



September 12, 2017 Luncheon

US Hydrocarbon Exports

Presented by

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THE UNIVERSITY OF TULSA

Collins College of Business

School of Energy Economics, Policy and Commerce

Crude Oil Prices

Description	Last	Net Change	Open	High	Low	Close	Volume
Oct 17 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	47.31	-0.17	47.58	47.94	47.26	47.48	220802
Nov 17 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	47.88	-0.18	48.15	48.50	47.84	48.06	63772
Dec 17 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	48.36	-0.20	48.65	49.00	48.32	48.56	35732
Jan 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	48.75	-0.20	49.00	49.37	48.72	48.95	17989
Feb 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.13	-0.12	49.46	49.64	49.07	49.25	8848
Mar 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.24	-0.22	49.49	49.84	49.24	49.46	8122
Apr 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.47	-0.13	49.75	49.94	49.42	49.60	3636
May 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.47	-0.23	49.78	49.99	49.47	49.70	4332
Jun 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.55	-0.22	49.91	50.13	49.54	49.77	9196
Jul 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.69	-0.12	50.13	50.13	49.69	49.81	1732
Aug 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.90	0.05	50.14	50.14	49.90	49.85	1118
Sep 18 NYMEX Light Sweet Crude Oil (WTI) Futures Electronic	49.90	0.01	50.09	50.17	49.90	49.89	2538

Oil Prices Over the Past Year



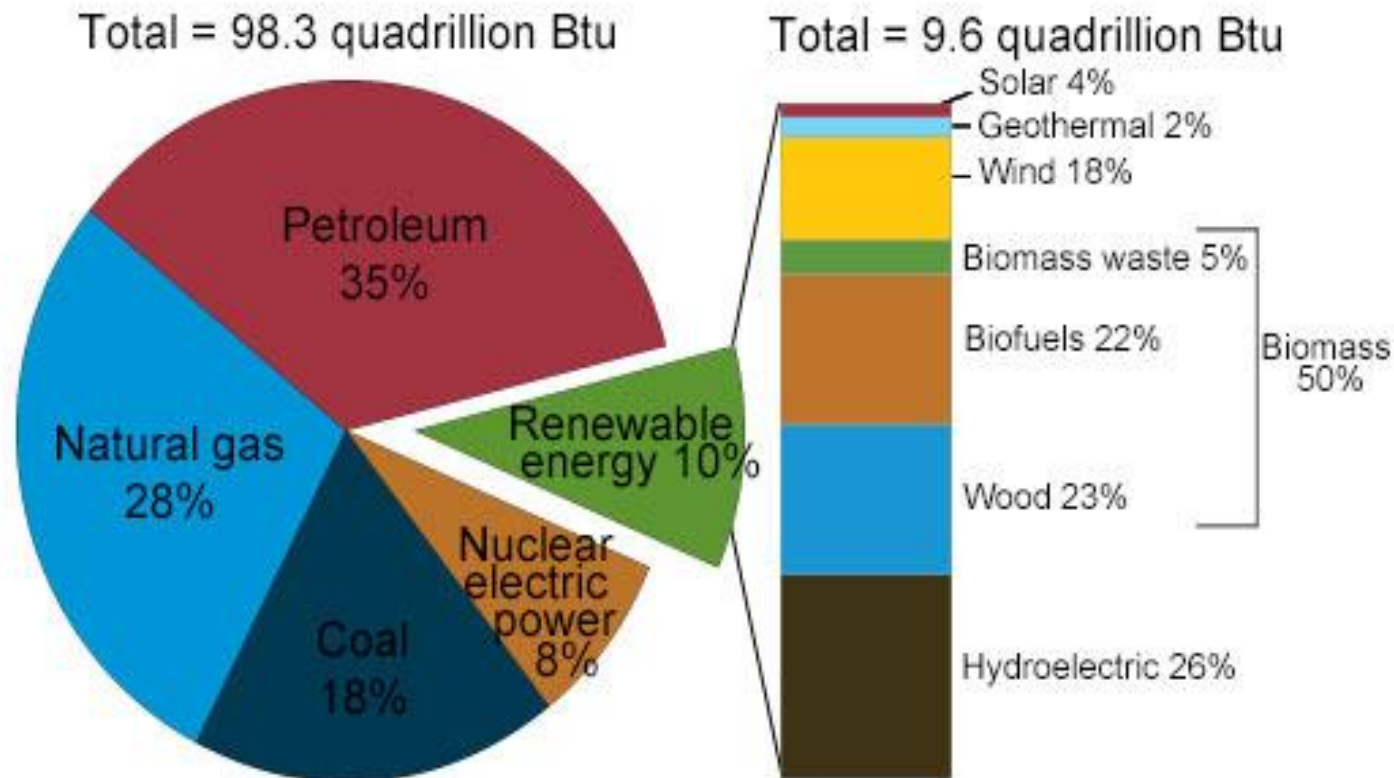
Natural Gas Prices

Description	Last	Net Change	Open	High	Low	Close	Volume
Oct 17 NYMEX Henry Hub Natural Gas Futures Electronic	2.944	0.054	2.910	2.947	2.899	2.890	45853
Nov 17 NYMEX Henry Hub Natural Gas Futures Electronic	3.013	0.048	2.984	3.015	2.972	2.965	18690
Dec 17 NYMEX Henry Hub Natural Gas Futures Electronic	3.169	0.046	3.140	3.171	3.128	3.123	8261
Jan 18 NYMEX Henry Hub Natural Gas Futures Electronic	3.278	0.048	3.249	3.279	3.238	3.230	10961
Feb 18 NYMEX Henry Hub Natural Gas Futures Electronic	3.281	0.047	3.253	3.282	3.241	3.234	4117
Mar 18 NYMEX Henry Hub Natural Gas Futures Electronic	3.238	0.044	3.218	3.240	3.200	3.194	6648
Apr 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.935	0.034	2.915	2.937	2.914	2.901	6138
May 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.907	0.034	2.880	2.907	2.880	2.873	4212
Jun 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.933	0.033	2.915	2.933	2.915	2.900	485
Jul 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.958	0.032	2.941	2.958	2.941	2.926	242
Aug 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.961	0.031	2.948	2.961	2.946	2.930	193
Sep 18 NYMEX Henry Hub Natural Gas Futures Electronic	2.939	0.032	2.925	2.939	2.922	2.907	235

Natural Gas Prices Over the Past Year



U.S. energy consumption by energy source, 2014



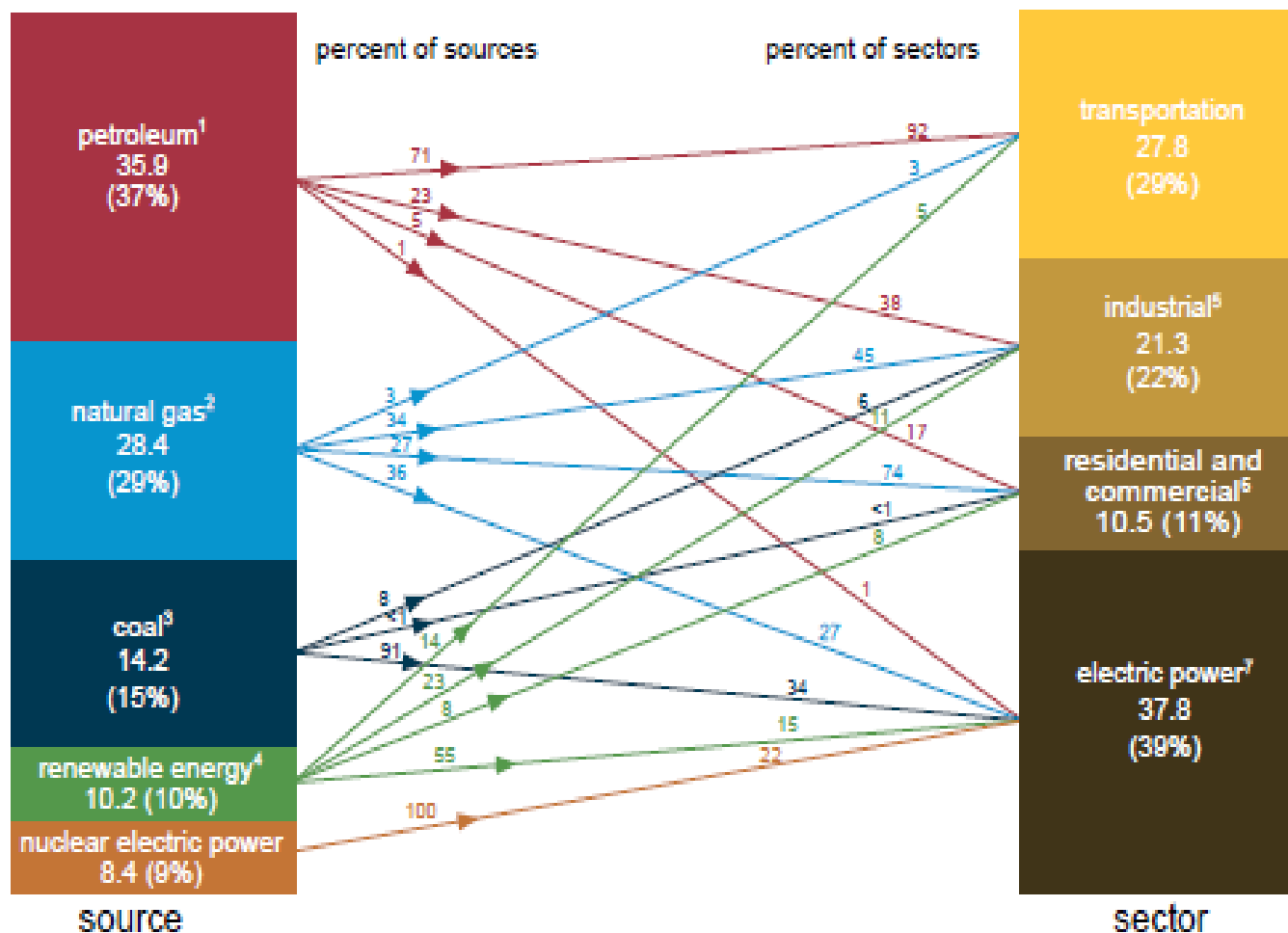
Note: Sum of components may not equal 100% as a result of independent rounding.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1 (March 2015), preliminary data

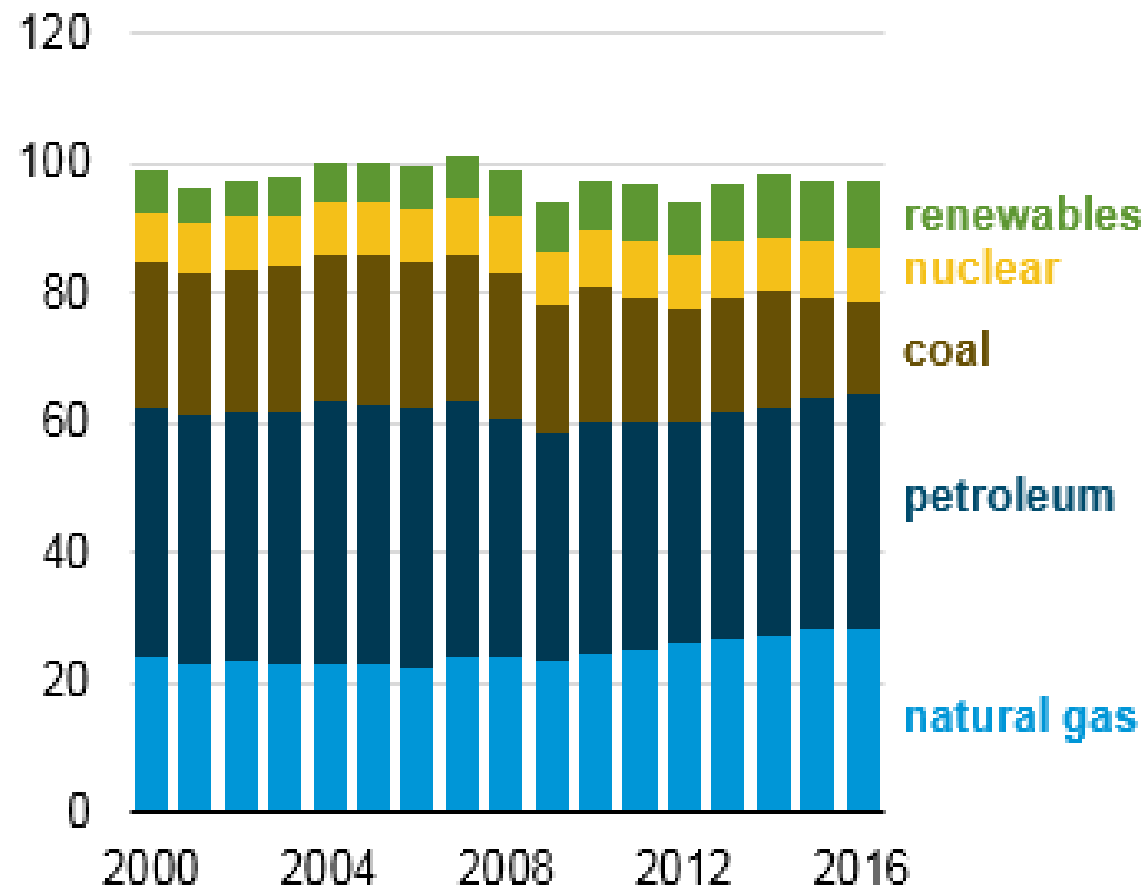


U.S. primary energy consumption by source and sector, 2016

Total = 97.4 quadrillion British thermal units (Btu)



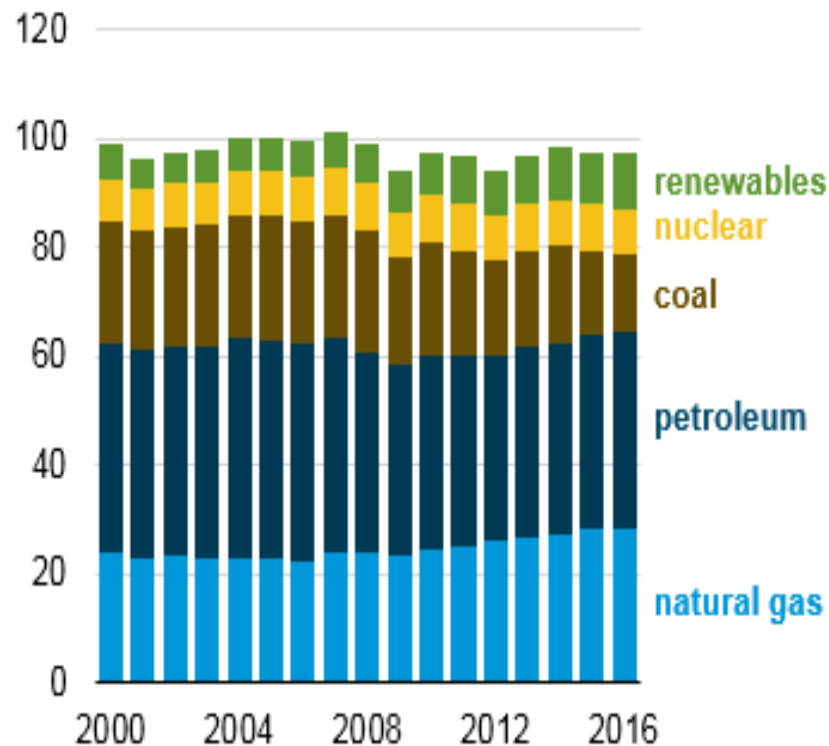
United States total energy consumption (2000-2016) quadrillion British thermal units



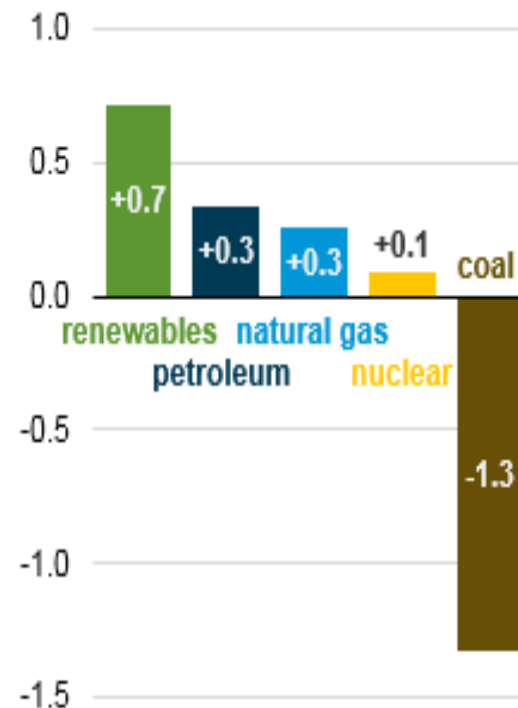
Source: U.S. Energy Information Administration, [Monthly Energy Review](#)

U.S. energy consumption rose slightly in 2016 despite a significant decline in coal use

United States total energy consumption (2000-2016)
quadrillion British thermal units

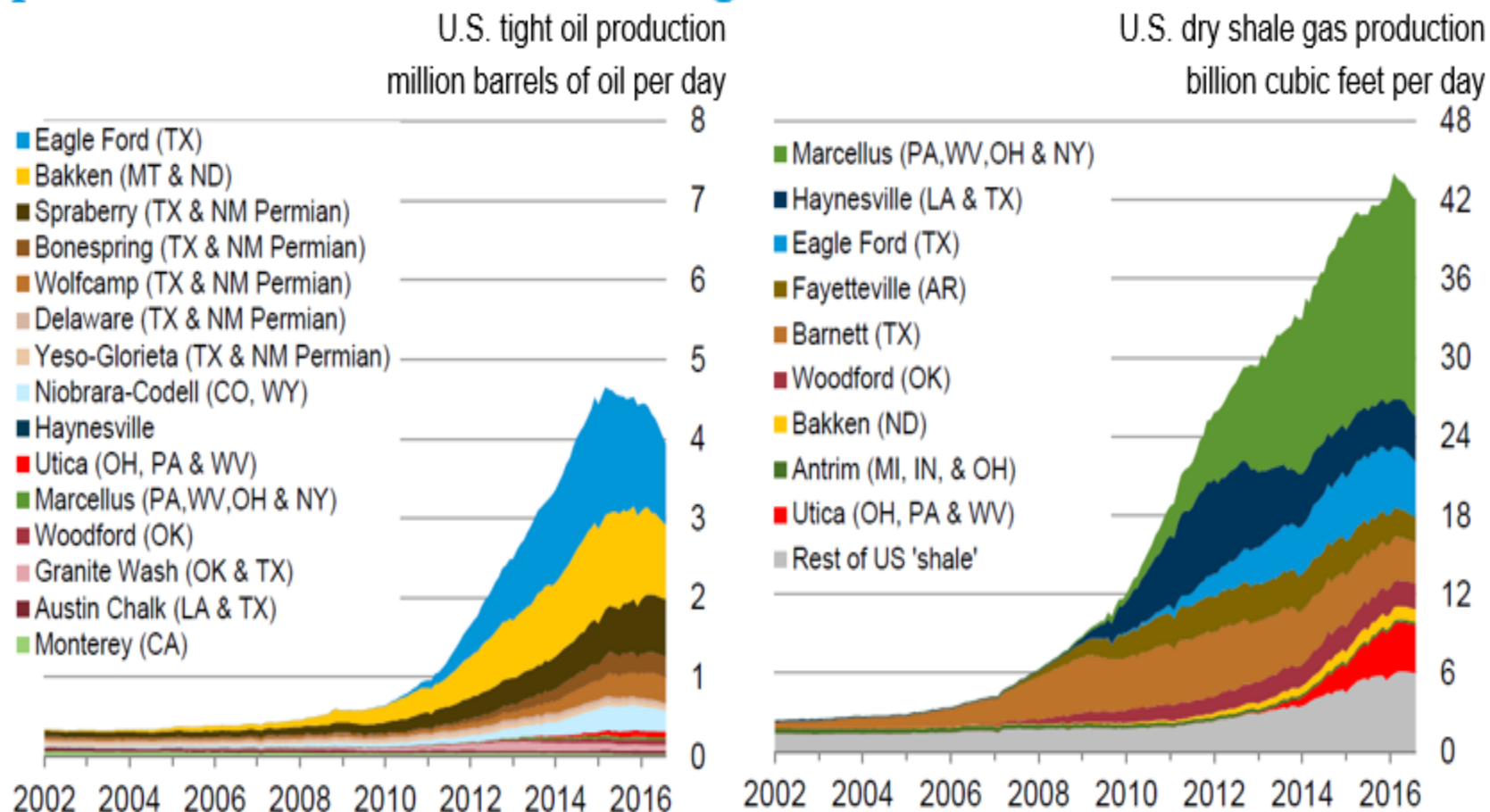


Change from 2015
quadrillion British thermal units



Source: U.S. Energy Information Administration, [Monthly Energy Review](#)

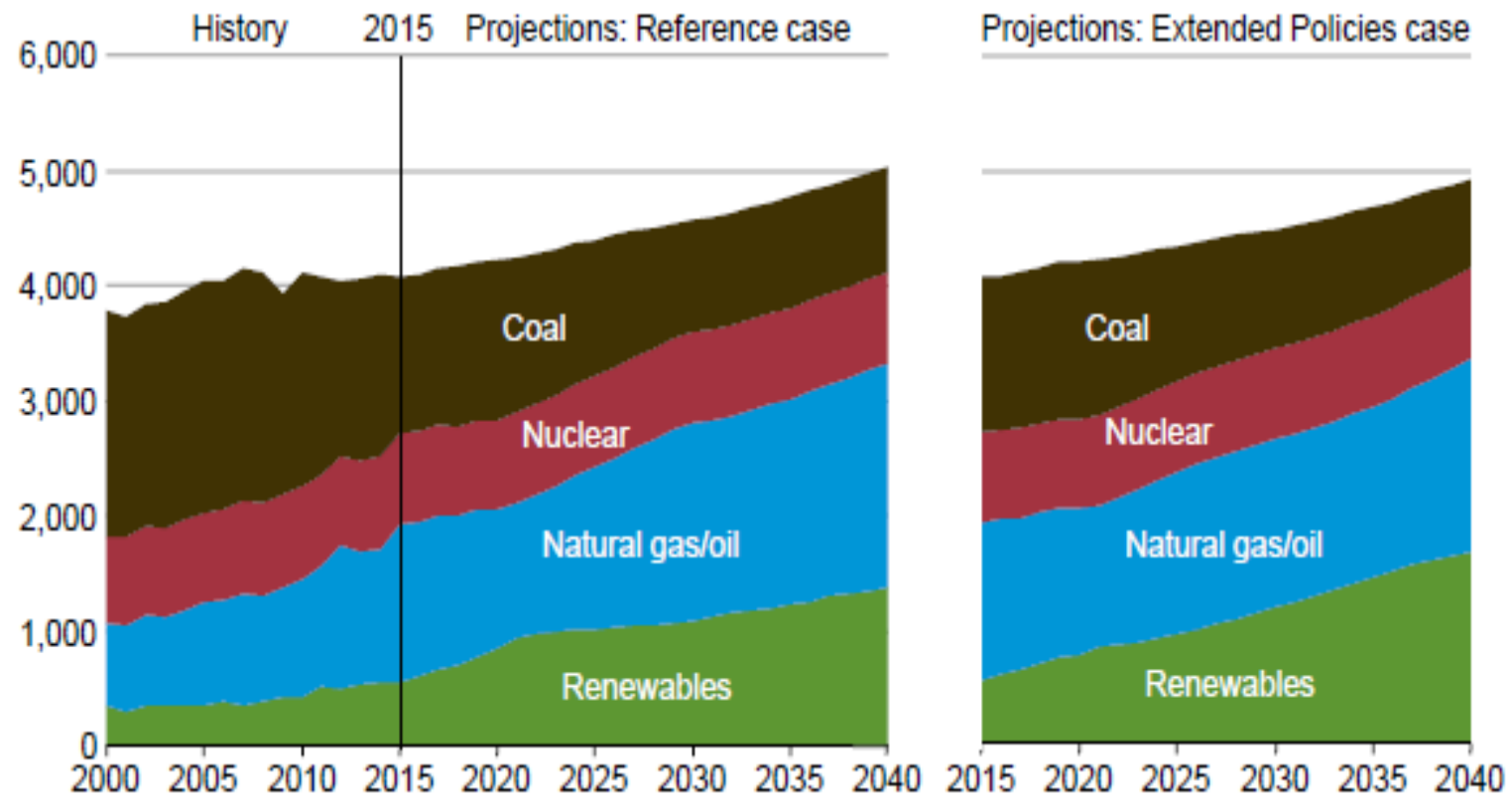
The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources



Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through August 2016 and represent EIA's official tight oil & shale gas estimates, but are not survey data. State abbreviations indicate primary state(s). Note: Scales are presented at approximate barrel of oil equivalent.

Electric Generation by Fuel

Figure IF3-6. Electricity generation by fuel in the Reference and Extended Policies cases, 2000–2040 (billion kilowatthours)



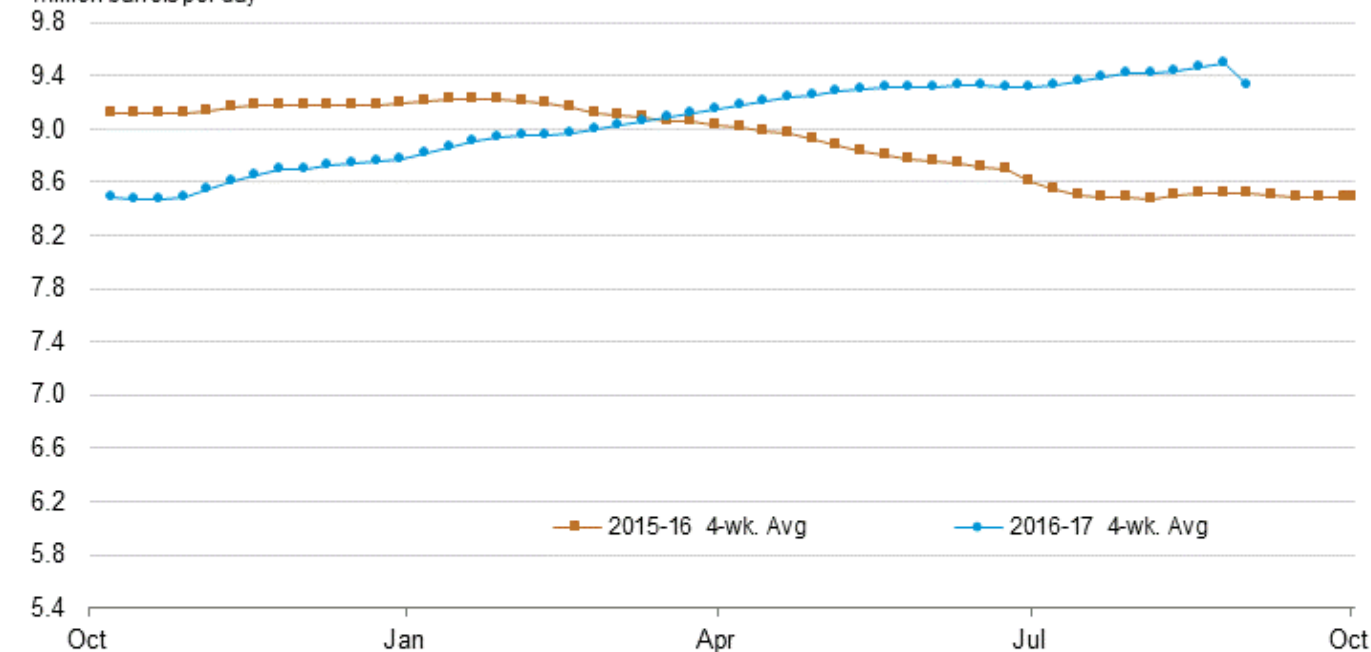
U.S. Energy Information Administration | Annual Energy Outlook 2016

US Crude Oil Production

Crude oil production and imports (million barrels per day)

U.S. crude oil domestic production

million barrels per day



Production

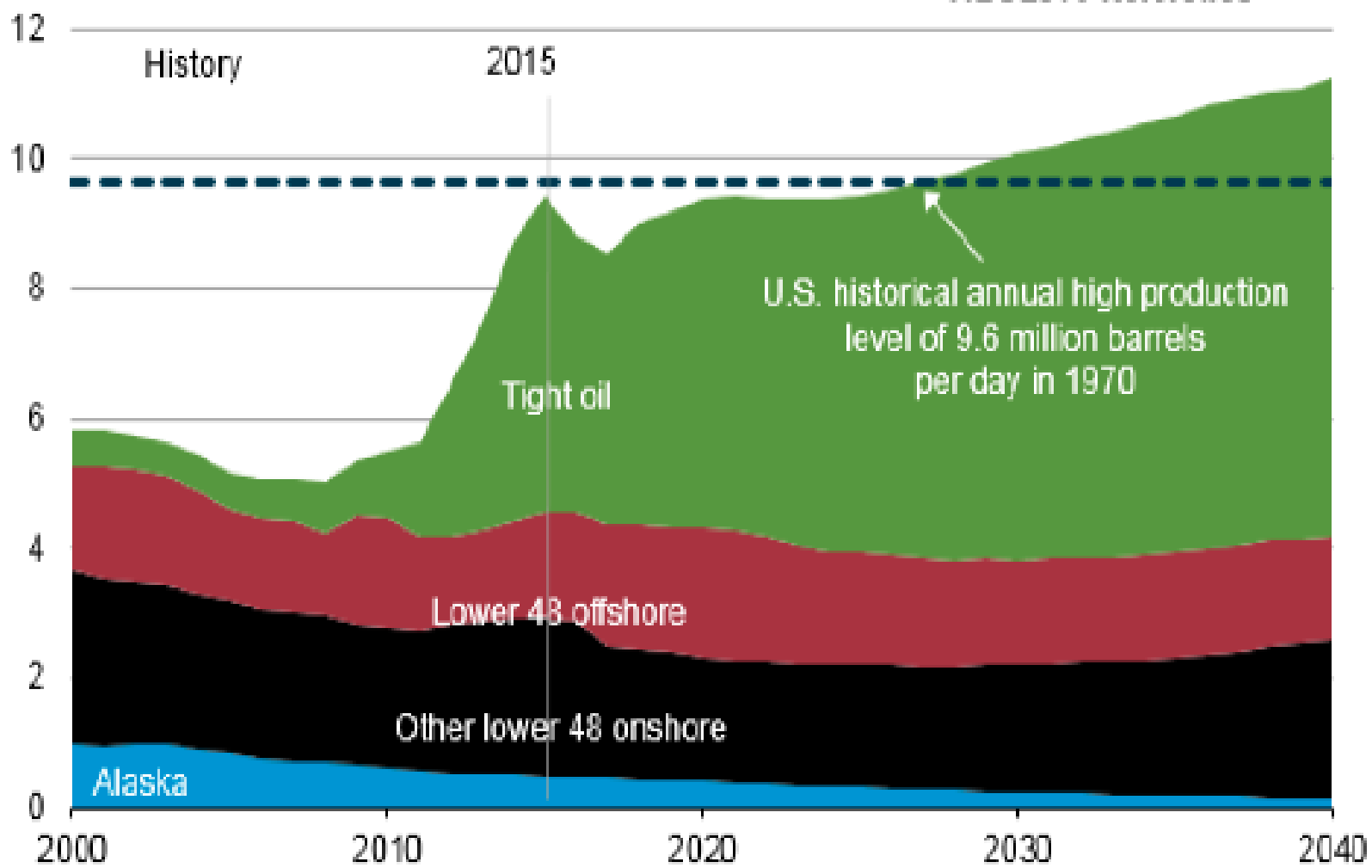
Imports

CRUDE OIL PRODUCTION (million barrels per day)

[more production data >](#)

	Year ago	Four-week averages				Year ago	Week ending			
	09/02/16	09/01/17	08/25/17	08/18/17	09/02/16	09/01/17	08/25/17	08/18/17		
U.S. production	8.523	9.335	9.496	9.471	8.458	8.781	9.530	9.528		

U.S. crude oil production
million barrels per day



Source: EIA, Annual Energy Outlook 2016

US Crude Oil Imports

Crude oil production and imports (million barrels per day)

U.S. crude oil imports

million barrels per day

9.0

8.0

7.0

6.0

Oct

Jan

Apr

Jul

Oct

2015-16 4-wk. Avg.

2016-17 4-wk. Avg.

Source: U.S. Energy Information Administration



Production



Imports

CRUDE OIL IMPORTS (million barrels per day)

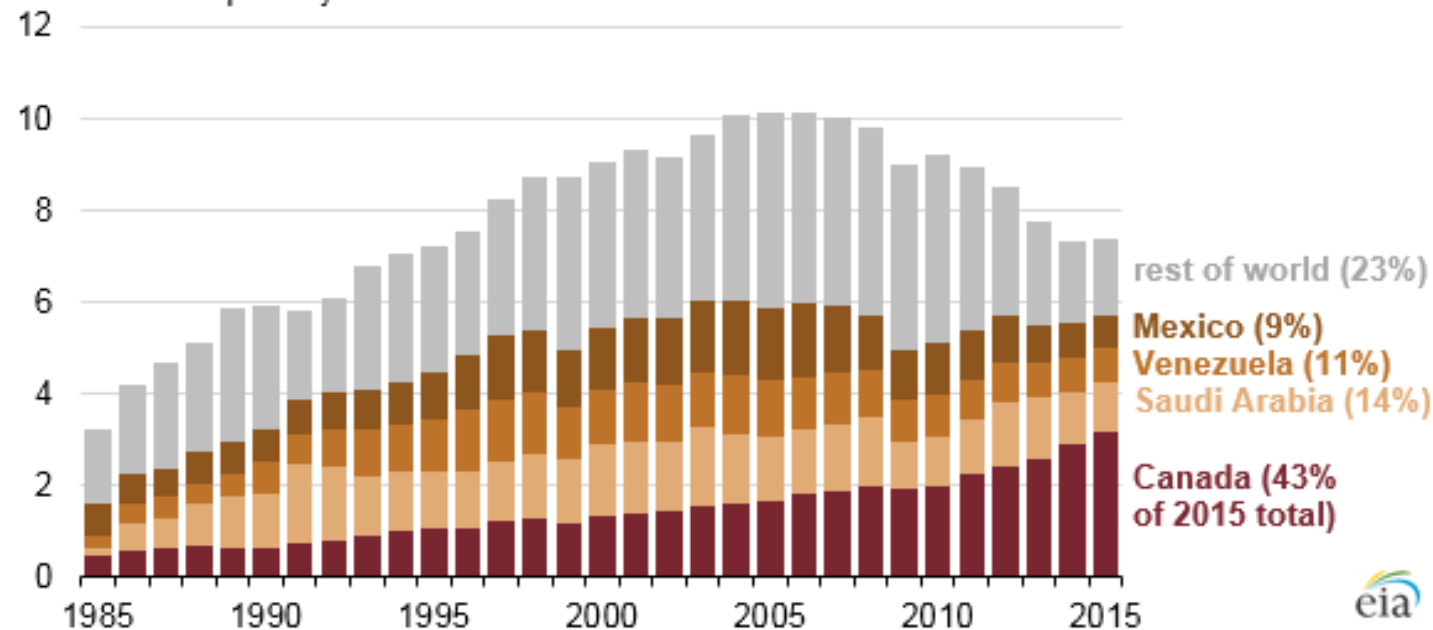
[more import data >](#)

	Year ago	Four-week averages			Year ago	Week ending		
	09/02/16	09/01/17	08/25/17	08/18/17	09/02/16	09/01/17	08/25/17	08/18/17
Crude oil, excluding SPR	8.205	7.976	8.146	8.233	7.069	7.083	7.905	8.790

Canada provides record-high share and amount of U.S. crude oil imports in 2015

Gross imports of crude oil to the United States by country, 1985-2015

million barrels per day



Source: U.S. Energy Information Administration, [Petroleum Supply Monthly](#)

Although total U.S. crude oil imports in 2015 continued to be lower than levels reached during the mid-2000s, imports from the United States' top foreign oil supplier—[Canada](#)—were the highest on record, according to annual trade data from EIA's [Petroleum Supply Monthly](#). Canada provided 4 out of every 10 barrels of oil imported into the United States in 2015.

Drilled-but-uncompleted Wells “DUCs”

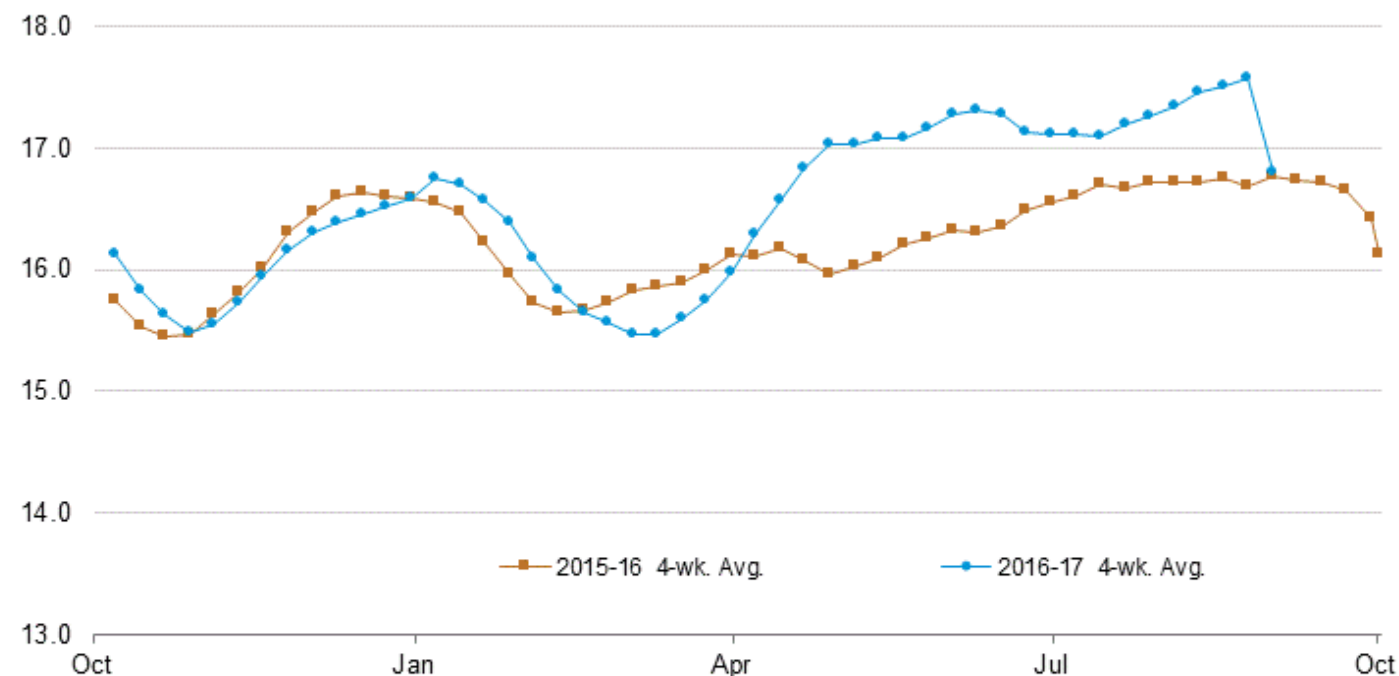
Region	Drilled but uncompleted wells (DUC) wells		
	June 2017	July 2017	change
Anadarko	906	948	42
Appalachia	724	711	(13)
Bakken	784	782	(2)
Eagle Ford	1,385	1,420	35
Haynesville	189	194	5
Niobrara	668	674	6
Permian	2,195	2,330	135
Total	6,851	7,059	208

Source: <https://www.eia.gov/petroleum/drilling/#tabs-summary-3>

US Crude Refinery Inputs

Crude oil refinery inputs (million barrels per day)

U.S. crude oil refinery inputs
million barrels per day



eia

U.S.

Regional

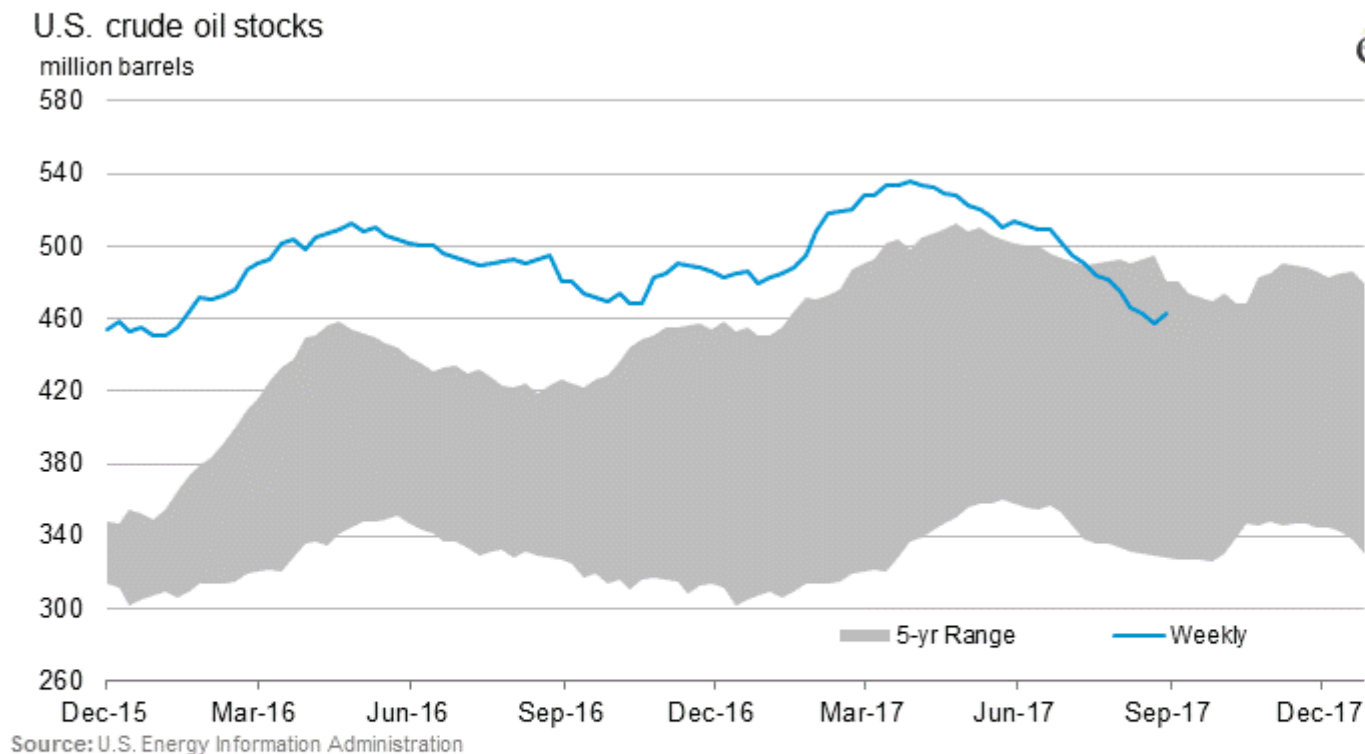
CRUDE OIL REFINERY INPUTS (million barrels per day)

[more refinery input data >](#)

	Year ago	Four-week averages			Year ago	Week ending		
	09/02/16	09/01/17	08/25/17	08/18/17	09/02/16	09/01/17	08/25/17	08/18/17
U.S.	16.772	16.806	17.581	17.502	16.930	14.472	17.725	17.461

US Crude Oil Inventory (non-SPR)

Crude oil stocks (million barrels) and days of supply



eia

U.S.

Regional

Days of supply

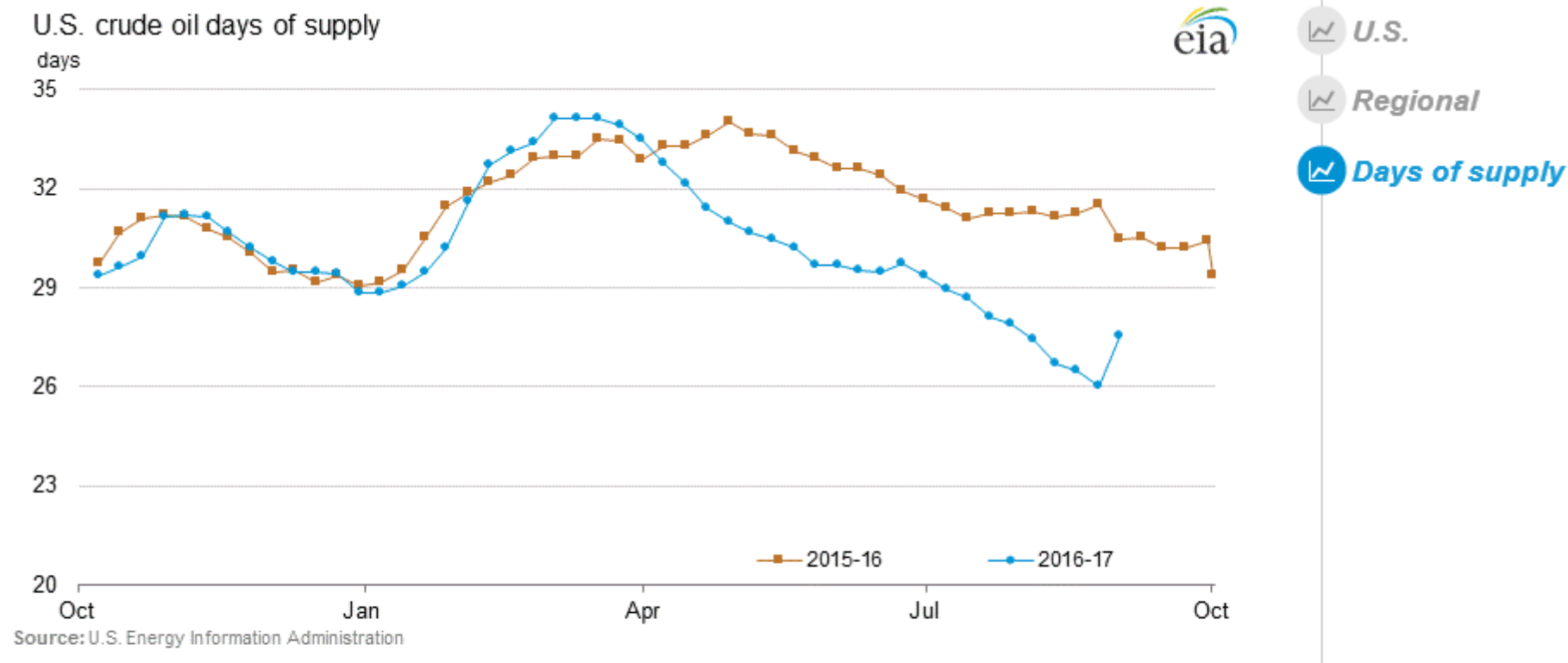
CRUDE OIL STOCKS (million barrels)

[more stock data >](#)

	Year ago	Most recent						
	09/02/16	09/01/17	08/25/17	08/18/17	08/11/17	08/04/17	07/28/17	07/21/17
U.S.	480.7	462.4	457.8	463.2	466.5	475.4	481.9	483.4

US Crude Oil Inventory – Days of Supply

Crude oil stocks (million barrels) and days of supply



CRUDE OIL STOCKS (million barrels)

[more stock data >](#)

	Year ago	Most recent						
	09/02/16	09/01/17	08/25/17	08/18/17	08/11/17	08/04/17	07/28/17	07/21/17
U.S.	480.7	462.4	457.8	463.2	466.5	475.4	481.9	483.4

Cushing, OK Stocks

Weekly Stocks

[DOWNLOAD](#)

Mbbbl



— Cushing, OK Ending Stocks excluding SPR of Crude Oil



Source: U.S. Energy Information Administration

Show Data By:

☒ Product ☐ Area

Graph
Clear

Commercial Crude Oil (Excl. Lease Stock)

☒

07/28/17

55,800

08/04/17

56,369

08/11/17

57,047

08/18/17

56,544

08/25/17

57,233

09/01/17

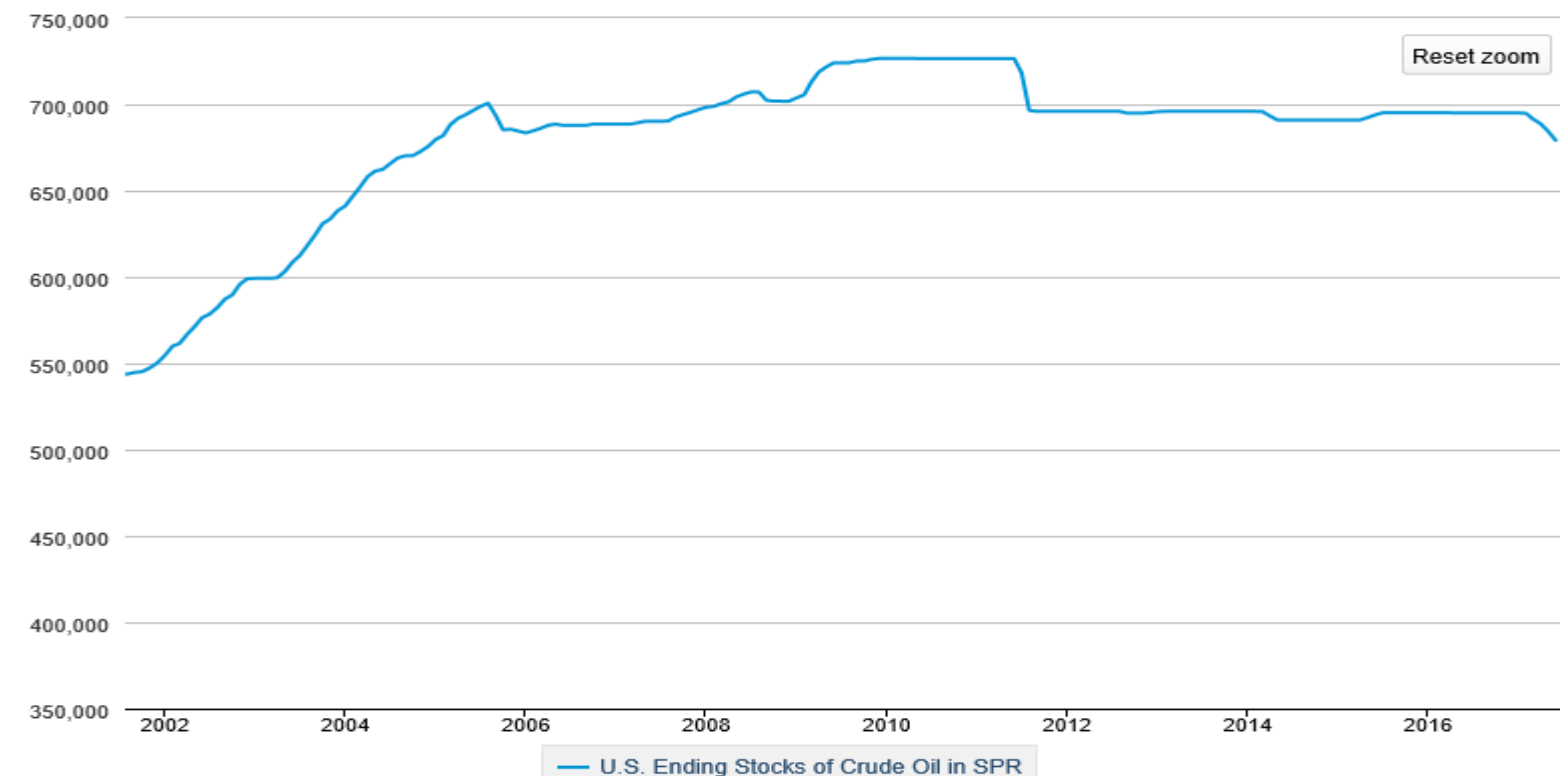
58,030

US Strategic Petroleum Reserve

Stocks by Type

DOWNLOAD

Mbbl



Source: U.S. Energy Information Administration

Show Data By:

☒ Product ☐ Stock Type ☐ Area

Graph
Clear

Crude Oil and Petroleum Products

☐

Jan-17

695,078

Feb-17

694,825

Mar-17

691,510

Apr-17

688,787

May-17

684,478

Jun-17

679,174

Crude Oil

☒

695,078

694,825

691,510

688,787

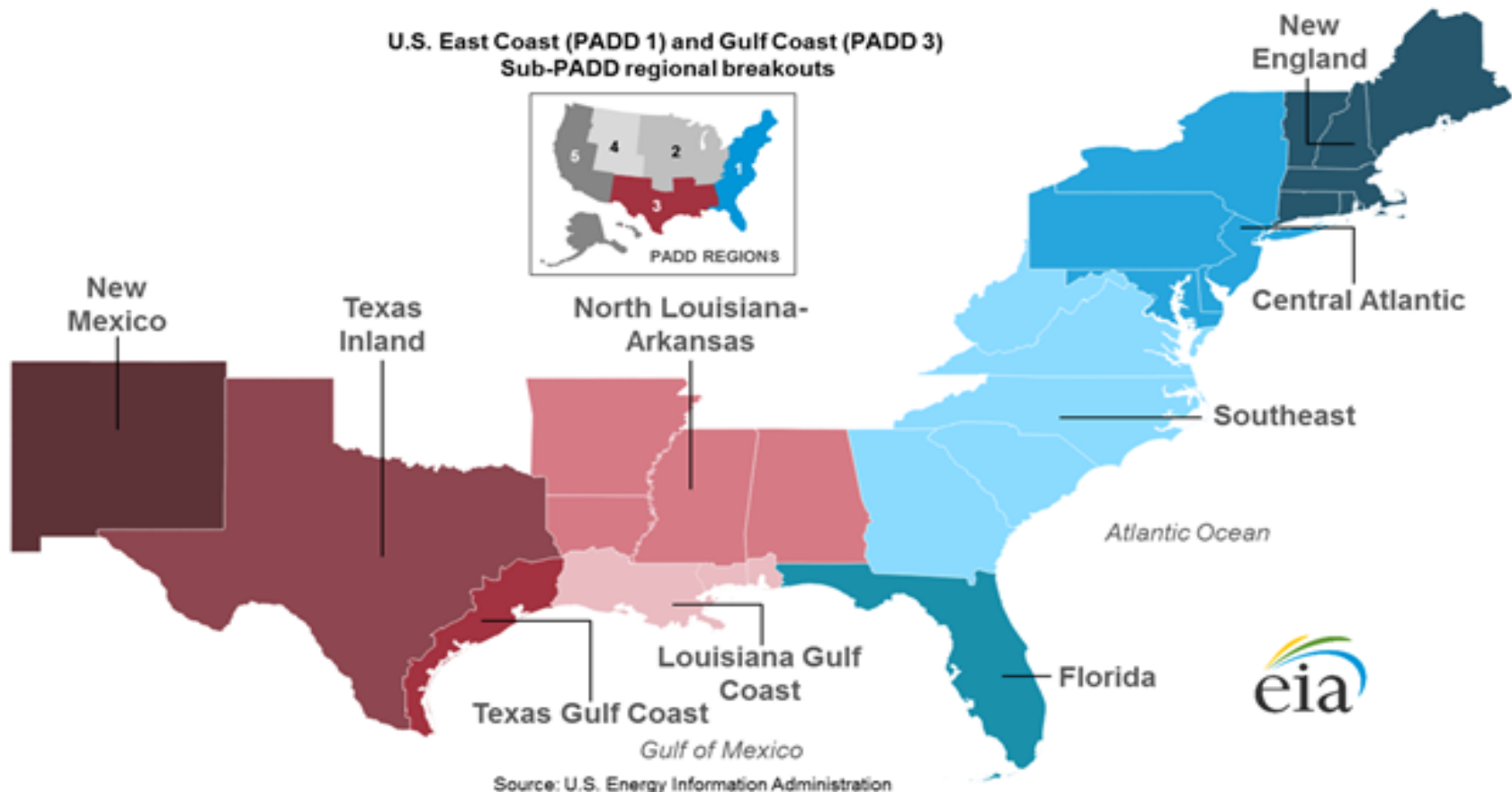
684,478

679,174

Harvey Impacts

■ Petroleum Administration for Defense District 3

Figure 1. U.S. East Coast (PADD 1) and Gulf Coast (PADD 3) Sub-PADD regional breakouts



Harvey Impacts

■ PADD-3

- 62% of US onshore oil production/18% offshore
- >50% of US refining capacity (40% in TX alone)
- ~50% of US crude oil storage capacity
- 40% of working storage for gasoline & diesel
- World's largest petroleum refining & petrochemical manufacturing corridor
 - More infrastructure additions in the past (5) years
 - Cheaper chemical feedstocks, e.g. – ethylene/propylene

Harvey Impacts

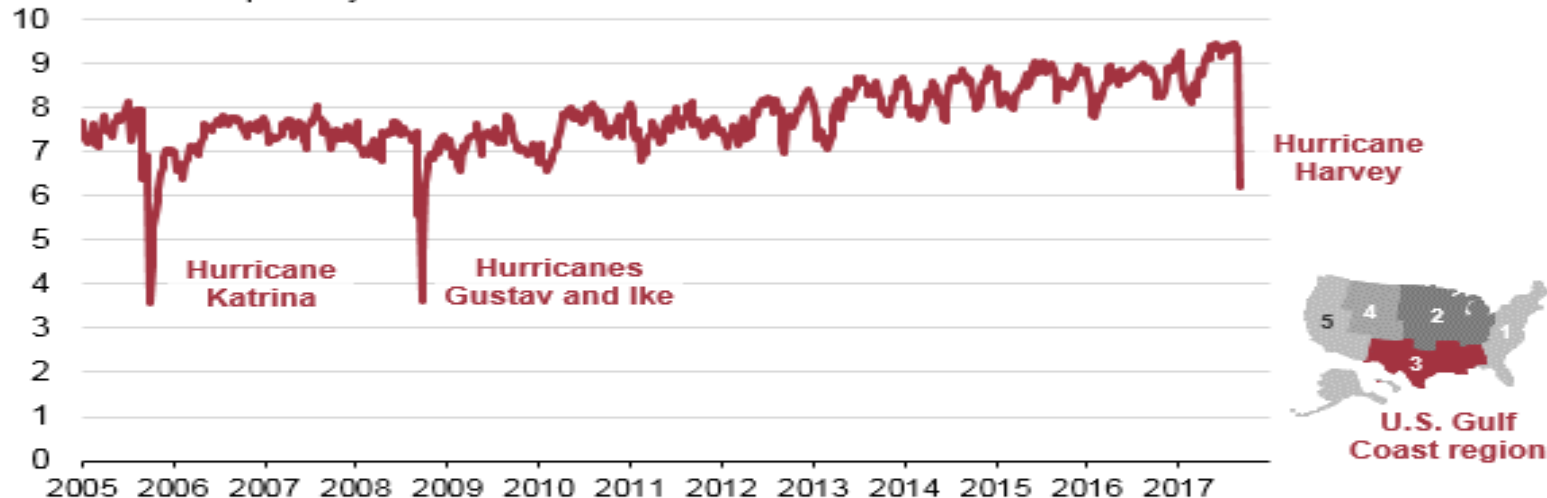
- Curtailments/Outages
 - -34% of refining capacity = 63% utilization
 - Colonial Pipeline (ETX to Northeast US)
 - Imports/Exports: Corpus Christi & Houston port closures – “stranded” vessels
 - Inventories: Crude increased/Distillates decreased
 - Petrochemical plants outages/exports halted

Harvey Impacts

SEPTEMBER 11, 2017

Hurricane Harvey caused U.S. Gulf Coast refinery runs to drop, gasoline prices to rise

Weekly gross inputs to U.S. Gulf Coast refineries (Jan 2005 - Sep 2017)
million barrels per day



Source: U.S. Energy Information Administration, [Weekly Petroleum Status Report](#)

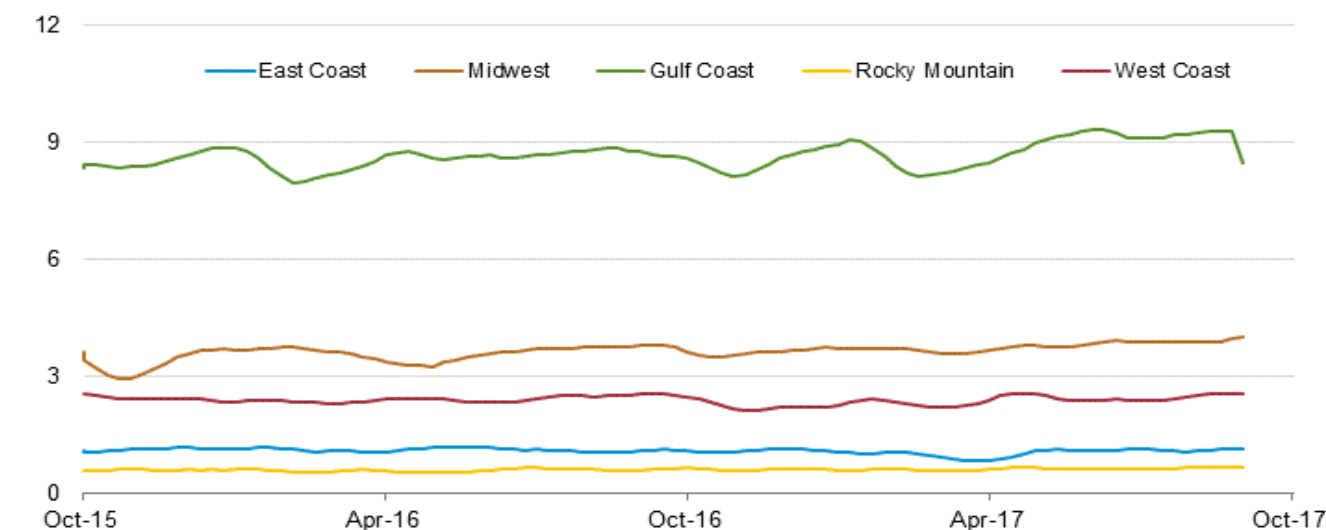
Hurricane Harvey caused substantial disruptions to crude oil and petroleum product supply chains and increased petroleum product prices. For the week ending September 1, 2017, gross inputs to refineries in the U.S. Gulf Coast fell by 3.2 million b/d, or 34%, from the previous week, the largest drop since Hurricanes Gustav and Ike in 2008. Weekly refinery utilization in the region fell from 96% to 63%, while other areas of the country remained virtually unchanged.

Just over half of all U.S. refinery capacity is located in the U.S. Gulf Coast (defined as [Petroleum Administration for Defense District 3](#)). Texas, where Harvey made landfall, represents 31% of all U.S. refinery capacity, based on [data from January 2017](#). These refineries supply petroleum products to domestic markets on the Gulf Coast, [East Coast](#), and [Midwest](#), as well as to international markets.

US Refinery Inputs - Regional

Crude oil refinery inputs (million barrels per day)

Regional crude oil refinery inputs 4-wk. Avg.
million barrels per day



Source: U.S. Energy Information Administration



U.S.

Regional

CRUDE OIL REFINERY INPUTS (million barrels per day)

[more refinery input data >](#)

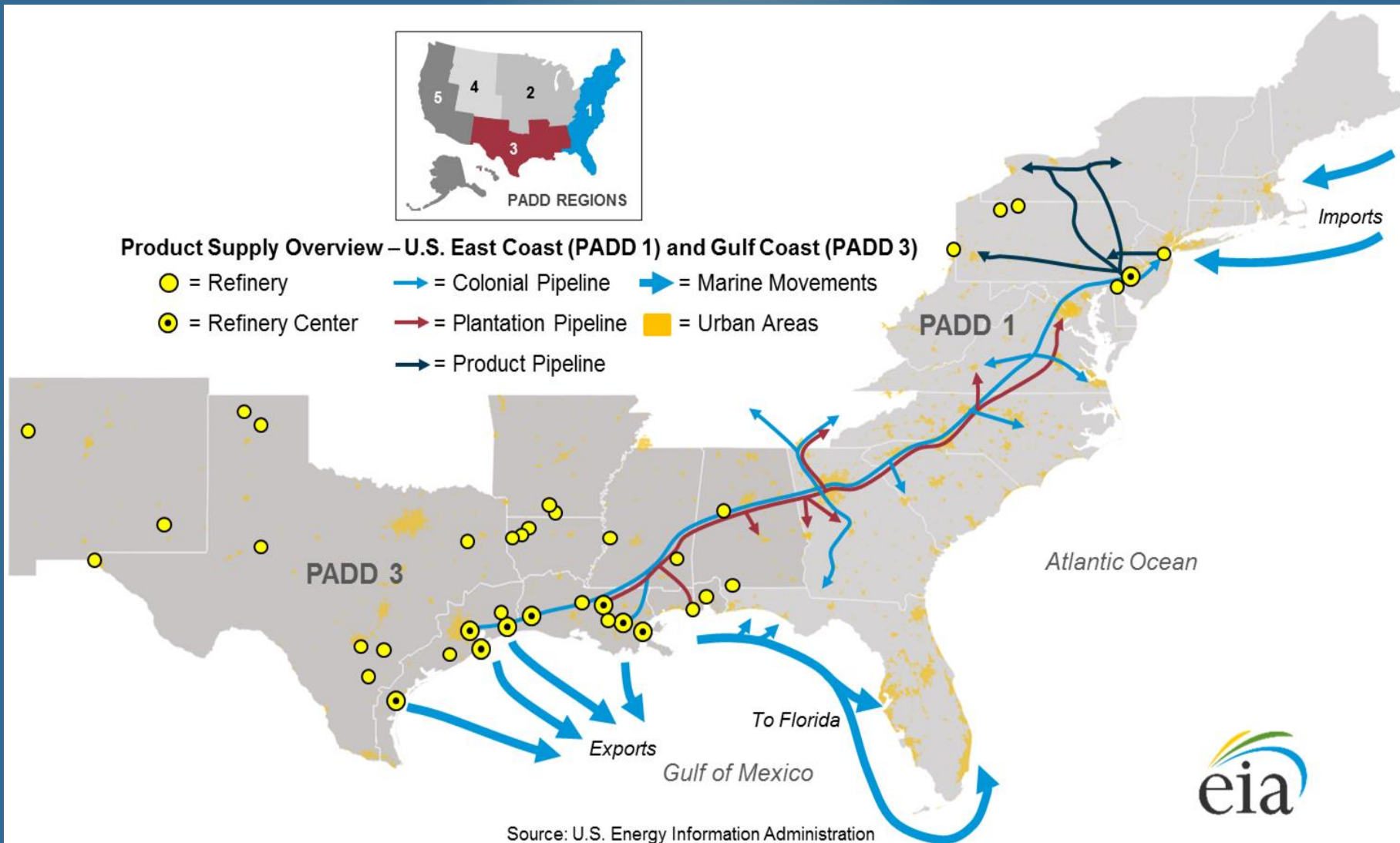
	Year ago	Four-week averages			Year ago	Week ending		
	09/02/16	09/01/17	08/25/17	08/18/17	09/02/16	09/01/17	08/25/17	08/18/17
U.S.	16.772	16.806	17.581	17.502	16.930	14.472	17.725	17.461
East Coast (PADD 1)	1.101	1.131	1.125	1.119	1.155	1.138	1.117	1.136
Midwest (PADD 2)	3.784	3.994	3.971	3.901	3.867	4.068	4.070	3.945
Gulf Coast (PADD 3)	8.748	8.451	9.263	9.260	8.745	6.026	9.293	9.164
Rocky Mountain (PADD 4)	0.595	0.658	0.657	0.653	0.618	0.680	0.682	0.635

PADD-3 Fuel Movements



Product Supply Overview – U.S. East Coast (PADD 1) and Gulf Coast (PADD 3)

- = Refinery
- = Refinery Center
- = Colonial Pipeline
- = Plantation Pipeline
- = Product Pipeline
- = Marine Movements
- = Urban Areas



Source: U.S. Energy Information Administration

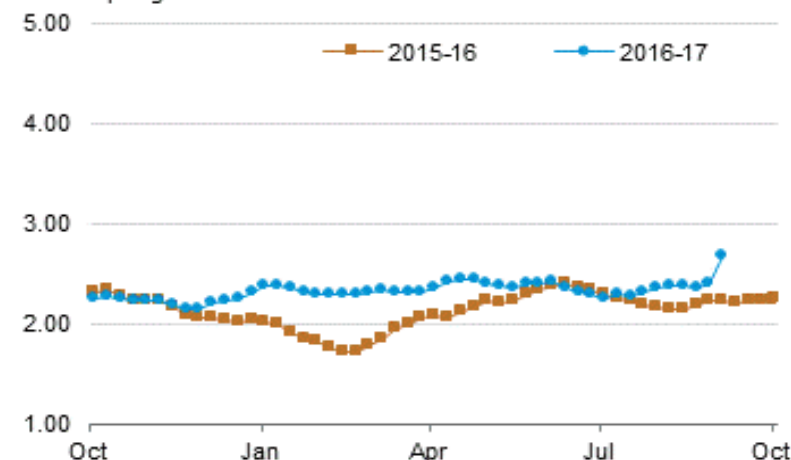
Harvey Impacts

■ Prices

Retail prices (dollars per gallon)

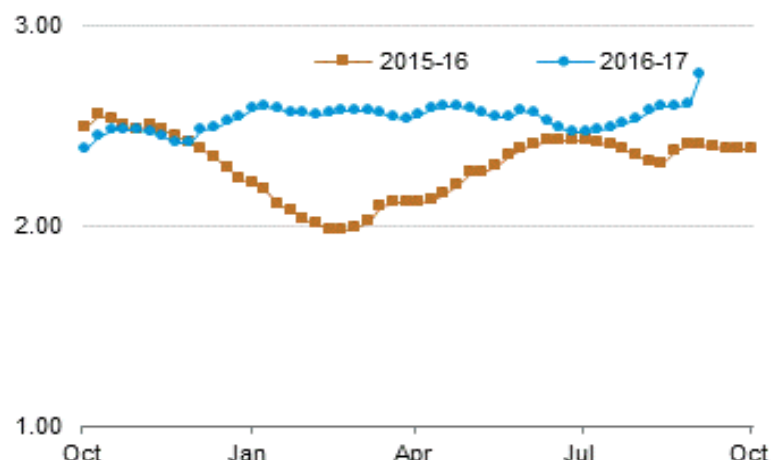
U.S. regular gasoline prices

dollars per gallon



U.S. on-highway diesel fuel prices

dollars per gallon



Retail prices Change from last

09/04/17

Week

Year

Gasoline 2.679 0.280 ↑ 0.456 ↑

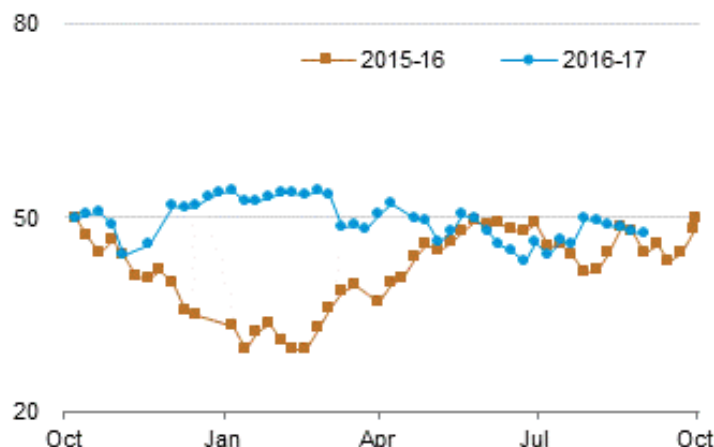
Diesel 2.758 0.153 ↑ 0.351 ↑

Harvey Impacts

■ Prices

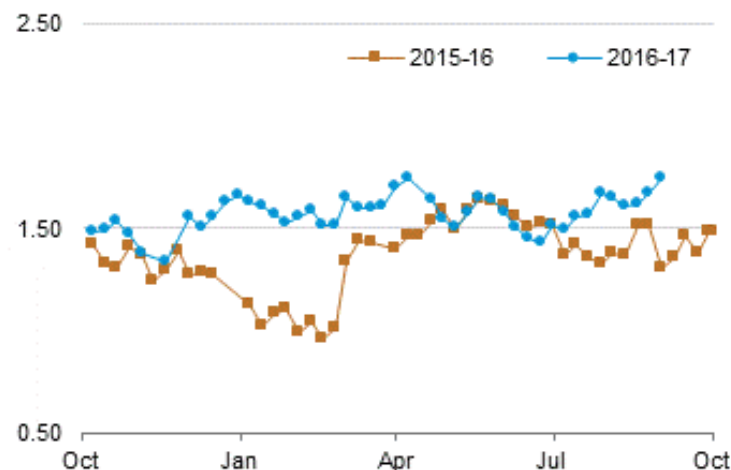
Futures prices (dollars per gallon*)

Crude oil futures price contract 1
dollars per barrel



Source: U.S. Energy Information Administration, New York Mercantile Exchange (NYMEX)

RBOB gasoline futures price contract 1
dollars per gallon



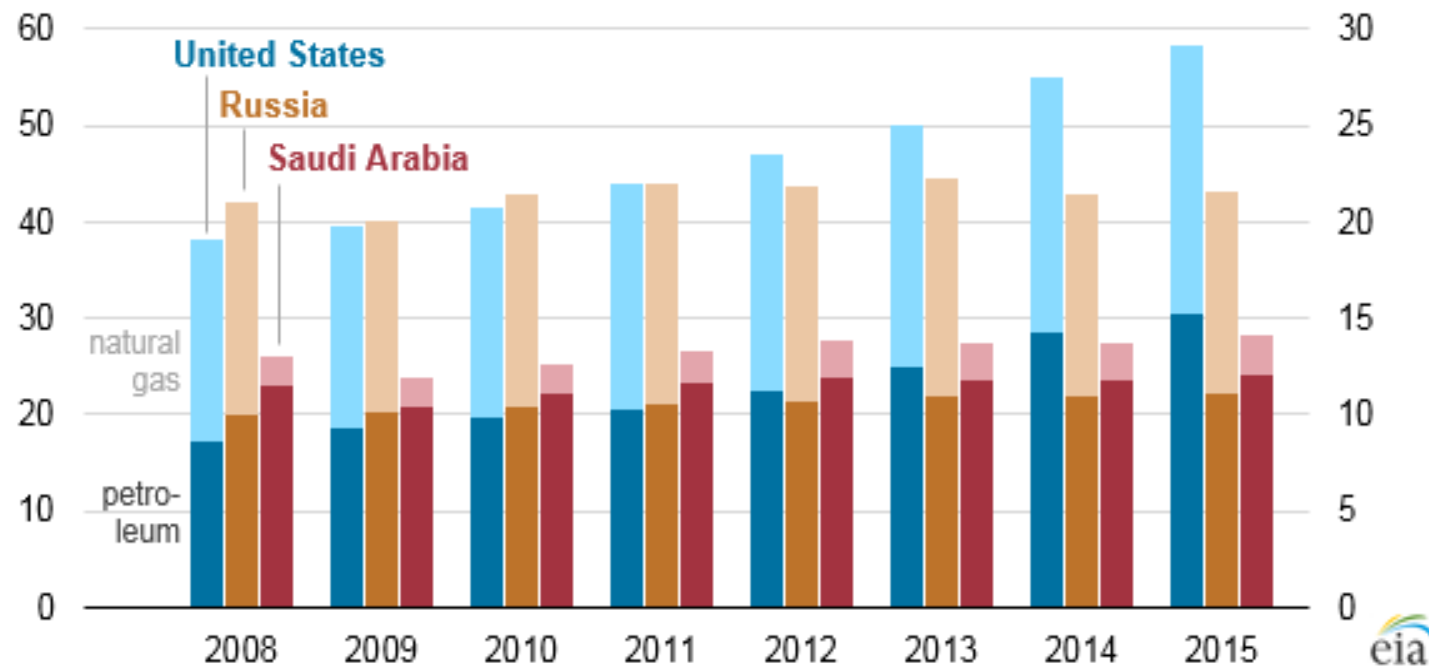
Source: U.S. Energy Information Administration, Thomson Reuters

	Futures prices	Change from last	
	09/01/17	Week	Year
Crude oil	47.29	-0.58 ▼	2.85 ▲
Gasoline	1.748	0.081 ▲	0.446 ▲
Heating oil	1.747	0.125 ▲	0.337 ▲

*Note: Crude oil price in dollars per barrel.

United States remains largest producer of petroleum and natural gas hydrocarbons

Estimated petroleum and natural gas hydrocarbon production in selected countries
 quadrillion British thermal units million barrels per day of oil equivalent



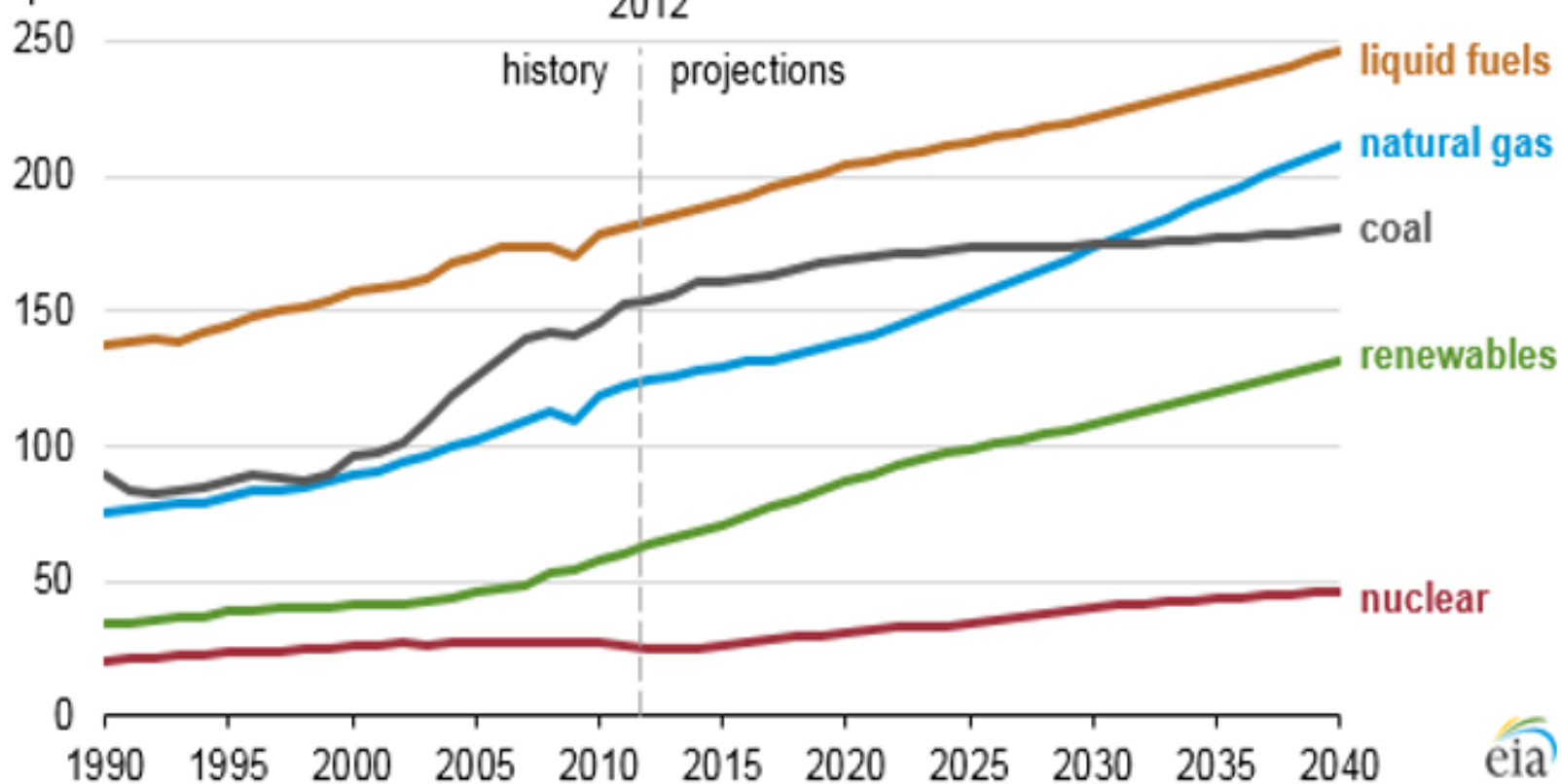
Source: U.S. Energy Information Administration

The United States remained the world's top producer of petroleum and natural gas hydrocarbons in 2015, according to U.S. Energy Information Administration estimates. U.S. petroleum and natural gas production first surpassed Russia in 2012, and the United States has been the world's top producer of natural gas since 2011 and the world's top producer of petroleum hydrocarbons since 2013.

EIA projects 48% increase in world energy consumption by 2040

World energy consumption by source, 1990-2040

quadrillion Btu



Source: U.S. Energy Information Administration, [International Energy Outlook 2016](#)

Global Crude Oil

- Supply growth: +4.1 mb/d 2016 – 2021
(vs. +11.0 2009 – 2015)
- Lower capex: -24% 2016; -17% 2017
- Demand growth: 1.2 mb/d per annum
through 2021
 - Est total = 100 million Bbld by 2020
 - India/China/Asia

Crude Exportation

- Energy Policy & Conservation Act – 1975
 - No exact definition of “crude”
 - Implies anything after the “still” is not crude
 - Loophole which qualified *processed* condensate
 - 07/14: Enterprise & Pioneer export condensate
- 12/18/15: Ban lifted – exporting starts
 - 12/31/15: *Theo T* leaves Corpus Christi (NuStar)
 - 01/20/16 - Arrives in Marseille, France
 - 01/01/16: *Seaqueen* leaves Port of Houston (EPP)
 - 01/21/16 – Arrives in Rotterdam, The Netherlands
 - 01/09/16: *Angelica Schulte* leaves Port of Houston
 - 01/31/16 - Arrives in Marseille, France

First Crude Oil Shipment in 40 Years Sails From U.S.

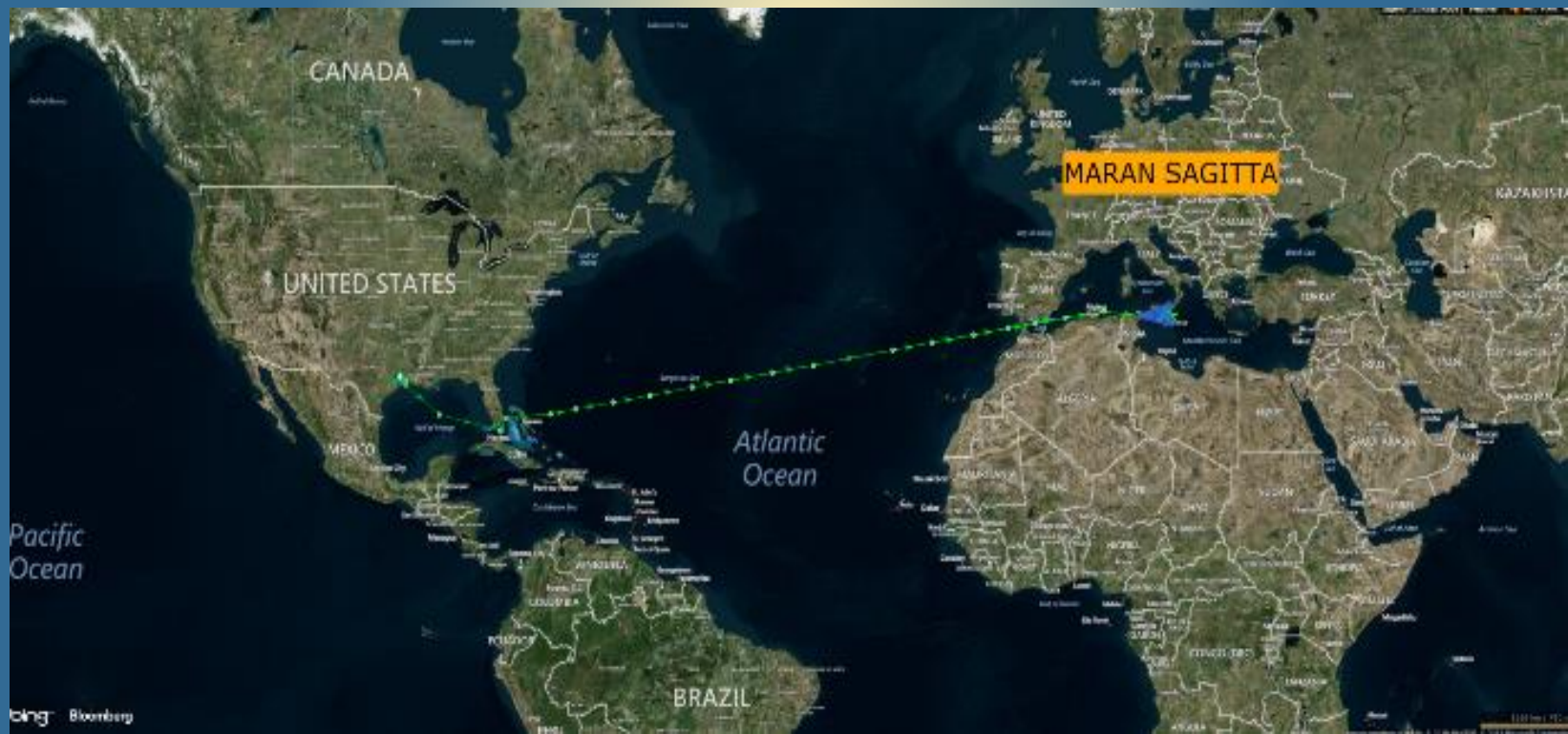


Tanker Theo T departing (courtesy Port of Corpus Christi)

12/31/15: Bahamian Vessel, *Theo T*, leaves The Port of Corpus Christi with a load of Conoco-Phillips crude oil bound for Italy. Corpus Christi has 1.0 million Bbld of offloading capability.

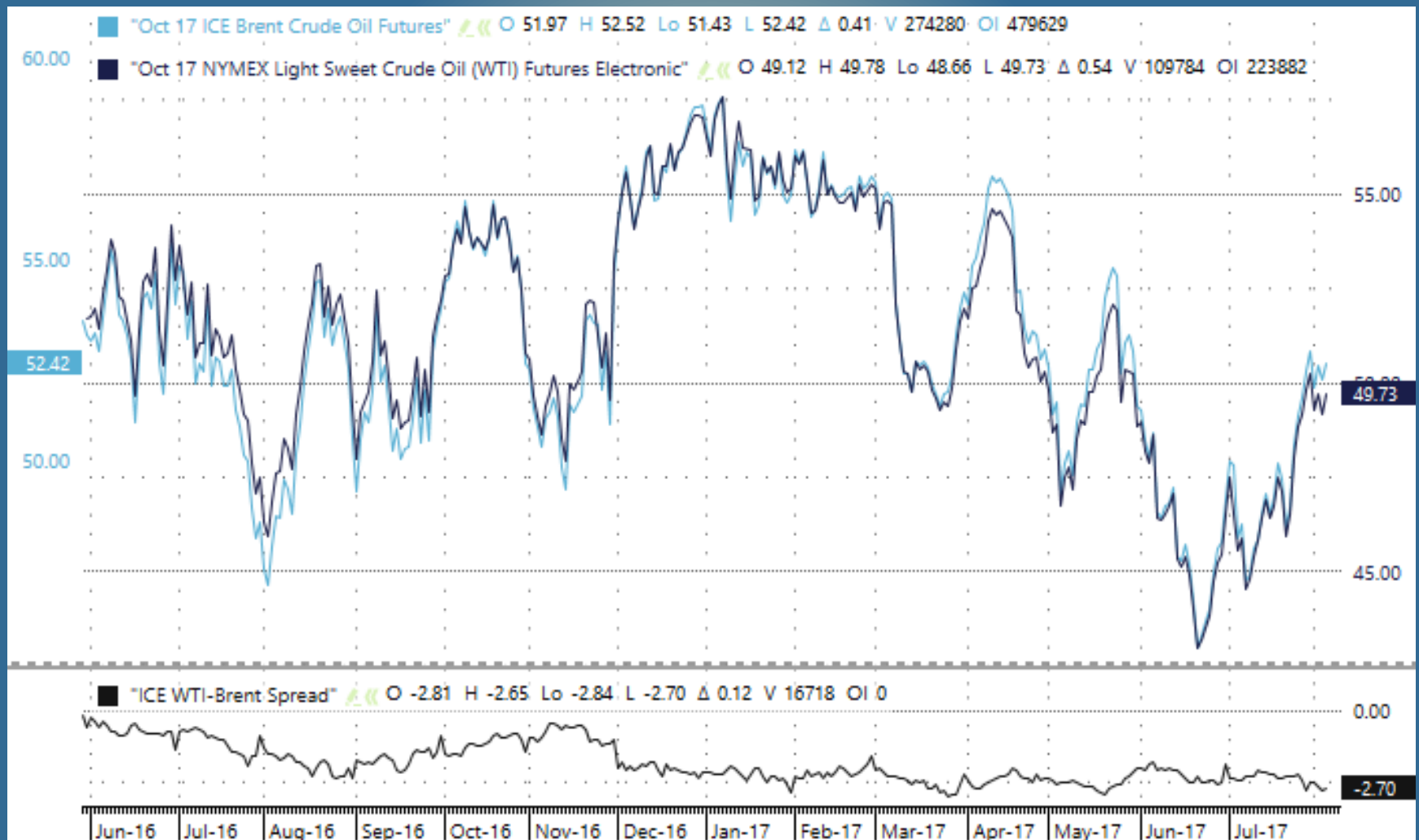
Exxon-Mobil

- 02/2016 – 1st US major oil company to export crude
 - *Maran Sagitta* leaves Beaumont, TX
 - 03/2016: arrives in Italy



Pricing Implications

Brent vs. WTI



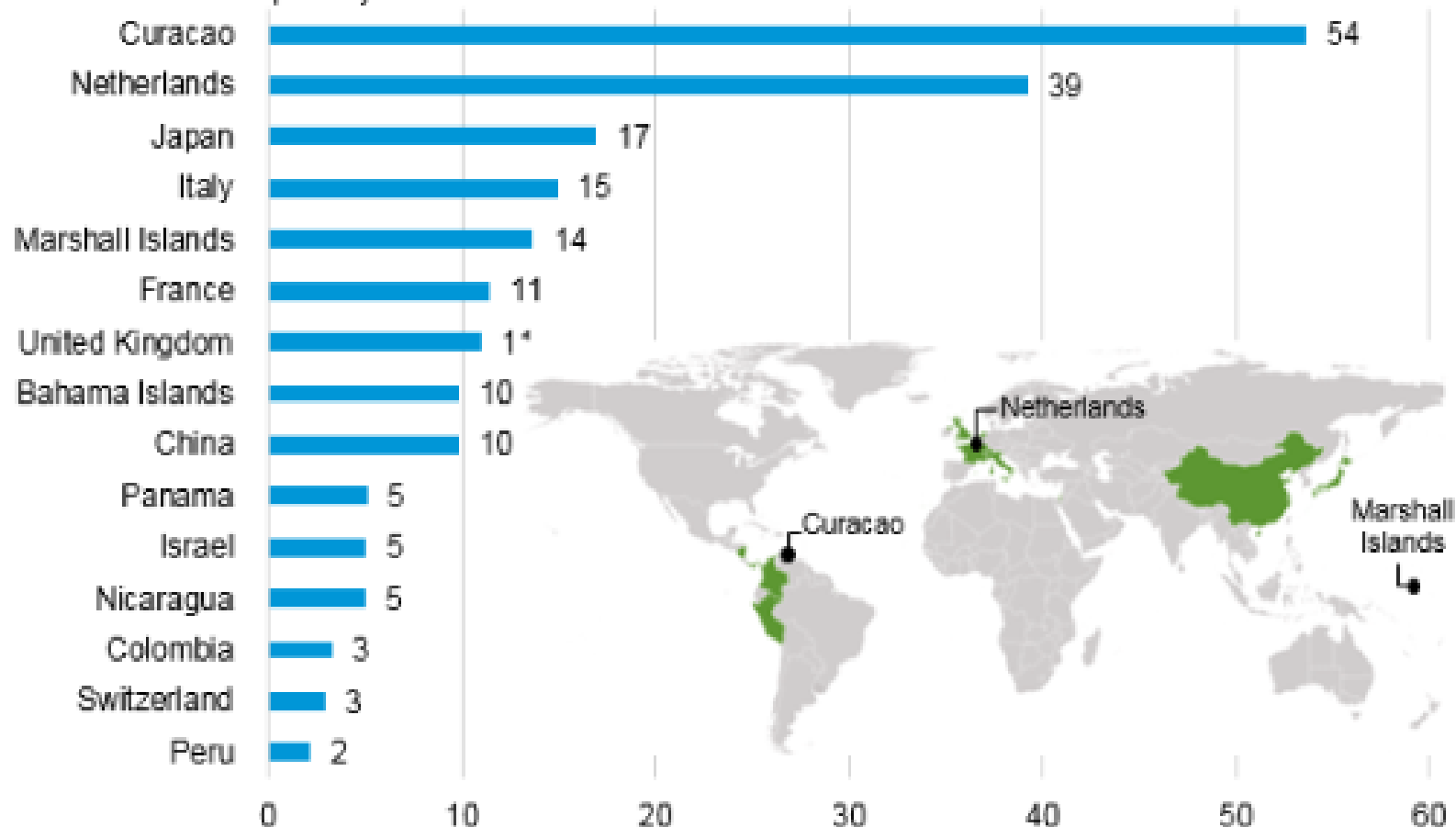
US Oil Export Issues

- Transport costs
 - WTI needs to be (\$2.50 - \$3.00) less than Brent to make exportation economical, esp., to Asia
 - Shipments going to Latin America, Europe primarily
- Infrastructure
 - “re-purposing” terminal facilities (unloading vs. loading)
 - Magellan Midstream & Enterprise Products Partners
 - Expansion projects – storage, pipelines, loading terminals
 - Corpus Christi/East Houston/Brownsville
 - Can’t load “VLCCs” at this time.
 - Can’t dock them.
 - 600 million Bbl/d max loading rates except for Corpus Christi
 - Major pipeline re-configurations & new projects
 - Move more domestic crude to export terminals.

**Figure 3. U.S. Crude oil exports January through May 2016
(excludes Canada)**



thousand barrels per day



Source: U.S. Energy Information Administration

US Exports of Crude Oil

Weekly Imports & Exports

[Download](#)

Mbbbl/d

1,500

1,250

1,000

750

500

250

Jul '14

Jan '15

Jul '15

Jan '16

Jul '16

Jan '17

Jul '17

[Reset zoom](#)

— U.S. Exports of Crude Oil

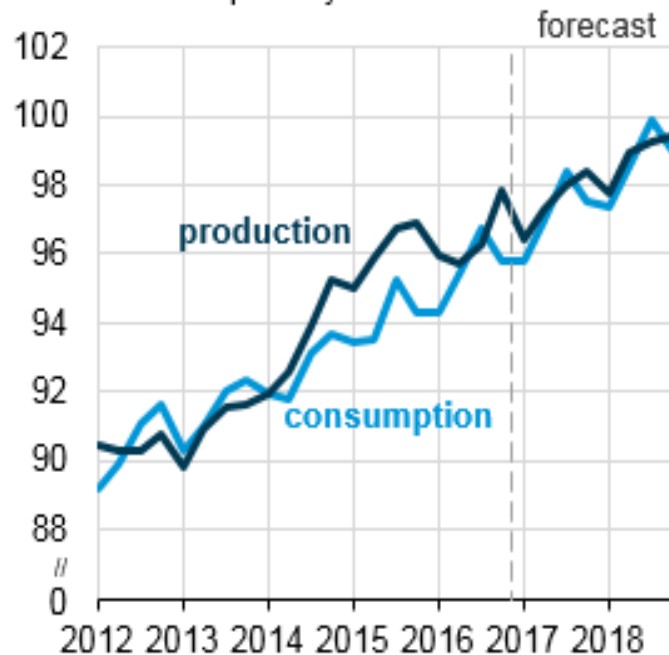


Source: U.S. Energy Information Administration

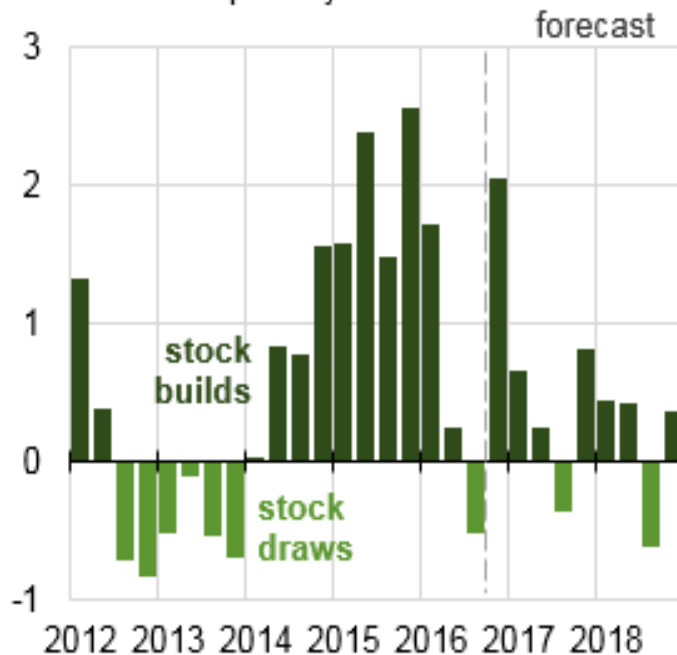
Global crude oil balances expected to tighten through 2018

World liquid fuels production and consumption balance

million barrels per day



million barrels per day



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, January 2017

EIA estimates that crude oil and other liquids inventories grew by 2.0 million barrels per day (b/d) in the fourth quarter of 2016, driven by an increase in production and a significant, but seasonal, drop in consumption. Global production and consumption are both projected to increase through 2018, but consumption is expected to increase at a faster rate than production. As a result, global balances are expected to tighten.

Exports of Refined Products

Weekly Imports & Exports

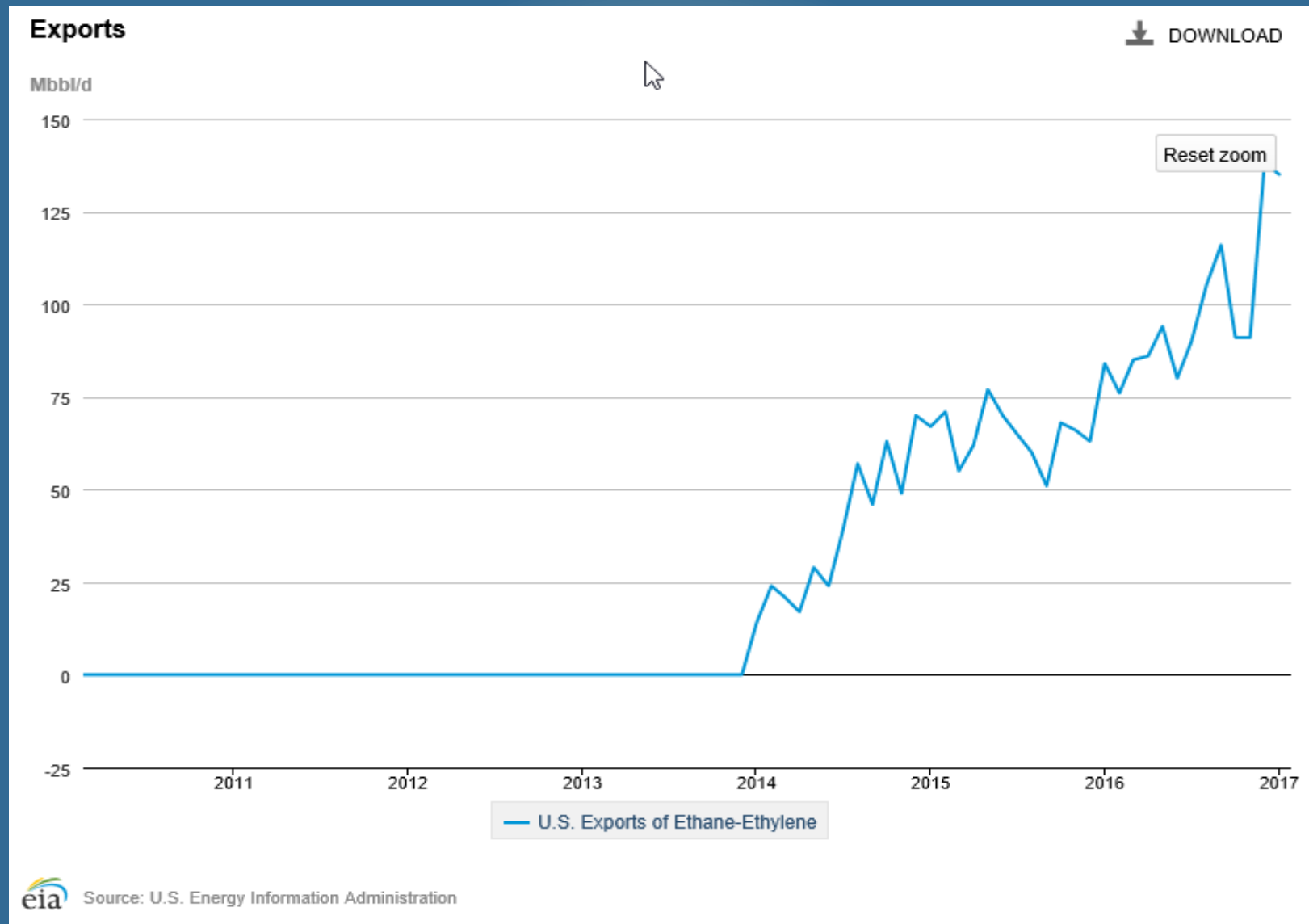
[Download](#)

Mbbbl/d

[Reset zoom](#)

— U.S. Exports of Total Petroleum Products

Exportation of Natural Gas Liquids



JS INEOS Intrepid prepares to load first ethane cargo at Morgan's Point export terminal



Source: Image courtesy of Enterprise Products Partners L.P.

The first ethane shipment out of Enterprise Products Partners' (EPP) new export terminal in Morgan's Point, Texas, is preparing to set sail for Norway.

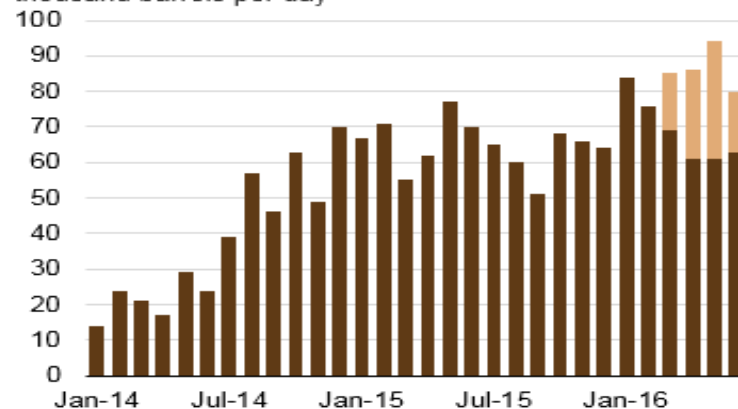
The terminal, located on the Houston Ship Channel, is the second to open in the United States, and has an export capacity of up to 200,000 barrels of liquefied ethane per day, of which about 90% is contracted.

The United States' first export terminal, at Marcus Hook, Pennsylvania, has been shipping ethane cargoes since March of last year.

Ethane cargoes from the United States are used as feedstock in European ethylene crackers.

First shipment of ethane from U.S. Gulf Coast arrives in Europe

U.S. exports of ethane (January 2014 - June 2016)
thousand barrels per day



marine exports
pipeline exports

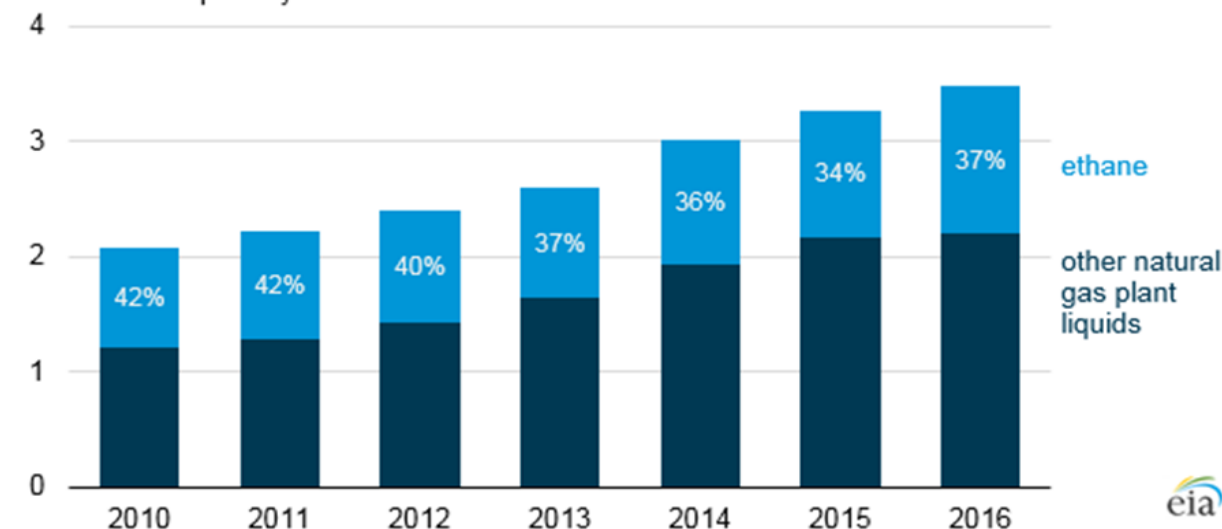


Source: U.S. Energy Information Administration, *Natural Gas Monthly*

Increased production of ethane in the United States has led to increased ethane exports, first by [pipeline to Canada](#) and more recently by tanker to overseas destinations. Ethane is used domestically and internationally as a key feedstock for plastics production and other industrial uses.

Production of ethane and other natural gas plant liquids (2010-16)

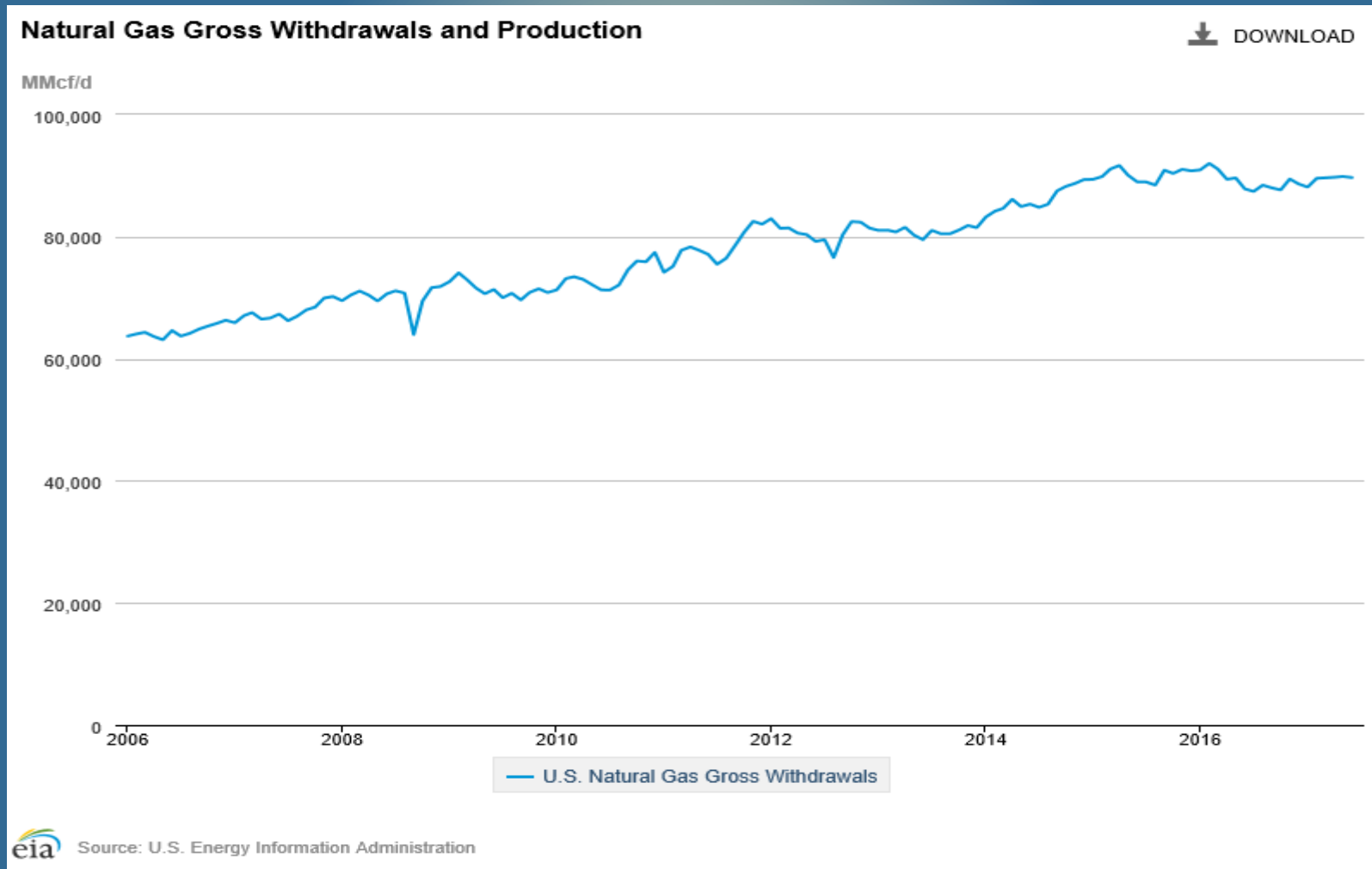
million barrels per day



Source: U.S. Energy Information Administration, *Natural Gas Monthly*

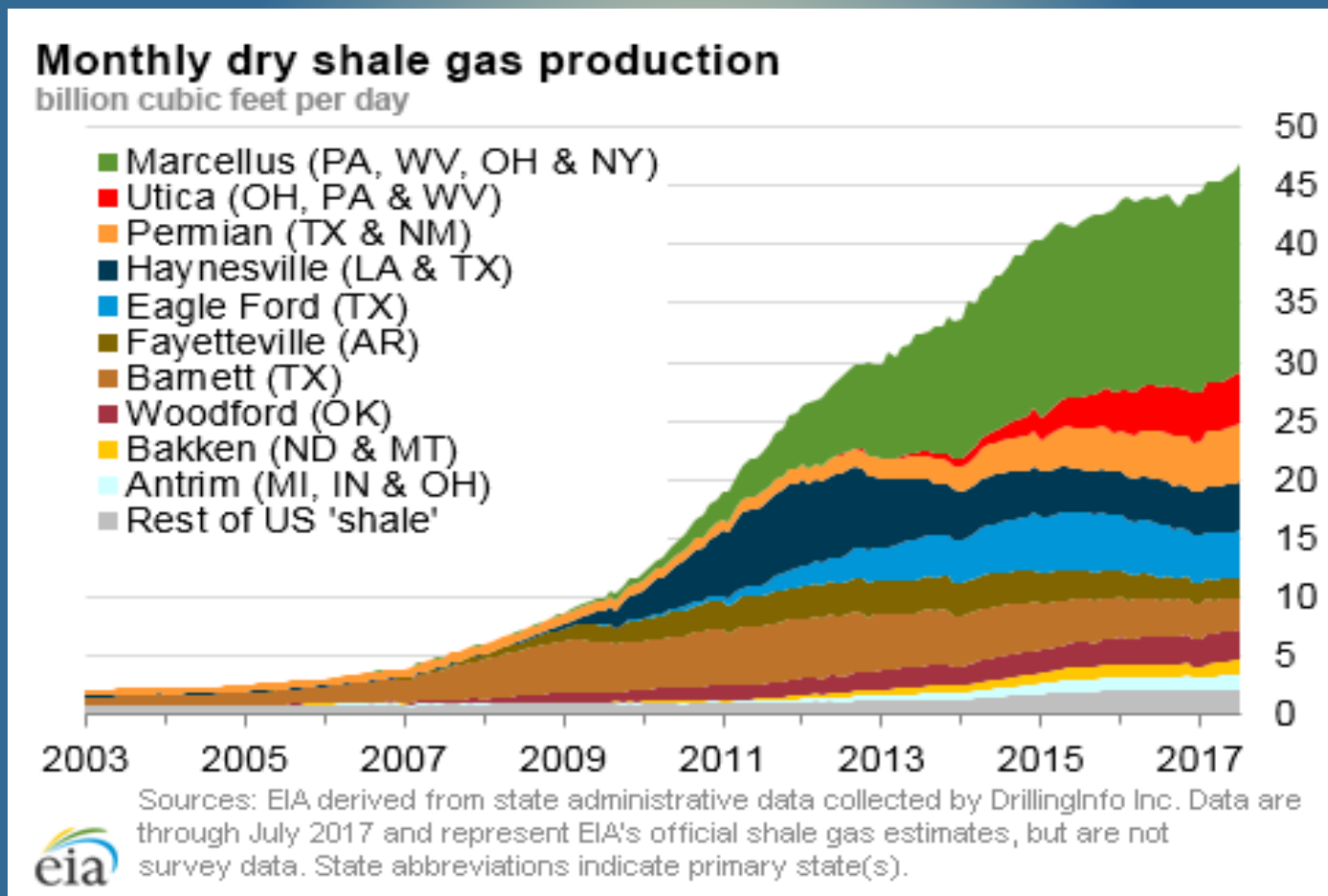
Natural Gas Supply

- Gross Production ~ 90 MMcfd

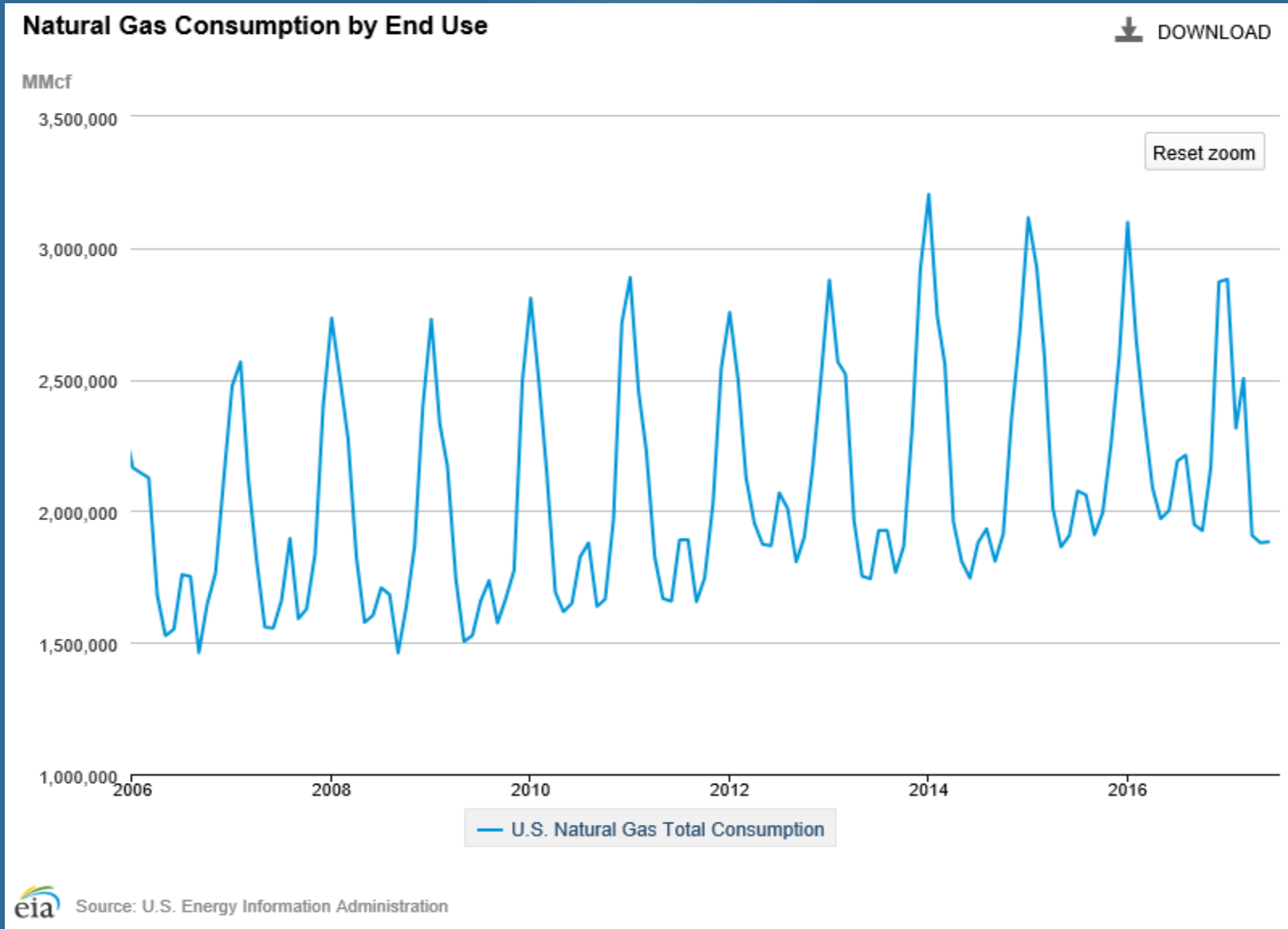


Natural Gas Supply

- Shale gas continues to increase:



Natural Gas Consumption

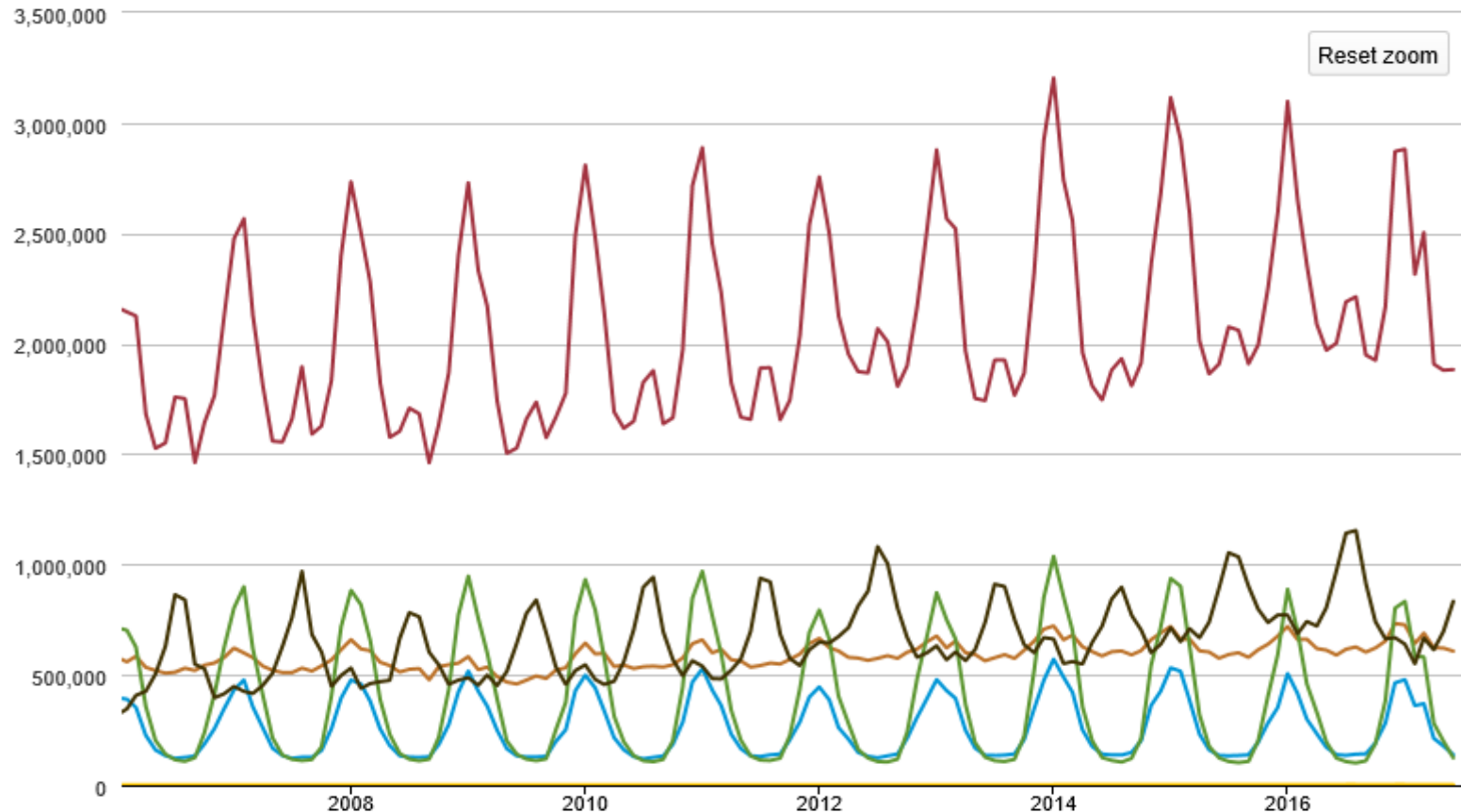


Natural Gas Consumption by Type

Natural Gas Consumption by End Use

DOWNLOAD

MMcf




— Natural Gas Deliveries to Commercial Consumers (Including Vehicle Fuel through 1996) in the U.S.
 — U.S. Natural Gas Industrial Consumption — U.S. Natural Gas Residential Consumption — U.S. Natural Gas Vehicle Fuel Consumption
 — U.S. Natural Gas Total Consumption — U.S. Natural Gas Deliveries to Electric Power Consumers

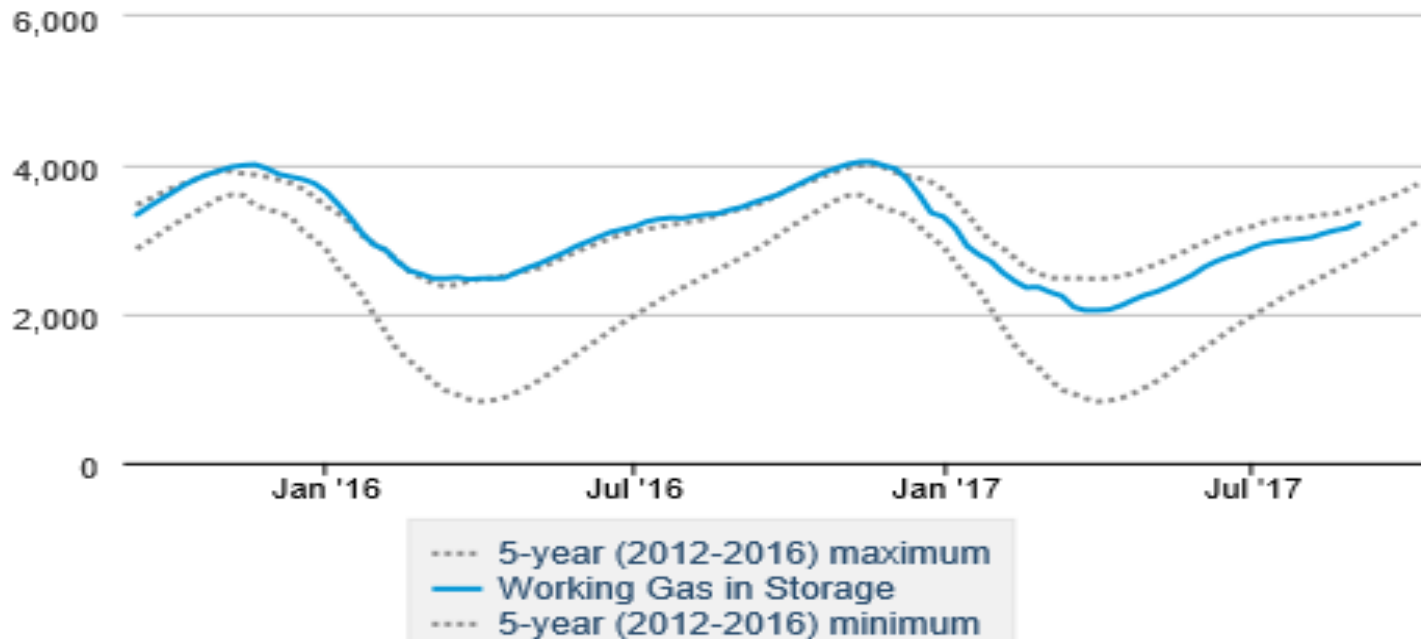
Source: U.S. Energy Information Administration

Natural Gas Inventory

Working natural gas in underground storage

 [DOWNLOAD](#)

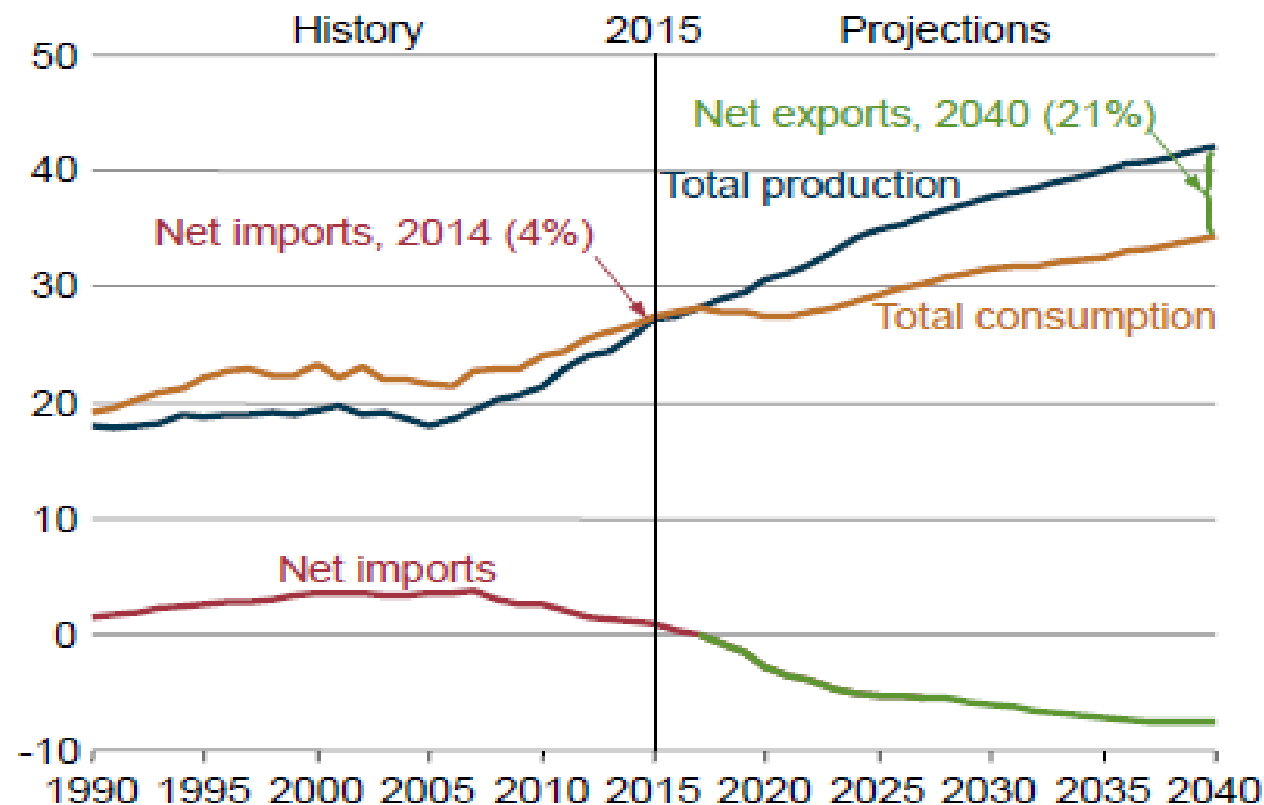
billion cubic feet



Source: Form EIA-912, "Weekly Underground Natural Gas Storage Report"

Ample natural gas supply is adequate to meet growth in both export and domestic markets

Figure MT-43. Natural gas production, consumption, and net imports and exports in the Reference case, 1990–2040 (trillion cubic feet)

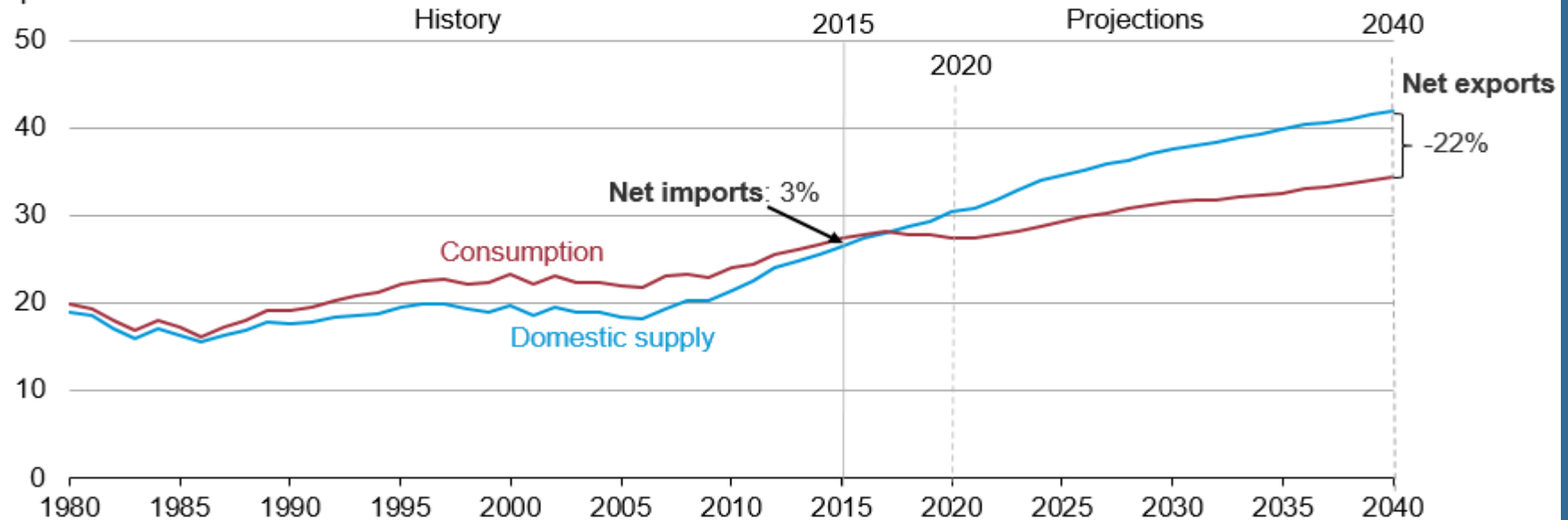


Natural Gas Exports

U.S. natural gas production will soon exceed consumption, making the United States a net exporter

U.S. energy production and consumption

quadrillion Btu

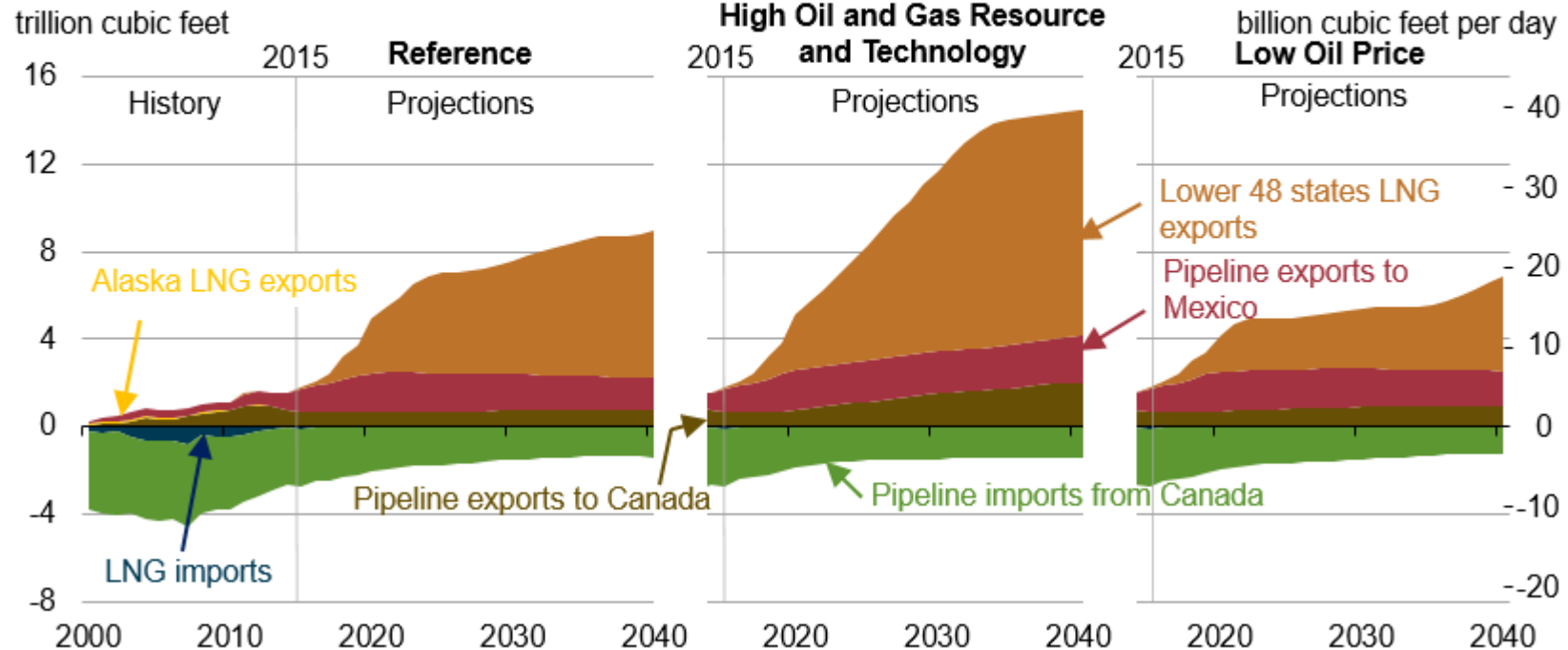


Source: EIA, Annual Energy Outlook 2016

- LNG \approx 2.0 Bcf/day (Cheniere – Sabine River Pass, LA)
- Mexico \approx 4.0 Bcf/day (2018 Projection \approx 8.0 Bcf/day)

Projected U.S. natural gas exports reflect the spread between domestic natural gas prices and world energy prices

U.S. natural gas imports and exports



Source: EIA, Annual Energy Outlook 2016

LNG Exports

- *Liquefied Natural Gas*
 - Liquefaction - natural gas cooled to -260 Degrees Fahrenheit
 - This reduces the volume by over 600 times making transportation & storage easier.
 - 1 ton of LNG = 47 MMBtu
 - One ocean-going tanker = ~ 3.0 Bcf natural gas
 - Re-gasification
 - Heat-up gas for pipeline transportation

LNG Exports

- Kenai, AK
 - Conoco-Phillips Liquefaction/Export terminal
 - 200K MMBtu/day capacity
- “Virtual” exports *aka*, “re-exports”
 - US to Mexico: LNG delivered by truck
 - Re-sale of tanker loads bound for US
 - Re-sale of stored LNG

North American LNG Import/Export Terminals Approved



Import Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC

1. Corpus Christi, TX: 0.4 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)

APPROVED – NOT UNDER CONSTRUCTION - FERC

2. Salinas, PR: 0.6 Bcfd (Aguirre Offshore GasPort, LLC) (CP13-193)

APPROVED - NOT UNDER CONSTRUCTION - MARAD/Coast Guard

3. Gulf of Mexico: 1.0 Bcfd (Main Pass McMoran Exp.)
4. Gulf of Mexico: 1.4 Bcfd (TORP Technology-Bienville LNG)

Export Terminals

U.S.

APPROVED - UNDER CONSTRUCTION - FERC

5. Sabine, LA: 0.7 Bcfd (Cheniere/Sabine Pass LNG) (CP11-72 & CP14-12)
6. Hackberry, LA: 2.1 Bcfd (Semptra–Cameron LNG) (CP13-25)
7. Freeport, TX: 2.14 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction) (CP12-509) (CP15-518)
8. Cove Point, MD: 0.82 Bcfd (Dominion–Cove Point LNG) (CP13-113)
9. Corpus Christi, TX: 2.14 Bcfd (Cheniere – Corpus Christi LNG) (CP12-507)
10. Sabine Pass, LA: 1.40 Bcfd (Sabine Pass Liquefaction) (CP13-552) ★
11. Elba Island, GA: 0.35 Bcfd (Southern LNG Company) (CP14-103)

APPROVED – NOT UNDER CONSTRUCTION - FERC

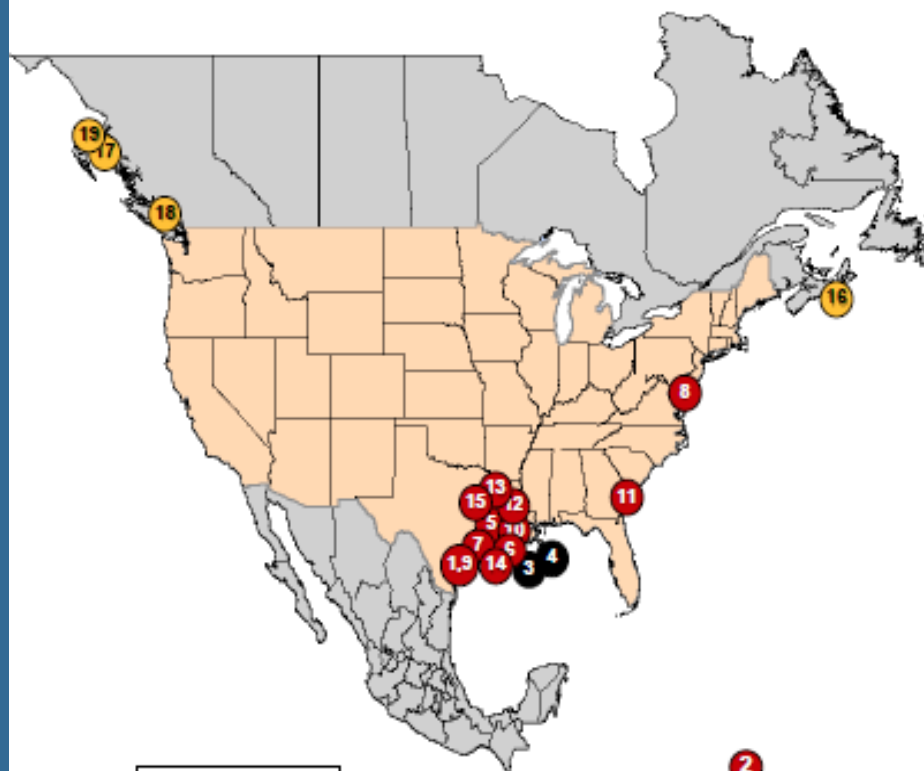
12. Lake Charles, LA: 2.2 Bcfd (Southern Union – Lake Charles LNG) (CP14-120)
13. Lake Charles, LA: 1.08 Bcfd (Magnolia LNG) (CP14-347)
14. Hackberry, LA: 1.41 Bcfd (Semptra - Cameron LNG) (CP15-560)
15. Sabine Pass, TX: 2.1 Bcfd (ExxonMobil – Golden Pass) (CP14-517)

Canada

APPROVED – NOT UNDER CONSTRUCTION

16. Port Hawkesbury, NS: 0.5 Bcfd (Bear Head LNG)
17. Kitimat, BC: 3.23 Bcfd (LNG Canada)
18. Squamish, BC: 0.29 Bcfd (Woodfibre LNG Ltd)
19. Prince Rupert Island, BC: 2.74 Bcfd (Pacific Northwest LNG)

★ Trains 5 & 6 with Train 5 under construction



US Jurisdiction

● FERC

● MARAD/USCG

As of May 1, 2017

Cheniere Energy, Inc.

Sabine Pass Liquefaction Facility



Cheniere – Sabine Pass LNG facility

- (2) initial liquefaction trains
- (4) additional by 2017
- Initial capacity = 1.5 Bcfd
- Design capacity = 4.0 Bcfd
- 02/24/16: First LNG shipment heads for Brazil
 - *Asia Vision* \approx 3.0 Bcf
 - US “net” exporter for a day (LNG/Canada/Mexico)



Loading of the first cargo at the Sabine Pass LNG Terminal - February 2016

National Natural Gas Market Overview: World LNG Landed Prices

Federal Energy Regulatory Commission • Market Oversight • www.ferc.gov/oversight

World LNG Estimated Landed Prices: Jul-17



Source: Waterborne Energy, Inc. Data in \$/MMBtu.

Note: Includes information and Data supplied by IHS Global Inc. and its affiliates ("IHS"); Copyright (publication year) all rights reserved. Prices are the monthly average of the weekly landed prices for the listed month. Landed prices are based on a netback calculation.

Updated: Aug-17

Questions?