



Refining Trends and Outlook

Presented by:
Greg Kohn, P.E., ASA

March 7, 2018
www.ryan.com

**2018 TXOGA PROPERTY
TAX REPRESENTATIVES
ANNUAL CONFERENCE**

TXOGA
TEXAS OIL & GAS ASSOCIATION | SINCE 1919



Agenda

- **Hurricane Harvey**
- **Tax Cuts and Jobs Act of 2017**
- **Current Refining Trends**
- **Refining Tailwinds**
- **Refining Headwinds**



Hurricane Harvey



Ryan

Hurricane Harvey

- **Hurricanes typically destroy demand**
- **Harvey destroyed demand and supply**
- **40% of U.S. Refining Capacity was impacted**
- **Pipelines, Ports, Rail, Utilities and other Infrastructure**
- **Workforce**

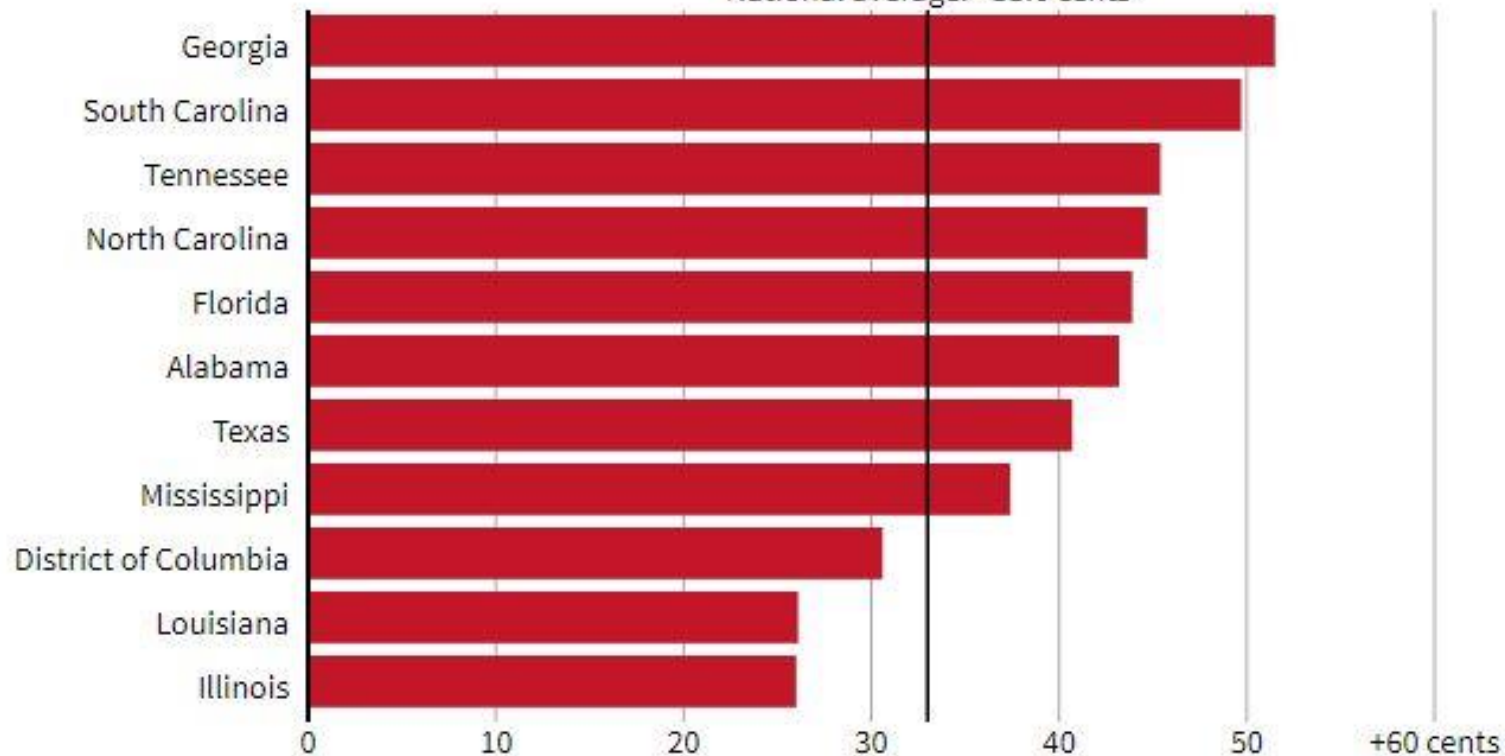


Hurricane Harvey

Rising Gas Prices

****change in gas prices since August 2017***

National average: +33.0 cents

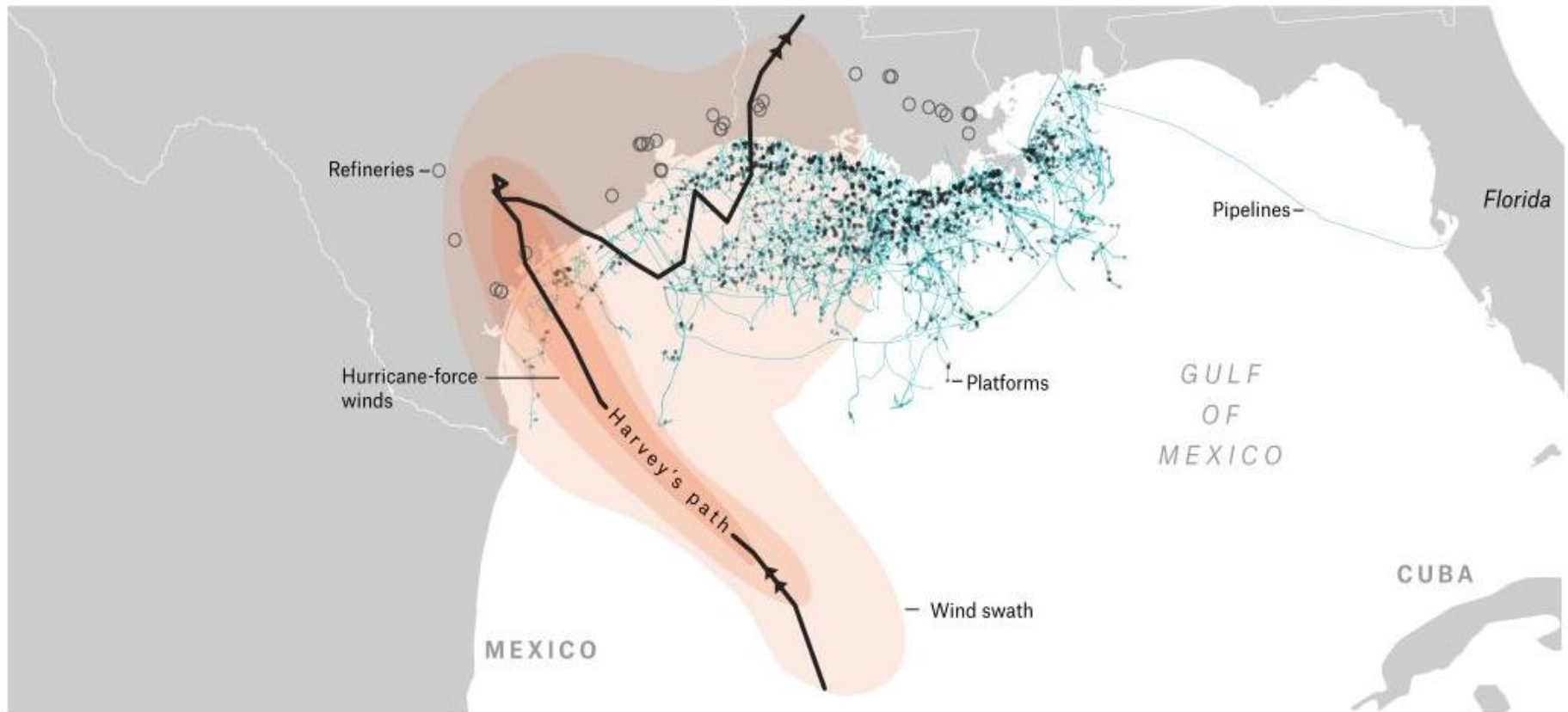


Sources: Reuters, updated on September 8, 2017



Hurricane Harvey

Gulf Oil Infrastructure After Harvey



Sources: NOAA's National Hurricane Center, Bureau of Ocean Energy Management, Energy Information Administration, FiveThirtyEight



Hurricane Harvey

Gulf Oil Infrastructure After Harvey



Sources: Reuters, updated on September 8, 2017



Tax Cuts & Job Acts of 2017



Ryan

Tax Cuts and Jobs Act of 2017

- **Corporate Tax Rate – lowered from 35% to 21%**
- **Expense new investment**
- **Competitive tax rate that aligns with global competition**
- **Expand US growth**



Current Refining Trends



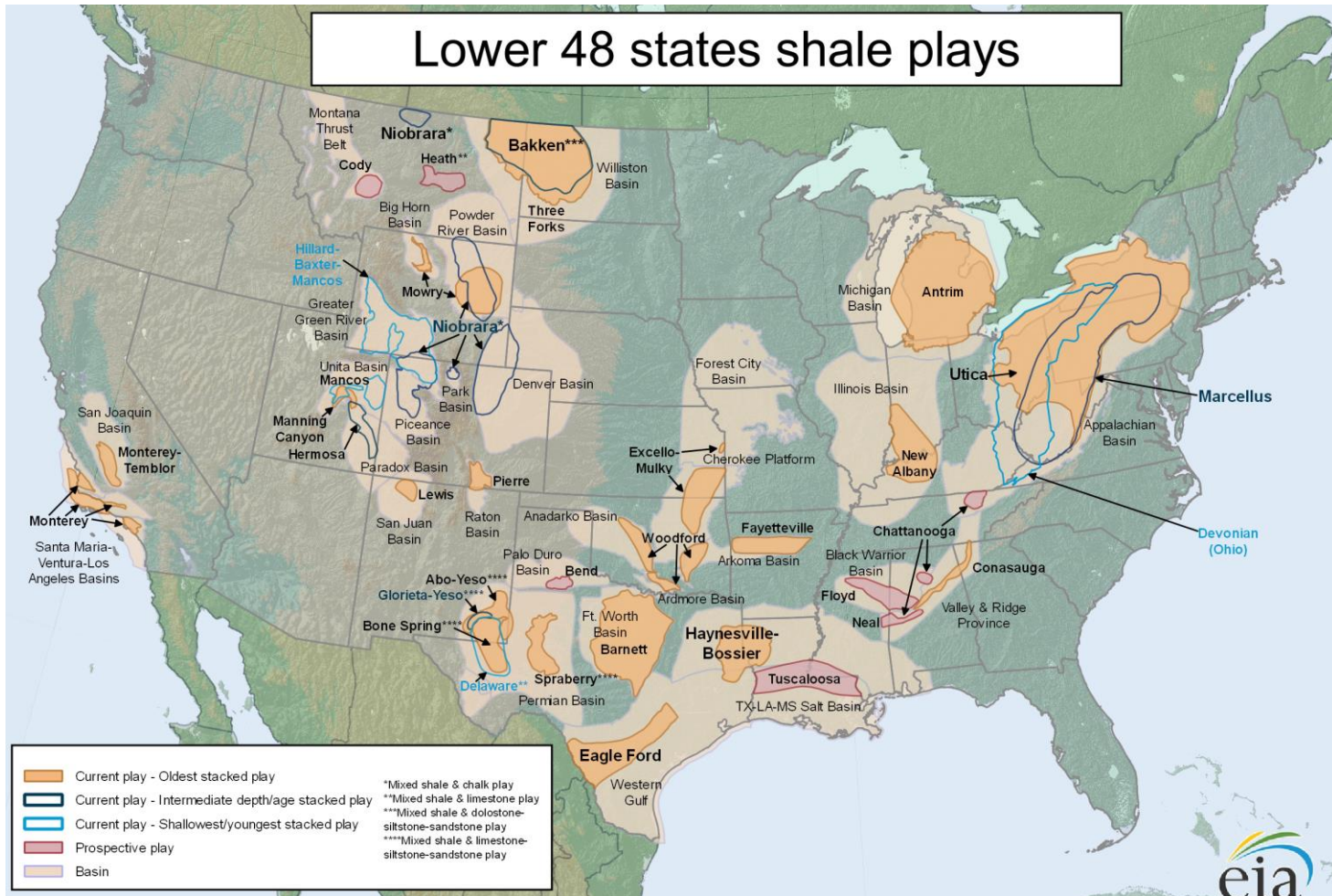
Current Refining Trends

- **Light crude oil processing**
- **Reduced imports of crude oil**
- **U.S. exporter of refined products**
- **Chemical Industry Update**
- **Marketplace**





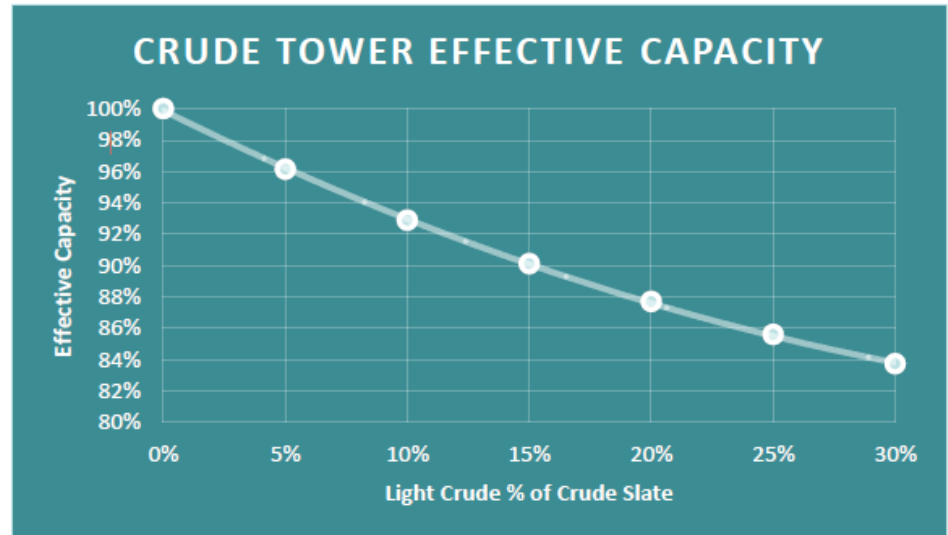
Current Refining Trends





U.S. Light Oil Refining Infrastructure

- **Heavy crude oil refineries cannot easily process light crudes like WTI**
- **Significant impact on effective refinery capacity as light crude oil is increased**
- **Capital investment can be significant to overcome bottlenecks**
- **Fouling of equipment and increased operating expenses**





U.S. Light Oil Refining Infrastructure

Condensate Splitters

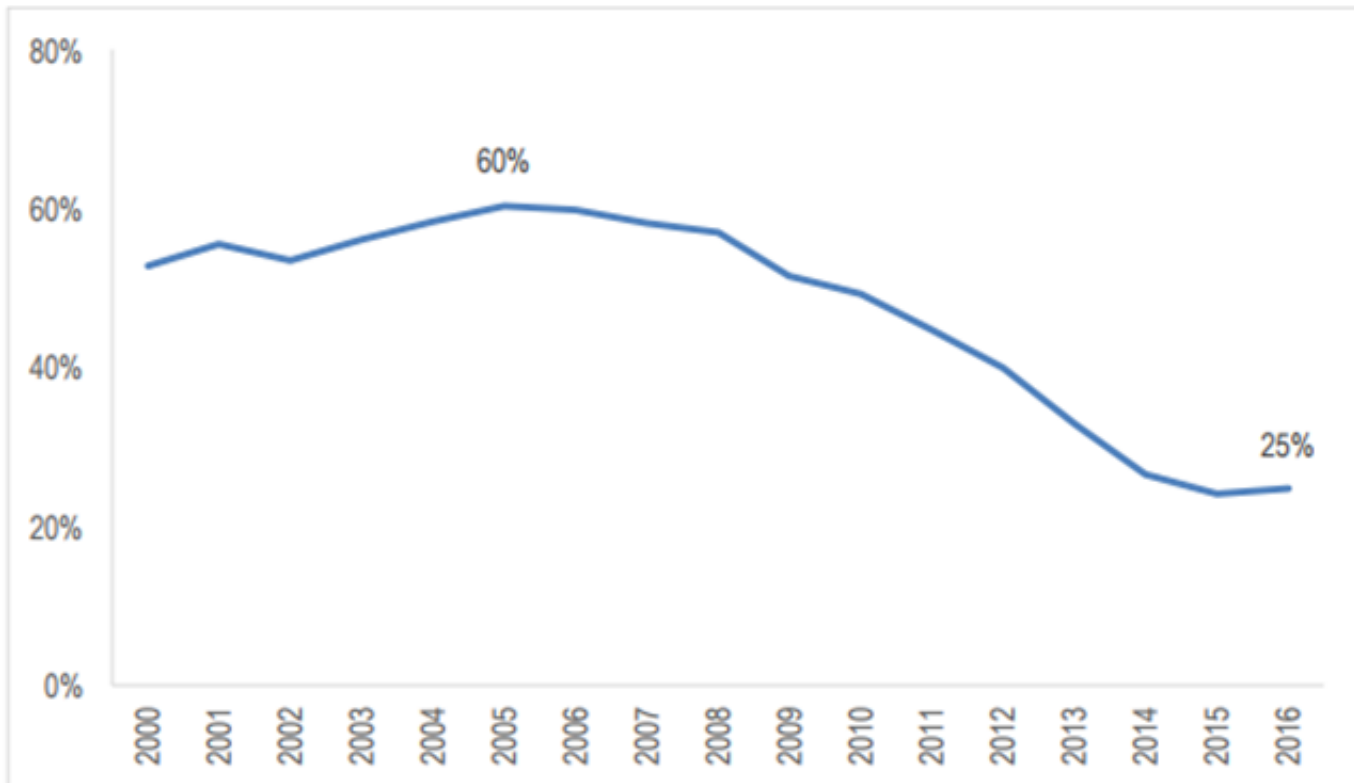
Condensate Refinery Processing and Topping Units

Company	Location	Mb/d
BASF	Port Arthur	75
Kinder Morgan	Galina Park	50 + 50
Castleton (x-LDH)	Corpus Christi	100
Martin	Corpus Christi	50
Magellan	Corpus Christi	50
Buckeye/Trafigura	Corpus Christi	50
Targa	Channelview	35
TOTAL		360

Company	Location	Mb/d
Flint Hills	Corpus Christi	30
Valero	Corpus Christi	70
Valero	Houston	90
Valero	McKee, TX	25
Marathon	Canton, OH	25
Blue Dolphin	Nixon, TX	15
Calumet	San Antonio	17.5
Marathon	Catlettsburg, KY	35
Western Refining	El Paso	25
TOTAL		332.5



U.S. Crude Oil Imports

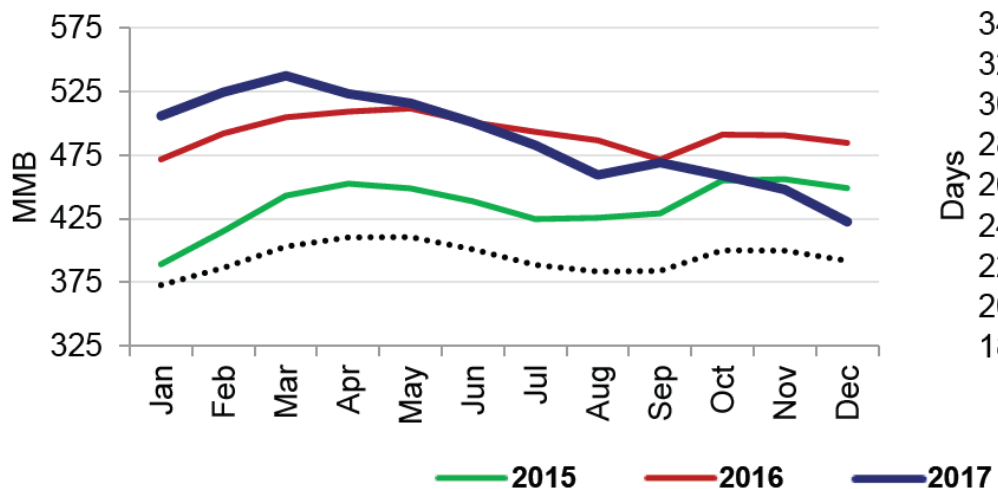


Source: U.S. Energy Information Administration

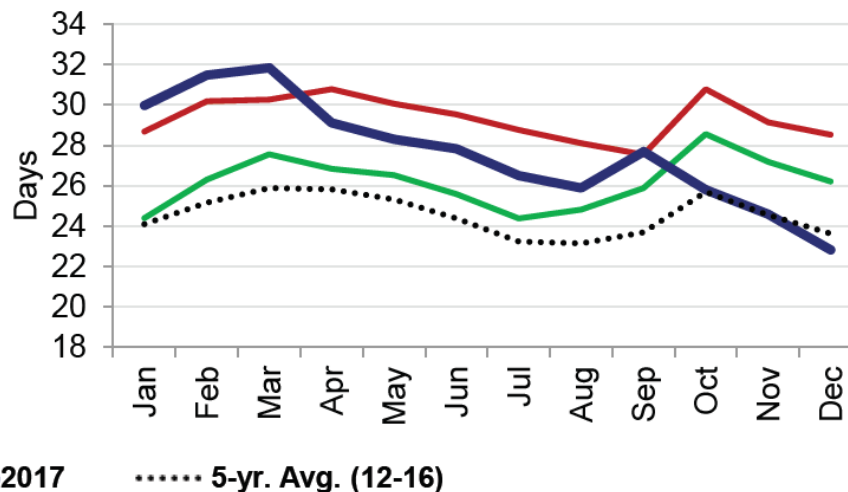


U.S. Crude Oil Inventory

Crude Inventories

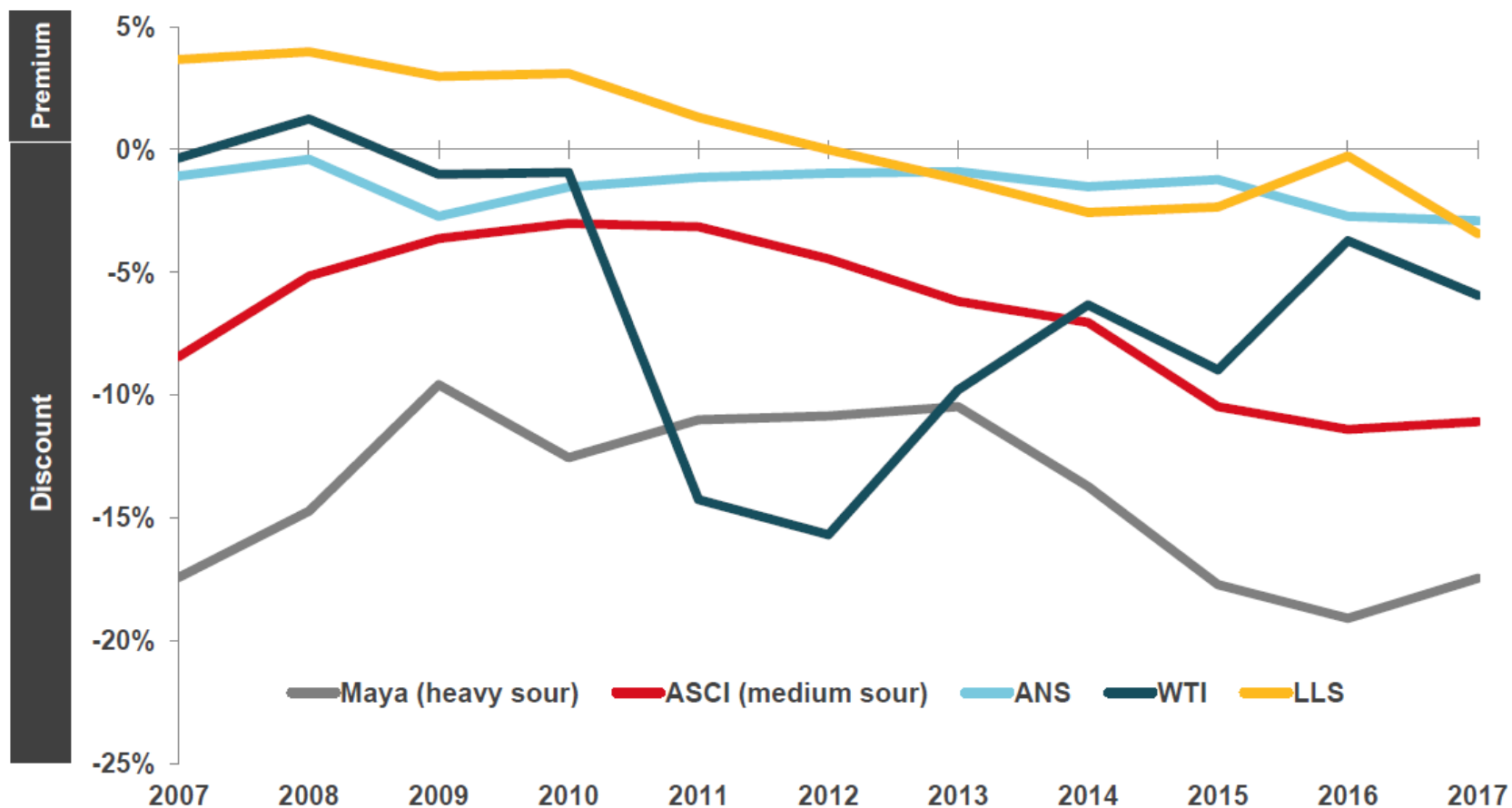


Crude Days of Supply + Exports





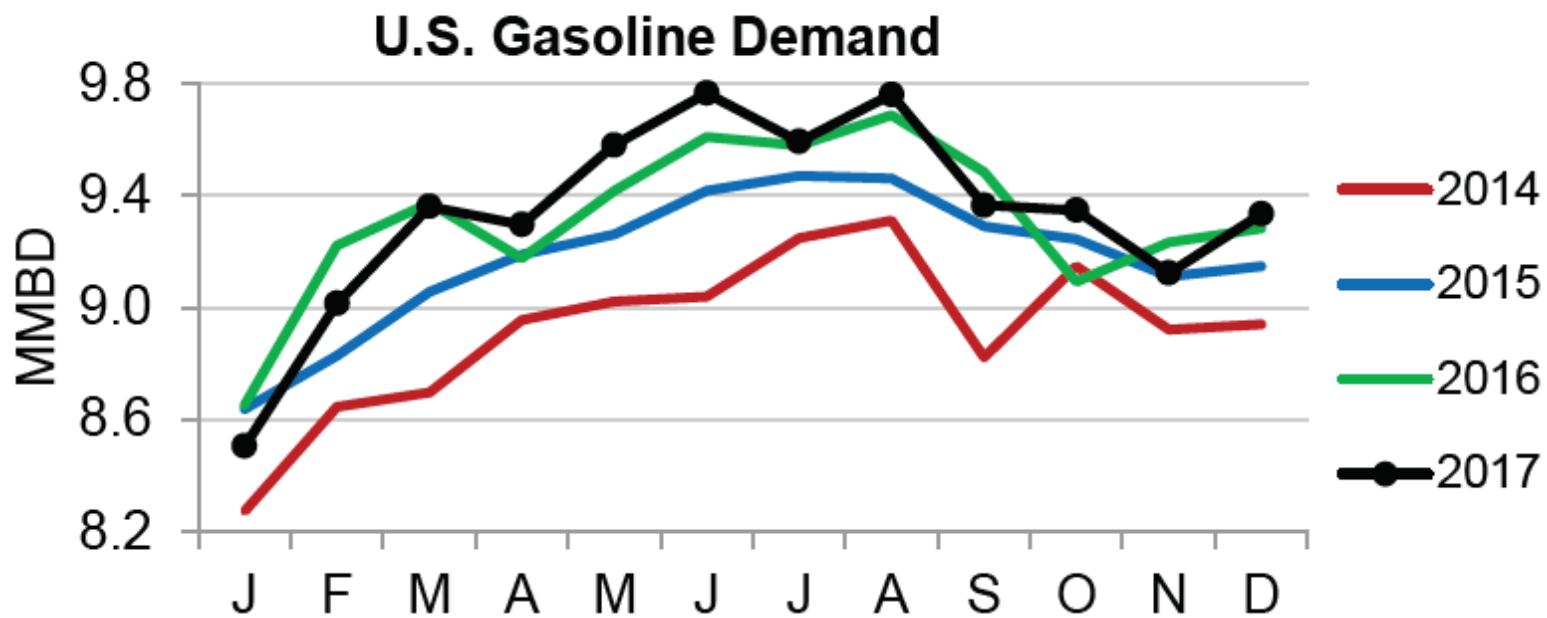
Crude Oil Price Differentials vs. Brent



Source: Valero Energy Corporation

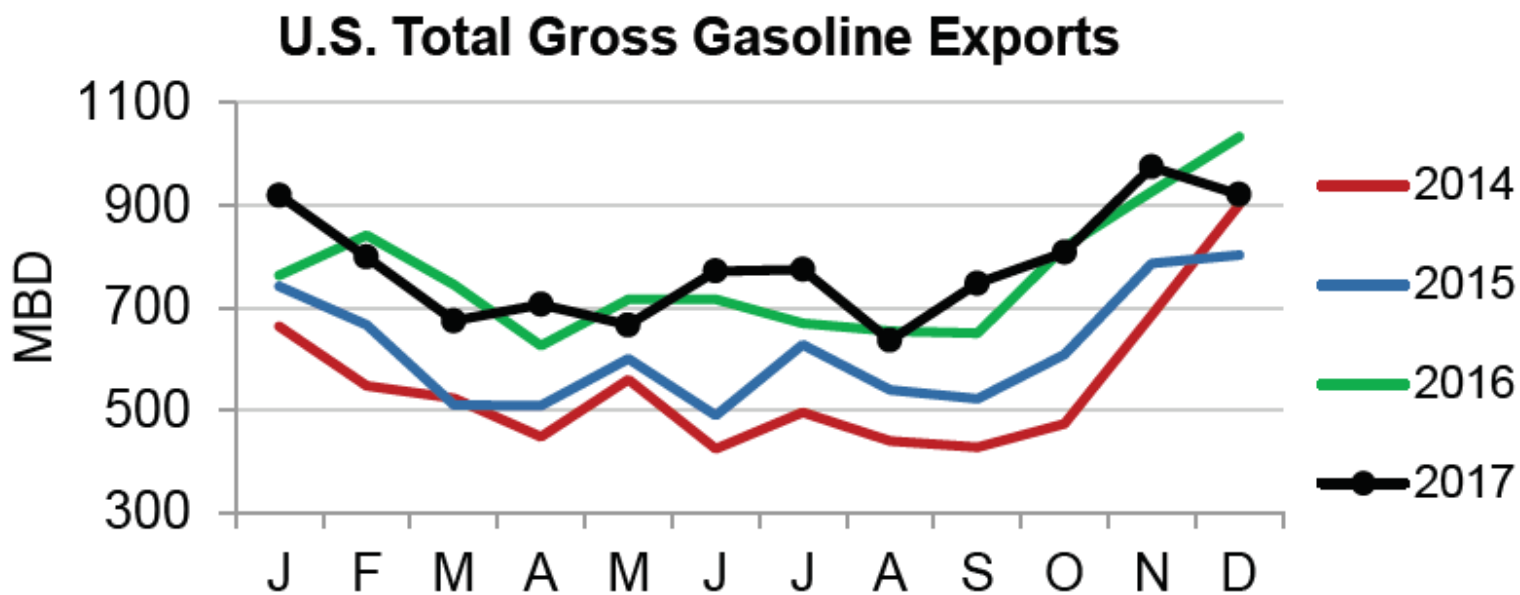


U.S. Gasoline Demand





U.S. Gasoline Exports





Chemical Industry Update

- **Huge USGC building boom**
- **Ethylene capacity**
- **On-purpose propylene**
- **Methanol / ammonia capacity**
- **Oil/Gas ratio remains healthy**

- **Pre-shale 8.5X / Post-shale 17X**
+





U.S. Ethylene Capacity Additions

Project	Capacity Type	Year Operational	Steam Cracker Capacity Addition (MMlbs/yr)	Ethane Demand (MB/d)
Williams – Geismar	Expansion	2014	600	16
Westlake – Calvert City	Expansion	2014	0	18
Dow – Plaquemine	Expansion	2014	150	11
Lyondell – La Porte	Expansion	2014	850	16
Lyondell – Corpus Christi	Expansion	2015	800	16
Westlake – Lake Charles #1	Expansion	2015	250	11
Exxon	New	2017	3,300	85
Chevron Phillips Chemical	New	2017	3,300	85
Occidental/Mexicham	New	2017	1,100	28
Formosa	New	2018	1,750	48
Dow	New	2018	3,300	85
Sasol	New	2018	3,300	85
Total/Nova/Borealis AG JV – Port Arthur	New	2020	2,200	--
ExxonMobil/Sabic JV – Corpus Christi	New	2020	3,000	--
TOTAL			23,900	504



Refining Marketplace

- **Andeavor acquires Western Refining**
- **MSEX Resources breaks ground in West Texas**
- **Philadelphia Energy Solutions files for bankruptcy**
- **Petrobras to sell Pasadena Refinery**
- **ExxonMobil to expand Beaumont Refinery**



Refining Tailwinds



Ryan 

Refining Tailwinds

- **Lower for longer oil price environment**
- **Less government regulations**
- **Tax Cuts and Jobs Act of 2017**
- **Closure of high cost refineries**
- **Continued Growth in Product Exports**



Refining Headwinds



Refining Headwinds

- **Vehicle fuel efficiency and electric vehicles**
- **Renewable Fuel Standard**
- **California refinery initiatives**
- **Ban of Fossil Fuel Powered Vehicles**

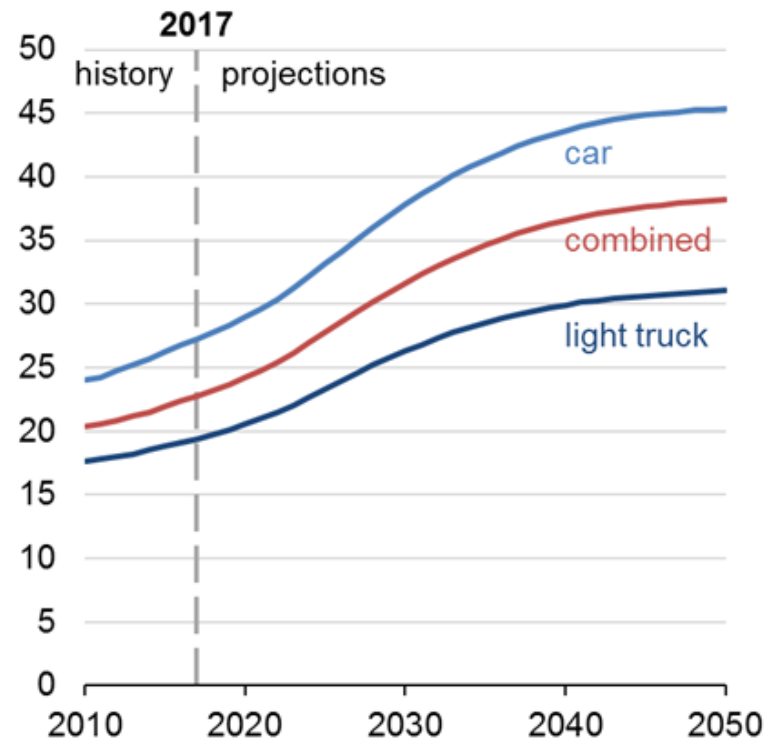




Refining Headwinds

- Increases in fuel economy standards temper growth in gasoline consumption
- AEO2018 – gasoline demand decreases by 31% between 2017 and 2050
- EV/Hybrid market share to increase from 4% to 20%
- Ridesharing economy
- Tesla, GM, Toyota major investments in EV

Light-duty vehicle stock fuel economy
miles per gallon





Renewable Fuel Standard

- **Renewable Fuel Standard (“RFS”) program was created under the Energy Policy Act of 2005, which amended the Clean Air Act (CAA)**
- **RFS program is a national policy that requires a certain volume of renewable fuel to replace or reduce the quantity of petroleum-based fuels**
- **Renewable identification numbers (RINs) are credits used for compliance with RFS**
- **RFS requires only refiners and importers to comply by generating RINs through blending biofuels**
- **RINs prices spiked from an average of about \$0.05 to more than \$1 per gallon in 2013 and have since remained at elevated levels**
- **Adds \$3-\$4 per barrel of crude oil processed for refiners**
- **RINs second largest expense for refiners after crude oil**
- **Refiners must own retail stations to avoid this expense**



California Refinery Initiatives

- **AB 32 - California Global Warming Solutions Act of 2006**
 - requires California to reduce its GHG emissions to 1990 levels by 2020
 - Increases capital and expenses for California Refineries
- **Low Carbon Fuel Standard**
 - Reduce carbon intensity in fuels by 2020
 - Increases capital and expenses for California Refineries
- **California's Zero-Emission Vehicle Program**
 - 1.5 million ZEVs in California by 2025
- **Ban HF Acid in Alkylation process – Los Angeles County**
 - Cannot produce California spec fuels without alkylate
 - Replace HF with Sulfuric Acid process



Fossil Fuel Vehicle Bans are Catching On

› Great Britain

- Ban fossil fuel powered vehicle sales by 2040

› France

- Ban fossil fuel powered vehicle sales by 2040

› Norway

- Ban fossil fuel powered vehicle sales by 2025

› California

- Legislation introduced to ban fossil fuel powered vehicle sales by 2040
- Already required to increase fuel efficiency to 54.5 miles by gallon y 2025





Thank You

Greg Kort, P.E., ASA

Principal
Austin, Texas

512.717.4988
gregory.kort@ryan.com

This document is presented by Ryan, LLC for general informational purposes only, and is not intended as specific or personalized recommendations or advice. The application and effect of certain laws can vary significantly based on specific facts, and professional advice of any nature should be sought only from appropriate professional advisors. This document is not intended, and shall not be deemed, to constitute legal, accounting, or other professional advice.

© 2018 Ryan, LLC. All rights reserved. All logos and trademarks are the property of their respective companies and are used with permission.