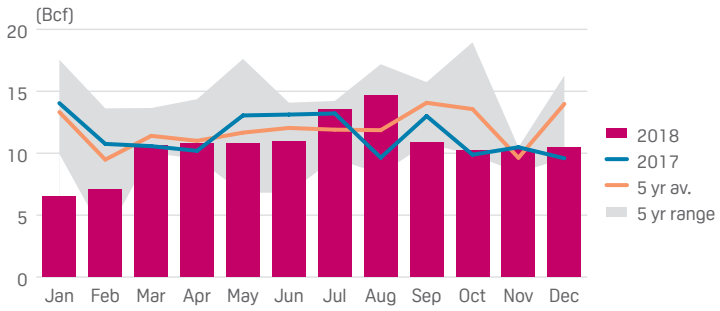
Source: S&P Global Platts Analytics

HENRY HUB vs NBP vs JKM



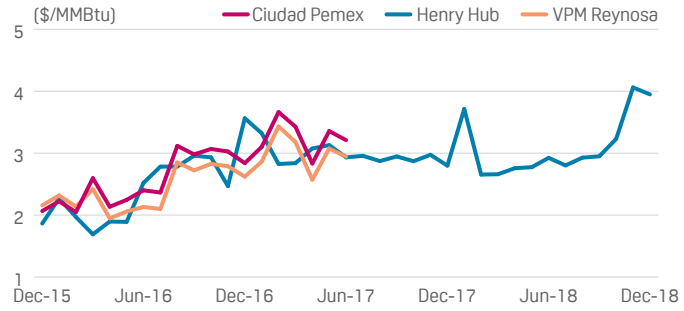
Source: S&P Global Platts

MANZANILLO LNG IMPORTS



Source: S&P Global Platts Analytics

VPM PRICES



Source: S&P Global Platts, PEMEX

LNG IMPORTS

Discharge date	Discharge terminal	Ship name	Vol (Bcf)	Export date	Export terminal	Export country
1/4/2019	Manzanillo LNG	RIOJA KNUTSEN	3.713	12/22/2018	Sabine Pass LNG	United States
12/21/2018	Altamira LNG	MARAN GAS AGAMEMNON	3.546	12/3/2018	Nigeria LNG (Bonny Island)	Nigeria
12/18/2018	Manzanillo LNG	MARAN GAS PERICLES	3.686	12/8/2018	Sabine Pass LNG	United States
12/11/2018	Manzanillo LNG	GOLAR ICE	3.39	12/2/2018	Sabine Pass LNG	United States
12/7/2018	Altamira LNG	MAGDALA	3.547	11/22/2018	Nigeria LNG (Bonny Island)	Nigeria
12/1/2018	Manzanillo LNG	MARAN GAS MYSTRAS	3.355	11/16/2018	Sabine Pass LNG	United States
11/20/2018	Manzanillo LNG	GOLAR ICE	3.374	11/7/2018	Sabine Pass LNG	United States
11/13/2018	Manzanillo LNG	MARIA ENERGY	3.626	10/24/2018	Sabine Pass LNG	United States
11/2/2018	Manzanillo LNG	BW PARIS	3.327	10/6/2018	Papua New Guinea LNG	Papua New Guinea

Source: S&P Global Platts

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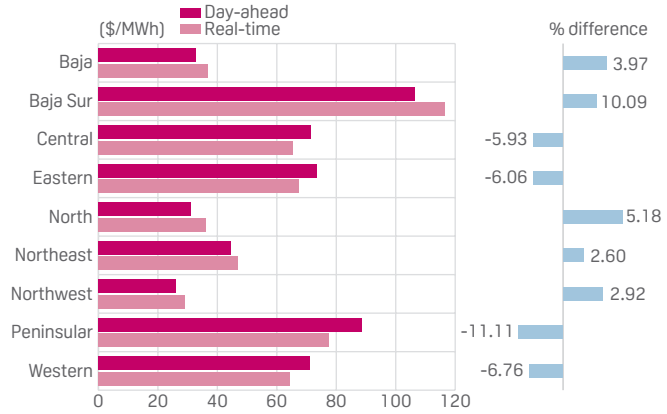
POWER PRICES AND DATA

New Energy Policy to pressure US exports to Mexico

- Platts Analytics has revised capacity assumptions in the power generation stack that has lowered the natural gas power burn forecast starting in 2020. The new President, Andrés Manuel López Obrador (AMLO) gave a speech on December 8, 2018 at the Malpaso Dam in Chiapas, where he revealed his National Electricity Program. The new AMLO administration plans to inject MX$20 billion to CFE's budget while also claiming that no CFE power plant will be shut down during his tenure. Additionally, the CFE and CONAGUA have identified upwards of 3.3 GW of new hydroelectric generation capacity, some of which could be part of a conversion of 2.0 GW from irrigation systems. Platts Analytics expects that high sulfur fuel oil (HSFO) generators will likely persist in the generation stack longer than the 2013-2014 energy reform planned. Platts Analytics is tracking 9.3 GW of HSFO capacity that was slated for retirement under the original energy reform. Using capacity from several of the dual-fired natural gas and HSFO complexes that were a part of the PRODESEN report and several large-scale facilities in Central Mexico, Platts has extended the retirement date for an additional 5.7 GW of capacity by roughly five years. Given that the International Maritime Organization (IMO) fuel standards take place at the beginning of 2020, it is likely that the fuel supply costs will be significantly lower during at the change of the next decade. SENER reported that Mexico has been procuring fuel oil at a cost of $12.01/MMBtu during 2018, while the NYMEX Gulf Coast HSFO 3% contracts for 2019 averaged $8.01/MWh during December 2018 and $7.11/MWh for 2020. Platts natural gas power burn forecast has been lowered by nearly 0.2 Bcf/d from 2020 – 2023.

- Wholesale LMP power prices generally fell M/M with the exception of the Baja and Northwest control regions, which had an increase in day-ahead prices of $4.21/MWh and $2.21/MWh, respectively. The decline in power prices can be attributed to seasonally lower load November – December, which in 2016 fell by 4%, 2017 by 7.2%, and in 2018 by 7.9%. Outside of constraint pricing in the Baja California Sur and Peninsula control regions, the Northeast had the largest M/M decline in power prices for $4.93/MWh; which also coincides with the largest outright and percentage decline in load across Mexico of 1.4 aGW (21%). Day-ahead Peninsula prices averaged $88.64/MWh in December, the highest in the SIN while the remaining regions have separated at distinct geographic levels. A hierarchy of prices has developed with large spreads moving north-to-south across CENACE control regions. The

AVERAGE DAY-AHEAD vs. REAL-TIME PRICE SPREAD



Source: CENACE

Northwest, North, and Northeast mainland control regions have set the lower range of power prices in December ($26.17 - $44.48/MWh) as they are geographically close to cheap US natural gas sources. Moving further south, the Western, Central, and Eastern regions make up a tight middle range ($71.28 - $73.59/MWh) while the Peninsula region sets the most-premium SIN LMP of $88.64/MWh. A continued decline of domestic natural gas production and delayed midstream infrastructure, which has hindered planned incremental US imports, has created a distinct north-to-south tier of power prices. This separation will likely persist until access to US natural gas supplies is debottlenecked, which Platts Analytics expects to first occur with the 2.6 Bcf/d Sur de Texas pipeline at the end of Q1 2019.

- The second half of December had a significant reduction in demand as many offices and industrial factors closed for the holidays. Starting on Saturday, December 22 – the weekend before the Christmas holiday – load fell 22% in the span of four days to bottom out on 23.7 aGW December 25. Load has fallen to nearly the same level over the past three years on December 25 at a tight range of 0.4 aGW. The CENACE day-ahead load forecast generally underestimated demand December 22 – 26 by 0.5 aGW (peaking to 1.3 aGW December 25) but then flipped to an overestimation during the remainder of the month by 0.9 aGW on average. The Eastern region had a negative load DART spread everyday of December at an average of 0.4 aGW (7%). The only mainland control regions with positive DART spreads were the northernmost, bordering the US.

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MONTHLY AVERAGE PEAKLOAD BY CONTROL REGION (MW)

Control Region	Oct	Nov	Dec	Month Chg	Month Chg %	Dec-18	Dec-17	Year Chg	Year Chg %
Baja	1,660	1,586	1,565	-21	-1	1,565	1,489	76	5
Baja Sur	366	321	285	-36	-11	285	278	7	3
Central	7,490	7,581	7,387	-194	-3	7,387	7,724	-338	-4
Eastern	6,610	6,353	6,178	-176	-3	6,178	5,763	414	7
North	2,902	2,763	2,704	-60	-2	2,704	2,708	-4	0
Northeast	6,479	5,774	5,155	-619	-11	5,155	5,400	-245	-5
Northwest	3,078	2,354	2,081	-273	-12	2,081	2,143	-62	-3
Peninsular	1,690	1,567	1,463	-104	-7	1,463	1,361	102	8
Western	8,101	8,074	7,756	-318	-4	7,756	7,798	-42	-1

Source: CENACE

MONTHLY AVERAGE DAY-AHEAD POWER PRICES ($/MWh)

Control Region	Oct	Nov	Dec	Month Chg	Month Chg %	Dec-18	Dec-17	Year Chg	Year Chg %
Baja	27.03	28.71	32.92	4.21	15	32.92	23.68	9.24	39
Baja Sur	177.56	148.44	106.46	-41.98	-28	106.46	126.46	-20.00	-16
Central	72.39	74.19	71.51	-2.68	-4	71.51	54.97	16.54	30
Eastern	77.03	77.52	73.59	-3.93	-5	73.59	56.01	17.58	31
North	47.41	34.00	31.12	-2.88	-9	31.12	48.32	-17.20	-36
Northeast	50.21	49.41	44.48	-4.93	-10	44.48	47.48	-3.00	-6
Northwest	52.40	23.96	26.17	2.21	9	26.17	46.53	-20.36	-44
Peninsular	136.08	111.93	88.64	-23.29	-21	88.64	64.42	24.22	38
Western	67.55	74.19	71.28	2.91	-4	71.28	54.94	16.34	30

Source: CENACE

DECEMBER AVERAGE DAY-AHEAD POWER PRICES

Source: CENACE

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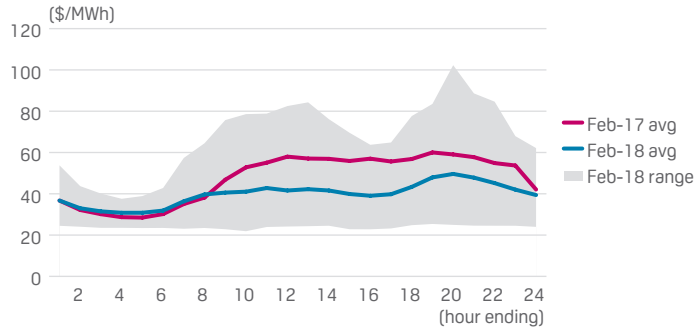
MONTERREY DISTRIBUTION NODE DAY-AHEAD PRICES ($/MWh)

	Month-over-month				Month		Yearly change			
Time block*	Nov	Dec	Chg	% Chg	Min	Max	Dec-18	Dec-17	Chg	% Chg
HE 1 - 4	36.47	32.99	-3.48	-10	23.50	53.77	32.99	31.85	1.14	4
HE 5 - 8	38.02	34.68	-3.34	-9	23.07	64.48	34.68	32.76	1.92	6
HE 9 - 12	46.68	41.49	-5.19	-11	21.87	82.50	41.49	52.36	-10.87	-21
HE 13 - 16	49.03	40.69	-8.34	-17	22.81	84.30	40.69	55.83	-15.14	-27
HE 17 - 20	56.80	45.17	-11.63	-20	23.21	102.29	45.17	57.12	-11.95	-21
HE 21 - 24	52.09	43.60	-8.49	-16	23.98	88.63	43.60	51.40	-7.80	-15

* Prices represent average hourly LMP across entire time block.

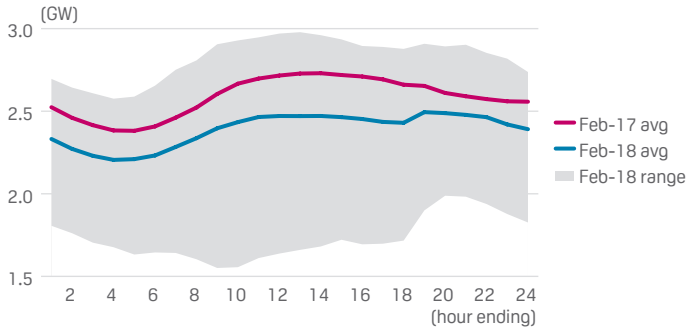
Source: CENACE

MONTERREY DISTRIBUTION NODE PRICE PROFILE



Source: CENACE

MONTERREY DISTRIBUTION NODE LOAD PROFILE



Source: CENACE

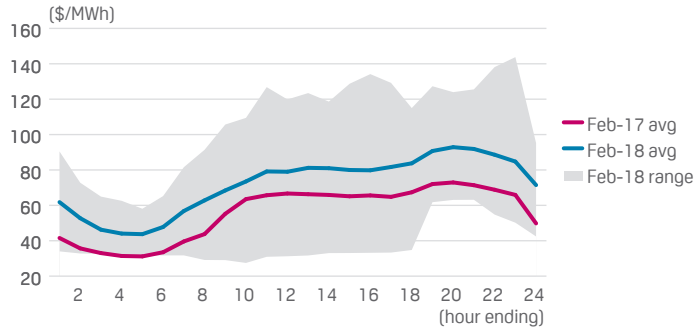
VDM NORTE DISTRIBUTION NODE DAY-AHEAD PRICES ($/MWh)

	Month-over-month				Month		Yearly change			
Time block*	Nov	Dec	Chg	% Chg	Min	Max	Dec-18	Dec-17	Chg	% Chg
HE 1 - 4	54.06	51.21	-2.85	-5	31.77	90.46	51.21	35.36	15.85	45
HE 5 - 8	57.79	52.77	-5.02	-9	29.13	91.38	52.77	36.78	15.99	43
HE 9 - 12	78.50	75.02	-3.48	-4	27.46	126.80	75.02	61.80	13.22	21
HE 13 - 16	82.10	80.49	-1.61	-2	31.67	134.16	80.49	64.69	15.80	24
HE 17 - 20	91.02	87.26	-3.76	-4	33.31	129.21	87.26	68.38	18.88	28
HE 21 - 24	84.81	84.16	-0.65	-1	42.41	143.76	84.16	63.25	20.91	33

* Prices represent average hourly LMP across entire time block.

Source: CENACE

VDM NORTE DISTRIBUTION NODE PRICE PROFILE



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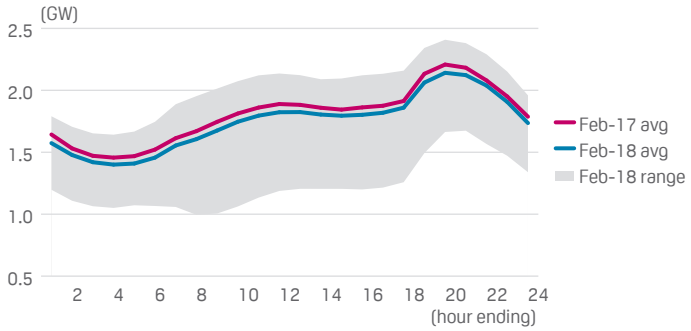
VDM NORTE DISTRIBUTION NODE LOAD PROFILE



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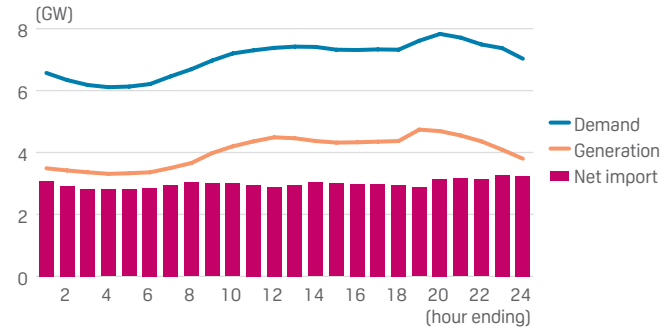
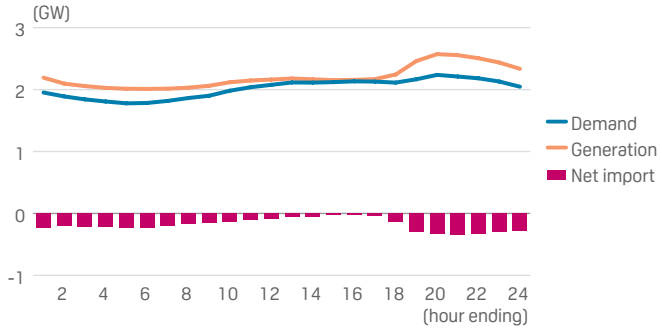
- Load across the Sistema Eléctrico Nacional (SEN) fell 2.7 aGW (8%) M/M to an average of 31.4 aGW in December, the lowest monthly average since the same month in 2017. Year-on-year, load across the SEN is up by 0.5 aGW (2%) while population-weighted temperatures were 0.7 °F warmer in 2018. The SEN includes the Baja California and Baja California South CENACE control regions, which are not connected to the mainland by either natural gas pipelines or power transmission to mainland Mexico; which is named the Sistema Interconectado Nacional (SIN). Regionally, the Northeast had the largest M/M decline in load of 1.4 aGW (21%). The Western and Central regions had declines in load of 0.4 aGW (5%) and 0.3 (4%), respectively. Every region outside of the Northeast and Northwest had a Y/Y increase in load during December; however, the previous two were nearly flat over that time. Non-weather adjusted SEN load increased by 1.1 aGW (3%) 2017 – 2018.

WESTERN SUPPLY AND DEMAND



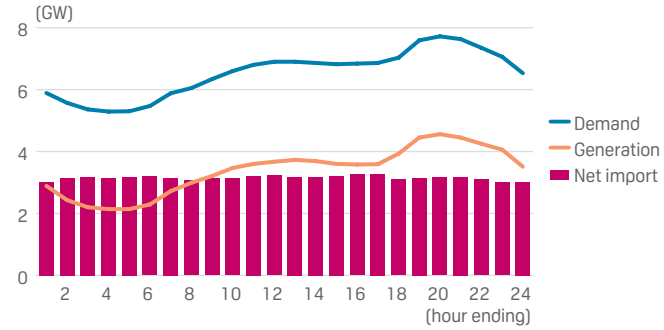
Source: CENACE

NORTHWEST SUPPLY AND DEMAND



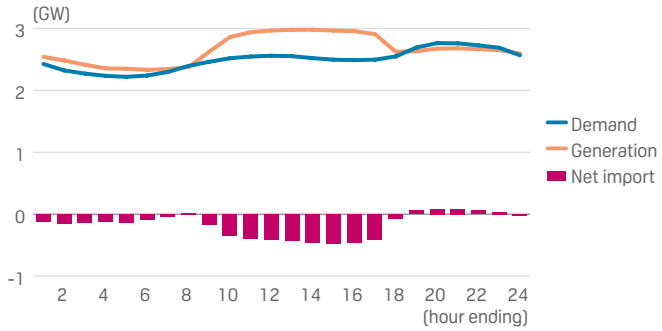
Source: CENACE

CENTRAL SUPPLY AND DEMAND



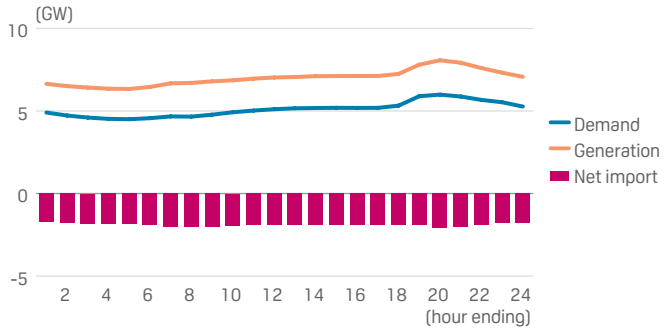
Source: CENACE

NORTHERN SUPPLY AND DEMAND



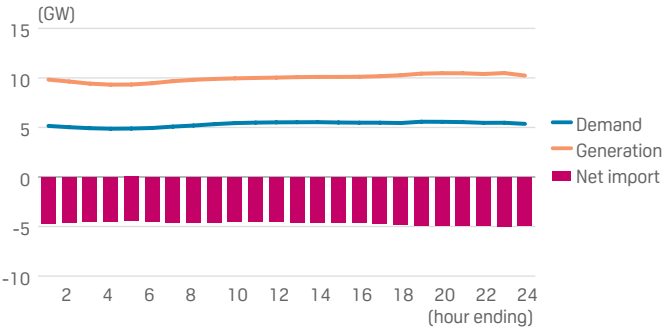
Source: CENACE

EASTERN SUPPLY AND DEMAND



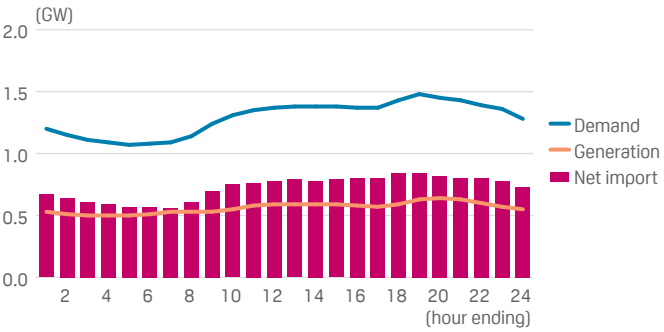
Source: CENACE

NORTHEAST SUPPLY AND DEMAND



Source: CENACE

PENINSULAR SUPPLY AND DEMAND



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POWER TRANSMISSION

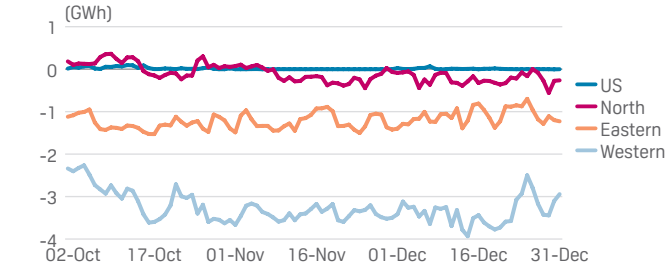
MEXICO REGIONAL SUPPLY AND DEMAND (MMcf/d)

		Tranmission Flows (MWh)			Month-over-Month		LMP Spreads ($/MWh)			Month-over-Month	
Source	Destination	Oct-18	Nov-18	Dec-18	Chg	% Chg	Oct-18	Nov-18	Dec-18	Chg	% Chg
Baja	US	-42	27	88	61	226	N/A			N/A	
Eastern	Central	1,419	1,783	2,159	376	21	-4.63	-3.33	-2.08	1.25	-38
Eastern	Guatemala	103	110	26	-84	-76	N/A			N/A	
Eastern	Peninsula	944	703	769	66	9	59.06	34.42	15.06	-19.36	-56
North	Northwest	143	101	202	101	100	5.00	-10.04	-4.95	5.08	-51
North	US	—	—	—	—	—	N/A			N/A	
North	Western	192	181	174	-7	-4	20.14	40.19	40.15	-0.03	0
Northeast	Eastern	1,285	1,233	1,105	-128	-10	26.82	28.11	29.11	1.00	4
Northeast	North	-77	161	231	69	43	-2.81	-15.41	-13.36	2.05	-13
Northeast	US	-32	1	-8	-9	-1379	N/A			N/A	
Northeast	Western	3,052	3,396	3,368	-28	-1	17.34	24.78	26.79	2.02	8
Northwest	Western	119	371	413	42	11	15.14	50.23	45.11	-5.12	-10
Peninsular	Belize	48	48	48	-	0	N/A			N/A	
Western	Central	1,490	1,035	963	-72	-7	4.84	0.00	0.23	0.23	36271
Western	Eastern	251	258	240	-18	-7	9.48	3.33	2.31	-1.02	-31

Net Export (-) Net Import (+)

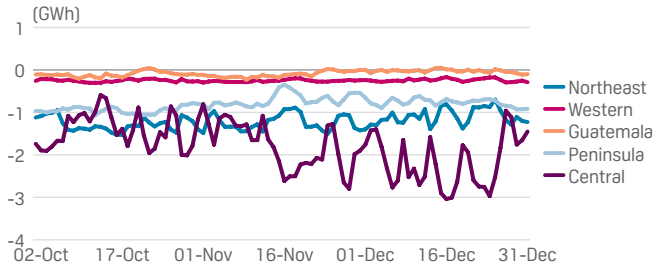
Source: S&P Global Platts Analytics

NORTHEAST TRANSMISSION CORRIDOR NET EXPORTS



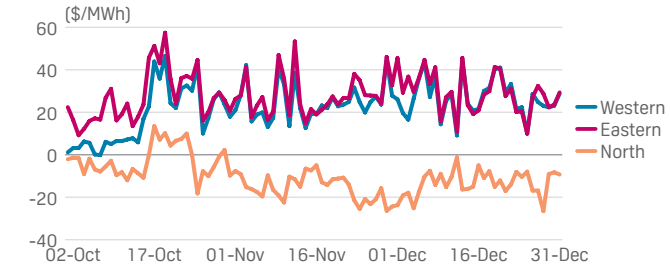
Source: S&P Global Platts Analytics

EASTERN TRANSMISSION CORRIDOR NET EXPORTS



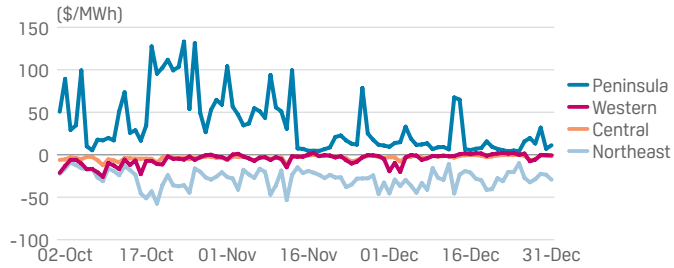
Source: S&P Global Platts Analytics

NORTHEAST WHOLESALE LMP SPREADS BY REGION



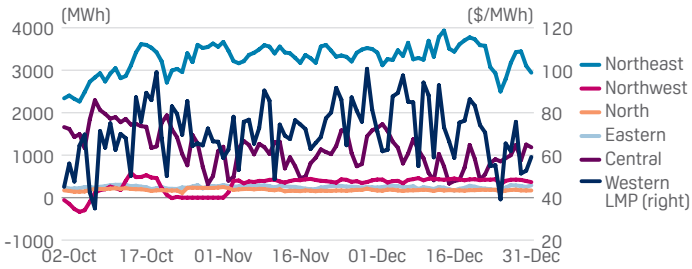
Source: S&P Global Platts Analytics

EASTERN WHOLESALE LMP SPREADS BY REGION



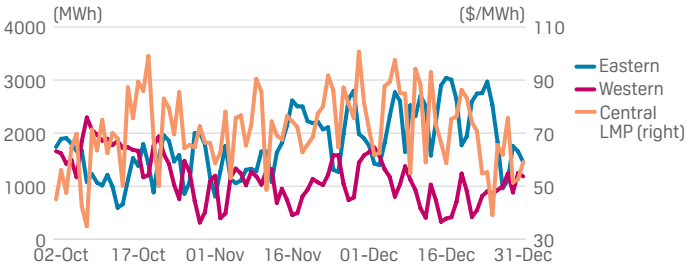
Source: S&P Global Platts Analytics

WESTERN TRANSMISSION CORRIDOR NET IMPORTS



Source: S&P Global Platts Analytics

CENTRAL TRANSMISSION CORRIDOR NET IMPORTS



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POWER TRANSMISSION

MEXICAN ELECTRIC TRANSMISSION SYSTEM

a-c **1** Tijuana I - Eólico Rumorosa - La Herradura - Cucapah
2 Cucapah - Seri
3 Seri - Choacahui
4 Bahía de Kino - El Infiernito
5 El Infiernito - Mezquital
6 Mezquital - Villa Constitución
a-f **7** Moctezuma – El Encino – Francisco Villa - Camargo II – Lerdo - Torreón Sur - Jerónimo Ortíz
a-b **8** Jerónimo Ortíz – Calera - Ixtlahuacán
a-b **9** Torreón Sur – Parras - Derramadero
10 Jacalitos - Regiomontano
11 Regiomontano - Güémez
a-d **12** Parras – Primero de Mayo - Cañada - Potrerillos - Salamanca II
13 La Pila - San Luis de la Paz II
a-b **14** Volcán Gordo - Yautepec Potencia - Topilejo
15 Yautepec Potencia - Ixtepec Potencia
16 Texcoco - La Paz
17 Olmeca - Temascal III
18 Angostura - Tapachula Potencia
19 Kantenáh - Leona Vicario
20 Kantenáh - Tecpatán

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NEWS HIGHLIGHTS

Mexico needs private sector help with fuel theft

Mexico needs enough storage capacity to overcome the 72 hours it takes to identify, fix and restart an illegally tapped pipeline, Ramses Pech, director of Mexican energy consulting firm Caravaia y Asociados, told S&P Global Platts on Wednesday.

"Mexico requires to increase its fuel storage capacity urgently. However, the new administration won't have the money to do this, requiring the private sector to fill the gap," he said.

Lopez Obrador has said Pemex would operate pipelines cautiously to avoid theft, shutting them down when a loss of pressure is registered. In 2018, siphoned fuel cost Pemex $3.3 billion, according to the government.

"It would be easy to open the pipeline and say supply is normal again, but that would mean we were accepting and tolerating fuel theft," Lopez Obrador said Wednesday in a webcast press conference.

"We are going to resist all pressures ... we will continue with this plan to avoid fuel theft," said Lopez Obrador, adding that to restore fuel supply, Pemex is increasing fuel distribution with trucks.

Mexico in 2018 distributed 76% of its fuel by pipeline and 12% by over 15,000 fuel trucks. To supply the country's total demand, Pemex would require 110,000 fuel truck units, Pech said.

"Until logistics infrastructure is expanded, it will be common to see sporadic episodes of fuel shortages as long as the new strategy continues," he added.

Aid for new terminals

Each new 300,000-barrel storage terminal costs about $80 million-$100 million, Pech said. As a comparison, Pemex only has a capital budget of over $60 million for logistic projects in 2019.

Mexico's Central and Western regions have 11 and 10 inland terminals, respectively, that are mainly supplied via pipelines. The operative fuel storage capacity in both regions is over 2.5 million barrels of gasoline, diesel and jet fuel.

However, there are currently three terminals with a storage capacity of 1 million barrels being developed in Western Mexico, and 12 projects capable of storing 9 million barrels in Central Mexico, SENER data showed. These facilities will be supplied by unit train deliveries linked to new private port terminals.

Having more terminals would give Mexico the redundancy required to protect itself from any supply disruption, Gonzalo Monroy, managing director of GMEC, a Mexico City-based energy consultancy, told Platts.

"Hopefully the new administration will realize Pemex's terminals are vulnerable to disruptions and aren't enough to fulfill all of Mexico's needs," Monroy said.

The new government could help to advance these and new storage projects by streamlining the regulatory process, assisting developers to gain social support and raise investment certainty, he added.

"We require leadership from the new administration to bring new terminals into fruition," Monroy said.

There is concern from investors that contracts could be modified under social or political pressure. Also, developers worry that price controls are not sending the signals required to identify weakness in Mexico's supply system, he added.

However, to provide a definitive solution to Mexico's fuel theft problem is to directly confront criminal groups, Monroy said.

By just building new infrastructure, criminal groups will have more pipelines to tap," Monroy said. "Lopez Obrador also needs to follow [former Colombian President] Alvaro Uribe's strategy of arming the state up to the teeth and implement the rule of law," he added.

— *Daniel Rodriguez*

Pemex cancellation of LNG import terminal puts southern Mexican energy security at risk: analysts

Pemex 's decision to cancel the Pajaritos LNG floating regasification and storage unit (FRSU) project is a mistake that puts the energy security of southern Mexico at risk, analysts told S&P Global Platts Monday.

The terminal, which would have been located at the Port of Pajaritos in Veracruz State, was been a vital project in ensuring reliable gas supplies, said Gonzalo Monroy, managing director of GMEC, a Mexico City-based energy consultancy.

"Southern Mexico 's gas balance is very fragile, and a new FRSU terminal is needed to cover any demand growth or supply disruptions," Monroy said.

In recent months, southern Mexico has seen gas shortages.

According to government estimates, gas demand from generators in southern Mexico hovered at about 500 MMcf/d in 2018, but consumption could have risen a further 280 MMcf/d.

Gas demand from Mexico 's petrochemical sector, which is mostly clustered in the southern portion of Veracruz state, has been in free fall, slumping to 214 MMcf/d in 2016 from 697 MMcf/d in 2013.

Currently, most of the gas Pemex produces is used by the company to enhance oil production or for its petrochemical operations, said Ramses Pech, director of energy consulting firm Caravaia y Asociados.

As a result, this leaves a limited amount available to power and industrial customers in southern Mexico , Pech said.

On Friday, Pemex , through its Mex Gas Supply (MGS) subsidiary, announced the cancellation of the project, citing upstream and infrastructure investments that had shifted the medium- and long-term gas supply outlook in the region.

High hopes for Pemex 's upstream strategy

According to estimates from President Andres Manuel Lopez Obrador's administration, Pemex 's gas output from existing producing wells is expected to fall to 1.7 Bcf/d from 3.5 Bcf/d today and 7 Bcf/d in 2010.

By introducing a new upstream strategy, the state-owned company expects to raise gas output to 7 Bcf/d by 2024 with 2.3 Bcf/d coming from discoveries, 1 Bcf/d via enhanced recovery, and nearly 1.4 Bcf/d via well completions and work-overs.

"The new government is putting all its eggs in the Pemex upstream

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production basket, which will strain the company," Monroy said.

With existing investment levels, Pemex will not be able to increase gas production beyond existing levels, Pech said.

A significant concern with the company's upstream strategy is that most of the increases in output will come from associated gas production, Pech said, adding: "The new government doesn't have a strong gas and petrochemical strategy."

Pemex has high expectations for the high risk and technically complex Ixachi onshore discovery, Pech said.

"Pemex is putting high hopes in a project that might be unsuccessful," he added.

The company has said Ixachi will have a peak production of over 720 MMcf/d by 2022, helping to increase domestic gas supply in southern Mexico . Ixachi's reservoir has high pressure and temperatures at a depth between 6,000-7,000 meters.

— *Daniel Rodriguez*

FID expected within year for Mexico LNG export project

Mexico Pacific Limited expects to reach a final investment decision for a new LNG export terminal on Mexico 's Pacific Coast before year-end or early 2020, a senior company official said.

"We intend to reach FID for our first phase of between 2 and 4 million mt/year by the end of 2019 or early 2020," Jake Lewis , MPL finance VP, told S&P Global Platts in an interview last week.

In September, MPL awarded TechnipFMC a pre-front-end engineering and design contract for the engineering, project management and construction support to advance the project to FID.

Mexico hasn't built its first LNG export terminal yet. However, the country has emerged in recent years as a potential outlet to export constrained gas in the US to Asian customers. The location of MPL's terminal on Mexico 's Pacific Coast is closer to growing Asian LNG demand, with significant shipping cost savings relative to the US Gulf Coast , Lewis said.

Sempra Energy is also looking at Mexico 's Pacific Coast to export LNG . The company seeks to reconfigure its Energia Costa Azul regasification terminal in the state of Baja California to export 2.4 million mt/year. FID is also expected during late 2019.

Project details

MPL's terminal would be based in Puerto Libertad, Sonora state. It would take advantage of a natural deep-water port and would be designed to have a final capacity of 12 million mt/year. The area was previously acquired in 2004 by DKRW Energy to develop an LNG import terminal to supply Arizona and California . Recently, MPL reconfigured the project, modifying existing permits to suit an export facility.

MPL is a joint venture of DKRW Energy and AECOM Capital. DKRW has developed multiple wind power projects, including the 585-MW Sweetwater facility in Texas .

The US Department of Energy has authorized MPL to export US gas to Mexico and re-export it abroad. MPL is looking to source gas for the project from the Permian, San Juan and other basins in the western US , Lewis said.

Exports from Mexico 's Pacific Coast to Asia would not have to transit the Panama Canal , therefore avoiding the incremental costs of canal tolls as well as potential transit delays, he added.

A memorandum of understanding signed in December by the states of Arizona , New Mexico and Sonora is a positive development for MPL's project, Lewis said, but he would not elaborate.

Potential supply routes

MPL is evaluating different gas supply routes that would feed its facility. "The existing pipeline system can support the needs of our first development phase," he said.

Mexico 's Comision Federal de Electricidad controls a majority of cross-border and downstream natural gas pipeline capacity in Mexico and is the single largest buyer in Mexico of US gas , according to Lewis . He would not comment on negotiations taking place between MPL and CFE regarding access to pipeline capacity.

A source close to CFEnergia, the marketing arm of CFE, told Platts that the state company is in advanced negotiations with MPL to supply up to 400 MMcf/d to the LNG terminal starting in 2021-2022.

The most ideal route to supply MPL's project would be the 471 MMcf/d Samalayuca-Sasabe pipeline, he added. For MPL's terminal to reach its full 12 million mt/year capacity, CFE would have to expand capacity of the 771-MMcf/d Sasabe-Guaymas pipeline, the source added.

— *Daniel Rodriguez*

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MEXICAN NATURAL GAS PIPELINES

Source: S&P Global Platts Analytics

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