



AFPM United States Refining and Storage Capacity Report

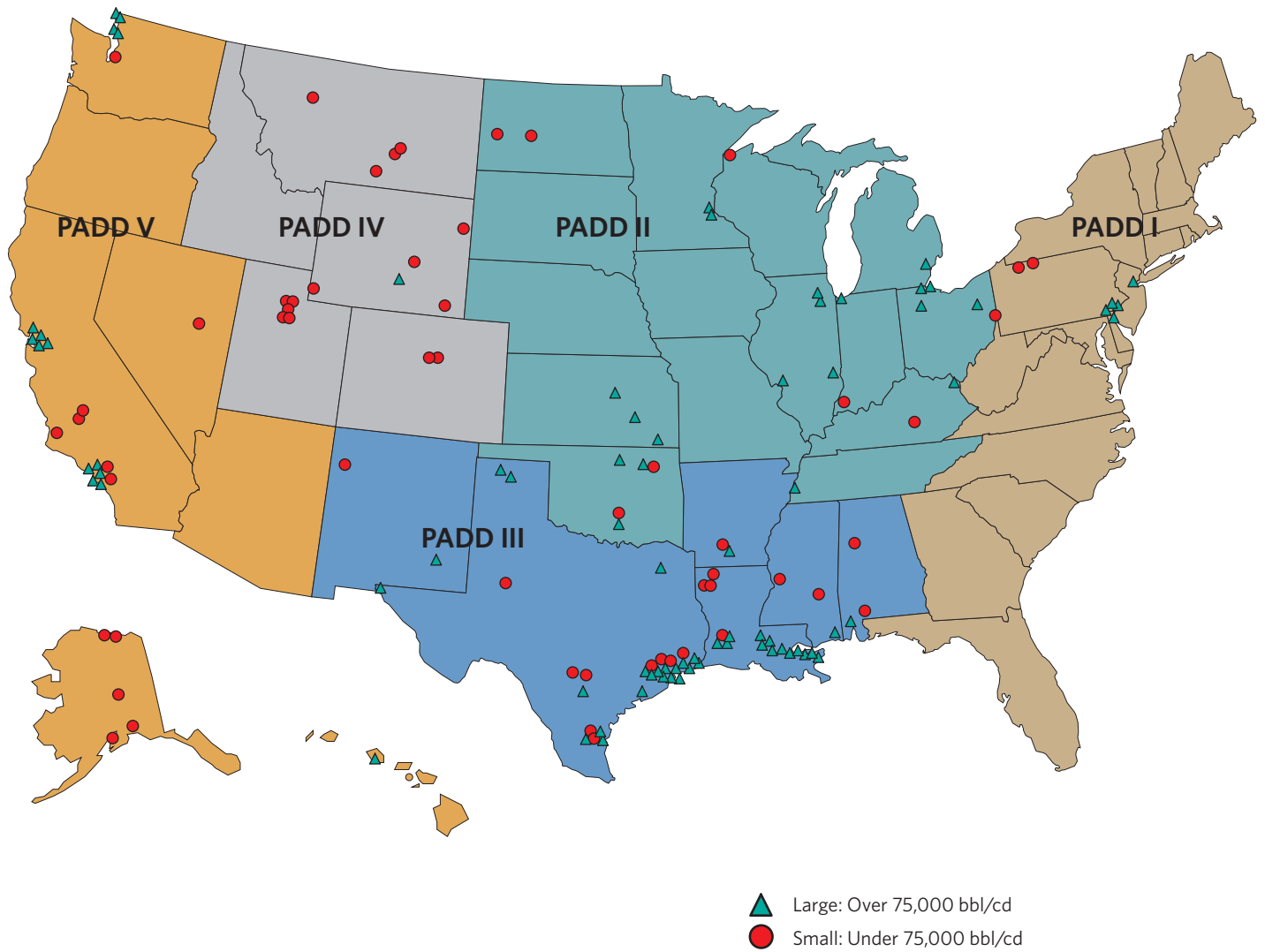
January 1, 2019

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Refining Capacity Report January 1, 2019

Locations of U.S. Refineries 2019



Refining Capacity Report January 1, 2019

AFPM United States Refining and Storage Capacity Report

The enclosed statistics provide U.S. refining and storage capacity data as reported by the DOE Energy Information Administration in their 2019 Refinery Capacity Report. These data, along with other DOE statistics, are also available electronically. (See the note at the bottom for details). This report is also available on the AFPM website (www.afpm.org) located within the Data & Reports dropdown menu at the top of the webpage by clicking the Data & Statistics link.

On January 1, 2019, there were 135^a operable refineries in the United States with total crude distillation capacity of about 18.80 million barrels per calendar day (bbl/cd) and 19.96 million barrels per stream day (bbl/sd). Of these, 132 refineries were operating on January 1, 2019, with operating capacity listed at 18.69 million bbl/cd and 19.83 million bbl/sd.

Overall, U.S. refining capacity increased about 200,000 bbl/cd in 2019, which is an increase equivalent to the addition of one medium-sized refinery. The number of idle refineries on January 1, 2019, increased from 0 to 3 from 2018 to 2019. More than half of the 2019 increase was in capacity along the U.S. Gulf Coast, which is home to more than 50 percent of total U.S. refining capacity, with the balance split between the Midwest and the West Coast.

The following table lists the total U.S. refining capacity for the past five years:

January 1 Total Capacity in Thousands of Barrels Per Calendar Day

	2015	2016	2017	2018	2019
U.S. Capacity	17,967	18,317	18,617	18,598	18,802

Percentage Change in U.S. Capacity from Previous Year

	2015	2016	2017	2018	2019
	0.23%	1.95%	1.64%	-0.01%	1.10%

This summary of petroleum refineries in the United States and U.S. territories is taken from the Department of Energy's 2019 Refinery Capacity Report, published June 21, 2019. Capacity data are reproduced by AFPM as a courtesy to members. The data enclosed, as well as other DOE refining statistics, are available electronically from DOE (<https://www.eia.gov>). For more information, call EIA's automated information line at 202.586.8800 or email them at: InfoCtr@eia.gov.

^a The total count of operable refineries (135) includes six facilities which did not operate distillation capacity (Excel Paralubes, Westlake, LA; Continental Refining Company, Somerset, KY; Equistar Chemicals, Channelview, TX; South Hampton Resources, Silsbee, TX; Targa Channelview, Channelview, TX; and Superior Refining Company, Superior, WI). Targa Channelview is listed as a reactivated/new refinery in the report. Suncor, Commerce City East and Commerce City West resumed reporting as separate entities, they reported as one entity in the 2018 report. Tesoro Refining and Marketing, Wilmington and Carson began reporting as one entity with the 2019 report. Par Hawaii Refining LLC purchased the atmospheric unit at Island Energy Services Downstream and began operating as one entity in December 2018.

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Table 1. Number and Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 2019

PAD District and State	Number of Operable Refineries			Atmospheric Crude Oil Distillation Capacity					
				Barrels per Calendar Day			Barrels per Stream Day		
	Total	Operating	Idle ^a	Total	Operating	Idle ^b	Total	Operating	Idle ^b
PAD District I	8	8	0	1,224,000	1,224,000	0	1,291,100	1,291,100	0
Delaware.....	1	1	0	182,200	182,200	0	190,200	190,200	0
New Jersey.....	2	2	0	418,500	418,500	0	438,100	438,100	0
Pennsylvania.....	4	4	0	601,000	601,000	0	639,800	639,800	0
West Virginia.....	1	1	0	22,300	22,300	0	23,000	23,000	0
PAD District II	27	25	2	4,141,015	4,075,515	65,500	4,376,833	4,297,533	79,300
Illinois.....	4	4	0	1,018,865	996,865	22,000	1,089,200	1,066,200	23,000
Indiana.....	2	2	0	458,800	458,800	0	470,800	470,800	0
Kansas.....	3	3	0	393,735	393,735	0	405,400	405,400	0
Kentucky.....	2	1	1	282,500	277,000	5,500	298,300	292,000	6,300
Michigan.....	1	1	0	140,000	140,000	0	147,000	147,000	0
Minnesota.....	2	2	0	418,515	418,515	0	448,700	448,700	0
North Dakota.....	2	2	0	90,000	90,000	0	94,000	94,000	0
Ohio.....	4	4	0	597,800	597,800	0	633,000	633,000	0
Oklahoma.....	5	5	0	522,800	522,800	0	555,433	555,433	0
Tennessee.....	1	1	0	180,000	180,000	0	185,000	185,000	0
Wisconsin.....	1	0	1	38,000	0	38,000	50,000	0	50,000
PAD District III	57	56	1	9,875,599	9,840,599	35,000	10,535,025	10,497,025	38,000
Alabama.....	3	3	0	141,675	141,675	0	150,500	150,500	0
Arkansas.....	2	2	0	90,500	90,500	0	92,700	92,700	0
Louisiana.....	17	17	0	3,325,990	3,325,990	0	3,529,825	3,529,825	0
Mississippi.....	3	3	0	393,940	393,940	0	415,000	415,000	0
New Mexico.....	2	2	0	136,000	136,000	0	151,000	151,000	0
Texas.....	30	29	1	5,787,494	5,752,494	35,000	6,196,000	6,158,000	38,000
PAD District IV	16	16	0	686,750	677,150	9,600	740,200	730,200	10,000
Colorado.....	2	2	0	103,000	103,000	0	111,700	111,700	0
Montana.....	4	4	0	214,700	205,100	9,600	224,900	214,900	10,000
Utah.....	5	5	0	200,550	200,550	0	212,200	212,200	0
Wyoming.....	5	5	0	168,500	168,500	0	191,400	191,400	0
PAD District V	27	27	0	2,875,071	2,875,071	0	3,017,400	3,017,400	0
Alaska.....	5	5	0	164,200	164,200	0	178,500	178,500	0
California.....	15	15	0	1,909,671	1,909,671	0	2,009,400	2,009,400	0
Hawaii.....	1	1	0	147,500	147,500	0	152,000	152,000	0
Nevada.....	1	1	0	2,000	2,000	0	5,000	5,000	0
Washington.....	5	5	0	651,700	651,700	0	672,500	672,500	0
U.S. Total	135	132	3	18,802,435	18,692,335	110,100	19,960,558	19,833,258	127,300

Table 1. Number and Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 2019

PAD District and State	Downstream Charge Capacity (Barrels per Stream Day)							
	Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Hydro-Cracking	Catalytic Reforming	Hydrotreating/Desulfurization	Fuels Solvent Deasphalting
			Fresh	Recycled				
PAD District I	554,400	81,500	497,500	5,000	45,300	268,600	1,057,900	22,000
Delaware	104,600	54,500	82,000	4,000	22,300	43,800	151,500	0
New Jersey	165,000	27,000	200,000	0	0	67,900	335,100	22,000
Pennsylvania	276,200	0	215,500	1,000	23,000	152,200	547,200	0
West Virginia	8,600	0	0	0	0	4,700	24,100	0
PAD District II	1,823,842	596,285	1,354,435	15,800	378,400	904,593	3,959,684	22,350
Illinois	475,900	212,400	324,300	0	100,700	249,000	957,750	0
Indiana	284,000	102,000	185,600	7,200	0	71,500	456,800	0
Kansas	157,000	74,000	104,000	500	43,000	81,600	400,500	0
Kentucky	130,000	0	104,000	0	0	58,300	275,800	13,000
Michigan	89,000	36,500	41,000	0	0	21,500	133,000	0
Minnesota	284,600	75,000	124,800	2,500	67,000	75,700	449,030	4,500
North Dakota	0	0	27,000	3,600	0	13,600	51,300	0
Ohio	159,500	58,000	208,300	0	109,000	170,300	513,400	0
Oklahoma	220,342	38,385	154,112	2,000	32,200	117,793	552,604	4,850
Tennessee	0	0	70,000	0	26,500	36,000	129,000	0
Wisconsin	23,500	0	11,323	0	0	9,300	40,500	0
PAD District III	4,867,295	1,664,480	3,083,190	21,500	1,422,500	1,927,870	9,550,600	264,400
Alabama	47,000	32,000	0	0	20,500	37,300	125,100	0
Arkansas	48,850	0	21,000	0	0	15,300	98,750	7,400
Louisiana	1,752,070	575,500	1,139,800	5,500	504,400	657,890	3,067,580	71,000
Mississippi	354,875	104,000	88,000	0	119,000	101,600	307,300	0
New Mexico	33,800	0	39,200	3,000	18,000	31,300	131,100	18,000
Texas	2,630,700	952,980	1,795,190	13,000	760,600	1,084,480	5,820,770	168,000
PAD District IV	276,300	91,400	219,360	1,990	60,200	132,450	600,490	6,000
Colorado	33,500	0	30,000	500	0	21,900	87,430	0
Montana	129,300	47,700	64,860	990	30,200	39,550	218,260	0
Utah	34,500	10,000	70,000	0	15,000	36,900	144,400	6,000
Wyoming	79,000	33,700	54,500	500	15,000	34,100	150,400	0
PAD District V	1,599,306	612,000	831,400	17,600	584,050	576,500	2,625,900	80,300
Alaska	26,000	0	0	0	12,500	13,500	24,500	0
California	1,201,356	514,200	683,700	14,600	486,550	407,500	2,097,800	56,000
Hawaii	71,000	11,000	0	0	20,000	13,500	13,000	0
Nevada	2,750	0	0	0	0	0	0	0
Washington	298,200	86,800	147,700	3,000	65,000	142,000	490,600	24,300
U.S. Total	9,121,143	3,045,665	5,985,885	61,890	2,490,450	3,810,013	17,794,574	395,050

^a Refineries where distillation units were completely idle but not permanently shutdown on January 1, 2019.

^b Includes capacity from refineries that are either completely or partially idle.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Table 2. Production Capacity of Operable Petroleum Refineries by PAD District and State as of January 1, 2019 (Barrels per Stream Day, Except Where Noted)

PAD District and State	Production Capacity							
	Alkylates	Aromatics	Asphalt and Road Oil	Isomers	Lubricants	Marketable Petroleum Coke	Hydrogen ^a (MMcfd)	Sulfur (short tons/day)
PAD District I	84,729	10,111	43,765	22,300	20,345	21,120	84	1,110
Delaware	11,729	5,191	0	6,000	0	13,620	40	596
New Jersey	30,000	0	21,000	4,000	12,000	7,500	31	280
Pennsylvania	43,000	4,920	22,065	12,300	2,945	0	10	233
West Virginia	0	0	700	0	5,400	0	3	1
PAD District II	286,786	112,500	291,014	162,000	9,900	181,984	625	8,525
Illinois	86,100	17,200	43,100	16,000	0	67,150	202	2,380
Indiana	34,200	16,800	33,700	31,100	0	30,000	0	1,913
Kansas	33,600	0	4,000	32,300	0	23,064	120	831
Kentucky	21,500	2,500	35,400	17,000	0	0	0	448
Michigan	7,500	0	32,000	0	0	12,320	0	460
Minnesota	19,150	0	59,600	28,500	0	26,000	199	1,320
North Dakota	4,800	0	0	0	0	0	2	17
Ohio	29,950	20,000	23,800	23,200	0	14,400	0	683
Oklahoma	35,586	21,000	43,414	13,900	9,900	9,050	72	324
Tennessee	12,700	29,000	0	0	0	0	30	116
Wisconsin	1,700	6,000	16,000	0	0	0	0	33
PAD District III	664,250	207,865	175,625	319,710	192,795	500,582	742	25,106
Alabama	0	0	16,500	5,350	0	7,120	40	228
Arkansas	5,000	0	21,300	7,500	6,000	0	13	157
Louisiana	235,400	49,900	60,500	100,220	66,000	169,152	118	6,966
Mississippi	21,500	15,600	16,125	0	48,000	35,500	242	1,224
New Mexico	11,100	0	7,000	0	0	0	38	226
Texas	391,250	142,365	54,200	206,640	72,795	288,810	291	16,305
PAD District IV	49,050	0	82,350	15,950	0	27,050	233	1,027
Colorado	0	0	12,250	0	0	0	22	116
Montana	17,050	0	44,300	6,750	0	14,050	149	489
Utah	21,500	0	1,800	9,200	0	2,500	0	93
Wyoming	10,500	0	24,000	0	0	10,500	62	329
PAD District V	252,462	1,500	52,650	220,225	39,800	172,430	1,389	5,871
Alaska	0	0	12,500	5,000	0	0	13	25
California	213,262	1,500	30,550	178,125	39,800	148,780	1,219	4,986
Hawaii	0	0	0	0	0	0	18	38
Nevada	0	0	1,600	0	0	0	0	0
Washington	39,200	0	8,000	37,100	0	23,650	139	822
U.S. Total	1,337,277	331,976	645,404	740,185	262,840	903,166	3,073	41,639

^a Includes hydrogen production capacity of hydrogen plants on refinery grounds.

MMcfd = Million cubic feet per day.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Directory of Operable Petroleum Refineries on Tables 3 and 4

Refiner	State(s)	Refiner	State(s)
Alon Refining Krotz Springs Inc.....		LA Kinder Morgan Crude &.....	
Alon USA Energy Inc.....	TX	Lazarus Energy LLC.....	TX
American Refining Group Inc.....	PA	Lima Refining Company.....	OH
BP Exploration Alaska Inc.....	AK	Lion Oil Co.....	AR
BP Products North America Inc.....	IN	Little America Refining Co.....	WY
BP West Coast Products LLC.....	WA	Lunday Thagard Co.....	CA
BP-Husky Refining LLC.....	OH	Magellan Terminal Holdings LP.....	TX
Big West Oil Co.....	UT	Marathon Petroleum Co LP.....	IL, KY, LA, MI, OH, TX
Buckeye Texas Processing LLC.....	TX	Monroe Energy LLC.....	PA
CHS McPherson Refinery Inc.....	KS	Motiva Enterprises LLC.....	TX
Calcasieu Refining Co.....	LA	PDV Midwest Refining LLC.....	IL
Calumet Cotton Valley Refining LLC.....	LA	Par Hawaii Refining LLC.....	HI
Calumet Montana Refining LLC.....	MT	Pasadena Refining Systems Inc.....	TX
Calumet Princeton Refining LLC.....	LA	Paulsboro Refining Co LLC.....	NJ
Calumet San Antonio Refining LLC.....	TX	Petro Star Inc.....	AK
Calumet Shreveport Refining LLC.....	LA	Petromax Refining Co LLC.....	TX
Genex Harvest States Coop.....	MT	Philadelphia Energy Solutions.....	PA
Chalmette Refining LLC.....	LA	Phillips 66 Company.....	CA, LA, MT, NJ, OK, TX, WA
Chevron USA Inc.....	CA, MS, UT	Placid Refining Co.....	LA
Citgo Petroleum Corp.....	LA	Premcor Refining Group Inc.....	TX
Citgo Refining & Chemical Inc.....	TX	San Joaquin Refining Co Inc.....	CA
Coffeyville Resources Rtg & Mktg.....	KS	Santa Maria Refining Company.....	CA
ConocoPhillips Alaska Inc.....	AK	Shell Chemical LP.....	AL
Continental Refining Company LLC.....	KY	Shell Oil Products US.....	CA, LA, WA
Countrymark Cooperative Inc.....	IN	Silver Eagle Refining.....	UT, WY
Cross Oil Refining & Marketing Inc.....	AR	Sinclair Wyoming Refining Co.....	WY
Dakota Prairie Refining LLC.....	ND	South Hampton Resources Inc.....	TX
Deer Park Refining LTD Partnership.....	TX	St Paul Park Refining Co LLC.....	MN
Delaware City Refining Co LLC.....	DE	Suncor Energy (USA) Inc.....	CO
Delek Refining LTD.....	TX	Superior Refining Company LLC.....	WI
Diamond Shamrock Refining Co LP.....	TX	Targa Channelview LLC.....	TX
Equistar Chemicals LP.....	TX	Tesoro Alaska Company LLC.....	AK
Ergon Refining Inc.....	MS	Tesoro Refining & Marketing Co.....	CA, ND, UT, WA
Ergon West Virginia Inc.....	WV	Toledo Refining Co LLC.....	OH
Excel Paralubes.....	LA	Torrance Refining Co LLC.....	CA
ExxonMobil Refining & Supply Co.....	IL, LA, MT, TX	Total Petrochemicals & Refining USA.....	TX
Flint Hills Resources LP.....	MN, TX	US Oil & Refining Co.....	WA
Foreland Refining Corp.....	NV	Ultramar Inc.....	CA
Goodway Refining LLC.....	AL	United Refining Co.....	PA
Hermes Consolidated LLC.....	WY	Valero Ref Company Tennessee LLC.....	TN
HollyFrontier Cheyenne Refining LLC.....	WY	Valero Refining - Meraux LLC.....	LA
HollyFrontier El Dorado Refining LLC.....	KS	Valero Refining Co California.....	CA
HollyFrontier Navajo Refining LLC.....	NM	Valero Refining Co Oklahoma.....	OK
HollyFrontier Tulsa Refining LLC.....	OK	Valero Refining Co Texas LP.....	TX
HollyFrontier Woods Cross Refining LLC.....	UT	Valero Refining New Orleans LLC.....	LA
Houston Refining LP.....	TX	WRB Refining LP.....	IL, TX
Hunt Refining Co.....	AL	Western Refining Company LP.....	TX
Hunt Southland Refining Co.....	MS	Western Refining Southwest Inc.....	NM
Kern Oil & Refining Co.....	CA	Wynnewood Refining Co.....	OK

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
Alabama	141,675	0	150,500	0	47,000	32,000	0	0	0
Goodway Refining LLC									
Atmore	4,100	0	5,000	0	0	0	0	0	0
Hunt Refining Co									
Tuscaloosa	46,000	0	50,000	0	18,000	32,000	0	0	0
Shell Chemical LP									
Saraland	91,575	0	95,500	0	29,000	0	0	0	0
Alaska	164,200	0	178,500	0	26,000	0	0	0	0
BP Exploration Alaska Inc									
Prudhoe Bay	6,500	0	8,000	0	0	0	0	0	0
ConocoPhillips Alaska Inc									
Prudhoe Bay	15,000	0	16,000	0	0	0	0	0	0
Petro Star Inc									
North Pole	19,700	0	22,500	0	0	0	0	0	0
Valdez	55,000	0	60,000	0	0	0	0	0	0
Tesoro Alaska Company LLC									
Kenai	68,000	0	72,000	0	26,000	0	0	0	0
Arkansas	90,500	0	92,700	0	48,850	0	0	0	0
Cross Oil Refining & Marketing Inc									
Smackover	7,500	0	7,700	0	3,850	0	0	0	0
Lion Oil Co									
El Dorado	83,000	0	85,000	0	45,000	0	0	0	0
California	1,909,671	0	2,009,400	0	1,201,356	457,200	52,000	5,000	0
Chevron USA Inc									
El Segundo	269,000	0	290,500	0	169,100	76,700	0	0	0
Richmond	245,271	0	257,200	0	123,456	0	0	0	0
Kern Oil & Refining Co									
Bakersfield	26,000	0	27,000	0	0	0	0	0	0
Lunday Thagard Co									
South Gate	8,500	0	10,000	0	5,000	0	0	0	0
Phillips 66 Company									
Rodeo	120,200	0	128,000	0	93,200	51,000	0	0	0
Wilmington	139,000	0	147,000	0	82,000	53,200	0	0	0
San Joaquin Refining Co Inc									
Bakersfield	15,000	0	25,000	0	14,300	0	0	5,000	0
Santa Maria Refining Company									
Santa Maria	9,500	0	10,000	0	10,000	0	0	0	0
Shell Oil Products US									
Martinez	156,400	0	158,000	0	102,000	25,500	22,500	0	0
Tesoro Refining & Marketing Co									
Carson	363,000	0	382,000	0	205,000	109,100	0	0	0
Martinez	161,500	0	166,000	0	158,500	50,900	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Alabama	0	0	0	20,500	0	15,300	22,000	0
Goodway Refining LLC Atmore	0	0	0	0	0	0	0	0
Hunt Refining Co Tuscaloosa	0	0	0	20,500	0	15,300	0	0
Shell Chemical LP Saraland	0	0	0	0	0	0	22,000	0
Alaska	0	0	0	12,500	0	13,500	0	0
BP Exploration Alaska Inc Prudhoe Bay	0	0	0	0	0	0	0	0
ConocoPhillips Alaska Inc Prudhoe Bay	0	0	0	0	0	0	0	0
Petro Star Inc North Pole	0	0	0	0	0	0	0	0
Valdez	0	0	0	0	0	0	0	0
Tesoro Alaska Company LLC Kenai	0	0	0	12,500	0	13,500	0	0
Arkansas	21,000	0	0	0	0	15,300	0	7,400
Cross Oil Refining & Marketing Inc Smackover	0	0	0	0	0	0	0	0
Lion Oil Co El Dorado	21,000	0	0	0	0	15,300	0	7,400
California	683,700	14,600	222,450	264,100	0	197,800	209,700	56,000
Chevron USA Inc El Segundo	73,800	0	0	55,000	0	49,000	0	0
Richmond	90,000	0	0	103,400	0	71,300	0	56,000
Kern Oil & Refining Co Bakersfield	0	0	0	0	0	2,500	3,300	0
Lunday Thagard Co South Gate	0	0	0	0	0	0	0	0
Phillips 66 Company Rodeo	0	0	0	69,000	0	0	34,000	0
Wilmington	51,600	0	27,500	0	0	0	36,200	0
San Joaquin Refining Co Inc Bakersfield	0	0	0	0	0	0	0	0
Santa Maria Refining Company Santa Maria	0	0	0	0	0	0	0	0
Shell Oil Products US Martinez	72,000	0	42,900	0	0	31,000	0	0
Tesoro Refining & Marketing Co Carson	102,500	0	89,750	0	0	0	79,000	0
Martinez	72,200	1,000	0	36,700	0	26,000	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Alabama	40,100	0	20,500	30,000	24,000	0	10,500	0
Goodway Refining LLC								
Atmore	0	0	0	0	0	0	0	0
Hunt Refining Co								
Tuscaloosa	12,100	0	2,500	0	24,000	0	10,500	0
Shell Chemical LP								
Saraland	28,000	0	18,000	30,000	0	0	0	0
Alaska	13,000	0	0	11,500	0	0	0	0
BP Exploration Alaska Inc								
Prudhoe Bay	0	0	0	0	0	0	0	0
ConocoPhillips Alaska Inc								
Prudhoe Bay	0	0	0	0	0	0	0	0
Petro Star Inc								
North Pole	0	0	0	0	0	0	0	0
Valdez	0	0	0	0	0	0	0	0
Tesoro Alaska Company LLC								
Kenai	13,000	0	0	11,500	0	0	0	0
Arkansas	20,000	8,750	0	35,000	0	0	21,000	14,000
Cross Oil Refining & Marketing Inc								
Smackover	0	0	0	0	0	0	0	6,000
Lion Oil Co								
El Dorado	20,000	8,750	0	35,000	0	0	21,000	8,000
California	444,200	248,300	202,800	324,100	100,100	0	708,100	70,200
Chevron USA Inc								
El Segundo	62,500	0	41,500	51,500	14,000	0	74,000	0
Richmond	57,600	64,800	96,000	64,800	0	0	65,000	34,000
Kern Oil & Refining Co								
Bakersfield	5,000	0	0	0	9,000	0	0	0
Lunday Thagard Co								
South Gate	0	0	0	0	0	0	0	0
Phillips 66 Company								
Rodeo	27,500	0	0	35,000	0	0	0	0
Wilmington	50,800	0	12,900	32,000	0	0	55,000	0
San Joaquin Refining Co Inc								
Bakersfield	0	0	0	0	3,600	0	1,800	0
Santa Maria Refining Company								
Santa Maria	0	0	0	0	0	0	0	0
Shell Oil Products US								
Martinez	27,500	92,500	0	0	49,000	0	84,500	14,500
Tesoro Refining & Marketing Co								
Carson	99,000	17,000	37,000	22,000	0	0	144,000	0
Martinez	27,000	30,800	0	39,000	19,500	0	69,500	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
California	1,909,671	0	2,009,400	0	1,201,356	457,200	52,000	5,000	0
Torrance Refining Co LLC									
Torrance	160,000	0	166,200	0	102,300	62,000	0	0	0
Ultramar Inc									
Wilmington	85,000	0	87,000	0	46,000	28,800	0	0	0
Valero Refining Co California									
Benicia	145,000	0	149,000	0	85,500	0	29,500	0	0
Wilmington	6,300	0	6,500	0	5,000	0	0	0	0
Colorado	103,000	0	111,700	0	33,500	0	0	0	0
Suncor Energy (USA) Inc									
Commerce City East	36,000	0	38,700	0	8,500	0	0	0	0
Commerce City West	67,000	0	73,000	0	25,000	0	0	0	0
Delaware	182,200	0	190,200	0	104,600	0	54,500	0	0
Delaware City Refining Co LLC									
Delaware City	182,200	0	190,200	0	104,600	0	54,500	0	0
Hawaii	147,500	0	152,000	0	71,000	0	0	11,000	0
Par Hawaii Refining LLC									
Kapolei	147,500	0	152,000	0	71,000	0	0	11,000	0
Illinois	996,865	22,000	1,066,200	23,000	475,900	212,400	0	0	0
ExxonMobil Refining & Supply Co									
Joliet	238,600	0	275,000	0	126,700	57,500	0	0	0
Marathon Petroleum Co LP									
Robinson	245,000	0	258,000	0	75,500	30,500	0	0	0
PDV Midwest Refining LLC									
Lemont	179,265	0	188,700	0	77,200	40,700	0	0	0
WRB Refining LP									
Wood River	334,000	22,000	344,500	23,000	196,500	83,700	0	0	0
Indiana	458,800	0	470,800	0	284,000	102,000	0	0	0
BP Products North America Inc									
Whiting	430,000	0	440,000	0	270,000	102,000	0	0	0
Countrymark Cooperative Inc									
Mount Vernon	28,800	0	30,800	0	14,000	0	0	0	0
Kansas	393,735	0	405,400	0	157,000	74,000	0	0	0
CHS McPherson Refinery Inc									
McPherson	99,735	0	104,400	0	46,000	30,000	0	0	0
Coffeyville Resources Rfg & Mktg									
Coffeyville	132,000	0	136,000	0	46,000	25,000	0	0	0
HollyFrontier El Dorado Refining LLC									
El Dorado	162,000	0	165,000	0	65,000	19,000	0	0	0
Kentucky	277,000	5,500	292,000	6,300	130,000	0	0	0	0
Continental Refining Company LLC									
Somerset	0	5,500	0	6,300	0	0	0	0	0
Marathon Petroleum Co LP									
Catlettsburg	277,000	0	292,000	0	130,000	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							Fuels Solvent Deasphalting
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
California	683,700	14,600	222,450	264,100	0	197,800	209,700	56,000
Torrance Refining Co LLC								
Torrance	90,000	13,600	28,300	0	0	0	20,000	0
Ultramar Inc								
Wilmington	56,300	0	0	0	0	18,000	0	0
Valero Refining Co California								
Benicia	75,300	0	34,000	0	0	0	37,200	0
Wilmington	0	0	0	0	0	0	0	0
Colorado	30,000	500	0	0	0	21,900	0	0
Suncor Energy (USA) Inc								
Commerce City East	9,000	500	0	0	0	11,000	0	0
Commerce City West	21,000	0	0	0	0	10,900	0	0
Delaware	82,000	4,000	0	22,300	0	43,800	0	0
Delaware City Refining Co LLC								
Delaware City	82,000	4,000	0	22,300	0	43,800	0	0
Hawaii	0	0	2,000	18,000	0	13,500	0	0
Par Hawaii Refining LLC								
Kapolei	0	0	2,000	18,000	0	13,500	0	0
Illinois	324,300	0	0	100,700	0	213,800	35,200	0
ExxonMobil Refining & Supply Co								
Joliet	99,300	0	0	0	0	52,600	0	0
Marathon Petroleum Co LP								
Robinson	54,500	0	0	44,000	0	81,500	0	0
PDV Midwest Refining LLC								
Lemont	69,500	0	0	0	0	0	35,200	0
WRB Refining LP								
Wood River	101,000	0	0	56,700	0	79,700	0	0
Indiana	185,600	7,200	0	0	0	6,500	65,000	0
BP Products North America Inc								
Whiting	177,000	7,000	0	0	0	0	65,000	0
Countrymark Cooperative Inc								
Mount Vernon	8,600	200	0	0	0	6,500	0	0
Kansas	104,000	500	0	43,000	0	58,100	23,500	0
CHS McPherson Refinery Inc								
McPherson	24,000	500	0	43,000	0	24,600	0	0
Coffeyville Resources Rfg & Mktg								
Coffeyville	36,000	0	0	0	0	26,000	0	0
HollyFrontier El Dorado Refining LLC								
El Dorado	44,000	0	0	0	0	7,500	23,500	0
Kentucky	104,000	0	0	0	0	24,000	34,300	13,000
Continental Refining Company LLC								
Somerset	0	0	0	0	0	0	1,300	0
Marathon Petroleum Co LP								
Catlettsburg	104,000	0	0	0	0	24,000	33,000	13,000

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
California	444,200	248,300	202,800	324,100	100,100	0	708,100	70,200
Torrance Refining Co LLC								
Torrance	25,300	0	0	19,800	0	0	108,300	0
Ultramar Inc								
Wilmington	32,000	0	0	45,000	0	0	67,000	0
Valero Refining Co California								
Benicia	30,000	43,200	15,400	15,000	5,000	0	39,000	21,700
Wilmington	0	0	0	0	0	0	0	0
Colorado	22,000	0	12,100	23,330	0	0	30,000	0
Suncor Energy (USA) Inc								
Commerce City East	11,000	0	0	0	0	0	0	0
Commerce City West	11,000	0	12,100	23,330	0	0	30,000	0
Delaware	50,000	33,000	16,500	52,000	0	0	0	0
Delaware City Refining Co LLC								
Delaware City	50,000	33,000	16,500	52,000	0	0	0	0
Hawaii	13,000	0	0	0	0	0	0	0
Par Hawaii Refining LLC								
Kapolei	13,000	0	0	0	0	0	0	0
Illinois	439,900	115,500	66,950	328,600	0	0	0	6,800
ExxonMobil Refining & Supply Co								
Joliet	169,500	0	0	78,000	0	0	0	0
Marathon Petroleum Co LP								
Robinson	75,000	41,500	0	79,500	0	0	0	0
PDV Midwest Refining LLC								
Lemont	111,100	0	13,700	94,800	0	0	0	6,800
WRB Refining LP								
Wood River	84,300	74,000	53,250	76,300	0	0	0	0
Indiana	78,000	6,500	46,000	134,300	0	0	192,000	0
BP Products North America Inc								
Whiting	69,000	0	46,000	120,800	0	0	192,000	0
Countrymark Cooperative Inc								
Mount Vernon	9,000	6,500	0	13,500	0	0	0	0
Kansas	125,500	49,000	21,000	128,000	27,000	0	50,000	0
CHS McPherson Refinery Inc								
McPherson	39,500	0	0	44,000	0	0	0	0
Coffeyville Resources Rfg & Mktg								
Coffeyville	36,000	22,000	9,000	30,000	27,000	0	0	0
HollyFrontier El Dorado Refining LLC								
El Dorado	50,000	27,000	12,000	54,000	0	0	50,000	0
Kentucky	59,300	0	31,000	78,500	0	0	107,000	0
Continental Refining Company LLC								
Somerset	1,300	0	0	1,000	0	0	0	0
Marathon Petroleum Co LP								
Catlettsburg	58,000	0	31,000	77,500	0	0	107,000	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
Louisiana	3,325,990	0	3,529,825	0	1,752,070	563,700	0	0	11,800
Alon Refining Krotz Springs Inc Krotz Springs	80,000	0	83,000	0	36,200	0	0	0	0
Calcasieu Refining Co Lake Charles	128,000	0	129,500	0	36,000	0	0	0	0
Calumet Cotton Valley Refining LLC Cotton Valley	13,020	0	14,000	0	0	0	0	0	0
Calumet Princeton Refining LLC Princeton	8,300	0	8,655	0	7,000	0	0	0	0
Calumet Shreveport Refining LLC Shreveport	57,000	0	60,000	0	28,000	0	0	0	0
Chalmette Refining LLC Chalmette	190,000	0	197,000	0	169,000	30,000	0	0	0
Citgo Petroleum Corp Lake Charles	418,000	0	440,000	0	230,000	110,000	0	0	0
Excel Paralubes Westlake	0	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co Baton Rouge	502,500	0	523,200	0	246,100	123,500	0	0	0
Marathon Petroleum Co LP Garyville	564,000	0	594,000	0	296,000	94,500	0	0	0
Phillips 66 Company Belle Chasse	253,600	0	266,970	0	104,170	26,000	0	0	0
Westlake	260,000	0	273,000	0	125,000	65,200	0	0	11,800
Placid Refining Co Port Allen	75,000	0	82,500	0	27,000	0	0	0	0
Shell Oil Products US Convent	211,270	0	260,000	0	116,300	0	0	0	0
Norco	225,300	0	250,000	0	91,300	28,500	0	0	0
Valero Refining - Meraux LLC Meraux	125,000	0	128,000	0	60,000	0	0	0	0
Valero Refining New Orleans LLC Norco	215,000	0	220,000	0	180,000	86,000	0	0	0
Michigan	140,000	0	147,000	0	89,000	36,500	0	0	0
Marathon Petroleum Co LP Detroit	140,000	0	147,000	0	89,000	36,500	0	0	0
Minnesota	418,515	0	448,700	0	284,600	75,000	0	0	0
Flint Hills Resources LP Saint Paul	320,000	0	345,000	0	234,000	75,000	0	0	0
St Paul Park Refining Co LLC Saint Paul	98,515	0	103,700	0	50,600	0	0	0	0
Mississippi	393,940	0	415,000	0	354,875	104,000	0	0	0
Chevron USA Inc Pascagoula	356,440	0	375,200	0	330,000	104,000	0	0	0
Ergon Refining Inc Vicksburg	26,500	0	27,300	0	18,000	0	0	0	0
Hunt Southland Refining Co Sandersville	11,000	0	12,500	0	6,875	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Louisiana	1,139,800	5,500	55,000	394,900	54,500	515,690	142,200	71,000
Alon Refining Krotz Springs Inc Krotz Springs	34,000	0	0	0	0	0	13,000	0
Calcasieu Refining Co Lake Charles	0	0	0	0	0	0	0	0
Calumet Cotton Valley Refining LLC Cotton Valley	0	0	0	0	0	0	0	0
Calumet Princeton Refining LLC Princeton	0	0	0	0	0	0	0	0
Calumet Shreveport Refining LLC Shreveport	0	0	0	0	0	12,000	0	0
Chalmette Refining LLC Chalmette	75,600	0	0	0	0	22,700	30,000	0
Citgo Petroleum Corp Lake Charles	148,000	3,000	0	51,200	0	60,000	53,200	0
Excel Paralubes Westlake	0	0	0	43,000	0	0	0	0
ExxonMobil Refining & Supply Co Baton Rouge	244,500	0	27,000	0	0	80,000	0	0
Marathon Petroleum Co LP Garyville	145,000	0	0	123,000	0	136,500	0	38,000
Phillips 66 Company Belle Chasse	105,000	2,000	0	0	0	48,490	0	0
Westlake	51,600	0	0	0	0	48,000	0	0
Placid Refining Co Port Allen	25,000	500	0	0	0	11,000	0	11,000
Shell Oil Products US Convent	92,300	0	0	0	54,500	0	46,000	0
Norco	118,800	0	0	44,000	0	40,000	0	0
Valero Refining - Meraux LLC Meraux	0	0	0	48,700	0	32,000	0	22,000
Valero Refining New Orleans LLC Norco	100,000	0	28,000	85,000	0	25,000	0	0
Michigan	41,000	0	0	0	0	21,500	0	0
Marathon Petroleum Co LP Detroit	41,000	0	0	0	0	21,500	0	0
Minnesota	124,800	2,500	67,000	0	0	37,000	38,700	4,500
Flint Hills Resources LP Saint Paul	94,300	0	67,000	0	0	37,000	13,800	0
St Paul Park Refining Co LLC Saint Paul	30,500	2,500	0	0	0	0	24,900	4,500
Mississippi	88,000	0	0	119,000	0	61,600	40,000	0
Chevron USA Inc Pascagoula	88,000	0	0	119,000	0	61,600	40,000	0
Ergon Refining Inc Vicksburg	0	0	0	0	0	0	0	0
Hunt Southland Refining Co Sandersville	0	0	0	0	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Louisiana	676,040	858,740	237,500	950,600	0	13,500	306,200	25,000
Alon Refining Krotz Springs Inc Krotz Springs	14,000	18,000	0	0	0	0	0	0
Calcasieu Refining Co Lake Charles	0	0	0	0	0	0	0	0
Calumet Cotton Valley Refining LLC Cotton Valley	6,500	0	0	0	0	0	0	0
Calumet Princeton Refining LLC Princeton	0	0	0	0	0	0	0	0
Calumet Shreveport Refining LLC Shreveport	16,000	0	0	14,000	0	0	21,100	1,200
Chalmette Refining LLC Chalmette	42,000	46,000	0	35,000	0	0	65,600	0
Citgo Petroleum Corp Lake Charles	121,000	85,400	68,000	100,000	0	0	0	23,800
Excel Paralubes Westlake	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co Baton Rouge	76,000	242,000	0	208,500	0	0	0	0
Marathon Petroleum Co LP Garyville	115,500	116,500	84,500	179,000	0	0	106,000	0
Phillips 66 Company Belle Chasse	50,540	72,340	0	74,800	0	0	0	0
Westlake	50,000	63,500	28,000	62,000	0	13,500	50,000	0
Placid Refining Co Port Allen	11,000	20,000	0	25,000	0	0	0	0
Shell Oil Products US Convent	50,000	58,000	42,000	76,300	0	0	39,500	0
Norco	38,500	77,000	0	70,000	0	0	0	0
Valero Refining - Meraux LLC Meraux	40,000	0	15,000	40,000	0	0	0	0
Valero Refining New Orleans LLC Norco	45,000	60,000	0	66,000	0	0	24,000	0
Michigan	35,000	0	7,000	46,500	0	0	44,500	0
Marathon Petroleum Co LP Detroit	35,000	0	7,000	46,500	0	0	44,500	0
Minnesota	89,700	51,200	53,600	95,630	0	0	158,900	0
Flint Hills Resources LP Saint Paul	51,300	51,200	43,500	62,000	0	0	128,000	0
St Paul Park Refining Co LLC Saint Paul	38,400	0	10,100	33,630	0	0	30,900	0
Mississippi	60,800	0	34,000	37,700	0	0	104,000	70,800
Chevron USA Inc Pascagoula	60,800	0	34,000	35,500	0	0	104,000	50,000
Ergon Refining Inc Vicksburg	0	0	0	2,200	0	0	0	20,800
Hunt Southland Refining Co Sandersville	0	0	0	0	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
Montana	205,100	9,600	214,900	10,000	129,300	37,700	10,000	0	0
Calumet Montana Refining LLC									
Great Falls	24,000	9,600	25,000	10,000	20,000	0	0	0	0
Cenex Harvest States Coop									
Laurel	59,600	0	61,100	0	32,200	16,000	0	0	0
ExxonMobil Refining & Supply Co									
Billings	61,500	0	62,900	0	32,300	0	10,000	0	0
Phillips 66 Company									
Billings	60,000	0	65,900	0	44,800	21,700	0	0	0
Nevada	2,000	0	5,000	0	2,750	0	0	0	0
Foreland Refining Corp									
Ely	2,000	0	5,000	0	2,750	0	0	0	0
New Jersey	418,500	0	438,100	0	165,000	27,000	0	0	0
Paulsboro Refining Co LLC									
Paulsboro	160,000	0	166,000	0	90,000	27,000	0	0	0
Phillips 66 Company									
Linden	258,500	0	272,100	0	75,000	0	0	0	0
New Mexico	136,000	0	151,000	0	33,800	0	0	0	0
HollyFrontier Navajo Refining LLC									
Artesia	110,000	0	124,000	0	33,800	0	0	0	0
Western Refining Southwest Inc									
Gallup	26,000	0	27,000	0	0	0	0	0	0
North Dakota	90,000	0	94,000	0	0	0	0	0	0
Dakota Prairie Refining LLC									
Dickinson	19,000	0	20,000	0	0	0	0	0	0
Tesoro Refining & Marketing Co									
Mandan	71,000	0	74,000	0	0	0	0	0	0
Ohio	597,800	0	633,000	0	159,500	58,000	0	0	0
BP-Husky Refining LLC									
Toledo	155,000	0	160,000	0	71,500	35,000	0	0	0
Lima Refining Company									
Lima	177,000	0	185,000	0	53,000	23,000	0	0	0
Marathon Petroleum Co LP									
Canton	93,000	0	100,000	0	35,000	0	0	0	0
Toledo Refining Co LLC									
Toledo	172,800	0	188,000	0	0	0	0	0	0
Oklahoma	522,800	0	555,433	0	220,342	38,385	0	0	0
HollyFrontier Tulsa Refining LLC									
Tulsa East	70,300	0	75,500	0	27,000	0	0	0	0
Tulsa West	85,000	0	91,020	0	32,000	11,000	0	0	0
Phillips 66 Company									
Ponca City	207,000	0	222,913	0	89,042	27,385	0	0	0
Valero Refining Co Oklahoma									
Ardmore	86,000	0	88,000	0	32,000	0	0	0	0
Wynnewood Refining Co									
Wynnewood	74,500	0	78,000	0	40,300	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Montana	64,860	990	6,200	24,000	0	12,500	27,050	0
Calumet Montana Refining LLC Great Falls	3,000	0	0	24,000	0	0	1,000	0
Cenex Harvest States Coop Laurel	16,500	0	0	0	0	12,500	0	0
ExxonMobil Refining & Supply Co Billings	23,660	0	6,200	0	0	0	12,500	0
Phillips 66 Company Billings	21,700	990	0	0	0	0	13,550	0
Nevada	0	0	0	0	0	0	0	0
Foreland Refining Corp Ely	0	0	0	0	0	0	0	0
New Jersey	200,000	0	0	0	0	67,900	0	22,000
Paulsboro Refining Co LLC Paulsboro	55,000	0	0	0	0	32,000	0	0
Phillips 66 Company Linden	145,000	0	0	0	0	35,900	0	22,000
New Mexico	39,200	3,000	0	18,000	0	24,000	7,300	18,000
HollyFrontier Navajo Refining LLC Artesia	30,000	0	0	18,000	0	24,000	0	18,000
Western Refining Southwest Inc Gallup	9,200	3,000	0	0	0	0	7,300	0
North Dakota	27,000	3,600	0	0	0	0	13,600	0
Dakota Prairie Refining LLC Dickinson	0	0	0	0	0	0	0	0
Tesoro Refining & Marketing Co Mandan	27,000	3,600	0	0	0	0	13,600	0
Ohio	208,300	0	52,000	57,000	0	63,500	106,800	0
BP-Husky Refining LLC Toledo	55,000	0	0	31,000	0	42,000	0	0
Lima Refining Company Lima	45,300	0	0	26,000	0	0	55,000	0
Marathon Petroleum Co LP Canton	26,000	0	0	0	0	21,500	0	0
Toledo Refining Co LLC Toledo	82,000	0	52,000	0	0	0	51,800	0
Oklahoma	154,112	2,000	14,000	18,200	0	64,200	53,593	4,850
HollyFrontier Tulsa Refining LLC Tulsa East	25,000	2,000	0	0	0	25,000	0	0
Tulsa West	0	0	0	0	0	0	0	0
Phillips 66 Company Ponca City	76,912	0	0	0	0	0	53,593	0
Valero Refining Co Oklahoma Ardmore	30,000	0	14,000	0	0	20,500	0	0
Wynnewood Refining Co Wynnewood	22,200	0	0	18,200	0	18,700	0	4,850

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Montana	46,950	26,500	19,400	46,750	25,000	0	45,760	7,900
Calumet Montana Refining LLC								
Great Falls	2,500	0	6,000	6,000	0	0	0	0
Cenex Harvest States Coop								
Laurel	17,000	0	0	0	25,000	0	20,000	0
ExxonMobil Refining & Supply Co								
Billings	13,900	20,500	7,600	11,000	0	0	0	7,900
Phillips 66 Company								
Billings	13,550	6,000	5,800	29,750	0	0	25,760	0
Nevada	0	0	0	0	0	0	0	0
Foreland Refining Corp								
Ely	0	0	0	0	0	0	0	0
New Jersey	97,500	37,000	29,100	154,000	17,500	0	0	0
Paulsboro Refining Co LLC								
Paulsboro	32,000	37,000	29,100	46,000	0	0	0	0
Phillips 66 Company								
Linden	65,500	0	0	108,000	17,500	0	0	0
New Mexico	49,600	0	15,000	48,500	0	0	18,000	0
HollyFrontier Navajo Refining LLC								
Artesia	42,000	0	15,000	43,000	0	0	18,000	0
Western Refining Southwest Inc								
Gallup	7,600	0	0	5,500	0	0	0	0
North Dakota	12,500	0	0	32,300	6,500	0	0	0
Dakota Prairie Refining LLC								
Dickinson	0	0	0	8,500	0	0	0	0
Tesoro Refining & Marketing Co								
Mandan	12,500	0	0	23,800	6,500	0	0	0
Ohio	181,400	107,000	69,500	82,000	0	0	73,500	0
BP-Husky Refining LLC								
Toledo	40,000	0	0	22,000	0	0	51,000	0
Lima Refining Company								
Lima	63,000	35,000	24,000	36,000	0	0	0	0
Marathon Petroleum Co LP								
Canton	32,500	0	13,500	24,000	0	0	22,500	0
Toledo Refining Co LLC								
Toledo	45,900	72,000	32,000	0	0	0	0	0
Oklahoma	158,411	102,987	18,678	139,600	37,590	0	58,338	37,000
HollyFrontier Tulsa Refining LLC								
Tulsa East	25,000	29,000	0	45,000	0	0	0	0
Tulsa West	28,000	0	0	0	0	0	0	21,600
Phillips 66 Company								
Ponca City	51,511	58,987	18,678	34,000	37,590	0	23,888	15,400
Valero Refining Co Oklahoma								
Ardmore	27,000	0	0	35,000	0	0	34,450	0
Wynnewood Refining Co								
Wynnewood	26,900	15,000	0	25,600	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
Pennsylvania	601,000	0	639,800	0	276,200	0	0	0	0
American Refining Group Inc Bradford	11,000	0	11,800	0	0	0	0	0	0
Monroe Energy LLC Trainer	190,000	0	208,000	0	73,000	0	0	0	0
Philadelphia Energy Solutions Philadelphia	335,000	0	350,000	0	163,200	0	0	0	0
United Refining Co Warren	65,000	0	70,000	0	40,000	0	0	0	0
Tennessee	180,000	0	185,000	0	0	0	0	0	0
Valero Ref Company Tennessee LLC Memphis	180,000	0	185,000	0	0	0	0	0	0
Texas	5,752,494	35,000	6,158,000	38,000	2,630,700	910,980	42,000	0	0
Alon USA Energy Inc Big Spring	73,000	0	74,000	0	28,000	0	0	0	0
Buckeye Texas Processing LLC Corpus Christi	60,000	0	65,000	0	0	0	0	0	0
Calumet San Antonio Refining LLC San Antonio	20,000	0	21,000	0	0	0	0	0	0
Citgo Refining & Chemical Inc Corpus Christi	157,500	0	163,500	0	85,300	44,900	0	0	0
Deer Park Refining LTD Partnership Deer Park	275,000	0	340,000	0	180,000	92,000	0	0	0
Delek Refining LTD Tyler	75,000	0	76,000	0	28,000	7,500	0	0	0
Diamond Shamrock Refining Co LP Sunray	195,000	0	200,000	0	50,000	0	0	0	0
Three Rivers	89,000	0	91,000	0	33,500	0	0	0	0
Equistar Chemicals LP Channelview	0	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co Baytown	560,500	0	584,000	0	297,000	54,000	42,000	0	0
Beaumont	369,024	0	384,400	0	148,800	46,500	0	0	0
Flint Hills Resources LP Corpus Christi	320,000	0	330,000	0	87,500	15,500	0	0	0
Houston Refining LP Houston	263,776	0	296,300	0	196,500	100,500	0	0	0
Kinder Morgan Crude & Condensate Galena Park	84,000	0	100,000	0	0	0	0	0	0
Lazarus Energy LLC Nixon	13,765	0	15,000	0	0	0	0	0	0
Magellan Terminal Holdings LP Corpus Christi	42,500	0	50,000	0	0	0	0	0	0
Marathon Petroleum Co LP Galveston Bay	585,000	0	616,000	0	259,000	33,000	0	0	0
Motiva Enterprises LLC Port Arthur	607,000	0	639,700	0	331,800	178,000	0	0	0
Pasadena Refining Systems Inc Pasadena	112,229	0	115,700	0	38,000	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Pennsylvania	215,500	1,000	23,000	0	0	50,000	102,200	0
American Refining Group Inc Bradford	0	0	0	0	0	0	2,200	0
Monroe Energy LLC Trainer	53,000	0	23,000	0	0	50,000	0	0
Philadelphia Energy Solutions Philadelphia	137,500	0	0	0	0	0	86,000	0
United Refining Co Warren	25,000	1,000	0	0	0	0	14,000	0
Tennessee	70,000	0	26,500	0	0	36,000	0	0
Valero Ref Company Tennessee LLC Memphis	70,000	0	26,500	0	0	36,000	0	0
Texas	1,795,190	13,000	250,300	425,800	84,500	979,200	105,280	168,000
Alon USA Energy Inc Big Spring	23,500	0	0	0	0	21,500	0	10,000
Buckeye Texas Processing LLC Corpus Christi	0	0	0	0	0	0	0	0
Calumet San Antonio Refining LLC San Antonio	0	0	0	0	0	0	6,000	0
Citgo Refining & Chemical Inc Corpus Christi	83,800	0	0	0	0	51,500	0	0
Deer Park Refining LTD Partnership Deer Park	75,000	5,000	0	60,000	0	44,900	24,500	0
Delek Refining LTD Tyler	20,250	0	0	0	0	13,000	4,500	0
Diamond Shamrock Refining Co LP Sunray	54,500	0	0	29,000	0	29,000	18,000	14,500
Three Rivers	23,840	0	0	28,000	0	23,500	10,000	10,500
Equistar Chemicals LP Channelview	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co Baytown	220,000	8,000	29,900	0	0	127,500	0	47,000
Beaumont	115,000	0	70,000	0	0	143,500	0	0
Flint Hills Resources LP Corpus Christi	110,000	0	0	16,000	0	0	0	0
Houston Refining LP Houston	110,000	0	0	0	0	0	0	0
Kinder Morgan Crude & Condensate Galena Park	0	0	0	0	0	0	0	0
Lazarus Energy LLC Nixon	0	0	0	0	0	0	0	0
Magellan Terminal Holdings LP Corpus Christi	0	0	0	0	0	0	0	0
Marathon Petroleum Co LP Galveston Bay	204,500	0	78,500	0	84,500	142,500	0	19,000
Motiva Enterprises LLC Port Arthur	92,600	0	0	107,000	0	129,500	0	0
Pasadena Refining Systems Inc Pasadena	52,000	0	0	0	0	23,000	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Pennsylvania	187,600	104,000	28,300	70,300	157,000	0	0	0
American Refining Group Inc Bradford	3,600	0	0	0	0	0	0	0
Monroe Energy LLC Trainer	80,000	34,000	23,300	53,300	0	0	0	0
Philadelphia Energy Solutions Philadelphia	78,000	65,000	0	0	157,000	0	0	0
United Refining Co Warren	26,000	5,000	5,000	17,000	0	0	0	0
Tennessee	52,000	39,000	0	38,000	0	0	0	0
Valero Ref Company Tennessee LLC Memphis	52,000	39,000	0	38,000	0	0	0	0
Texas	1,405,590	1,117,220	630,200	1,397,420	16,000	75,000	1,033,640	145,700
Alon USA Energy Inc Big Spring	25,500	0	5,000	24,000	0	0	6,500	0
Buckeye Texas Processing LLC Corpus Christi	0	0	0	0	0	0	0	0
Calumet San Antonio Refining LLC San Antonio	6,000	0	0	8,000	0	0	0	0
Citgo Refining & Chemical Inc Corpus Christi	52,800	45,120	0	99,320	0	0	70,900	0
Deer Park Refining LTD Partnership Deer Park	71,500	46,600	40,000	50,000	0	0	49,500	43,000
Delek Refining LTD Tyler	28,000	13,000	0	36,000	0	0	0	0
Diamond Shamrock Refining Co LP Sunray	44,400	39,600	0	47,500	0	0	0	0
Three Rivers	24,000	0	10,000	25,000	0	0	20,000	0
Equistar Chemicals LP Channelview	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co Baytown	155,500	196,000	132,700	146,300	0	0	117,000	46,500
Beaumont	159,800	71,000	51,000	42,000	0	0	0	19,500
Flint Hills Resources LP Corpus Christi	93,800	75,000	54,000	78,000	0	0	54,000	0
Houston Refining LP Houston	61,000	89,000	44,500	92,600	0	0	117,000	5,200
Kinder Morgan Crude & Condensate Galena Park	0	0	0	0	0	0	0	0
Lazarus Energy LLC Nixon	0	0	0	0	0	0	0	0
Magellan Terminal Holdings LP Corpus Christi	0	0	0	0	0	0	0	0
Marathon Petroleum Co LP Galveston Bay	121,000	57,000	79,000	55,000	0	0	108,000	0
Motiva Enterprises LLC Port Arthur	163,150	55,000	79,000	173,300	0	0	53,300	21,000
Pasadena Refining Systems Inc Pasadena	23,000	40,000	0	0	16,000	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Atmospheric Crude Oil Distillation Capacity				Downstream Charge Capacity				
	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			Other/Gas Oil
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	
Texas	5,752,494	35,000	6,158,000	38,000	2,630,700	910,980	42,000	0	0
Petromax Refining Co LLC									
Houston	25,000	0	27,500	0	0	0	0	0	0
Phillips 66 Company									
Sweeny	265,000	0	278,900	0	132,100	78,700	0	0	0
Premcor Refining Group Inc									
Port Arthur	335,000	0	415,000	0	220,000	103,000	0	0	0
South Hampton Resources Inc									
Silsbee	0	0	0	0	0	0	0	0	0
Targa Channelview LLC									
Channelview	0	35,000	0	38,000	0	0	0	0	0
Total Petrochemicals & Refining USA									
Port Arthur	225,500	0	245,000	0	117,000	60,000	0	0	0
Valero Refining Co Texas LP									
Corpus Christi	290,000	0	297,000	0	91,000	15,500	0	0	0
Houston	205,000	0	210,000	0	38,000	0	0	0	0
Texas City	225,000	0	231,000	0	133,500	53,500	0	0	0
Western Refining Company LP									
El Paso	133,700	0	138,000	0	55,700	0	0	0	0
WRB Refining LP									
Borger	146,000	0	154,000	0	80,000	28,380	0	0	0
Utah	200,550	0	212,200	0	34,500	10,000	0	0	0
Big West Oil Co									
North Salt Lake	30,500	0	33,000	0	0	0	0	0	0
Chevron USA Inc									
Salt Lake City	54,720	0	57,600	0	27,500	10,000	0	0	0
HollyFrontier Woods Cross Refining LLC									
Woods Cross	39,330	0	41,400	0	0	0	0	0	0
Silver Eagle Refining									
Woods Cross	15,000	0	15,700	0	7,000	0	0	0	0
Tesoro Refining & Marketing Co									
Salt Lake City	61,000	0	64,500	0	0	0	0	0	0
Washington	651,700	0	672,500	0	298,200	86,800	0	0	0
BP West Coast Products LLC									
Ferndale	242,000	0	251,000	0	112,000	61,500	0	0	0
Phillips 66 Company									
Ferndale	105,000	0	110,500	0	50,700	0	0	0	0
Shell Oil Products US									
Anacortes	145,000	0	149,000	0	65,800	25,300	0	0	0
Tesoro Refining & Marketing Co									
Anacortes	119,000	0	120,000	0	50,500	0	0	0	0
US Oil & Refining Co									
Tacoma	40,700	0	42,000	0	19,200	0	0	0	0
West Virginia	22,300	0	23,000	0	8,600	0	0	0	0
Ergon West Virginia Inc									
Newell	22,300	0	23,000	0	8,600	0	0	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Texas	1,795,190	13,000	250,300	425,800	84,500	979,200	105,280	168,000
Petromax Refining Co LLC Houston	0	0	0	0	0	0	0	0
Phillips 66 Company Sweeny	107,700	0	0	0	0	41,500	0	0
Premcor Refining Group Inc Port Arthur	75,000	0	0	134,800	0	55,000	0	0
South Hampton Resources Inc Silsbee	0	0	0	0	0	5,200	0	0
Targa Channelview LLC Channelview	0	0	0	0	0	0	0	0
Total Petrochemicals & Refining USA Port Arthur	80,000	0	0	0	0	43,000	0	15,500
Valero Refining Co Texas LP Corpus Christi	95,500	0	0	51,000	0	39,000	11,000	0
Houston	75,000	0	71,900	0	0	0	0	18,000
Texas City	86,000	0	0	0	0	18,100	0	33,500
Western Refining Company LP El Paso	35,000	0	0	0	0	28,000	0	0
WRB Refining LP Borger	56,000	0	0	0	0	0	31,280	0
Utah	70,000	0	0	15,000	0	0	36,900	6,000
Big West Oil Co North Salt Lake	12,500	0	0	0	0	0	8,500	0
Chevron USA Inc Salt Lake City	15,500	0	0	0	0	0	8,500	0
HollyFrontier Woods Cross Refining LLC Woods Cross	17,500	0	0	15,000	0	0	8,400	6,000
Silver Eagle Refining Woods Cross	0	0	0	0	0	0	0	0
Tesoro Refining & Marketing Co Salt Lake City	24,500	0	0	0	0	0	11,500	0
Washington	147,700	3,000	0	65,000	0	113,500	28,500	24,300
BP West Coast Products LLC Ferndale	0	0	0	65,000	0	65,000	0	0
Phillips 66 Company Ferndale	38,500	0	0	0	0	18,500	0	0
Shell Oil Products US Anacortes	57,900	0	0	0	0	0	21,700	0
Tesoro Refining & Marketing Co Anacortes	51,300	3,000	0	0	0	30,000	0	24,300
US Oil & Refining Co Tacoma	0	0	0	0	0	0	6,800	0
West Virginia	0	0	0	0	0	4,700	0	0
Ergon West Virginia Inc Newell	0	0	0	0	0	4,700	0	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Texas	1,405,590	1,117,220	630,200	1,397,420	16,000	75,000	1,033,640	145,700
Petromax Refining Co LLC Houston	0	0	0	0	0	0	0	0
Phillips 66 Company Sweeny	73,400	68,700	0	126,300	0	0	110,200	0
Premcor Refining Group Inc Port Arthur	48,700	85,000	33,000	104,600	0	0	60,000	0
South Hampton Resources Inc Silsbee	11,000	0	0	0	0	0	0	4,000
Targa Channelview LLC Channelview	0	0	0	0	0	0	0	0
Total Petrochemicals & Refining USA Port Arthur	57,500	51,600	31,000	80,000	0	0	54,400	0
Valero Refining Co Texas LP Corpus Christi	57,000	54,500	10,000	72,000	0	75,000	25,000	0
Houston	9,000	33,600	16,000	0	0	0	0	0
Texas City	25,000	61,500	28,000	55,000	0	0	110,000	6,500
Western Refining Company LP El Paso	29,000	35,000	8,500	47,000	0	0	0	0
WRB Refining LP Borger	65,540	0	8,500	35,500	0	0	77,840	0
Utah	45,000	8,000	2,900	49,800	31,500	0	0	7,200
Big West Oil Co North Salt Lake	11,500	0	0	11,000	0	0	0	0
Chevron USA Inc Salt Lake City	8,500	0	0	13,300	20,700	0	0	7,200
HollyFrontier Woods Cross Refining LLC Woods Cross	12,500	0	2,900	0	10,800	0	0	0
Silver Eagle Refining Woods Cross	1,000	0	0	3,000	0	0	0	0
Tesoro Refining & Marketing Co Salt Lake City	11,500	8,000	0	22,500	0	0	0	0
Washington	172,000	100,800	42,000	175,800	0	0	0	0
BP West Coast Products LLC Ferndale	75,800	0	20,000	59,000	0	0	0	0
Phillips 66 Company Ferndale	19,400	22,100	0	33,400	0	0	0	0
Shell Oil Products US Anacortes	21,700	39,100	22,000	47,700	0	0	0	0
Tesoro Refining & Marketing Co Anacortes	44,700	39,600	0	27,500	0	0	0	0
US Oil & Refining Co Tacoma	10,400	0	0	8,200	0	0	0	0
West Virginia	7,700	0	0	9,500	0	0	6,900	0
Ergon West Virginia Inc Newell	7,700	0	0	9,500	0	0	6,900	0

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Barrels per Calendar Day		Barrels per Stream Day		Vacuum Distillation	Thermal Cracking			
	Operating	Idle	Operating	Idle		Delayed Coking	Fluid Coking	Visbreaking	Other/Gas Oil
Wisconsin	0	38,000	0	50,000	23,500	0	0	0	0
Superior Refining Company LLC Superior	0	38,000	0	50,000	23,500	0	0	0	0
Wyoming	168,500	0	191,400	0	79,000	33,700	0	0	0
Hermes Consolidated LLC New Castle	18,000	0	18,500	0	0	0	0	0	0
HollyFrontier Cheyenne Refining LLC Cheyenne	48,000	0	52,000	0	28,000	13,700	0	0	0
Little America Refining Co Evansville	24,500	0	25,500	0	0	0	0	0	0
Silver Eagle Refining Evanston	3,000	0	3,400	0	0	0	0	0	0
Sinclair Wyoming Refining Co Sinclair	75,000	0	92,000	0	51,000	20,000	0	0	0
U.S. Total	18,692,335	110,100	19,833,258	127,300	9,121,143	2,859,365	158,500	16,000	11,800

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Catalytic Cracking		Catalytic Hydrocracking			Catalytic Reforming		Fuels Solvent Deasphalting
	Fresh	Recycled	Distillate	Gas Oil	Residual	Low Pressure	High Pressure	
Wisconsin	11,323	0	0	0	0	9,300	0	0
Superior Refining Company LLC Superior	11,323	0	0	0	0	9,300	0	0
Wyoming	54,500	500	15,000	0	0	14,200	19,900	0
Hermes Consolidated LLC New Castle	7,500	0	0	0	0	0	4,000	0
HollyFrontier Cheyenne Refining LLC Cheyenne	13,500	0	0	0	0	9,200	0	0
Little America Refining Co Evansville	11,500	500	0	0	0	5,000	0	0
Silver Eagle Refining Evanston	0	0	0	0	0	0	2,900	0
Sinclair Wyoming Refining Co Sinclair	22,000	0	15,000	0	0	0	13,000	0
U.S. Total	5,985,885	61,890	733,450	1,618,000	139,000	2,698,290	1,111,723	395,050

Table 3. Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Downstream Charge Capacity							
	Desulfurization (incl. Catalytic Hydrotreating)							
	Naphtha/ Reformer Feed	Gasoline	Kerosene/ Jet Fuel	Diesel Fuel	Other Distillate	Residual	Heavy Gas Oil	Other
Wisconsin	12,500	12,500	8,000	7,500	0	0	0	0
Superior Refining Company LLC Superior	12,500	12,500	8,000	7,500	0	0	0	0
Wyoming	46,900	16,500	14,000	53,000	0	0	20,000	0
Hermes Consolidated LLC New Castle	4,000	0	0	6,000	0	0	0	0
HollyFrontier Cheyenne Refining LLC Cheyenne	10,000	10,000	0	18,000	0	0	0	0
Little America Refining Co Evansville	7,500	6,500	0	10,500	0	0	0	0
Silver Eagle Refining Evanston	3,900	0	0	0	0	0	0	0
Sinclair Wyoming Refining Co Sinclair	21,500	0	14,000	18,500	0	0	20,000	0
U.S. Total	4,642,191	3,042,497	1,626,028	4,580,230	442,190	88,500	2,988,338	384,600

Note: Refer to Table 5 for corporate ownership information. Some names of previously independent companies have been preserved by acquiring companies.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Directory of Operable Petroleum Refineries on Tables 3 and 4

Refiner	State(s)	Refiner	State(s)
Alon Refining Krotz Springs Inc.....	LA	Kinder Morgan Crude & Condensate.....	TX
Alon USA Energy Inc.....	TX	Lazarus Energy LLC.....	TX
American Refining Group Inc.....	PA	Lima Refining Company.....	OH
BP Exploration Alaska Inc.....	AK	Lion Oil Co.....	AR
BP Products North America Inc.....	IN	Little America Refining Co.....	WY
BP West Coast Products LLC.....	WA	Lunday Thagard Co.....	CA
BP-Husky Refining LLC.....	OH	Magellan Terminal Holdings LP.....	TX
Big West Oil Co.....	UT	Marathon Petroleum Co LP.....	IL, KY, LA, MI, OH, TX
Buckeye Texas Processing LLC.....	TX	Monroe Energy LLC.....	PA
CHS McPherson Refinery Inc.....	KS	Motiva Enterprises LLC.....	TX
Calcasieu Refining Co.....	LA	PDV Midwest Refining LLC.....	IL
Calumet Cotton Valley Refining LLC.....	LA	Par Hawaii Refining LLC.....	HI
Calumet Montana Refining LLC.....	MT	Pasadena Refining Systems Inc.....	TX
Calumet Princeton Refining LLC.....	LA	Paulsboro Refining Co LLC.....	NJ
Calumet San Antonio Refining LLC.....	TX	Petro Star Inc.....	AK
Calumet Shreveport Refining LLC.....	LA	Petromax Refining Co LLC.....	TX
Cenex Harvest States Coop.....	MT	Philadelphia Energy Solutions.....	PA
Chalmette Refining LLC.....	LA	Phillips 66 Company.....	CA, LA, MT, NJ, OK, TX, WA
Chevron USA Inc.....	CA, MS, UT	Placid Refining Co.....	LA
Citgo Petroleum Corp.....	LA	Premcor Refining Group Inc.....	TX
Citgo Refining & Chemical Inc.....	TX	San Joaquin Refining Co Inc.....	CA
Coffeyville Resources Rfg & Mktg.....	KS	Santa Maria Refining Company.....	CA
ConocoPhillips Alaska Inc.....	AK	Shell Chemical LP.....	AL
Continental Refining Company LLC.....	KY	Shell Oil Products US.....	CA, LA, WA
Countrymark Cooperative Inc.....	IN	Silver Eagle Refining.....	UT, WY
Cross Oil Refining & Marketing Inc.....	AR	Sinclair Wyoming Refining Co.....	WY
Dakota Prairie Refining LLC.....	ND	South Hampton Resources Inc.....	TX
Deer Park Refining LTD Partnership.....	TX	St Paul Park Refining Co LLC.....	MN
Delaware City Refining Co LLC.....	DE	Suncor Energy (USA) Inc.....	CO
Delek Refining LTD.....	TX	Superior Refining Company LLC.....	WI
Diamond Shamrock Refining Co LP.....	TX	Targa Channelview LLC.....	TX
Equistar Chemicals LP.....	TX	Tesoro Alaska Company LLC.....	AK
Ergon Refining Inc.....	MS	Tesoro Refining & Marketing Co.....	CA, ND, UT, WA
Ergon West Virginia Inc.....	WV	Toledo Refining Co LLC.....	OH
Excel Paralubes.....	LA	Torrance Refining Co LLC.....	CA
ExxonMobil Refining & Supply Co.....	IL, LA, MT, TX	Total Petrochemicals & Refining USA.....	TX
Flint Hills Resources LP.....	MN, TX	US Oil & Refining Co.....	WA
Foreland Refining Corp.....	NV	Ultramar Inc.....	CA
Goodway Refining LLC.....	AL	United Refining Co.....	PA
Hermes Consolidated LLC.....	WY	Valero Ref Company Tennessee LLC.....	TN
HollyFrontier Cheyenne Refining LLC.....	WY	Valero Refining - Meraux LLC.....	LA
HollyFrontier El Dorado Refining LLC.....	KS	Valero Refining Co California.....	CA
HollyFrontier Navajo Refining LLC.....	NM	Valero Refining Co Oklahoma.....	OK
HollyFrontier Tulsa Refining LLC.....	OK	Valero Refining Co Texas LP.....	TX
HollyFrontier Woods Cross Refining LLC.....	UT	Valero Refining New Orleans LLC.....	LA
Houston Refining LP.....	TX	WRB Refining LP.....	IL, TX
Hunt Refining Co.....	AL	Western Refining Company LP.....	TX
Hunt Southland Refining Co.....	MS	Western Refining Southwest Inc.....	NM
Kern Oil & Refining Co.....	CA	Wynnewood Refining Co.....	OK

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Alabama	0	0	16,500	1,150	4,200	0	0	7,120	40	228
Hunt Refining Co										
Tuscaloosa	0	0	16,500	0	4,200	0	0	7,120	40	195
Shell Chemical LP										
Saratland	0	0	0	1,150	0	0	0	0	0	33
Alaska	0	0	12,500	0	5,000	0	0	0	13	25
Petro Star Inc										
North Pole	0	0	3,000	0	0	0	0	0	0	0
Tesoro Alaska Company LLC										
Kenai	0	0	9,500	0	5,000	0	0	0	13	25
Arkansas	5,000	0	21,300	0	7,500	0	6,000	0	13	157
Cross Oil Refining & Marketing Inc										
Smackover	0	0	800	0	0	0	6,000	0	3	0
Lion Oil Co										
EI Dorado	5,000	0	20,500	0	7,500	0	0	0	10	157
California	213,262	1,500	30,550	49,025	129,100	0	39,800	148,780	1,219	4,986
Chevron USA Inc										
EI Segundo	33,300	0	0	10,500	22,300	0	0	30,000	77	917
Richmond	32,662	0	0	7,200	46,000	0	34,000	0	330	818
Kern Oil & Refining Co										
Bakersfield	0	0	0	0	0	0	0	0	0	11
Lunday Thagard Co										
South Gate	0	0	3,750	0	0	0	0	0	0	0
Phillips 66 Company										
Rodeo	0	0	0	3,800	10,000	0	0	14,500	22	560
Wilmington	16,000	0	0	7,000	12,800	0	0	16,800	105	370

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
San Joaquin Refining Co Inc										
Bakersfield	0	1,500	8,000	0	0	0	5,800	0	4	6
Santa Maria Refining Company										
Santa Maria	0	0	6,300	0	0	0	0	0	0	0
Shell Oil Products US										
Martinez	12,500	0	0	0	15,000	0	0	9,000	193	413
Tesoro Refining & Marketing Co										
Carson	33,700	0	0	16,325	23,000	0	0	28,700	120	729
Martinez	16,000	0	0	0	0	0	0	13,800	87	179
Torrance Refining Co LLC										
Torrance	30,000	0	0	0	0	0	0	19,180	146	400
Ultramar Inc										
Wilmington	22,000	0	0	0	0	0	0	10,000	0	280
Valero Refining Co California										
Benicia	17,100	0	9,000	4,200	0	0	0	6,800	135	303
Wilmington	0	0	3,500	0	0	0	0	0	0	0
Colorado	0	0	12,250	0	0	0	0	0	22	116
Suncor Energy (USA) Inc										
Commerce City East	0	0	0	0	0	0	0	0	0	2
Commerce City West	0	0	12,250	0	0	0	0	0	22	114
Delaware	11,729	5,191	0	6,000	0	0	0	13,620	40	596
Delaware City Refining Co LLC										
Delaware City	11,729	5,191	0	6,000	0	0	0	13,620	40	596
Hawaii	0	0	0	0	0	0	0	0	18	38
Par Hawaii Refining LLC										
Kapolei	0	0	0	0	0	0	0	0	18	38

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Illinois	86,100	17,200	43,100	0	16,000	0	0	67,150	202	2,380
ExxonMobil Refining & Supply Co										
Joliet	29,100	0	15,100	0	0	0	0	18,595	0	683
Marathon Petroleum Co LP										
Robinson	12,500	3,300	0	0	16,000	0	0	7,755	0	202
PDV Midwest Refining LLC										
Lemont	22,700	9,400	0	0	0	0	0	12,900	12	487
WRB Refining LP										
Wood River	21,800	4,500	28,000	0	0	0	0	27,900	190	1,008
Indiana	34,200	16,800	33,700	0	31,100	0	0	30,000	0	1,913
BP Products North America Inc										
Whiting	32,000	16,800	30,000	0	27,900	0	0	30,000	0	1,904
Countrymark Cooperative Inc										
Mount Vernon	2,200	0	3,700	0	3,200	0	0	0	0	9
Kansas	33,600	0	4,000	5,300	27,000	0	0	23,064	120	831
CHS McPherson Refinery Inc										
McPherson	9,600	0	0	3,800	12,000	0	0	7,364	42	287
Coffeyville Resources Rig & Mktg										
Coffeyville	10,000	0	0	0	0	0	0	8,700	22	229
HollyFrontier El Dorado Refining LLC										
El Dorado	14,000	0	4,000	1,500	15,000	0	0	7,000	56	315
Kentucky	21,500	2,500	35,400	0	17,000	0	0	0	0	448
Marathon Petroleum Co LP										
Calletsburg	21,500	2,500	35,400	0	17,000	0	0	0	0	448
Louisiana	235,400	49,900	60,500	23,000	77,220	0	66,000	169,152	118	6,966

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Alon Refining Krotz Springs Inc										
Krotz Springs	0	0	0	0	6,220	0	0	0	0	0
Calumet Cotton Valley Refining LLC										
Cotton Valley	0	0	0	0	500	0	0	0	2	0
Calumet Princeton Refining LLC										
Princeton	0	0	2,000	0	0	0	7,000	0	4	3
Calumet Shreveport Refining LLC										
Shreveport	0	0	6,500	0	0	0	12,500	0	12	40
Chalmette Refining LLC										
Chalmette	16,800	10,500	15,000	0	0	0	0	9,000	0	920
Citgo Petroleum Corp										
Lake Charles	28,100	20,900	0	0	28,000	0	0	32,820	0	717
Excel Paralubes										
Westlake	0	0	0	0	0	0	30,000	0	0	185
ExxonMobil Refining & Supply Co										
Baton Rouge	41,000	0	0	0	0	0	16,500	31,525	0	944
Marathon Petroleum Co LP										
Garyville	37,500	0	33,000	23,000	26,500	0	0	33,275	0	1,476
Phillips 66 Company										
Belle Chasse	35,000	15,500	0	0	0	0	0	6,716	0	125
Westlake	9,000	0	4,000	0	0	0	0	22,500	0	440
Placid Refining Co										
Port Allen	7,500	0	0	0	0	0	0	0	0	55
Shell Oil Products US										
Convent	22,700	0	0	0	16,000	0	0	0	0	922
Norco	16,800	0	0	0	0	0	0	7,316	0	180
Valero Refining - Meraux LLC										
Meraux	0	0	0	0	0	0	0	0	0	224
Valero Refining New Orleans LLC										
Norco	21,000	3,000	0	0	0	0	0	26,000	100	735

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Michigan	7,500	0	32,000	0	0	0	0	12,320	0	460
Marathon Petroleum Co LP Detroit	7,500	0	32,000	0	0	0	0	12,320	0	460
Minnesota	19,150	0	59,600	1,000	27,500	0	0	26,000	199	1,320
Flint Hills Resources LP Saint Paul	12,500	0	45,000	0	18,000	0	0	26,000	189	1,198
St Paul Park Refining Co LLC Saint Paul	6,650	0	14,600	1,000	9,500	0	0	0	10	122
Mississippi	21,500	15,600	16,125	0	0	0	48,000	35,500	242	1,224
Chevron USA Inc Pascagoula	21,500	15,600	0	0	0	0	25,000	35,500	229	1,224
Ergon Refining Inc Vicksburg	0	0	10,000	0	0	0	23,000	0	13	0
Hunt Southland Refining Co Sandersville	0	0	6,125	0	0	0	0	0	0	0
Montana	17,050	0	44,300	5,250	1,500	0	0	14,050	149	489
Calumet Montana Refining LLC Great Falls	700	0	10,000	0	1,500	0	0	0	20	0
Cenex Harvest States Coop Laurel	4,000	0	19,800	1,250	0	0	0	4,100	70	243
ExxonMobil Refining & Supply Co Billings	5,100	0	14,500	0	0	0	0	4,000	23	0
Phillips 66 Company Billings	7,250	0	0	4,000	0	0	0	5,950	36	246
Nevada	0	0	1,600	0	0	0	0	0	0	0

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Foreland Refining Corp										
Ely	0	0	1,600	0	0	0	0	0	0	0
New Jersey	30,000	0	21,000	4,000	0	0	12,000	7,500	31	280
Pausboro Refining Co LLC										
Pausboro	11,200	0	21,000	0	0	0	12,000	7,500	9	280
Phillips 66 Company										
Linden	18,800	0	0	4,000	0	0	0	0	22	0
New Mexico	11,100	0	7,000	0	0	0	0	0	38	226
HollyFrontier Navajo Refining LLC										
Artesia	9,100	0	7,000	0	0	0	0	0	38	224
Western Refining Southwest Inc										
Gallup	2,000	0	0	0	0	0	0	0	0	2
North Dakota	4,800	0	0	0	0	0	0	0	2	17
Dakota Prairie Refining LLC										
Dickinson	0	0	0	0	0	0	0	0	2	2
Tesoro Refining & Marketing Co										
Mandan	4,800	0	0	0	0	0	0	0	0	15
Ohio	29,950	20,000	23,800	4,500	18,700	0	0	14,400	0	683
BP-Husky Refining LLC										
Toledo	11,500	0	9,000	0	0	0	0	10,000	0	353
Lima Refining Company										
Lima	0	9,200	0	4,500	18,700	0	0	4,400	0	110
Marathon Petroleum Co LP										
Canton	8,500	0	14,800	0	0	0	0	0	0	104
Toledo Refining Co LLC										
Toledo	9,950	10,800	0	0	0	0	0	0	0	116

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
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State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Oklahoma	35,586	21,000	43,414	900	13,000	0	9,900	9,050	72	324
HollyFrontier Tulsa Refining LLC										
Tulsa East	5,500	0	15,200	0	13,000	0	0	0	0	75
Tulsa West	0	0	6,500	900	0	0	9,900	2,750	0	0
Phillips 66 Company										
Ponca City	17,574	0	0	0	0	0	0	6,300	35	0
Valero Refining Co Oklahoma										
Ardmore	7,012	0	14,714	0	0	0	0	0	27	249
Wynnewood Refining Co										
Wynnewood	5,500	21,000	7,000	0	0	0	0	0	10	0
Pennsylvania	43,000	4,920	22,065	3,800	8,500	0	2,945	0	10	233
American Refining Group Inc										
Bradford	0	0	65	0	0	0	2,945	0	0	0
Monroe Energy LLC										
Trainer	12,000	0	0	0	0	0	0	0	0	90
Philadelphia Energy Solutions										
Philadelphia	26,500	4,920	0	3,800	0	0	0	0	0	76
United Refining Co										
Warren	4,500	0	22,000	0	8,500	0	0	0	10	67
Tennessee	12,700	29,000	0	0	0	0	0	0	30	116
Valero Ref Company Tennessee LLC										
Memphis	12,700	29,000	0	0	0	0	0	0	30	116
Texas	391,250	142,365	54,200	60,400	146,240	0	72,795	288,810	291	16,305
Alon USA Energy Inc										
Big Spring	5,000	1,000	7,600	0	0	0	0	0	0	150

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State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Citgo Refining & Chemical Inc										
Corpus Christi	23,100	16,270	0	0	0	0	0	17,374	0	380
Deer Park Refining LTD Partnership										
Deer Park	20,000	0	0	0	0	0	0	29,000	0	1,140
Delek Refining LTD										
Tyler	4,700	0	0	0	0	0	0	1,500	0	39
Diamond Shamrock Refining Co LP										
Sunray	9,800	0	12,000	3,000	0	0	0	0	30	75
Three Rivers	7,000	10,800	0	3,000	0	0	1,900	0	0	224
Equistar Chemicals LP										
Channelview	22,000	0	0	0	0	0	0	0	0	0
ExxonMobil Refining & Supply Co										
Baytown	41,000	0	0	0	0	0	28,000	22,750	0	1,828
Beaumont	14,900	0	0	11,200	33,800	0	0	15,039	0	661
Flint Hills Resources LP										
Corpus Christi	15,500	0	0	4,900	3,500	0	0	2,953	0	293
Houston Refining LP										
Houston	11,250	20,700	0	0	0	0	3,895	30,150	0	1,123
Marathon Petroleum Co LP										
Galveston Bay	58,000	39,400	0	0	0	0	0	11,910	0	1,452
Motiva Enterprises LLC										
Port Arthur	20,500	0	0	0	49,140	0	39,000	50,975	0	3,203
Pasadena Refining Systems Inc										
Pasadena	12,500	0	0	0	0	0	0	0	0	28
Phillips 66 Company										
Sweeny	21,600	20,500	0	0	10,100	0	0	22,800	0	915
Premcor Refining Group Inc										
Port Arthur	19,500	0	0	0	0	0	0	32,240	0	1,490
South Hampton Resources Inc										
Silsbee	0	3,640	0	0	4,400	0	0	0	0	0

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
Total Petrochemicals & Refining USA										
Port Arthur	6,700	13,600	0	0	7,800	0	0	19,200	0	806
Valero Refining Co Texas LP										
Corpus Christi	24,500	16,455	30,600	16,000	0	0	0	5,919	160	1,142
Houston	12,500	0	0	0	0	0	0	0	0	336
Texas City	14,700	0	0	0	6,500	0	0	19,000	0	680
Western Refining Company LP										
El Paso	12,500	0	4,000	7,300	0	0	0	0	10	0
WRB Refining LP										
Borger	14,000	0	0	15,000	31,000	0	0	8,000	91	340
Utah	21,500	0	1,800	3,200	6,000	0	0	2,500	0	93
Big West Oil Co										
North Salt Lake	3,100	0	0	1,900	3,000	0	0	0	0	4
Chevron USA Inc										
Salt Lake City	5,600	0	0	1,300	0	0	0	2,500	0	63
HollyFrontier Woods Cross Refining LLC										
Woods Cross	5,300	0	1,800	0	3,000	0	0	0	0	10
Tesoro Refining & Marketing Co										
Salt Lake City	7,500	0	0	0	0	0	0	0	0	16
Washington	39,200	0	8,000	6,600	30,500	0	0	23,650	139	822
BP West Coast Products LLC										
Ferndale	0	0	0	0	26,000	0	0	15,250	139	284
Phillips 66 Company										
Ferndale	11,800	0	0	2,800	0	0	0	0	0	123
Shell Oil Products US										
Anacortes	12,100	0	0	0	0	0	0	8,400	0	350
Tesoro Refining & Marketing Co										
Anacortes	15,300	0	0	3,800	0	0	0	0	0	54

Table 4. Production Capacity of Operable Petroleum Refineries by State as of January 1, 2019
(Barrels per Stream Day, Except Where Noted)

State/Refiner/Location	Alkylates	Aromatics	Asphalt and Road Oil	Isomers			Lubricants	Marketable Petroleum Coke	Hydrogen (MMcfd) ^a	Sulfur (short tons per day)
				Isobutane	Isopentane and Isohexane	Isooctane				
US Oil & Refining Co										
Tacoma	0	0	8,000	0	4,500	0	0	0	0	11
West Virginia	0	0	700	0	0	0	5,400	0	3	1
Ergon West Virginia Inc										
Newell	0	0	700	0	0	0	5,400	0	3	1
Wisconsin	1,700	6,000	16,000	0	0	0	0	0	0	33
Superior Refining Company LLC										
Superior	1,700	6,000	16,000	0	0	0	0	0	0	33
Wyoming	10,500	0	24,000	0	0	0	0	10,500	62	329
Hermes Consolidated LLC										
New Castle	1,300	0	0	0	0	0	0	0	0	0
HollyFrontier Cheyenne Refining LLC										
Cheyenne	4,200	0	16,000	0	0	0	0	4,700	10	116
Little America Refining Co										
Evansville	0	0	0	0	0	0	0	0	0	10
Sinclair Wyoming Refining Co										
Sinclair	5,000	0	8,000	0	0	0	0	5,800	52	203
U.S. Total	1,337,277	331,976	645,404	174,125	566,060	0	262,840	903,166	3,073	41,639

^a Includes hydrogen production capacity of hydrogen plants on refinery grounds.

Note: Refer to Table 5 for corporate ownership information. Some names of previously independent companies have been preserved by acquiring companies.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day
Companies with Capacity Over 100,000 bbl/cd			
MARATHON PETROLEUM CORP	3,024,715	Diamond Shamrock Refining Co LP	
Marathon Petroleum Co LP		Sunray, Texas	195,000
Galveston Bay, Texas	585,000	Three Rivers, Texas	89,000
Garyville, Louisiana	564,000	Valero Refining New Orleans LLC	
Catlettsburg, Kentucky	277,000	Norco, Louisiana	215,000
Robinson, Illinois	245,000	Valero Ref Company Tennessee LLC	
Detroit, Michigan	140,000	Memphis, Tennessee	180,000
Canton, Ohio	93,000	Valero Refining Co California	
^a Tesoro Refining & Marketing Co		Benicia, California	145,000
^b Carson, California	363,000	Wilmington, California	6,300
Martinez, California	161,500	Valero Refining - Meraux LLC	
Anacortes, Washington	119,000	Meraux, Louisiana	125,000
Mandan, North Dakota	71,000	Valero Refining Co Oklahoma	
Salt Lake City, Utah	61,000	Ardmore, Oklahoma	86,000
^c Western Refining Company LP		Ultramar Inc	
El Paso, Texas	133,700	Wilmington, California	85,000
^d St Paul Park Refining Co LLC		EXXON MOBIL CORP	1,732,124
Saint Paul, Minnesota	98,515	ExxonMobil Refining & Supply Co	
^e Tesoro Alaska Company LLC		Baytown, Texas	560,500
Kenai, Alaska	68,000	Baton Rouge, Louisiana	502,500
^f Western Refining Southwest Inc		Beaumont, Texas	369,024
Gallup, New Mexico	26,000	Joliet, Illinois	238,600
^g Dakota Prairie Refining LLC		Billings, Montana	61,500
Dickinson, North Dakota	19,000		
VALERO ENERGY CORP	2,181,300		
Valero Refining Co Texas LP			
Corpus Christi, Texas	290,000		
Texas City, Texas	225,000		
Houston, Texas	205,000		
Premcor Refining Group Inc			
Port Arthur, Texas	335,000		

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day
PHILLIPS 66 COMPANY	1,668,300	Martinez, California	156,400
Phillips 66 Company		Anacortes, Washington	145,000
Sweeny, Texas	265,000	Shell Chemical LP	
Westlake, Louisiana	260,000	Saraland, Alabama	91,575
Linden, New Jersey	258,500	PDV AMERICA INC	754,765
Belle Chasse, Louisiana	253,600	Citgo Petroleum Corp	
Ponca City, Oklahoma	207,000	Lake Charles, Louisiana	418,000
Wilmington, California	139,000	PDV Midwest Refining LLC	
Rodeo, California	120,200	Lemont, Illinois	179,265
Ferndale, Washington	105,000	Citgo Refining & Chemical Inc	
Billings, Montana	60,000	Corpus Christi, Texas	157,500
CHEVRON CORP	925,431	BP PLC	678,500
Chevron USA Inc		BP Products North America Inc	
Pascagoula, Mississippi	356,440	Whiting, Indiana	430,000
El Segundo, California	269,000	BP West Coast Products LLC	
Richmond, California	245,271	Ferndale, Washington	242,000
Salt Lake City, Utah	54,720	BP Exploration Alaska Inc	
PBF ENERGY CO LLC	865,000	Prudhoe Bay, Alaska	6,500
Chalmette Refining LLC		KOCH INDUSTRIES INC	640,000
Chalmette, Louisiana	190,000	Flint Hills Resources LP	
Delaware City Refining Co LLC		Corpus Christi, Texas	320,000
Delaware City, Delaware	182,200	Saint Paul, Minnesota	320,000
Toledo Refining Co LLC		SAUDI ARAMCO	
Toledo, Ohio	172,800	Motiva Enterprises LLC	
Paulsboro Refining Co LLC		Port Arthur, Texas	607,000
Paulsboro, New Jersey	160,000		
Torrance Refining Co LLC			
Torrance, California	160,000		
ROYAL DUTCH/SHELL GROUP	829,545		
Shell Oil Products US			
Norco, Louisiana	225,300		
Convent, Louisiana	211,270		

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day
HOLLYFRONTIER CORP	514,630	ACCESS INDUSTRIES	
HollyFrontier El Dorado Refining LLC		Houston Refining LP	
El Dorado, Kansas	162,000	Houston, Texas	263,776
HollyFrontier Tulsa Refining LLC		TOTAL SA	
Tulsa West, Oklahoma	85,000	Total Petrochemicals & Refining USA	
Tulsa East, Oklahoma	70,300	Port Arthur, Texas	225,500
HollyFrontier Navajo Refining LLC		HUSKY ENERGY INC	215,000
Artesia, New Mexico	110,000	Lima Refining Company	
HollyFrontier Cheyenne Refining LLC		Lima, Ohio	177,000
Cheyenne, Wyoming	48,000	Superior Refining Company LLC	
HollyFrontier Woods Cross Refining LLC		Superior, Wisconsin	38,000
Woods Cross, Utah	39,330	CVR ENERGY	206,500
WRB REFINING LP	502,000	Coffeyville Resources Rfg & Mktg	
WRB Refining LP		Coffeyville, Kansas	132,000
Wood River, Illinois	356,000	Wynnewood Refining Co	
(50% Phillips 66, 50% Cenovus)		Wynnewood, Oklahoma	74,500
Borger, Texas	146,000	DELTA AIR LINES INC	
(50% Phillips 66, 50% Cenovus)		Monroe Energy LLC	
CARLYLE GROUP		Trainer, Pennsylvania	190,000
Philadelphia Energy Solutions		PAR PACIFIC HOLDINGS	165,500
Philadelphia, Pennsylvania	335,000	Par Hawaii Refining LLC	
DELEK GROUP LTD	311,000	Kapolei, Hawaii	147,500
Lion Oil Co		Hermes Consolidated LLC	
El Dorado, Arkansas	83,000	New Castle, Wyoming	18,000
Alon Refining Krotz Springs Inc		CHS INC	159,335
Krotz Springs, Louisiana	80,000	CHS McPherson Refinery Inc	
Delek Refining LTD		McPherson, Kansas	99,735
Tyler, Texas	75,000	Cenex Harvest States Coop	
Alon USA Energy Inc		Laurel, Montana	59,600
Big Spring, Texas	73,000	BP-HUSKY REFINING LLC	
DEER PARK REFINING LTD PTNRSHP		(50% BP, 50% Husky)	
(50% Royal Dutch/Shell Group, 50% Pemex)		BP-Husky Refining LLC	
Deer Park Refining LTD Partnership		Toledo, Ohio	155,000
Deer Park, Texas	275,000		

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day
CALUMET SPECIALTY PRODUCTS PARTNERS, L.P.	131,920	Placid Refining Co	
Calumet Shreveport Refining LLC		Port Allen, Louisiana	75,000
Shreveport, Louisiana	57,000	ARCTIC SLOPE REGIONAL CORP	74,700
Calumet Montana Refining LLC		Petro Star Inc	
Great Falls, Montana	33,600	Valdez, Alaska	55,000
Calumet San Antonio Refining LLC		North Pole, Alaska	19,700
San Antonio, Texas	20,000	RED APPLE GROUP INC	
Calumet Cotton Valley Refining LLC		United Refining Co	
Cotton Valley, Louisiana	13,020	Warren, Pennsylvania	65,000
Calumet Princeton Refining LLC		BUCKEYE PARTNERS LP	
Princeton, Louisiana	8,300	Buckeye Texas Processing LLC	
TRANSWORLD OIL USA INC		Corpus Christi, Texas	60,000
Calcasieu Refining Co		HUNT CONSLD INC	57,000
Lake Charles, Louisiana	128,000	Hunt Refining Co	
PETROBRAS AMERICA INC		Tuscaloosa, Alabama	46,000
Pasadena Refining Systems Inc		Hunt Southland Refining Co	
Pasadena, Texas	112,229	Sandersville, Mississippi	11,000
SUNCOR ENERGY INC	103,000	ERGON INC	48,800
Suncor Energy (USA) Inc		Ergon Refining Inc	
Commerce City West, Colorado	67,000	Vicksburg, Mississippi	26,500
Commerce City East, Colorado	36,000	Ergon West Virginia Inc	
Total	17,900,070	Newell, West Virginia	22,300
		MAGELLAN MIDSTREAM PARTNERS LP	
Companies with Capacity 30,001 to 100,000 bbl/cd		Magellan Terminal Holdings LP	
SINCLAIR OIL CORP	99,500	Corpus Christi, Texas	42,500
Sinclair Wyoming Refining Co		TRAILSTONE LP	
Sinclair, Wyoming	75,000	US Oil & Refining Co	
Little America Refining Co		Tacoma, Washington	40,700
Evansville, Wyoming	24,500		
KINDER MORGAN ENERGY PTNRS LP			
Kinder Morgan Crude & Condensate			
Galena Park, Texas	84,000		
PLACID OIL CO			

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day
TARGA RESOURCES CORP		Bradford, Pennsylvania	11,000
Targa Channelview LLC		Total.....	152,565
Channelview, Texas	35,000	Companies with Capacity 10,000 bbl/cd or Less	
FJ MANAGEMENT INC		GREKA ENERGY	
Big West Oil Co		Santa Maria Refining Company	
North Salt Lake, Utah	30,500	Santa Maria, California	9,500
Total.....	712,700	WORLD OIL CO	
Companies with Capacity 10,001 to 30,000 bbl/cd		Lunday Thagard Co	
COUNTRYMARK COOP INC		South Gate, California	8,500
Countrymark Cooperative Inc		MARTIN RESOURCE MGMT CORP	
Mount Vernon, Indiana	28,800	Cross Oil Refining & Marketing Inc	
KERN OIL & REFINING CO		Smackover, Arkansas	7,500
Kern Oil & Refining Co		CONTINENTAL REFINING CO LLC	
Bakersfield, California	26,000	Continental Refining Company LLC	
PETROMAX REFINING CO LLC		Somerset, Kentucky	5,500
Petromax Refining Co LLC		GOODWAY REFINING LLC	
Houston, Texas	25,000	Goodway Refining LLC	
SILVER EAGLE REFINING INC	18,000	Atmore, Alabama	4,100
Silver Eagle Refining		FORELAND REFINING CORP	
Woods Cross, Utah	15,000	Foreland Refining Corp	
Evanston, Wyoming	3,000	Ely, Nevada	2,000
CONOCOPHILLIPS CO		Total.....	37,100
ConocoPhillips Alaska Inc		U.S. Total.....	18,802,435
Prudhoe Bay, Alaska	15,000		
SAN JOAQUIN REFINING CO INC			
San Joaquin Refining Co Inc			
Bakersfield, California	15,000		
BLUE DOLPHIN ENERGY CO			
Lazarus Energy LLC			
Nixon, Texas	13,765		
AMERICAN REFINING GROUP INC			
American Refining Group Inc			

Table 5. Refiners' Total Operable Atmospheric Crude Oil Distillation Capacity as of January 1, 2019

CORPORATION / Refiner / Location	Barrels per Calendar Day	CORPORATION / Refiner / Location	Barrels per Calendar Day

a Formerly owned by Andeavor

b Tesoro Refining & Marketing Co, Wilmington and Carson began reporting as one entity with the 2019 Refinery Capacity Report.

c Formerly owned by Andeavor

d Formerly owned by Andeavor

e Formerly owned by Andeavor

f Formerly owned by Andeavor

g Formerly owned by Andeavor

h Par Hawaii Refining purchased the atmospheric unit at Island Energy Services Downstream and began operating as one entity in December 2018.

i Suncor, Commerce City East and Commerce City West resumed reporting as separate entities with the 2019 Refinery Company Report. They reported as one entity in 2018.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Table 6. Operable Crude Oil and Downstream Charge Capacity of Petroleum Refineries, January 1, 1990 to January 1, 2019 (Thousand Barrels per Stream Day, Except Where Noted)

Year/PAD District	Atmospheric Crude Oil Distillation	Downstream Charge Capacity							
		Vacuum Distillation	Thermal Cracking	Catalytic Cracking		Catalytic Hydro- Cracking	Catalytic Reforming	Hydrotreating/ Desulfurization	Fuels Solvent Deasphalting
				Fresh	Recycled				
JAN 1, 1990	16,507	7,245	2,108	5,441	314	1,282	3,896	9,537	279
JAN 1, 1991	16,557	7,276	2,158	5,559	304	1,308	3,926	9,676	271
JAN 1, 1992	16,633	7,127	2,100	5,608	280	1,363	3,907	9,644	276
JAN 1, 1993	15,935	6,892	2,082	5,540	244	1,397	3,728	9,677	269
JAN 1, 1994	15,904	6,892	2,107	5,586	191	1,376	3,875	10,616	261
JAN 1, 1995	16,326	7,248	2,123	5,583	169	1,386	3,867	10,916	251
JAN 1, 1997	16,287	7,349	2,050	5,595	155	1,388	3,727	11,041	275
JAN 1, 1999	17,155	7,538	2,046	5,920	153	1,552	3,779	11,461	319
JAN 1, 2000	17,393	7,617	2,163	5,949	99	1,576	3,770	11,440	351
JAN 1, 2001	17,511	7,798	2,277	5,983	86	1,615	3,797	11,673	350
JAN 1, 2002	17,676	7,779	2,329	5,989	80	1,633	3,753	11,845	362
JAN 1, 2003	17,675	7,788	2,377	6,052	79	1,644	3,777	11,987	350
JAN 1, 2004	17,815	7,964	2,435	6,098	87	1,602	3,812	13,501	366
JAN 1, 2005	18,031	8,120	2,491	6,151	87	1,624	3,836	14,087	384
JAN 1, 2006	18,308	8,398	2,540	6,188	87	1,637	3,859	14,808	386
JAN 1, 2007	18,425	8,251	2,564	6,219	82	1,791	3,908	15,447	379
JAN 1, 2008	18,558	8,421	2,606	6,266	79	1,770	3,892	15,807	378
JAN 1, 2009	18,681	8,542	2,639	6,292	79	1,743	3,829	16,131	381
JAN 1, 2010	18,581	8,543	2,632	6,140	92	1,820	3,700	16,023	383
JAN 1, 2011	18,953	8,650	2,672	6,220	96	1,856	3,721	16,683	383
JAN 1, 2012	18,560	8,680	2,763	6,033	85	1,880	3,642	16,565	375
JAN 1, 2013	18,972	8,938	2,877	6,089	84	2,081	3,758	16,860	368
JAN 1, 2014	19,064	8,987	2,959	6,032	76	2,208	3,759	17,095	370
JAN 1, 2015	19,134	8,979	2,975	6,012	76	2,305	3,741	17,324	370
JAN 1, 2016	19,508	9,073	2,983	6,052	76	2,318	3,743	17,483	371
JAN 1, 2017	19,800	9,126	2,994	6,007	76	2,421	3,750	17,621	393
JAN 1, 2018	19,794	9,076	3,023	6,031	77	2,462	3,801	17,697	393
JAN 1, 2019	19,961	9,121	3,046	5,986	62	2,490	3,810	17,795	395
PADD I	1,291	554	82	498	5	45	269	1,058	22
PADD II	4,377	1,824	596	1,354	16	378	905	3,960	22
PADD III	10,535	4,867	1,664	3,083	22	1,423	1,928	9,551	264
PADD IV	740	276	91	219	2	60	132	600	6
PADD V	3,017	1,599	612	831	18	584	577	2,626	80
JAN 1, 2020 ^a	19,986	9,133	3,065	5,986	62	2,490	3,810	17,890	395
PADD I	1,291	554	82	498	5	45	269	1,058	22
PADD II	4,380	1,828	600	1,355	16	378	905	4,053	22
PADD III	10,557	4,875	1,680	3,083	22	1,423	1,928	9,553	264
PADD IV	740	276	91	219	2	60	132	600	6
PADD V	3,018	1,599	612	831	18	584	577	2,626	80
2019-2020 ^a	25	12	19	0	0	0	0	95	0
PADD I	0	0	0	0	0	0	0	0	0
PADD II	3	4	4	1	0	0	0	93	0
PADD III	22	8	16	0	0	0	0	2	0
PADD IV	0	0	0	0	0	0	0	0	0
PADD V	1	0	0	0	0	0	0	0	0

^a Projected data from refiners.

Notes:

NA = Not available.

Totals may not equal sum of components due to independent rounding.

The EIA-820 refinery capacity survey was not conducted for January 1, 1996 or January 1, 1998.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Table 7. Operable Production Capacity of Petroleum Refineries, January 1, 1990 to January 1, 2019 (Thousand Barrels per Stream Day, Except Where Noted)

Year/PAD District	Production Capacity							
	Alkylates	Aromatics	Asphalt and Road Oil	Isomers	Lubricants	Marketable Petroleum Coke	Hydrogen ^a (MMcfd)	Sulfur (short tons/day)
JAN 1, 1990	1,030	290	844	456	232	341	2,607	24,202
JAN 1, 1991	1,077	292	866	490	229	367	2,527	23,875
JAN 1, 1992	1,095	290	812	494	217	356	2,644	23,811
JAN 1, 1993	1,083	286	814	499	217	393	2,674	25,940
JAN 1, 1994	1,086	278	793	499	213	410	2,940	24,554
JAN 1, 1995	1,105	285	846	502	217	427	3,139	24,885
JAN 1, 1997	1,120	288	872	577	244	458	3,052	26,466
JAN 1, 1999	1,172	302	846	667	233	441	3,104	26,423
JAN 1, 2000	1,185	315	886	643	218	464	3,143	26,645
JAN 1, 2001	1,191	318	900	654	214	538	3,230	27,446
JAN 1, 2002	1,181	313	917	658	218	548	3,244	29,107
JAN 1, 2003	1,191	316	873	679	216	646	3,265	29,766
JAN 1, 2004	1,205	322	887	688	210	672	3,258	30,606
JAN 1, 2005	1,229	318	881	703	217	696	2,965	31,004
JAN 1, 2006	1,238	319	893	708	220	709	2,823	32,421
JAN 1, 2007	1,227	306	877	739	234	722	3,100	33,021
JAN 1, 2008	1,261	285	858	727	249	735	3,109	33,487
JAN 1, 2009	1,261	299	847	736	230	762	2,914	33,500
JAN 1, 2010	1,249	271	844	715	240	760	2,985	34,058
JAN 1, 2011	1,262	297	828	703	243	778	3,082	35,483
JAN 1, 2012	1,247	297	796	688	242	823	3,215	36,663
JAN 1, 2013	1,269	318	741	737	241	867	3,047	39,478
JAN 1, 2014	1,266	297	744	739	240	883	3,094	41,375
JAN 1, 2015	1,267	316	710	757	265	887	3,102	41,266
JAN 1, 2016	1,286	323	733	755	273	889	2,997	41,343
JAN 1, 2017	1,300	324	726	749	261	898	3,009	41,766
JAN 1, 2018	1,316	324	659	743	262	896	3,037	41,419
JAN 1, 2019	1,337	332	645	740	263	903	3,073	41,639
PADD I	85	10	44	22	20	21	84	1,110
PADD II	287	113	291	162	10	182	625	8,525
PADD III	664	208	176	320	193	501	742	25,106
PADD IV	49	0	82	16	0	27	233	1,027
PADD V	252	2	53	220	40	172	1,389	5,871
JAN 1, 2020^b	1,358	332	645	740	263	909	3,083	42,106
PADD I	85	10	44	22	20	21	84	1,180
PADD II	287	113	291	162	10	183	635	8,627
PADD III	685	208	176	320	193	505	742	25,211
PADD IV	49	0	82	16	0	27	233	1,027
PADD V	252	2	53	220	40	172	1,389	6,061
2019-2020^b	21	0	0	0	0	6	10	467
PADD I	0	0	0	0	0	0	0	70
PADD II	0	0	0	0	0	1	10	102
PADD III	21	0	0	0	0	4	0	105
PADD IV	0	0	0	0	0	0	0	0
PADD V	0	0	0	0	0	0	0	190

^a Includes hydrogen production capacity of hydrogen plants on refinery grounds.

^b Projected data from refiners.

Notes:

NA = Not available. MMcfd = Million cubic feet per day.

Totals may not equal sum of components due to independent rounding.

The EIA-820 refinery capacity survey was not conducted for January 1, 1996 or January 1, 1998.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

**Table 8. Capacity and Fresh Feed Input to Selected Downstream Units at U.S. Refineries, 2017 - 2019
(Barrels per Calendar Day)**

Year/PAD	Cokers		Catalytic Crackers		Hydrocrackers		Reformers	
	Capacity	Inputs	Capacity	Inputs	Capacity	Inputs	Capacity	Inputs
2017	2,689,470	2,378,868	5,530,482	4,955,416	2,220,779	1,862,351	3,419,464	2,797,318
PADD I	74,900	47,271	464,000	407,732	41,500	34,699	213,600	191,638
PADD II	528,230	482,948	1,235,100	1,107,778	320,900	315,551	821,765	684,088
PADD III	1,485,330	1,337,682	2,805,942	2,546,258	1,267,439	1,013,279	1,736,879	1,415,208
PADD IV	84,900	67,416	202,640	170,005	57,950	22,997	119,990	91,962
PADD V	516,110	443,551	822,800	723,644	532,990	475,825	527,230	414,422
2018	2,719,950	2,420,668	5,552,991	4,969,438	2,245,934	1,905,285	3,463,906	2,804,808
PADD I	74,900	56,647	442,800	367,674	41,500	31,975	237,600	186,164
PADD II	541,430	482,540	1,238,749	1,103,868	340,520	302,932	824,435	682,359
PADD III	1,499,920	1,350,079	2,850,087	2,606,115	1,277,749	1,063,318	1,769,985	1,439,063
PADD IV	84,300	64,397	202,555	166,274	57,325	22,400	119,880	91,822
PADD V	519,400	467,005	818,800	725,507	528,840	484,660	512,006	405,400
2019	2,762,557	NA	5,577,090	NA	2,284,833	NA	3,487,295	NA
PADD I	74,900	NA	466,100	NA	41,500	NA	243,500	NA
PADD II	549,505	NA	1,249,347	NA	342,020	NA	828,328	NA
PADD III	1,506,262	NA	2,884,088	NA	1,318,588	NA	1,769,030	NA
PADD IV	85,300	NA	204,255	NA	57,325	NA	119,140	NA
PADD V	546,590	NA	773,300	NA	525,400	NA	527,297	NA

NA = Not Available.

Note: Capacities are as of January 1 of the indicated year.

Sources: Capacities are from the Energy Information Administration (EIA) Form EIA-820, "Annual Refinery Report." Inputs are from the form EIA-810, "Monthly Refinery Report." Year 2017 data is final, 2018 data is preliminary.

Table 9. Refinery Receipts of Crude Oil by Method of Transportation by PAD District, 2018^a
(Thousand Barrels)

Method	PAD Districts					United States
	I	II	III	IV	V	
Pipeline	24,881	1,369,475	2,397,520	184,284	265,762	4,241,922
Domestic	3,871	713,604	2,044,249	86,918	189,801	3,038,443
Foreign	21,010	655,871	353,271	97,366	75,961	1,203,479
Tanker	303,328	0	805,760	0	562,698	1,671,786
Domestic	28,518	0	26,271	0	177,512	232,301
Foreign	274,810	0	779,489	0	385,186	1,439,485
Barge	4,198	9,372	161,417	0	29,389	204,376
Domestic	3,933	9,372	123,686	0	742	137,733
Foreign	265	0	37,731	0	28,647	66,643
Tank Cars (Rail)	46,838	560	8,611	14	59,013	115,036
Domestic	26,721	558	1,490	14	53,100	81,883
Foreign	20,117	2	7,121	0	5,913	33,153
Trucks	1,954	6,953	52,359	42,014	7,816	111,096
Domestic	1,954	6,953	52,359	42,014	7,816	111,096
Foreign	0	0	0	0	0	0
Total	381,199	1,386,360	3,425,667	226,312	924,678	6,344,216
Domestic	64,997	730,487	2,248,055	128,946	428,971	3,601,456
Foreign	316,202	655,873	1,177,612	97,366	495,707	2,742,760

^a Receipts are reported by the last method of transportation used if the distance traveled is greater than 100 miles. If several methods are used and none are greater than 100 miles, the method which represents the greatest distance traveled is reported. For example, if crude oil traveled by rail for 1,500 miles and then by barge for 120 miles, then the reported mode of transportation would be barge rather than rail.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report."

Table 10a. Fuel Consumed at Refineries by PAD District, 2018
(Thousand Barrels, Except Where Noted)

Commodity	PAD Districts					United States
	I	II	III	IV	V	
Crude Oil	0	0	0	0	0	0
Liquefied Petroleum Gases	0	820	634	153	739	2,346
Distillate Fuel Oil	0	35	169	10	225	439
Residual Fuel Oil	0	19	8	0	230	257
Still Gas	16,958	53,644	114,402	8,040	46,297	239,341
Marketable Petroleum Coke	0	1	0	568	0	569
Catalyst Petroleum Coke	7,712	17,631	43,233	2,796	13,198	84,570
Natural Gas (million cubic feet)	52,103	159,986	482,945	29,527	184,214	908,775
Coal (thousand short tons)	0	0	0	0	0	0
Purchased Electricity (million kWh)	2,568	13,086	25,717	2,337	4,378	48,086
Purchased Steam (million pounds)	5,714	14,081	82,194	1,246	12,969	116,204
Other Products ^a	131	18	296	1	478	924

Note: Includes volumes used as fuel at refineries and all nonprocessing losses of crude oil and petroleum products (e.g., spills, fire losses, contamination, etc.)

^a Includes pentanes plus, other hydrocarbons, oxygenates, hydrogen, unfinished oils, gasoline, special naphthas, jet fuel, lubricants, asphalt and road oil, and miscellaneous products.

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report," and Form EIA-810, "Monthly Refinery Report."

Table 10b. Natural Gas Used as Feedstock for Hydrogen Production by PAD District, 2018
(Million Cubic Feet)

Commodity	PAD Districts					United States
	I	II	III	IV	V	
Natural Gas Used As Feedstock For Hydrogen Production	5,331	51,153	59,469	16,832	62,059	194,844

Source: Energy Information Administration (EIA), Form EIA-820, "Annual Refinery Report".

Table 11. New, Shutdown and Reactivated Refineries During 2018

PAD District / Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd) ^a	Total Downstream Charge Capacity (bbl/sd) ^b	Date Operable	Date of Last Operation	Date Shutdown
NEW						
PAD District III		35,000				
Targa Channelview LLC	Channelview, TX	35,000		01/19		
OTHER						
PAD District IV		103,000				
^c Suncor Energy (USA) Inc	Commerce City West, CO	67,000				
^c Suncor Energy (USA) Inc	Commerce City East, CO	36,000				
PAD District V		510,500				
^d Tesoro Refining & Marketing Co	Carson, CA	363,000				
^e Par Hawaii Refining LLC	Kapolei, HI	147,500				

^a bbl/cd=Barrels per calendar day.

^b bbl/sd=Barrels per stream day.

^c Suncor, Commerce City East and Commerce City West resumed reporting as separate entities with the 2019 Refinery Capacity Report. They reported as one entity in 2018.

^d Tesoro Refining and Marketing, Wilmington and Carson began reporting as one entity with the 2019 Refinery Capacity Report.

^e Par Hawaii Refining LLC purchased the atmospheric unit at Island Energy Services Downstream and began operating as one entity in December 2018.

Table 12. Refinery Sales During 2018

Former Corporation/Refiner	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd)	New Corporation/Refiner	Date of Sale
Andeavor/Dakota Prairie Refining LLC		Marathon Petroleum/Dakota Prairie Refining LLC	10/18
Dickinson, ND	19,000		
Andeavor/St. Paul Park Refining Co LLC		Marathon Petroleum/St. Paul Park Refining Co LLC	10/18
St. Paul, MN	98,515		
Andeavor/Tesoro Alaska Petroleum Co		Marathon Petroleum/Tesoro Alaska Petroleum Co	10/18
Kenai, AK	68,000		
Andeavor/Tesoro Refining and Marketing Co		Marathon Petroleum/Tesoro Refining and Marketing Co	10/18
Anacortes, WA	119,000		
Carson, CA and Wilmington, CA ¹	363,000		
Mandan, ND	71,000		
Martinez, CA	161,500		
Salt Lake City, UT	61,000		
Andeavor/Western Refining Company LP		Marathon Petroleum/Western Refining Company LP	10/18
El Paso, TX	133,700		
Andeavor/Western Refining Southwest Inc		Marathon Petroleum/Western Refining Southwest Inc	10/18
Gallup, NM	26,000		
Island Energy Services LLC/Island Energy Services Downstream		Par Pacific Holdings/Par Hawaii Refining LLC	12/18
Kapolei, HI ²	54,000		

¹ Tesoro Refining and Marketing, Wilmington and Carson began reporting as one entity with the 2019 Refinery Capacity Report.

² Par Hawaii Refining LLC purchased Island Energy Services Downstream and began operating the Kapolei refinery as one entity in December 2018. The combined capacity is 147,500 b/d.

bbl/cd= Barrels per calendar day

Sources: Energy Information Administration (EIA) Form EIA-810, "Monthly Refinery Report" and Form EIA-820, "Annual Refinery Report."

Table 13. Refineries Permanently Shutdown By PAD District Between January 1, 1990 and January 1, 2019

PAD District / Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd)	Total Downstream Charge Capacity (bbl/sd)	Date of Last Operation	Date Shutdown
PAD District I		644,450	975,900		
GNC Energy Corp	Greensboro, NC	3,000	0	a	
Primary Energy Corp	Richmond, VA	6,100	0	a	
Saint Mary's Refining Co	Saint Mary's, WV	4,000	4,480	02/93	03/93
Cibro Refining	Albany, NY	41,850	27,000	07/93	09/93
Calumet Lubricants Co LP	Rouseville, PA	12,800	26,820	03/00	06/00
Young Refining Corp.	Douglasville, GA	5,400	0	07/04	07/04
Sunoco Inc	Westville, NJ	145,000	263,000	11/09	02/10
Western Refining Yorktown Inc	Yorktown, VA	66,300	182,600	09/11	12/11
Sunoco Inc	Marcus Hook, PA	178,000	278,000	12/11	12/11
Chevron USA Inc	Perth Amboy, NJ	80,000	47,000	03/08	07/12
Hess Corporation	Port Reading, NJ	0	115,000	02/13	03/13
Axeon Specialty Products LLC	Savannah, GA	28,000	0	09/12	12/14
Axeon Specialty Products LLC	Paulsboro, NJ	74,000	32,000	04/17	06/17
PAD District II		472,315	657,690		
Coastal Refining & Mktg	El Dorado, KS	0	20,000	b	
Intercoastal Energy Svcs Corp	Troy, IN	1,250	2,250	11/90	03/91
Farmland Industries	Philipsburg, KS	26,400	22,800	12/91	07/92
Coastal Refining & Mktg	Wichita, KS	28,800	41,300	05/93	06/93
Coastal Refining & Mktg	Augusta, KS	0	21,000	06/93	06/93
Crystal Refining	Carson City, MI	3,000	0	10/92	09/93
Marathon	Indianapolis, IN	50,000	68,000	09/93	10/93
Indian Refining	Lawrenceville, IL	80,750	103,000	09/95	10/95
Cyril Petrochemical Corp	Cyril, OK	7,500	0	09/95	12/95
Laketon Refining	Laketon, IN	11,100	0	06/95	01/96
Total Petroleum, Inc.	Arkansas City, KS	56,000	74,840	08/96	09/96
TPI Petro Inc.	Alma, MI	51,000	63,300	11/99	12/99
Premcor Refining Group	Blue Island, IL	80,515	124,500	01/01	04/01
Premcor Refining Group	Hartford, IL	64,000	116,700	09/02	10/02
Ventura Refining & Transmission LLC	Thomas, OK	12,000	0	10/10	11/14

Table 13. Refineries Permanently Shutdown By PAD District Between January 1, 1990 and January 1, 2019

PAD District / Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd)	Total Downstream Charge Capacity (bbl/sd)	Date of Last Operation	Date Shutdown
PAD District III		344,480	351,900		
Imron Refining, Inc.	San Leon, TX	7,000	0	c	08/90
Eagle Refining	Jackson, TX	1,800	1,800	01/90	10/90
Vulcan Refining	Cordova, AL	9,500	5,000	09/90	12/90
Sabine Resources	Stonewall, LA	12,000	0	c	02/92
Rattlesnake Refining	Wickett, TX	8,000	10,400	02/92	03/92
Longview Refining Assoc	Longview, TX	13,300	13,800	08/92	09/92
Thriftway Co	Bloomfield, NM	4,000	3,250	01/92	10/92
El Paso Refining	El Paso, TX	50,000	76,000	10/92	12/92
Dubach Gas	Dubach, LA	8,500	3,000	12/93	12/93
Amerada Hess	Purvis, MS	30,000	50,500	01/94	02/94
Barrett Refg Corp	Vicksburg, MS	8,000	0	06/95	01/96
Arcadia Refining & Mktg	Lisbon, LA	7,350	6,700	01/96	02/96
Canal Refg Co.	Chuch Point, LA	9,500	2,100	07/95	09/97
Gold Line Refining LTD	Jennings, LA	12,000	0	07/97	01/98
Petrolite Corp	Kilgore, TX	600	750	12/97	02/98
Pride Refining Inc.	Abilene, TX	42,750	40,500	05/98	04/98
Shell Oil Co	Odessa, TX	28,300	33,500	10/98	11/98
Berry Petroleum Co.	Stephens, AR	6,700	3,700	07/99	02/00
Dow Haltermann Products	Channelview, TX	880	0	09/04	12/05
Hunt Southland Refining Co	Lumberton, MS	5,800	0	03/05	12/06
Gulf Atlantic Operations LLC	Mobile, AL	16,700	15,400	03/06	09/07
Western Refining Southwest Inc	Bloomfield, NM	16,800	19,500	12/09	11/12
Trigeant LTD	Corpus Christi, TX	0	29,000	12/13	12/14
Pelican Refining Company LLC	Lake Charles, LA	0	12,000	12/14	01/15
Shell Oil Products US	Saint Rose, LA	45,000	25,000	01/18	01/18
PAD District IV		61,800	83,700		
Amoco Oil Co.	Casper, WY	40,000	44,900	12/91	12/91
Landmark Refining	Fruita, CO	10,000	25,900	01/92	11/93
Pennzoil Producing Co.	Roosevelt, UT	8,000	12,900	09/94	10/94
Antelope Refining LLC	Douglas, WY	3,800	0	02/15	12/16

Table 13. Refineries Permanently Shutdown By PAD District Between January 1, 1990 and January 1, 2019

PAD District / Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd)	Total Downstream Charge Capacity (bbl/sd)	Date of Last Operation	Date Shutdown
PAD District V		494,860	505,350		
Gibson Oil & Refining	Bakersfield, CA	9,600	0	07/87	12/90
Chevron USA Inc	Kenai, AK	22,000	0	06/91	07/91
Anchor Refining Co.	McKittrick, CA	10,000	6,000	06/91	08/91
Golden West	Santa Fe Springs, CA	47,000	94,300	02/92	03/92
Eco Asphalt Inc.	Long Beach, CA	10,550	7,000	c	10/92
Fletcher Oil & Refining	Carson, CA	29,675	48,100	09/92	10/92
Sunbelt Refining	Coolidge, AZ	10,000	7,000	08/93	09/93
Chemoil Refining Corp	Long Beach, CA	18,000	0	02/94	04/94
Powerine Oil Co.	Santa Fe Springs, CA	46,500	100,300	06/95	09/95
Sunland Refining Corp.	Bakersfield, CA	12,000	2,650	03/95	12/95
Intermountain Refining Co.	Fredonia, AZ	3,800	2,000	01/94	05/96
Pacific Refining Co.	Hercules, CA	50,000	62,400	07/95	09/97
Sound Refining Inc	Tacoma, WA	11,900	6,000	10/98	12/98
Chevron USA Inc.	Richmond Beach, WA	0	6,200	05/00	06/00
Foreland Refining Corp.	Tonopah, NV	0	3,000	02/01	01/02
Tricor Refining LLC	Bakersfield, CA	0	14,400	07/01	01/02
Paramount Petroleum Corporation	Portland, OR	0	10,000	11/06	12/08
Tenby Inc	Oxnard, CA	2,800	0	12/11	12/11
Flint Hills Resources LP	North Pole, AK	126,535	5,500	a	06/14
Alon Bakersfield Operating Inc	Bakersfield, CA	0	52,000	12/08	09/17
Paramount Petroleum Corporation	Paramount, CA	84,500	78,500	10/12	09/17
U.S. Total		2,017,905	2,574,540		

Table 13. Refineries Permanently Shutdown By PAD District Between January 1, 1990 and January 1, 2019

PAD District / Refinery	Location	Total Atmospheric Crude Oil Distillation Capacity (bbl/cd)	Total Downstream Charge Capacity (bbl/sd)	Date of Last Operation	Date Shutdown
PAD District VI		704,300	1,413,200		
Arochem International	Ponce, PR	75,600	37,000	12/91	12/92
Peerless Oil & Chemical	Ponce, PR	8,800	45,200	09/94	12/94
Chevron Phillips Chem	Guayama, PR	0	93,200	03/01	01/02
Caribbean Petroleum Corp	San Juan, PR	42,000	60,500	12/00	01/05
Shell Chem Yabucoa Inc	Yabucoa, PR	77,900	91,300	10/08	12/09
Hovensa LLC	Kingshill, VI	500,000	1,086,000	02/12	02/12

a. Facility in operation as other than a refinery since it no longer processes crude oil or unfinished oils.

b. Facility maintained asphalt production capacity until September, 2004.

c. Never Operated

bbl/cd=Barrels per calendar day

bbl/sd=Barrels per stream day.

Sources: Energy Information Administration (EIA) Form EIA-810, "Monthly Refinery Report" and Form EIA-820, "Annual Refinery Report."

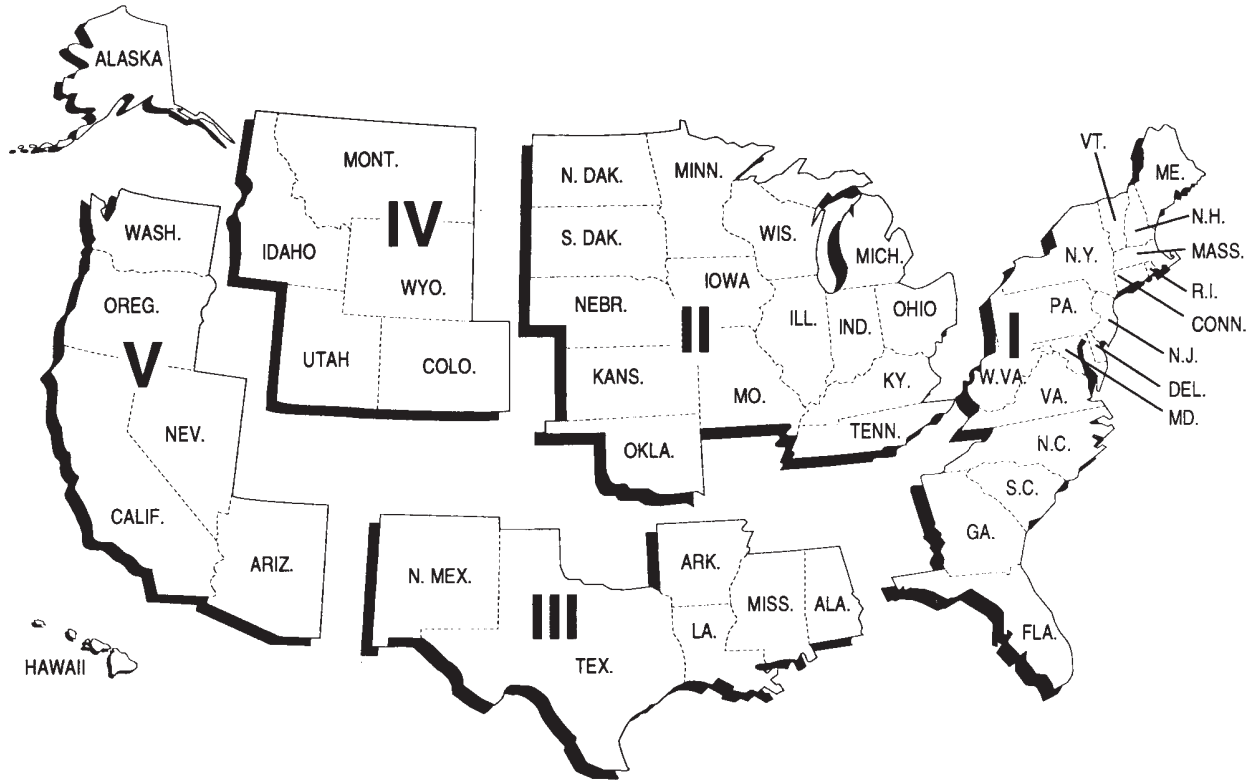


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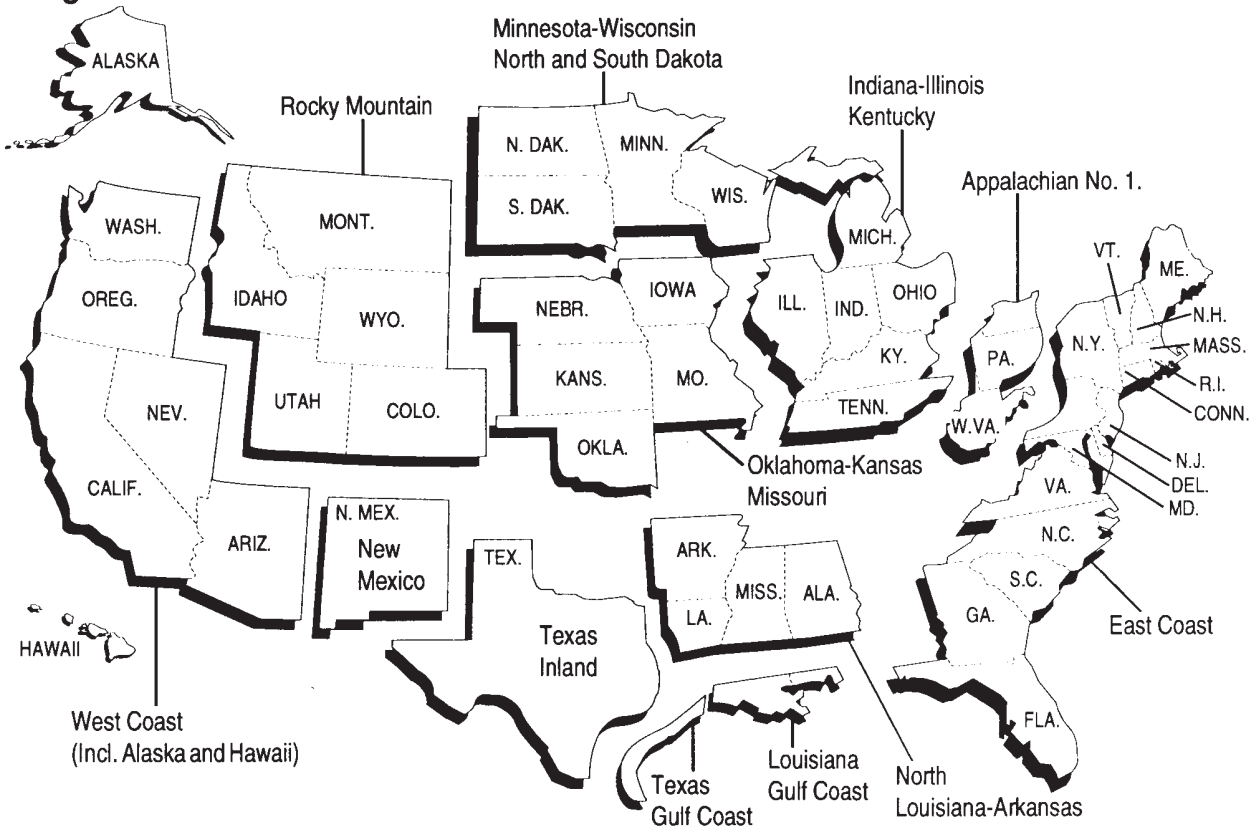
Appendix A: District Descriptions and Maps



Petroleum Administration for Defense (PAD) Districts



Refining Districts



Appendix A

District Descriptions and Maps

The following are the Refining Districts which make up the Petroleum Administration for Defense (PAD) Districts.

PAD District I

East Coast: District of Columbia and the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, and the following counties of the State of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof. Also the following counties in the State of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.

Appalachian No. 1: The State of West Virginia and those parts of the States of Pennsylvania and New York not included in the East Coast District.

Sub-PAD District I

New England: The States of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

Central Atlantic: The District of Columbia and the States of Delaware, Maryland, New Jersey, New York, and Pennsylvania.

Lower Atlantic: The States of Florida, Georgia, North Carolina, South Carolina, Virginia and West Virginia.

PAD District II

Indiana-Illinois-Kentucky: The States of Indiana, Illinois, Kentucky, Tennessee, Michigan, and Ohio.

Minnesota-Wisconsin-North and South Dakota: The States of Minnesota, Wisconsin, North Dakota, and South Dakota.

Oklahoma-Kansas-Missouri: The States of Oklahoma, Kansas, Missouri, Nebraska, and Iowa.

PAD District III

Texas Inland: The State of Texas except the Texas Gulf Coast District.

Texas Gulf Coast: The following counties of the State of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.

Louisiana Gulf Coast: The following Parishes of the State of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Saint Helena, Tangipahoa, Washington, and all Parishes south thereof. Also the following counties of the State of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson. Also the following counties of the State of Alabama: Mobile and Baldwin.

North Louisiana-Arkansas: The State of Arkansas and those parts of the States of Louisiana, Mississippi, and Alabama not included in the Louisiana Gulf Coast District.

New Mexico: The State of New Mexico.

PAD District IV

Rocky Mountain: The States of Montana, Idaho, Wyoming, Utah, and Colorado.

PAD District V

West Coast: The States of Washington, Oregon, California, Nevada, Arizona, Alaska, and Hawaii.

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AFPM United States Refining and Storage Capacity Report

Appendix B: Explanatory Notes



Appendix B

Explanatory Notes

Description of Survey Form

The Form EIA-820, "Annual Refinery Report," is the primary source of data in the "Refinery Capacity Report" tables. The form collects data on the consumption of purchased steam, electricity, coal, and natural gas; refinery receipts of crude oil by method of transportation; operable capacity for atmospheric crude oil distillation units and downstream units; and production capacity for crude oil and petroleum products.

Frame

The respondent frame consists of all operating and idle petroleum refineries, located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam and other U.S. possessions. As of January 1, 2019 there were 135 refineries. The respondent frame is maintained by monitoring the monthly Form EIA-810, "Monthly Refinery Report," and industry publications for changes and developments in the petroleum industry such as refinery sales, mergers and new operations.

Collection

The Form EIA-820 is sent to respondents in January. Survey forms can be submitted by electronic mail or facsimile. Completed forms are required to be submitted by the 15th day of February of the current report year. Receipt of the reports is monitored using an automated respondent mailing list. Telephone follow-up calls are made to secure responses from those companies failing to report by February 15th.

Processing and Micro Editing

Upon receipt, all reported data are transformed into a standard format and sent through a log-in and prescreening process to validate respondent control information and resolve any discrepancies. The data are then processed using generalized edit and imputation procedures. Automated editing procedures check current data for consistency with past data and for internal consistency (e.g., totals equal to the sums of the parts). After the edit failures are resolved and imputation performed for nonrespondents, preliminary tables are produced and used to identify anomalies. Anomalies result in further review of respondent data which in turn may result in additional flagged data and imputation.

Imputation and Estimation

Imputation is performed for companies that fail to file prior to the publication deadline. When nonresponse occurs,

values for these companies are imputed from data reported on the most recent year's Form EIA-820 and/or from data reported on Form EIA-810, "Monthly Refinery Report," for that company. For most surveyed items, the value imputed for nonrespondents is the value that the company reported on the Form EIA-820 for the most recent year. For three categories of information however, the imputed value is also based on their data from the Form EIA-810 as follows:

Part 4: Refinery Receipts of Crude Oil by Method of Transportation

The imputation methodology for this section is based on data reported on both the monthly Form EIA-810 and the annual Form EIA-820. Annual refinery receipts of domestic and foreign crude oil for a nonrespondent are imputed by aggregating the values for the refinery on the monthly survey. These values are allocated to the method of transportation by using the percentages reported for the refinery in the previous year.

Part 5: Atmospheric Crude Oil Distillation Capacity

Operable atmospheric crude oil distillation capacity in barrels per calendar day is collected on the monthly Form EIA-810 as of the first day of each month and on the annual Form EIA-820 as of January 1. As part of the editing process for the Form EIA-820, these two values are compared. Companies are contacted and any discrepancies are resolved by the time of publication. Imputed values for operable atmospheric crude oil distillation capacity in barrels per calendar day are taken directly from the January Form EIA-810. A barrel per stream day capacity is then derived by dividing the reported barrels per calendar day capacity by .95.

Parts 6 and 7: Downstream Charge Capacity and Production Capacity

Current year and projected year data for downstream charge capacity and production capacity are taken directly from the previous year's annual report.

Macro Editing

A comparison of the data collected on the EIA-820 with other similar data series and industry trade journals is performed each year.

Dissemination

Prior to 2006, the data collected on Form EIA-820, "Annual Refinery Report," was published in the Petroleum

Supply Annual, Volume 1. Beginning with data for 2006, the Form EIA-820 data are published as a standalone product in the EIA publication "Refinery Capacity Report." This report contains statistics on consumption of purchased steam, electricity, coal, and natural gas; refinery receipts of crude oil by method of transportation; current and projected capacities for atmospheric crude oil distillation, downstream charge and production capacities. The data are also published in the Annual Energy Review. The "Refinery Capacity Report" can be found at: <http://www.eia.gov/petroleum/refinerycapacity/>

Additional Sources of Data

The Form EIA-820, "Annual Refinery Report," is the primary source of data in the "Refinery Capacity Report" tables. In addition, some data collected on the Form EIA-810, "Monthly Refinery Report," are included.

Quality

Response Rates

The response rate for the Form EIA-820 is normally 100 percent.

Non-sampling Errors

There are two types of errors usually associated with data produced from a survey -sampling errors and nonsampling errors. Because estimates from the Form EIA-820 survey are based on a complete census of the frame of petroleum refineries, there is no sampling error in the data presented in this report. The data, however, are subject to nonsampling errors. Nonsampling errors are those which can arise from: (1) the inability to obtain data from all companies in the frame or sample (nonresponse) and the method used to account for nonresponses; (2) definitional difficulties and/or improperly worded questions which lead to different interpretations; (3) mistakes in recording or coding the data obtained from respondents; and (4) other errors of collection, response, coverage, and estimation. Quality control procedures are employed in the collection and editing operations to minimize misrepresentation and misreporting. Nonresponse follow-up procedures are employed to reduce the number of nonrespondents, and procedures employed to impute missing data, introduce a minimal amount of error, given the relatively small volume of imputed data.

Resubmissions

EIA-820 resubmissions are required whenever an error greater than 5 percent of the true value is discovered. In the event of a reporting error, company reports are updated after contact with the company and are followed up by corrected report resubmissions.

Revision Policy

The "Refinery Capacity Report" reflects EIA's final data on refinery capacity and will be revised only if, in EIA's judgment, a revision is expected to substantively affect understanding of the U.S. refinery capacity.

Confidentiality

Information on operable atmospheric crude oil distillation capacity, downstream charge capacity, and production capacity reported on Parts 5, 6, and 7 of Form EIA-820 are not considered confidential and are published in the "Refinery Capacity Report." All other information reported on Form EIA-820 (i.e. Parts 3 and 4 and respondent information) will be protected and not disclosed to the public to the extent that it satisfies the criteria for exemption under the Freedom of Information Act (FOIA), 5 U.S.C. §552, the DOE regulations, 10 C.F.R. §1004.11, implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905.

The Federal Energy Administration Act requires the EIA to provide company-specific data to other Federal agencies when requested for official use. The information reported on this form may also be made available, upon request, to another component of the Department of Energy (DOE); to any Committee of Congress, the General Accountability Office, or other Federal agencies authorized by law to receive such information. A court of competent jurisdiction may obtain this information in response to an order. The information may be used for any nonstatistical purposes such as administrative, regulatory, law enforcement, or adjudicatory purposes.

Company specific data are also provided to other DOE offices for the purpose of examining specific petroleum operations in the context of emergency response planning and actual emergencies.

Disclosure limitation procedures are not applied to the statistical data published from this survey's information. Thus, there may be some statistics that are based on data from fewer than three respondents, or that are dominated by data from one or two large respondents. In these cases, it may be possible for a knowledgeable person to estimate the information reported by a specific respondent.

Refinery Capacity History

Refinery capacity data collection was begun in 1918 by the Bureau of Mines, then in the Department of Commerce, and was operated on a voluntary basis until 1980. In 1980, the mandatory Energy Information Administration (EIA) Form EIA-177, "Capacity of Petroleum Refineries," was implemented. Information on refining capacity was expanded to include not only current year operations, but two-year projections, and refinery input/production data. Working storage capacity data was also added to the form and product categories were added for total coverage. Information on refinery downstream facilities was expanded to include a breakdown of thermal operations and to add vacuum distillation, catalytic hydrorefining and hydrotreating. Production capacity was also added to include information on isomerization, alkylation, aromatics, asphalt/road oil, coking, lubricants and hydrogen.

In 1983, the form was revised to improve the consistency and quality of the data collected by the EIA and redesignated as Form EIA-820, "Annual Refinery Report." Two sections for data previously reported monthly were added: (1) refinery receipts of crude oil by method of transportation, and (2) fuels consumed for all purposes at refineries. Also, the second year projections on refining capacity were eliminated. As a result of a study conducted by the EIA evaluating motor gasoline data collected by the Federal Highway Administration (FHWA) and by the EIA, motor gasoline blending plants were included for the first time in the respondent frame in order to produce more accurate statistics on the production of motor gasoline.

In 1987, the form was revised to reduce respondent burden and to better reflect current refinery operations through updated terminology. Information on projected input/production of refinery processing facilities was deleted. Several categories under catalytic hydrotreating were combined: naphtha and reformer feeds were combined into a single category as well as residual fuel oil and "other." Thermal cracking types, gas oil and "other" were also combined into a single category. Catalytic reforming types, conventional and bi-metallic were replaced with low and high pressure processing units. Two new categories were added: fuels solvent deasphalting was added to downstream charge capacity and sulfur recovery was added to production capacity.

In 1994, the form was revised to enable EIA to calculate utilization rates for certain downstream processing units and to reflect storage capacity of fuels mandated by the Clean Air Act Amendments of 1990. Additions to the form included calendar day downstream charge capacity for fluid and delayed coking, catalytic cracking, and catalytic hydrocracking. Also storage capacity categories for reformulated, oxygenated,

and other finished motor gasoline were added, as well as oxygenate storage capacity and separate categories for high and low sulfur distillate fuel oil.

In 1995, motor gasoline blending plants were dropped from the survey frame, since by this time, the only section of the form that applied to them was working and shell storage capacity. Also in 1995, a decision was made to no longer collect storage capacity from shutdown refineries; therefore, these refineries were also eliminated from the survey frame.

In 1996, the survey was moved to a biennial schedule (every other year) and was renamed "Biennial Refinery Report." The survey was not conducted for January 1, 1996 or January 1, 1998. Respondents were not required to submit data for crude oil and petroleum products consumed at refineries during 1995 and 1997. These data are available from the Form EIA-810, "Monthly Refinery Report." The requirement to submit data for refinery consumption of natural gas, coal, and purchased steam and electricity on the Form EIA-820 remained.

In 2000, the survey was moved to an annual schedule.

In 2004, the survey form was amended to reflect the increasing emphasis on the removal of sulfur from transportation fuels.

In 2009, natural gas used as feedstock for hydrogen plant production was added to the form. Also, isooctane production capacity was added.

In 2010, the survey form was amended to reflect the increasing use of bio-fuels. Storage capacities of biomass-based diesel fuel, other renewable diesel fuel and other renewable fuels were added to the form. Also, barrels per calendar day capacity of the catalytic reformer was added; previously this was only collected on a stream day basis.

In 2011, storage capacity data was removed from the form. Storage capacity is now being collected as of March 31 and September 30 on the Form EIA-810, "Monthly Refinery Report."



AFPM United States Refining and Storage Capacity Report

Glossary



Glossary

Definitions of Petroleum Products and Other Terms (Revised June 2019)

Alcohol. The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group; CH₃ (CH₂)_n-OH (e.g., methanol, ethanol, and tertiary butyl alcohol).

Alkylate. The product of an alkylation reaction. It usually refers to the high-octane product from alkylation units. This alkylate is used in blending high octane gasoline.

Alkylation. A refining process for chemically combining isobutane with olefin hydrocarbons (e.g., propylene, butylenes) through the control of temperature and pressure in the presence of an acid catalyst, usually sulfuric acid or hydrofluoric acid. The product, alkylate, an isoparaffin, has high octane value and is blended with motor and aviation gasoline to improve the antiknock value of the fuel.

API Gravity. A scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it may be calculated in terms of the following formula:

$$\text{Degrees API} = 141.5/\text{sp.gr.}_{60^\circ\text{F}/60^\circ\text{F}} - 131.5$$

The higher the API gravity, the lighter the compound. Light crudes generally exceed 38 degrees API and heavy crudes are commonly labeled as all crudes with an API gravity of 22 degrees or below. Intermediate crudes fall in the range of 22 degrees to 38 degrees API gravity.

Aromatics. Hydrocarbons characterized by unsaturated ring structures of carbon atoms. Commercial petroleum aromatics are benzene, toluene, and xylenes (BTX).

Asphalt. A dark-brown-to-black cement-like material containing bitumens as the predominant constituent obtained by petroleum processing; used primarily for road construction. It includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts. Note: The conversion factor for asphalt is 5.5 barrels per short ton.

ASTM. The acronym for the American Society for Testing and Materials.

Atmospheric Crude Oil Distillation. The refining process of separating crude oil components at atmospheric pressure by heating to temperatures of about 600 degrees Fahrenheit to 750 degrees Fahrenheit (depending on the nature of the crude oil and desired products) and subsequent condensing of the fractions by cooling.

Aviation Gasoline (Finished). A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines. Fuel specifications are provided in ASTM Specification D 910 and Military Specification MIL-G-5572. Note: Data on blending components are not counted in data on finished aviation gasoline.

Aviation Gasoline Blending Components. Naphtha's which will be used for blending or compounding into finished aviation gasoline (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, and xylenes). Excludes oxygenates (alcohols, ethers), butanes, and pentanes. Oxygenates are reported as other hydrocarbons, hydrogen, and oxygenates.

Barrel. A unit of volume equal to 42 U.S. gallons.

Barrels per Calendar Day. The amount of input that a distillation facility can process under usual operating conditions. The amount is expressed in terms of capacity during a 24-hour period and reduces the maximum processing capability of all units at the facility under continuous operation (see Barrels per Stream Day) to account for the following limitations that may delay, interrupt, or slow down production: the capability of downstream facilities to absorb the output of crude oil processing facilities of a given refinery. No reduction is made when a planned distribution of intermediate streams through other than downstream facilities is part of a refinery's normal operation; the types and grades of inputs to be processed; the types and grades of products expected to be manufactured; the environmental constraints associated with refinery operations; the reduction of capacity for scheduled downtime due to such conditions as routine inspection, maintenance, repairs, and turnaround; and the reduction of capacity for unscheduled downtime due to such conditions as mechanical problems, repairs, and slowdowns.

Barrels Per Stream Day. The maximum number of barrels of input that a distillation facility can process within a 24-hour period when running at full capacity under optimal crude and product slate conditions with no allowance for downtime.

Benzene (C₆H₆). An aromatic hydrocarbon present in small proportion in some crude oils and made commercially from petroleum by the catalytic reforming of naphthenes in petroleum naphtha. It is also made from coal in the manufacture of coke. Used as a solvent, in manufacturing detergents, synthetic fibers, and petrochemicals and as a component of high-octane gasoline.

Blending Components. See Motor or Aviation Gasoline Blending Components.

Blending Plant. A facility which has no refining capability but is either capable of producing finished motor gasoline through mechanical blending or blends oxygenates with motor gasoline.

Bonded Petroleum Imports. Petroleum imported and entered into Customs bonded storage. These imports are not included in the import statistics until they are: (1) withdrawn from storage free of duty for use as fuel for vessels and aircraft engaged in international trade; or (2) withdrawn from storage with duty paid for domestic use.

BTX. The acronym for the commercial petroleum aromatics benzene, toluene, and xylenes. See individual categories for definitions.

Bulk Station. A facility used primarily for the storage and/or marketing of petroleum products which has a total bulk storage capacity of less than 50,000 barrels and receives its petroleum products by tank car or truck.

Bulk Terminal. A facility used primarily for the storage and/or marketing of petroleum products which has a total bulk storage capacity of 50,000 barrels or more and/or receives petroleum products by tanker, barge, or pipeline.

Butane (C₄H₁₀). A normally gaseous four-carbon straight-chain or branched-chain hydrocarbon extracted from natural gas or refinery gas streams. It includes normal butane and refinery-grade butane and is designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane.

Refinery-Grade Butane (C₄H₁₀). A refinery-produced stream that is composed predominantly of normal butane and/or isobutane and may also contain propane and/or natural gasoline. These streams may also contain significant levels of olefins and/or fluorides contamination.

Butylenes (C₄H₈). A four-carbon olefinic hydrocarbon recovered from refinery processes.

Captive Refinery Oxygenate Plants. Oxygenate production facilities located within or adjacent to a refinery complex.

Catalytic Cracking. The refining process of breaking down the larger, heavier, and more complex hydrocarbon molecules into simpler and lighter molecules. Catalytic cracking is accomplished by the use of a catalyst and is an effective process for increasing the yield of gasoline from crude oil. Catalytic cracking processes fresh feeds and recycled feeds.

Fresh Feeds. Crude oil or petroleum distillates which are being fed to processing units for the first time.

Recycled Feeds. Streams that have been processed and are fed back to the reactor for additional processing.

Catalytic Hydrocracking. A refining process that uses hydrogen and catalysts with relatively low temperatures and high pressures for converting middle boiling or residual material to high-octane gasoline, reformer charge stock, jet fuel, and/or high-grade fuel oil. The process uses one or more catalysts, depending upon product output, and can handle high sulfur feedstocks without prior desulfurization.

Catalytic Hydrotreating. A refining process for treating petroleum fractions from atmospheric or vacuum distillation units (e.g., naphthas, middle distillates, reformer feeds, residual fuel oil, and heavy gas oil) and other petroleum (e.g., cat cracked naphtha, coker naphtha, gas oil, etc.) in the presence of catalysts and substantial quantities of hydrogen. Hydrotreating includes desulfurization, removal of substances (e.g., nitrogen compounds) that deactivate catalysts, conversion of olefins to paraffins to reduce gum formation in gasoline, and other processes to upgrade the quality of the fractions.

Catalytic Reforming. A refining process using controlled heat and pressure with catalysts to rearrange certain hydrocarbon molecules, thereby converting paraffinic and naphthenic hydrocarbons (e.g., low-octane gasoline boiling range fractions) into petrochemical feedstocks and higher-octane stocks suitable for blending into finished gasoline. Catalytic reforming is reported in two categories. They are:

Low Pressure. A processing unit operating at less than 225 pounds per square inch gauge (PSIG) measured at the outlet separator.

High Pressure. A processing unit operating at either equal to or greater than 225 pounds per square inch gauge (PSIG) measured at the outlet separator.

Charge Capacity. The input (feed) capacity of the refinery processing facilities.

Coal. A readily combustible black or brownish-black rock whose composition, including inherent moisture, consists of more than 50 percent by weight and more than 70 percent by volume of carbonaceous material. It is formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time.

Commercial Kerosene-Type Jet Fuel. See **Kerosene-type Jet Fuel.**

Conventional Gasoline. See **Motor Gasoline (Finished).**

Crude Oil. A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include:

Continued from previous page....

Small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included; Small amounts of nonhydrocarbons produced from oil, such as sulfur and various metals; Drip gases, and liquid hydrocarbons produced from oil sands, gilsonite, and oil shale. Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content.

Crude oil is considered as either domestic or foreign, according to the following:

Domestic. Crude oil produced in the United States or from its "outer continental shelf" as defined in 43 USC 1331.

Foreign. Crude oil produced outside the United States. Imported Athabasca hydrocarbons (derived from Canadian oil sands) are included.

Crude Oil, Refinery Receipts. Receipts of domestic and foreign crude oil at a refinery. Includes all crude oil in transit except crude oil in transit by pipeline. Foreign crude oil is reported as a receipt only after entry through customs. Crude oil of foreign origin held in bonded storage is excluded.

Crude Oil Losses. Represents the volume of crude oil reported by petroleum refineries as being lost in their operations. These losses are due to spills, contamination, fires, etc. as opposed to refinery processing losses.

Crude Oil Production. The volume of crude oil produced from oil reservoirs during given periods of time. The amount of such production for a given period is measured as volumes delivered from lease storage tanks (i.e., the point of custody transfer) to pipelines, trucks, or other media for transport to refineries or terminals with adjustments for (1) net differences between opening and closing lease inventories, and (2) basic sediment and water (BS&W).

Crude Oil Qualities. Refers to two properties of crude oil, the sulfur content and API gravity, which affect processing complexity and product characteristics.

Delayed Coking. A process by which heavier crude oil fractions can be thermally decomposed under conditions of elevated temperatures and low pressure to produce a mixture of lighter oils and petroleum coke. The light oils can be processed further in other refinery units to meet product specifications. The coke can be used either as a fuel or in other applications such as the manufacturing of steel or aluminum.

Desulfurization. The removal of sulfur, from molten metals, petroleum oil, or flue gases. Petroleum desulfurization is a process that removes sulfur and its compounds from various streams during the refining process. Desulfurization processes include catalytic hydrotreating and other chemical/physical processes such as adsorption. Desulfurization processes vary based on the type of stream treated (e.g. naphtha, distillate, heavy gas oil, etc.) and the amount of sulfur removed (e.g. sulfur reduction to 10 ppm). See Catalytic Hydrotreating.

Disposition. The components of petroleum disposition are stock change, crude oil losses, refinery inputs, exports, and products supplied for domestic consumption.

Distillate Fuel Oil. A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

No. 1 Distillate. A light petroleum distillate that can be used as either a diesel fuel or a fuel oil.

No. 1 Diesel Fuel. A light distillate fuel oil that has distillation temperatures of 550 degrees Fahrenheit at the 90-percent point and meets the specifications defined in ASTM Specification D 975. It is used in high-speed diesel engines generally operated under frequent speed and load changes, such as those in city buses and similar vehicles.

No. 1 Fuel Oil. A light distillate fuel oil that has distillation temperatures of 400 degrees Fahrenheit at the 10-percent recovery point and 550 degrees Fahrenheit at the 90-percent point and meets the specifications defined in ASTM Specification D 396. It is used primarily as fuel for portable outdoor stoves and portable outdoor heaters.

No. 2 Distillate. A petroleum distillate that can be used as either a diesel fuel or a fuel oil.

No. 2 Diesel Fuel. A fuel that has distillation temperatures of 500 degrees Fahrenheit at the 10-percent recovery point and 640 degrees Fahrenheit at the 90 percent recovery point and meets the specifications defined in ASTM Specification D 975. It is used in high speed diesel engines that are generally operated under uniform speed and load conditions, such as those in railroad locomotives, trucks, and automobiles.

Low Sulfur No. 2 Diesel Fuel. No. 2 diesel fuel that has a sulfur level no higher than 0.05 percent by weight. It is used primarily in motor vehicle diesel engines for on-highway use.

High Sulfur No. 2 Diesel Fuel. No. 2 diesel fuel that has a sulfur level above 0.05 percent by weight.

No. 2 Fuel Oil (Heating Oil). A distillate fuel oil that has distillation temperatures of 400 degrees Fahrenheit at the 10-percent recovery point and 640 degrees Fahrenheit at the 90-percent recovery point and meets the specifications defined in ASTM Specification D 396. It is used in atomizing type burners for domestic heating or for moderate capacity commercial/industrial burner units.

No. 4 Fuel. A distillate fuel oil made by blending distillate fuel oil and residual fuel oil stocks. It conforms with ASTM Specification D 396 or Federal Specification VV-F-815C and is used extensively in industrial plants and in commercial burner installations that are not equipped with preheating facilities. It also includes No. 4 diesel fuel used for low-and medium-speed diesel engines and conforms to ASTM Specification D 975.

No. 4 Diesel Fuel. See **No. 4 Fuel.**

No. 4 Fuel Oil. See **No. 4 Fuel.**

Electricity (Purchased). Electricity purchased for refinery operations that is not produced within the refinery complex.

Ending Stocks. Primary stocks of crude oil and petroleum products held in storage as of 12 midnight on the last day of the month. Primary stocks include crude oil or petroleum products held in storage at (or in) leases, refineries, natural gas processing plants, pipelines, tank farms, and bulk terminals that can store at least 50,000 barrels of petroleum products or that can receive petroleum products by tanker, barge, or pipeline. Crude oil that is in-transit by water from Alaska, or that is stored on Federal leases or in the Strategic Petroleum Reserve is included. Primary Stocks exclude stocks of foreign origin that are held in bonded warehouse storage.

ETBE (Ethyl tertiary butyl ether) (CH₃)₃COC₂H₅. An oxygenate blend stock formed by the catalytic etherification of isobutylene with ethanol.

Ethane (C₂H₆). A normally gaseous straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of -127.48 degrees Fahrenheit. It is extracted from natural gas and refinery gas streams.

Ether. A generic term applied to a group of organic chemical compounds composed of carbon, hydrogen, and oxygen, characterized by an oxygen atom attached to two carbon atoms (e.g., methyl tertiary butyl ether).

Ethylene (C₂H₄). An olefinic hydrocarbon recovered from refinery processes or petrochemical processes. Ethylene is used as a petrochemical feedstock for numerous chemical applications and the production of consumer goods.

Exports. Shipments of crude oil and petroleum products from the 50 States and the District of Columbia to foreign countries, Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

Field Production. Represents crude oil production on leases, natural gas liquids production at natural gas processing plants, new supply of other hydrocarbons/ oxygenates and motor gasoline blending components, and fuel ethanol blended into finished motor gasoline.

Flexicoking. A thermal cracking process which converts heavy hydrocarbons such as crude oil, oil sands bitumen, and distillation residues into light hydrocarbons. Feedstocks can be any pumpable hydrocarbons including those containing high concentrations of sulfur and metals.

Fluid Coking. A thermal cracking process utilizing the fluidized-solids technique to remove carbon (coke) for continuous conversion of heavy, low-grade oils into lighter products.

Fresh Feed Input. Represents input of material (crude oil, unfinished oils, natural gas liquids, other hydrocarbons and oxygenates or finished products) to processing units at a refinery that is being processed (input) into a particular unit for the first time.

Examples:

(1) Unfinished oils coming out of a crude oil distillation unit which are input into a catalytic cracking unit are considered fresh feed to the catalytic cracking unit.

(2) Unfinished oils coming out of a catalytic cracking unit being looped back into the same catalytic cracking unit to be reprocessed are not considered fresh feed.

Fuel Ethanol (C₂H₅OH). An anhydrous denatured aliphatic alcohol intended for gasoline blending as described in Oxygenates definition.

Fuels Solvent Deasphalting. A refining process for removing asphalt compounds from petroleum fractions, such as reduced crude oil. The recovered stream from this process is used to produce fuel products.

Gas Oil. A liquid petroleum distillate having a viscosity intermediate between that of kerosene and lubricating oil. It derives its name from having originally been used in the manufacture of illuminating gas. It is now used to produce distillate fuel oils and gasoline.

Gasohol. A blend of finished motor gasoline containing alcohol (generally ethanol but sometimes methanol) at a concentration of 10 percent or less by volume. Data on gasohol that has at least 2.7 percent oxygen, by weight, and is intended for sale inside carbon monoxide nonattainment areas are included in data on oxygenated gasoline. See Oxygenates.

Continued from previous page....

Gasoline Blending Components. Naphthas which will be used for blending or compounding into finished aviation or motor gasoline (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, and xylenes). Excludes oxygenates (alcohols, ethers), butane, and natural gasoline.

Gross Input to Atmospheric Crude Oil Distillation Units.

Total input to atmospheric crude oil distillation units. Includes all crude oil, lease condensate, natural gas plant liquids, unfinished oils, liquefied refinery gases, slop oils, and other liquid hydrocarbons produced from oil sands, gilsonite, and oil shale.

Heavy Gas Oil. Petroleum distillates with an approximate boiling range from 651 degrees Fahrenheit to 1000 degrees Fahrenheit.

Hydrogen. The lightest of all gases, occurring chiefly in combination with oxygen in water; exists also in acids, bases, alcohols, petroleum, and other hydrocarbons.

Idle Capacity. The component of operable capacity that is not in operation and not under active repair, but capable of being placed in operation within 30 days; and capacity not in operation but under active repair that can be completed within 90 days.

Imported Crude Oil Burned As Fuel. The amount of foreign crude oil burned as a fuel oil, usually as residual fuel oil, without being processed as such. Imported crude oil burned as fuel includes lease condensate and liquid hydrocarbons produced from oil sands, gilsonite, and oil shale.

Imports. Receipts of crude oil and petroleum products into the 50 States and the District of Columbia from foreign countries, Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

Isobutane (C₄H₁₀). A normally gaseous four-carbon, branched-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 10.9 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams.

Isobutylene (C₄H₈). An olefinic four-carbon hydrocarbon recovered from refinery processes or petrochemical processes.

Isohexane (C₆H₁₄). A saturated six-carbon branched-chain hydrocarbon. It is a colorless liquid that boils at a temperature of 156.2 degrees Fahrenheit.

Isomerization. A refining process which alters the fundamental arrangement of atoms in the molecule without adding or removing anything from the original material. Used to convert normal butane into isobutane (C₄), an alkylation process feedstock, and normal pentane and hexane into isopentane (C₅) and isohexane (C₆), high-octane gasoline components.

Isopentane. See **Natural Gasoline**

Kerosene. A light petroleum distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps. Kerosene has a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point, a final boiling point of 572 degrees Fahrenheit, and a minimum flash point of 100 degrees Fahrenheit. Included are No. 1-K and No. 2-K, the two grades recognized by ASTM Specification D 3699 as well as all other grades of kerosene called range or stove oil, which have properties similar to those of No. 1 fuel oil. See **Kerosene-Type Jet Fuel**.

Kerosene-Type Jet Fuel. A kerosene-based product having a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point and a final maximum boiling point of 572 degrees Fahrenheit and meeting ASTM Specification D 1655 and Military Specifications MIL-T5624P and MIL-T-83133D (Grades JP-5 and JP-8). It is used for commercial and military turbojet and turboprop aircraft engines.

Commercial. Kerosene-type jet fuel intended for use in commercial aircraft.

Military. Kerosene-type jet fuel intended for use in military aircraft.

Lease Condensate. A mixture consisting primarily of pentanes and heavier hydrocarbons which is recovered as a liquid from natural gas in lease separation facilities. This category excludes natural gas liquids, such as butane and propane, which are recovered at downstream natural gas processing plants or facilities. See **Natural Gas Liquids**.

Light Gas Oils. Liquid petroleum distillates heavier than naphtha, with an approximate boiling range from 401 degrees Fahrenheit to 650 degrees Fahrenheit.

Liquefied Petroleum Gases (LPG). A group of hydrocarbon-based gases derived from crude oil refining or natural gas fractionation. They include: ethane, ethylene, propane, propylene, normal butane, butylenes, isobutane, and isobutylene. For convenience of transportation, these gases are liquefied through pressurization.

Liquefied Refinery Gases (LRG). Liquefied petroleum gases fractionated from refinery or still gases. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are ethane/ethylene, propane/propylene, normal butane/butylenes, and isobutane/isobutylene. Excludes still gas.

Lubricants. Substances used to reduce friction between bearing surfaces or as process materials either incorporated into other materials used as processing aids in the manufacture

of other products, or used as carriers of other materials. Petroleum lubricants may be produced either from distillates or residues. Lubricants include all grades of lubricating oils from spindle oil to cylinder oil and those used in greases.

Merchant Oxygenate Plants. Oxygenate production facilities that are not associated with a petroleum refinery. Production from these facilities is sold under contract or on the spot market to refiners or other gasoline blenders.

Methanol (CH₃OH). A light, volatile alcohol intended for gasoline blending as described in Oxygenate definition.

Middle Distillates. A general classification of refined petroleum products that includes distillate fuel oil and kerosene.

Military Kerosene-Type Jet Fuel. See **Kerosene-Type Jet Fuel.**

Miscellaneous Products. Includes all finished products not classified elsewhere (e.g., petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, and specialty oils). Note: Beginning with January 2004 data, naphtha-type jet fuel is included in Miscellaneous Products.

Motor Gasoline (Finished). A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in spark-ignition engines. Motor gasoline, as defined in ASTM Specification D 4814 or Federal Specification VV-G-1690C, is characterized as having a boiling range of 122 to 158 degrees Fahrenheit at the 10 percent recovery point to 365 to 374 degrees Fahrenheit at the 90 percent recovery point. "Motor Gasoline" includes conventional gasoline; all types of oxygenated gasoline, including gasohol; and reformulated gasoline, but excludes aviation gasoline. Note: Volumetric data on blending components, such as oxygenates, are not counted in data on finished motor gasoline until the blending components are blended into the gasoline.

Conventional Gasoline. Finished motor gasoline not included in the oxygenated or reformulated gasoline categories. Note: This category excludes reformulated gasoline blendstock for oxygenate blending (RBOB) as well as other blendstock.

OPRG. "Oxygenated Fuels Program Reformulated Gasoline" is reformulated gasoline which is intended for use in an oxygenated fuels program control area.

Oxygenated Gasoline (Including Gasohol). Oxygenated gasoline includes all finished motor gasoline, other than reformulated gasoline, having oxygen content of 2.0 percent or higher by weight. Gasohol containing a minimum 5.7 percent ethanol by volume is included in oxygenated gasoline. Oxygenated gasoline was reported as a separate product from January 1993 until December 2003 inclusive. Beginning

with monthly data for January 2004, oxygenated gasoline is included in conventional gasoline. Historical data for oxygenated gasoline excluded Federal Oxygenated Program Reformulated Gasoline (OPRG). Historical oxygenated gasoline data also excluded other reformulated gasoline with a seasonal oxygen requirement regardless of season.

Reformulated Gasoline. Finished gasoline formulated for use in motor vehicles, the composition and properties of which meet the requirements of the reformulated gasoline regulations promulgated by the U.S. Environmental Protection Agency under Section 211(k) of the Clean Air Act. It includes gasoline produced to meet or exceed emissions performance and benzene content standards of federal-program reformulated gasoline even though the gasoline may not meet all of the composition requirements (e.g. oxygen content) of federal-program reformulated gasoline. Reformulated gasoline excludes Reformulated Blendstock for Oxygenate Blending (RBOB) and Gasoline Treated as Blendstock (GTAB). Historical reformulated gasoline statistics included Oxygenated Fuels Program Reformulated Gasoline (OPRG).

Reformulated (Blended with Ether). Reformulated gasoline blended with an ether component (e.g. methyl tertiary butyl ether) at a terminal or refinery to raise the oxygen content.

Reformulated (Blended with Alcohol). Reformulated gasoline blended with an alcohol component (e.g. fuel ethanol) at a terminal or refinery to raise the oxygen content.

Reformulated (Non-Oxygenated). Reformulated gasoline without added ether or alcohol components.

Motor Gasoline Blending. Mechanical mixing of motor gasoline blending components, and oxygenates when required, to produce finished motor gasoline. Finished motor gasoline may be further mixed with other motor gasoline blending components or oxygenates, resulting in increased volumes of finished motor gasoline and/or changes in the formulation of finished motor gasoline (e.g., conventional motor gasoline mixed with MTBE to produce oxygenated motor gasoline).

Motor Gasoline Blending Components. Naphthas (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, xylenes) used for blending or compounding into finished motor gasoline. These components include reformulated gasoline blendstock for oxygenate blending (RBOB) but exclude oxygenates (alcohols, ethers), butane, and pentanes. Note: Oxygenates are reported as individual components and are included in the total for other hydrocarbons and oxygenates.

Conventional Blendstock for Oxygenate Blending (CBOB). Conventional gasoline blendstock intended for blending with oxygenates downstream of the refinery where it was produced. CBOB must become conventional gasoline after blending with oxygenates. Motor gasoline blending components that require blending other than with oxygenates to become finished

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conventional gasoline are reported as All Other Motor Gasoline Blending Components. Excludes reformulated blendstock for oxygenate blending (RBOB).

Gasoline Treated as Blendstock (GTAB). Non-certified Foreign Refinery gasoline classified by an importer as blendstock to be either blended or reclassified with respect to reformulated or conventional gasoline. GTAB is classified as either reformulated or conventional based on emissions performance and the intended end use.

Reformulated Blendstock for Oxygenate Blending (RBOB). Specially produced reformulated gasoline blendstock intended for blending with oxygenates downstream of the refinery where it was produced. Includes RBOB used to meet requirements of the Federal reformulated gasoline program and other blendstock intended for blending with oxygenates to produce finished gasoline that meets or exceeds emissions performance requirements of Federal reformulated gasoline (e.g. California RBOB and Arizona RBOB). Excludes conventional gasoline blendstocks for oxygenate blending (CBOB).

RBOB for Blending with Ether. Motor gasoline blending components intended to be blended with an ether component (e.g. methyl tertiary butyl ether) at a terminal or refinery to raise the oxygen content.

RBOB for Blending with Alcohol. Motor gasoline blending components intended to be blended with an alcohol component (e.g. fuel ethanol) at a terminal or refinery to raise the oxygen content.

All Other Motor Gasoline Blending Components. Naphthas (e.g. straight-run gasoline, alkylate, reformate, benzene, toluene, xylenes) used for blending or compounding into finished motor gasoline. Includes receipts and inputs of Gasoline Treated as Blendstock (GTAB). Excludes conventional blendstock for oxygenate blending (CBOB), reformulated blendstock for oxygenate blending, oxygenates (e.g. fuel ethanol and methyl tertiary butyl ether), butane, and natural gasoline.

MTBE (Methyl tertiary butyl ether) (CH₃)₃COCH₃. An ether intended for gasoline blending as described in Oxygenate definition.

Naphtha. A generic term applied to a petroleum fraction with an approximate boiling range between 122 degrees Fahrenheit and 400 degrees Fahrenheit.

Naphtha Less Than 401o F. See **Petrochemical Feedstocks.**

Naphtha-Type Jet Fuel. A fuel in the heavy naphtha boiling range having an average gravity of 52.8 degrees API, 20 to 90 percent distillation temperatures of 290 degrees to 470 degrees Fahrenheit, and meeting Military Specification MIL-T-5624L (Grade JP-4). It is used primarily for military

turbojet and turboprop aircraft engines because it has a lower freeze point than other aviation fuels and meets engine requirements at high altitudes and speeds. Note: Beginning with January 2004 data, naphtha-type jet fuel is included in **Miscellaneous Products.**

Natural Gas. A gaseous mixture of hydrocarbon compounds, the primary one being methane.

Natural Gas Field Facility. A field facility designed to process natural gas produced from more than one lease for the purpose of recovering condensate from a stream of natural gas; however, some field facilities are designed to recover propane, normal butane, natural gasoline, etc., and to control the quality of natural gas to be marketed.

Natural Gas Liquids. Those hydrocarbons in natural gas that are separated from the gas as liquids through the process of absorption, condensation, adsorption, or other methods in gas processing or cycling plants. Generally, such liquids consist of propane and heavier hydrocarbons and are commonly referred to as lease condensate, natural gasoline, and liquefied petroleum gases. Natural gas liquids include natural gas plant liquids (primarily ethane, propane, butane, and isobutane; see **Natural Gas Plant Liquids**) and lease condensate (primarily pentanes produced from natural gas at lease separators and field facilities; see **Lease Condensate**).

Natural Gas Plant Liquids. Those hydrocarbons in natural gas that are separated as liquids at natural gas processing plants, fractionating and cycling plants, and, in some instances, field facilities. Lease condensate is excluded. Products obtained include ethane; liquefied petroleum gases (propane, butanes, propane-butane mixtures, ethane-propane mixtures); isopentane; and other small quantities of finished products, such as motor gasoline, special naphthas, jet fuel, kerosene, and distillate fuel oil.

Natural Gas Processing Plant. Facilities designed to recover natural gas liquids from a stream of natural gas that may or may not have passed through lease separators and/or field separation facilities. These facilities control the quality of the natural gas to be marketed. Cycling plants are classified as gas processing plants.

Natural Gasoline and Isopentane. A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas, that meets vapor pressure, end-point, and other specifications for natural gasoline set by the Gas Processors Association. Includes isopentane which is a saturated five-carbon branched-chain hydrocarbon, (C₅H₁₂), obtained by fractionation of natural gasoline or isomerization of normal pentane.

Net Receipts. The difference between total movements into and total movements out of each PAD District by pipeline, tanker, and barge.

Normal Butane. See **Butane**.

OPEC. The acronym for the Organization of Petroleum Exporting Countries, that have organized for the purpose of negotiating with oil companies on matters of oil production, prices and future concession rights. Current members are Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela. The Neutral Zone between Kuwait and Saudi Arabia is considered part of OPEC. Prior to January 1, 1993, Ecuador was a member of OPEC. Prior to January 1995, Gabon was a member of OPEC.

Operable Capacity. The amount of capacity that, at the beginning of the period, is in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day or barrels per stream day.

Operating Capacity. The component of operable capacity that is in operation at the beginning of the period.

Operable Utilization Rate. Represents the utilization of the atmospheric crude oil distillation units. The rate is calculated by dividing the gross input to these units by the operable refining capacity of the units.

Operating Utilization Rate. Represents the utilization of the atmospheric crude oil distillation units. The rate is calculated by dividing the gross input to these units by the operating refining capacity of the units.

Other Hydrocarbons. Materials received by a refinery and consumed as a raw material. Includes hydrogen, coal tar derivatives, gilsonite, and natural gas received by the refinery for reforming into hydrogen. Natural gas to be used as fuel is excluded.

Other Oils Equal To or Greater Than 401o F. See **Petrochemical Feedstocks**.

Other Oxygenates. Other aliphatic alcohols and aliphatic ethers intended for motor gasoline blending (e.g., isopropyl ether (IPE) or n-propanol).
Oxygenated Gasoline. See **Motor Gasoline (Finished)**.

Oxygenates. Substances which, when added to gasoline, increase the amount of oxygen in that gasoline blend. Fuel Ethanol, Methyl Tertiary Butyl Ether (MTBE), Ethyl Tertiary Butyl Ether (ETBE), and methanol are common oxygenates.

Fuel Ethanol. Blends of up to 10 percent by volume anhydrous ethanol (200 proof) (commonly referred to as the "gasohol waiver").

Methanol. Blends of methanol and gasoline-grade tertiary butyl alcohol (GTBA) such that the total oxygen content does

not exceed 3.5 percent by weight and the ratio of methanol to GTBA is less than or equal to 1. It is also specified that this blended fuel must meet ASTM volatility specifications (commonly referred to as the "ARCO" waiver). Blends of up to 5.0 percent by volume methanol with a minimum of 2.5 percent by volume co-solvent alcohols having a carbon number of 4 or less (i.e., ethanol, propanol, butanol, and/or GTBA). The total oxygen must not exceed 3.7 percent by weight, and the blend must meet ASTM volatility specifications as well as phase separation and alcohol purity specifications (commonly referred to as the "DuPont" waiver).

MTBE (Methyl tertiary butyl ether). Blends up to 15.0 percent by volume MTBE which must meet the ASTM D4814 specifications. Blenders must take precautions that the blends are not used as base gasolines for other oxygenated blends (commonly referred to as the "Sun" waiver).

Pentanes Plus. A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Persian Gulf. The countries that comprise the Persian Gulf are: Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates.

Petrochemical Feedstocks. Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. The categories reported are "Naphtha Less Than 401° F" and "Other Oils Equal To or Greater Than 401° F."

Naphtha less Than 401o F. A naphtha with a boiling range of less than 401 degrees Fahrenheit that is intended for use as a petrochemical feedstock.

Other Oils Equal To or Greater Than 401o F. Oils with a boiling range equal to or greater than 401 degrees Fahrenheit that are intended for use as a petrochemical feedstock.

Petroleum Administration for Defense (PAD) Districts. Geographic aggregations of the 50 States and the District of Columbia into five districts by the Petroleum Administration for Defense in 1950. These districts were originally defined during World War II for purposes of administering oil allocation.

Petroleum Coke. A residue high in carbon content and low in hydrogen that is the final product of thermal decomposition in the condensation process in cracking. This product is reported as marketable coke. The conversion is 5 barrels (of 42 U.S. gallons each) per short ton. Coke from petroleum has a heating value of 6.024 million Btu per barrel.

Marketable Coke. Those grades of coke produced in delayed or fluid cokers which may be recovered as relatively pure carbon. This "green" coke may be sold as is or further purified by calcining.

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Catalyst Coke. The only catalytic coke used as a fuel is the coke on catalyst in the FCC process. In other catalytic processes there is coke deposited on catalyst, but it is not regenerated in a way such that the heat of combustion is recovered.

Petroleum Products. Petroleum products are obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

Pipeline (Petroleum). Crude oil and product pipelines used to transport crude oil and petroleum products respectively, (including interstate, intrastate, and intra-company pipelines) within the 50 States and the District of Columbia.

Plant Condensate. One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

Processing Gain. The volumetric amount by which total output is greater than input for a given period of time. This difference is due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.

Processing Loss. The volumetric amount by which total refinery output is less than input for a given period of time. This difference is due to the processing of crude oil into products which, in total, have a higher specific gravity than the crude oil processed.

Product Supplied, Crude Oil. Crude oil burned on leases and by pipelines as fuel.

Production Capacity. The maximum amount of product that can be produced from processing facilities.

Products Supplied. Approximately represents consumption of petroleum products because it measures the disappearance of these products from primary sources, i.e., refineries, natural gas processing plants, blending plants, pipelines, and bulk terminals. In general, product supplied of each product in any given period is computed as follows: field production, plus refinery production, plus imports, plus unaccounted for crude oil, (plus net receipts when calculated on a PAD District basis), minus stock change, minus crude oil losses, minus refinery inputs, minus exports. Propane (C₃H₈). A normally gaseous three-carbon straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of -43.67 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams. It includes all products designated in

ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

Propylene (C₃H₆). An olefinic three-carbon hydrocarbon recovered from refinery processes or petrochemical processes.

Propylene (C₃H₆) (nonfuel use). Propylene that is intended for use in nonfuel applications such as petrochemical manufacturing. Nonfuel use propylene includes chemical-grade propylene, polymer-grade propylene, and trace amounts of propane. Nonfuel use propylene also includes the propylene component of propane/propylene mixes where the propylene will be separated from the mix in a propane/propylene splitting process. Excluded is the propylene component of propane/propylene mixes where the propylene component of the mix is intended for sale into the fuel market.

Refinery. An installation that manufactures finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons, and oxygenates.

Refinery-Grade Butane. See **Butane**.

Refinery Input, Crude Oil. Total crude oil (domestic plus foreign) input to crude oil distillation units and other refinery processing units (cokers, etc.).

Refinery Input, Total. The raw materials and intermediate materials processed at refineries to produce finished petroleum products. They include crude oil, products of natural gas processing plants, unfinished oils, other hydrocarbons and oxygenates, motor gasoline and aviation gasoline blending components and finished petroleum products.

Refinery Production. Petroleum products produced at a refinery or blending plant. Published production of these products equals refinery production minus refinery input. Negative production will occur when the amount of a product produced during the month is less than the amount of that same product that is reprocessed (input) or reclassified to become another product during the same month. Refinery production of unfinished oils, and motor and aviation gasoline blending components appear on a net basis under refinery input.

Refinery Yield. Refinery yield (expressed as a percentage) represents the percent of finished product produced from input of crude oil and net input of unfinished oils. It is calculated by dividing the sum of crude oil and net unfinished input into the individual net production of finished products. Before calculating the yield for finished motor gasoline, the input of natural gas liquids, other hydrocarbons and oxygenates, and net input of motor gasoline blending components must be subtracted from the net production of finished motor gasoline. Before calculating the yield for finished aviation gasoline, input of aviation gasoline blending components must be subtracted from the net production of finished aviation gasoline.

Reformulated Gasoline. See Motor **Gasoline (Finished)**.

Residual Fuel Oil. A general classification for the heavier oils, known as No. 5 and No. 6 fuel oils, that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. It conforms to ASTM Specifications D 396 and D 975 and Federal Specification VV-F-815C. No. 5, a residual fuel oil of medium viscosity, is also known as Navy Special and is defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770). It is used in steam-powered vessels in government service and inshore power plants. No. 6 fuel oil includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.

Residuum. Residue from crude oil after distilling off all but the heaviest components, with a boiling range greater than 1000 degrees Fahrenheit.

Road Oil. Any heavy petroleum oil, including residual asphaltic oil used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades from 0, the most liquid, to 5, the most viscous.

Shell Storage Capacity. The design capacity of a petroleum storage tank which is always greater than or equal to working storage capacity.

Special Naphthas. All finished products within the naphtha boiling range that are used as paint thinners, cleaners, or solvents. These products are refined to a specified flash point. Special naphthas include all commercial hexane and cleaning solvents conforming to ASTM Specification D1836 and D484, respectively. Naphthas to be blended or marketed as motor gasoline or aviation gasoline, or that are to be used as petrochemical and synthetic natural gas (SNG) feedstocks are excluded.

Steam (Purchased). Steam, purchased for use by a refinery that was not generated from within the refinery complex.

Still Gas (Refinery Gas). Any form or mixture of gases produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylenes, propane, propylene, etc. Still gas is used as a refinery fuel and a petrochemical feedstock. The conversion factor is 6 million BTU's per fuel oil equivalent barrel.

Stock Change. The difference between stocks at the beginning of the reporting period and stocks at the end of the reporting period. Note: A negative number indicates a decrease (i.e., a drawdown) in stocks and a positive number indicates an increase (i.e., a buildup) in stocks during the reporting period.

Strategic Petroleum Reserve (SPR). Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

Sulfur. A yellowish nonmetallic element, sometimes known as "brimstone." It is present at various levels of concentration in many fossil fuels whose combustion releases sulfur compounds that are considered harmful to the environment. Some of the most commonly used fossil fuels are categorized according to their sulfur content, with lower sulfur fuels usually selling at a higher price. Note: No. 2 Distillate fuel is currently reported as having either a 0.05 percent or lower sulfur level for on-highway vehicle use or a greater than 0.05 percent sulfur level for off-highway use, home heating oil, and commercial and industrial uses. This also includes Ultra Low Sulfur Diesel (<15 ppm sulfur). Residual fuel, regardless of use, is classified as having either no more than 1 percent sulfur or greater than 1 percent sulfur. Coal is also classified as being low-sulfur at concentrations of 1 percent or less or high-sulfur at concentrations greater than 1 percent.

Supply. The components of petroleum supply are field production, refinery production, imports, and net receipts when calculated on a PAD District basis.

TAME (Tertiary amyl methyl ether) (CH₃)₂(C₂H₅)COCH₃. An oxygenate blend stock formed by the catalytic etherification of isoamylene with methanol.

Tank Farm. An installation used by gathering and trunk pipeline companies, crude oil producers, and terminal operators (except refineries) to store crude oil.

Tanker and Barge. Vessels that transport crude oil or petroleum products. Data are reported for movements between PAD Districts; from a PAD District to the Panama Canal; or from the Panama Canal to a PAD District.

TBA (Tertiary butyl alcohol) (CH₃)₃COH. An alcohol primarily used as a chemical feedstock, a solvent or feedstock for isobutylene production for MTBE; produced as a co-product of propylene oxide production or by direct hydration of isobutylene.

Thermal Cracking. A refining process in which heat and pressure are used to break down, rearrange, or combine hydrocarbon molecules. Thermal cracking includes gas oil, visbreaking, fluid coking, delayed coking, and other thermal cracking processes (e.g., Flexicoking). See individual categories for definition.

Toluene (C₆H₅CH₃). Colorless liquid of the aromatic group of petroleum hydrocarbons, made by the catalytic reforming of petroleum naphthas containing methyl cyclohexane. A high-octane gasoline-blending agent, solvent, and chemical intermediate, base for TNT.

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Unaccounted for Crude Oil. Represents the arithmetic difference between the calculated supply and the calculated disposition of crude oil. The calculated supply is the sum of crude oil production plus imports minus changes in crude oil stocks. The calculated disposition of crude oil is the sum of crude oil input to refineries, crude oil exports, crude oil burned as fuel, and crude oil losses.

Unfinished Oils. All oils requiring further processing, except those requiring only mechanical blending. Unfinished oils are produced by partial refining of crude oil and include naphthas and lighter oils, kerosene and light gas oils, heavy gas oils, and residuum.

Unfractionated Streams. Mixtures of unsegregated natural gas liquid components excluding, those in plant condensate. This product is extracted from natural gas.

United States. The United States is defined as the 50 States and the District of Columbia.

Vacuum Distillation. Distillation under reduced pressure (less than atmospheric) which lowers the boiling temperature of the liquid being distilled. This technique prevents cracking or decomposition of the charge stock which occurs above 1000°F.

Visbreaking. A thermal cracking process in which heavy atmospheric or vacuum-still bottoms are cracked at moderate temperatures to increase production of distillate products and reduce viscosity of the distillation residues.

Wax. A solid or semi-solid material consisting of a mixture of hydrocarbons obtained or derived from petroleum fractions, or through a Fischer-Tropsch type process, in which the straight-chained paraffin series predominates. This includes all marketable wax, whether crude or refined, with a congealing point (ASTM D 938) between 100 and 200 degrees Fahrenheit and a maximum oil content (ASTM D 3235) of 50 weight percent.

Working Storage Capacity. The difference in volume between the maximum safe fill capacity and the quantity below which pump suction is ineffective (bottoms).

Xylenes (C₆H₄(CH₃)₂). Colorless liquid of the aromatic group of hydrocarbons made the catalytic reforming of certain naphthenic petroleum fractions. Used as high-octane motor and aviation gasoline blending agents, solvents, chemical intermediates. Isomers are metaxylene, orthoxylene, paraxylene.

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