



ENERGY GUIDE

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THE NICHE FUND GROUP

Table of Contents

Energy Guide – The American Shale Revolution

- 3 The Oil Production Cycle
- 4 Lower 48 States Shale Plays
- 5 Production from Unconventional Basins
- 6 Typical Refined Crude Oil Products
- 7 Shale Exploration
- 8 U.S. Natural Gas Pipelines
- 9 U.S. Liquids Pipelines
- 10 U.S. Refinery Locations

Crude Oil – Pricing and Rig Counts

- 12 U.S. Rig Count and WTI Spot Price
- 13 Henry Hub Natural Gas Spot Price
- 14 Real vs. Nominal Gasoline Prices
- 15 U.S. Rig Count and Crude Oil Production
- 16 U.S. Crude Oil Inventories (Excluding SPR)
- 17 WTI Spot Price and U.S. Dollar Index

World Oil and Petroleum Consumption and Production

- 19 Worldwide Oil Consumption and Supply
- 20 Top Ten Countries in Total Petroleum Consumption
- 21 Top Ten Countries in Total Petroleum Production

OPEC, North America and the Rest of the World

- 23 Total Petroleum Production
- 24 OPEC Petroleum Production
- 25 North American Petroleum Production
- 26 Top Petroleum Producers from the Rest of the World

U.S. Production

- 28 Top 5 U.S. States in Crude Oil Production
- 29 Crude Oil Production from U.S. Shale Basins
- 30 Natural Gas Production from U.S. Shale Basins
- 31 U.S. Shale Production vs. Total U.S. Production (Crude Oil)
- 32 U.S. Shale Production vs. Total U.S. Production (Nat. Gas)

Demographics – Emerging Middle Class

- 34 Growth of Worldwide Population
- 35 Worldwide Net Electricity Generation
- 36 Net Electricity Generated - Top 5 Countries
- 37 Vehicles Used by Most Populated Countries
- 38 World Energy Consumption
- 39 Projected Growth of the Middle Class

Market Metrics

- 41 S&P 500 Energy Sector P/E Ratio
- 42 S&P 500 Energy Sector Price to Book
- 43 S&P 500 Energy Sector EBITDA
- 44 S&P 500 Energy Sector Dividend Yield
- 45 U.S. Oil and Natural Gas Extraction Employment

At a Glance

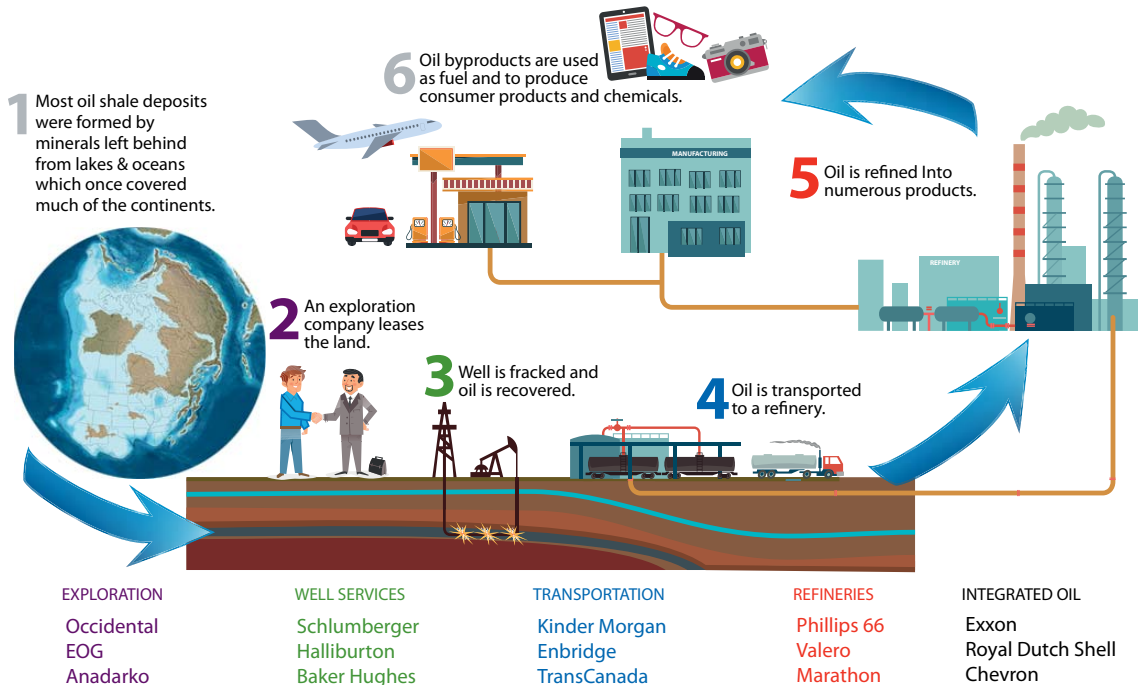
- 47 U.S. Net Generation of Coal and Natural Gas
- 48 World Energy Consumption by Primary Fuel
- 49 Net Petroleum Imports
- 50 Measuring Crude Oil Quality
- 51 Examples of API
- 52 Sulfur Content

Sources: EIA, Baker Hughes, Bloomberg, U.S. Census Bureau, OICA, American Energy Mapping,
U.S. Department of Labor – Bureau of Labor Statistics

ENERGY GUIDE

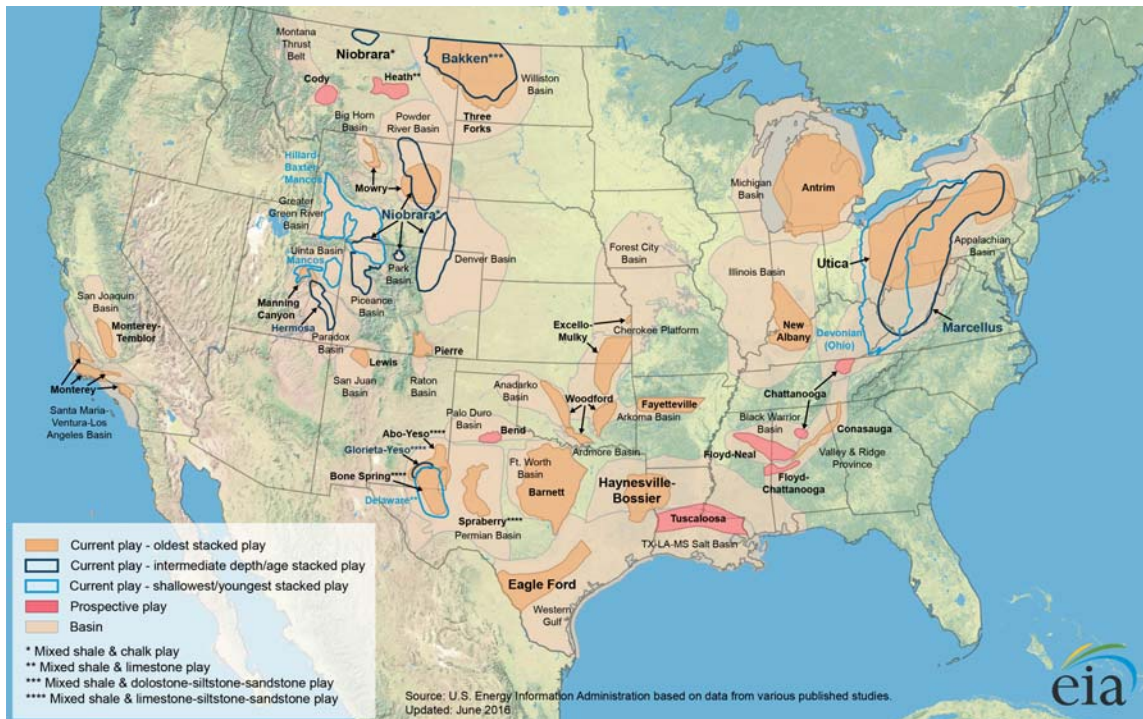
The American Shale Revolution

The Oil Production Cycle

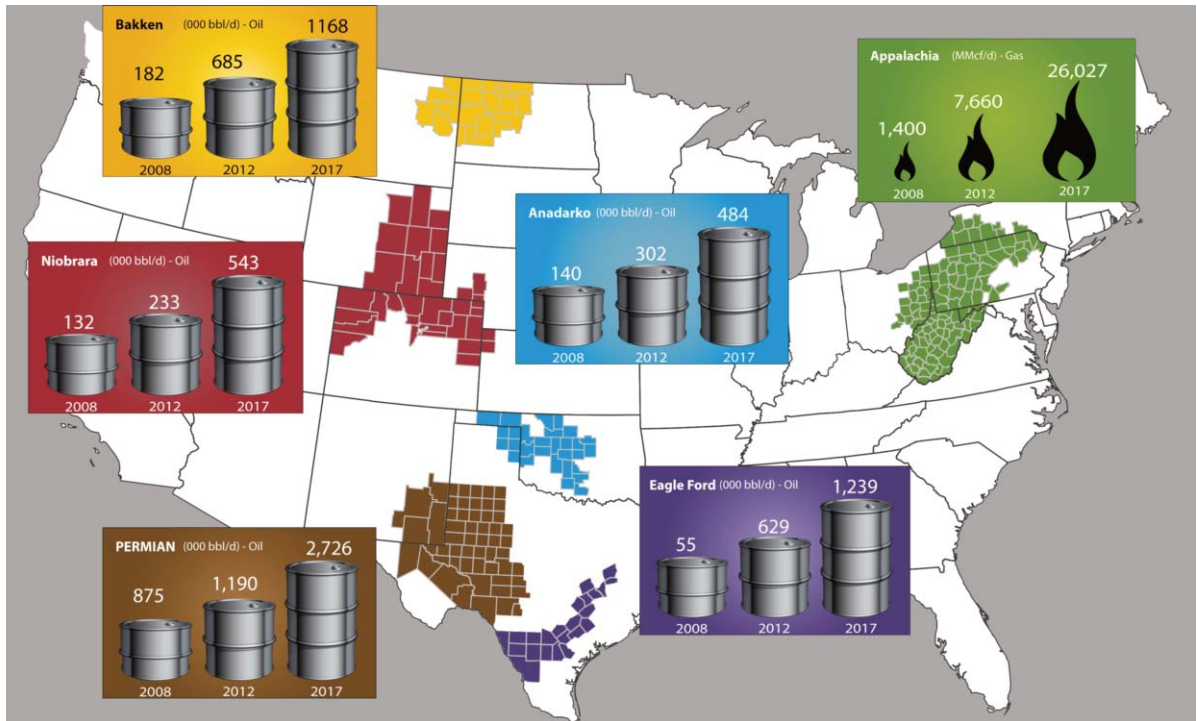


Listed are the top companies by market cap in the S&P500

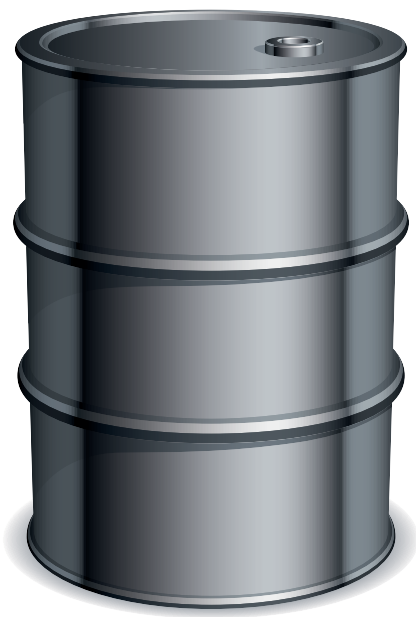
Lower 48 States Shale Plays



Production from Unconventional Basins



Typical Refined Crude Oil Products



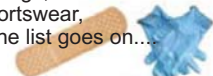
A 42-gallon barrel of refined crude oil

- ← 3% Asphalt
- ← 4% Liquefied Petroleum
- ← 10% Jet Fuel
- ← 18% Other Products

Examples: crayons, toothbrushes, soap, golf bags, nail polish, CDs, tires, floor wax, cameras, sportswear, eyeglasses, shoes, shampoo, shingles, and the list goes on....

- ← 23% Diesel Fuel & Heating Oil

- ← 47% Gasoline



Shale Exploration

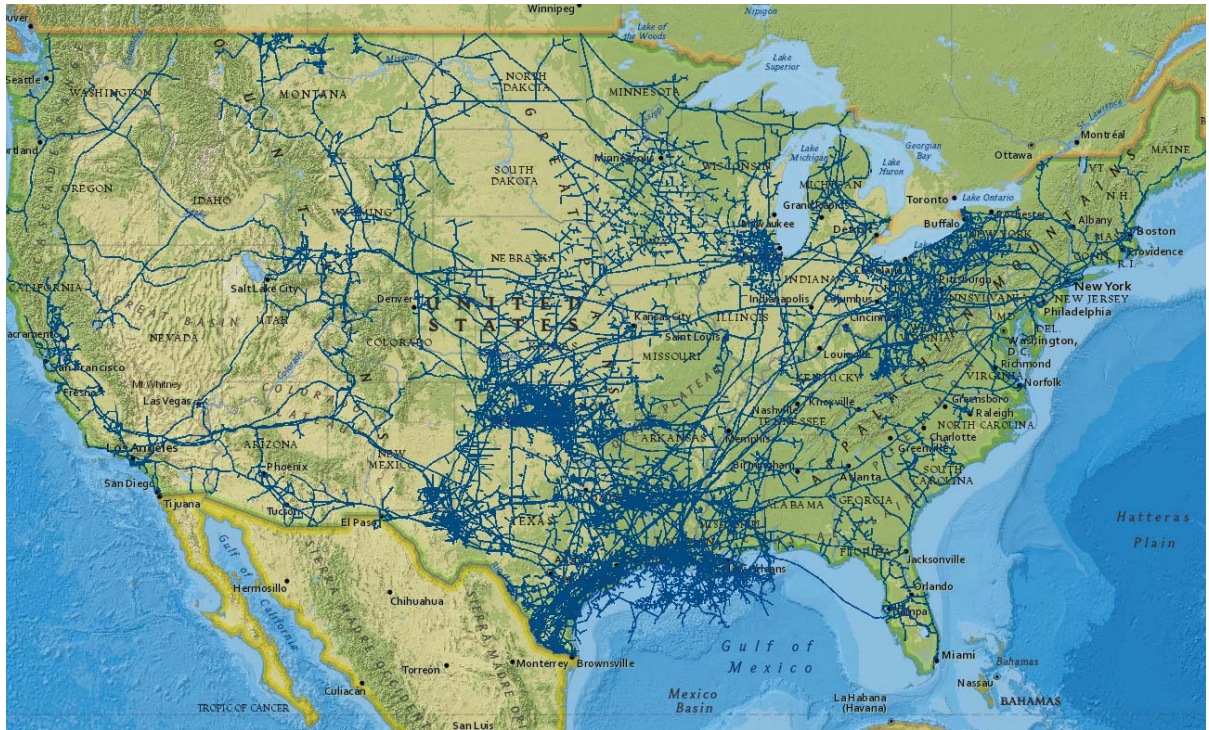


The advancement in shale exploration has been the main contributor to the staggering growth of the oil and gas industry in the Mid-North America region. Horizontal drilling and hydraulic fracturing (fracking) are allowing companies to unlock more of the resources from shale formations.

The Fracking Process

- Drill up to 2 miles vertically followed by 2 miles horizontally
- Stimulation
 - Send explosives into the well bore at 180-220 foot intervals (up to 60 stages)
 - Add 5-20 million pounds of ceramic proppant/sand
 - Add 2.1 million gallons of water
 - Pressure pump at 8,000-10,000 PSI (pounds per square inch)

U.S. Natural Gas Pipelines



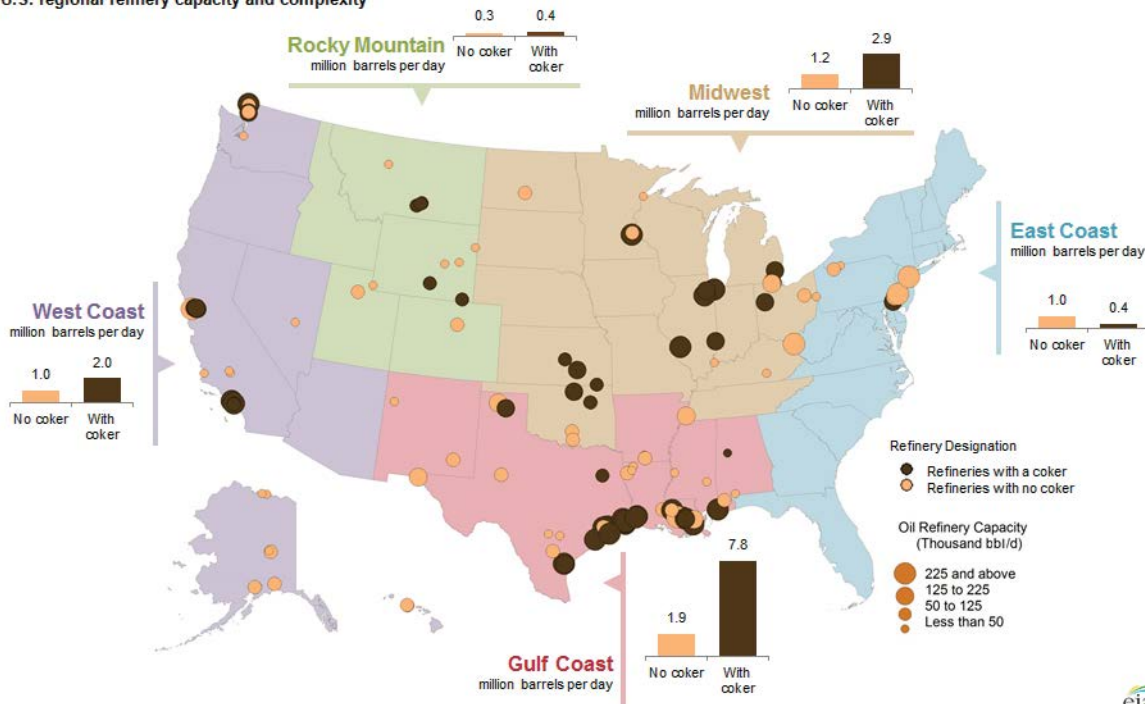
U.S. Liquids Pipelines



Source: EIA U.S. Energy Mapping System 2018

U.S. Refinery Locations

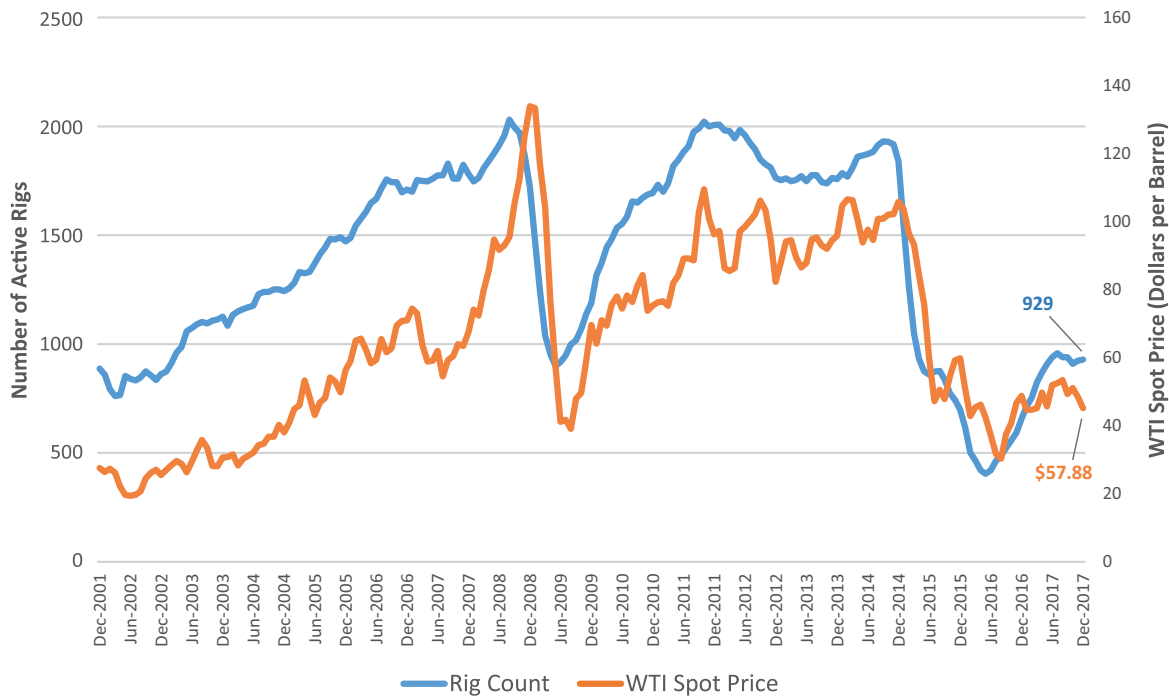
U.S. regional refinery capacity and complexity



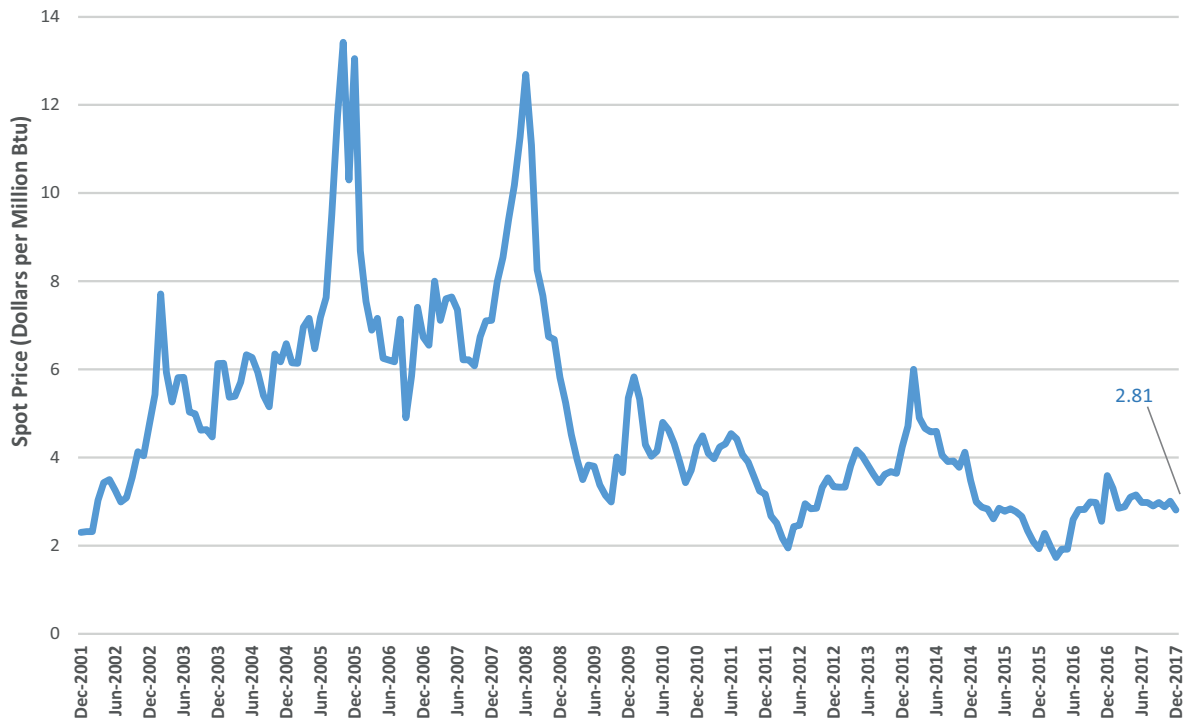
CRUDE OIL

Pricing and Rig Counts

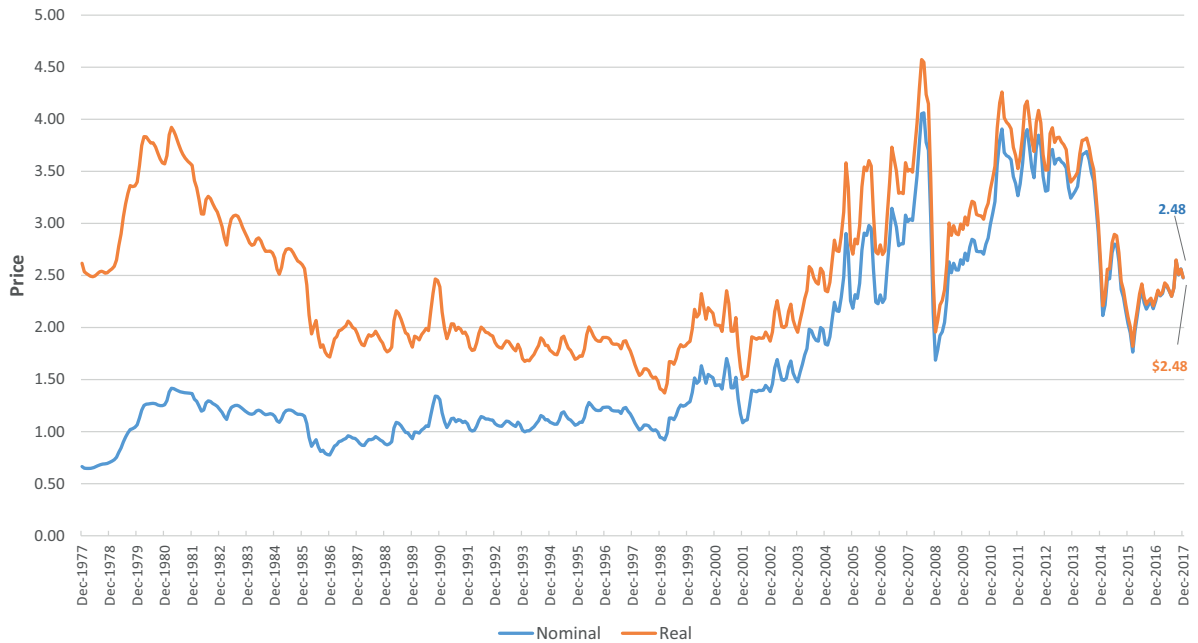
U.S. Rig Count and WTI Spot Price



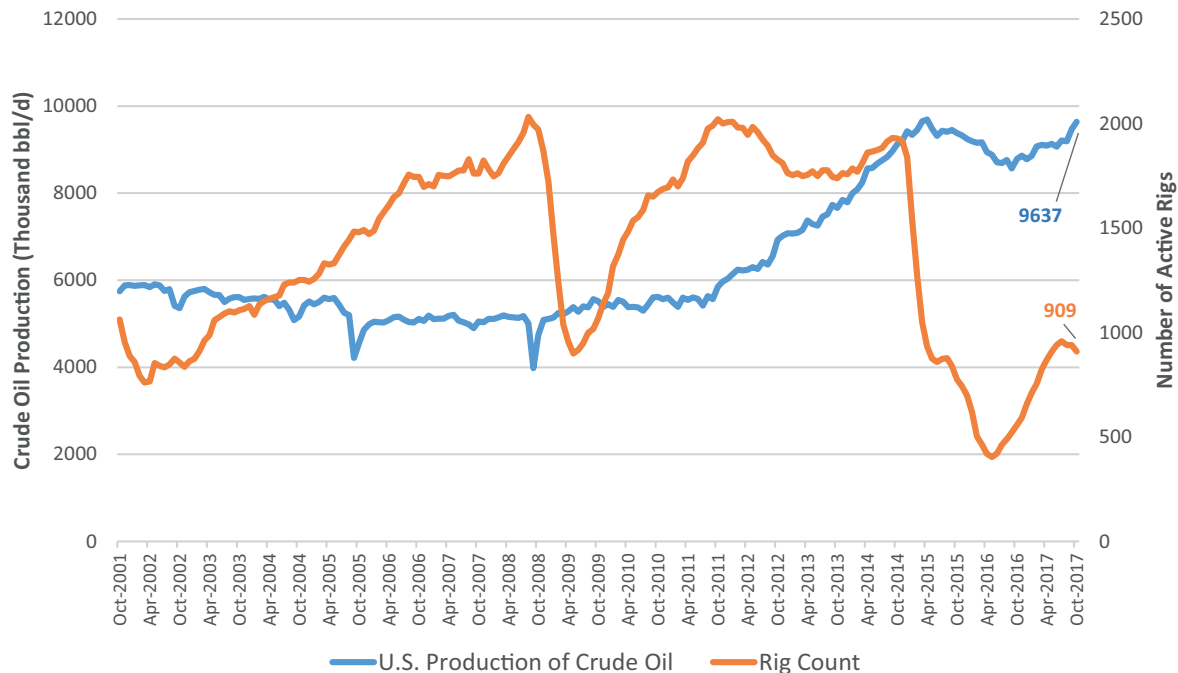
Henry Hub Natural Gas Spot Price



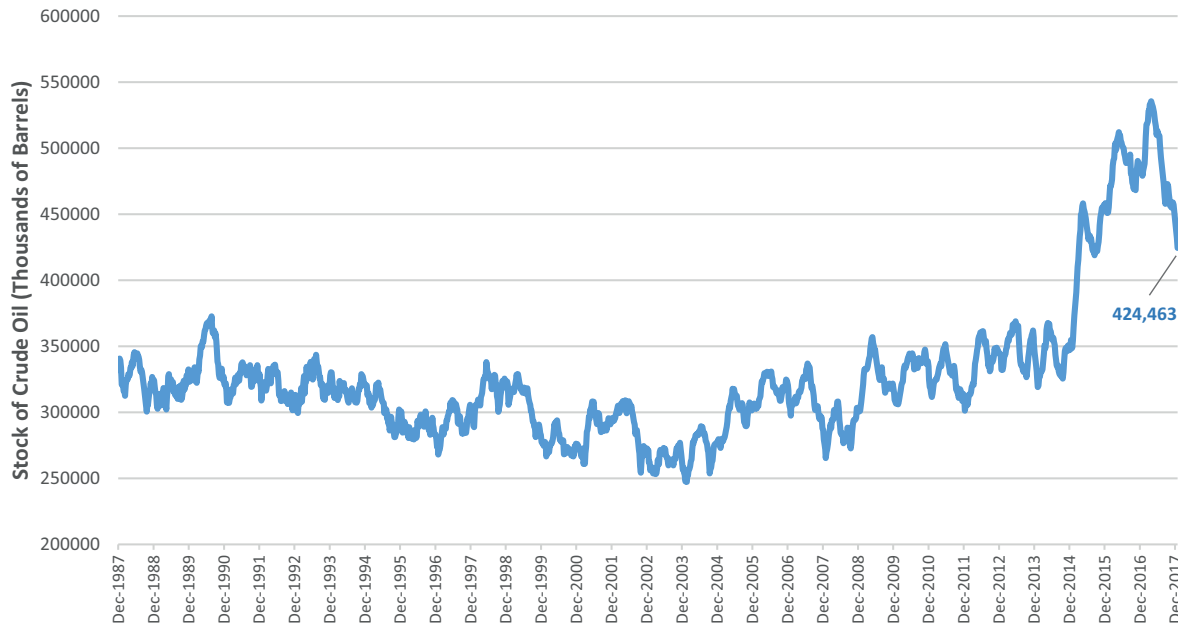
Real vs. Nominal Gasoline Prices



U.S. Rig Count and Crude Oil Production

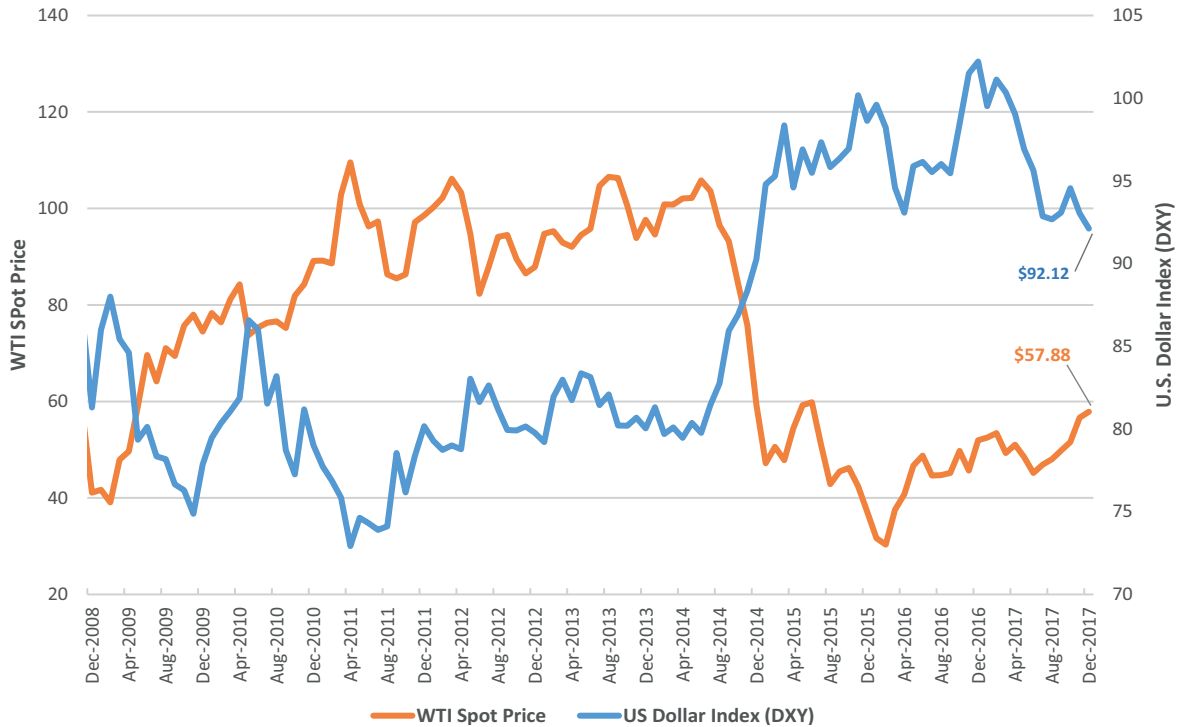


U.S. Crude Oil Inventories (Excluding SPR)



SPR is the emergency reserve of oil constantly added in order to prevent a total depletion during unstable times.

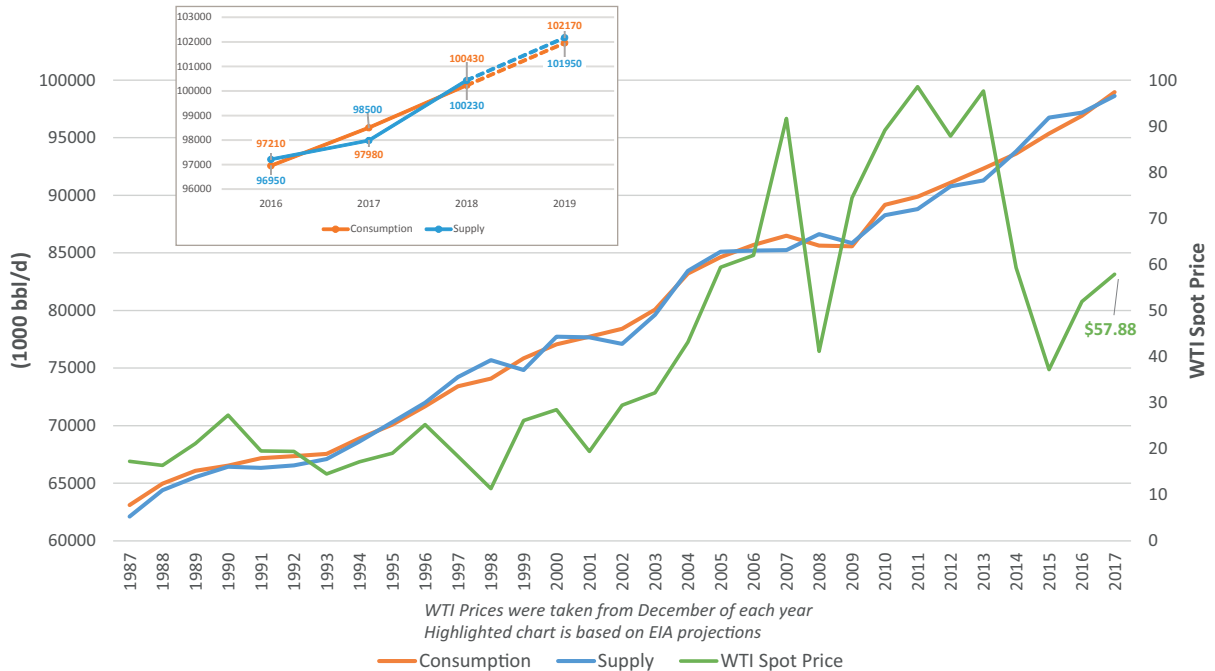
WTI Spot Price and U.S. Dollar Index



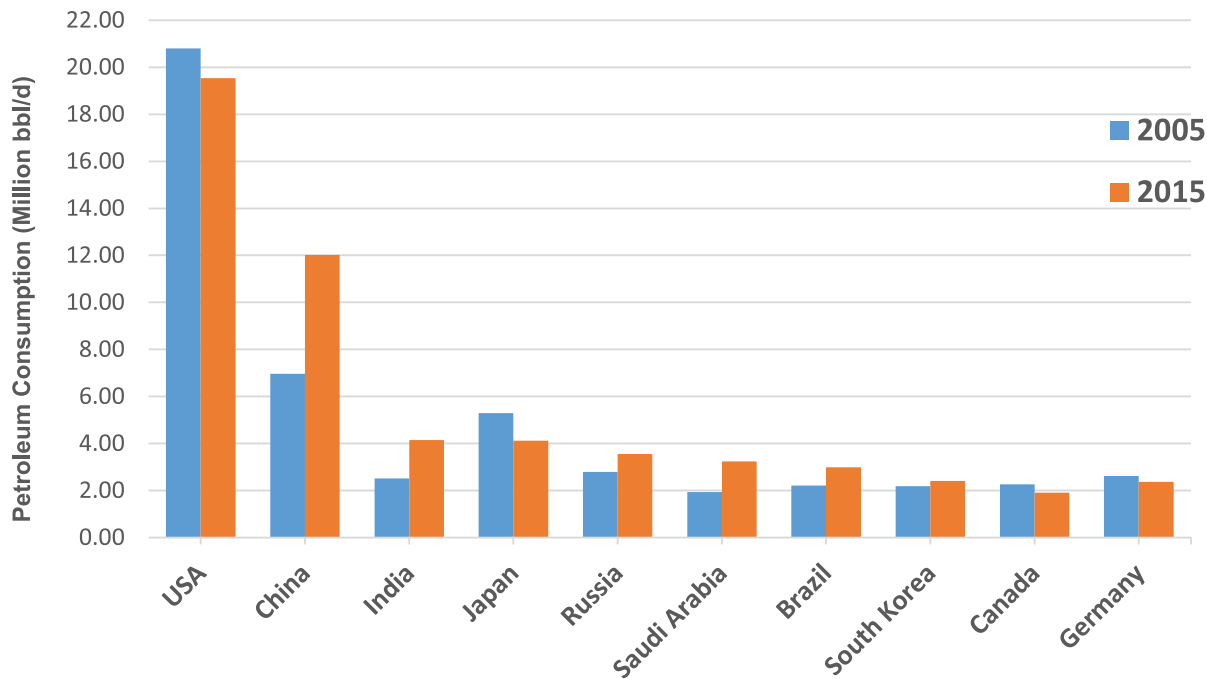
WORLD

Oil & Petroleum Consumption and Production

Worldwide Oil Consumption and Supply

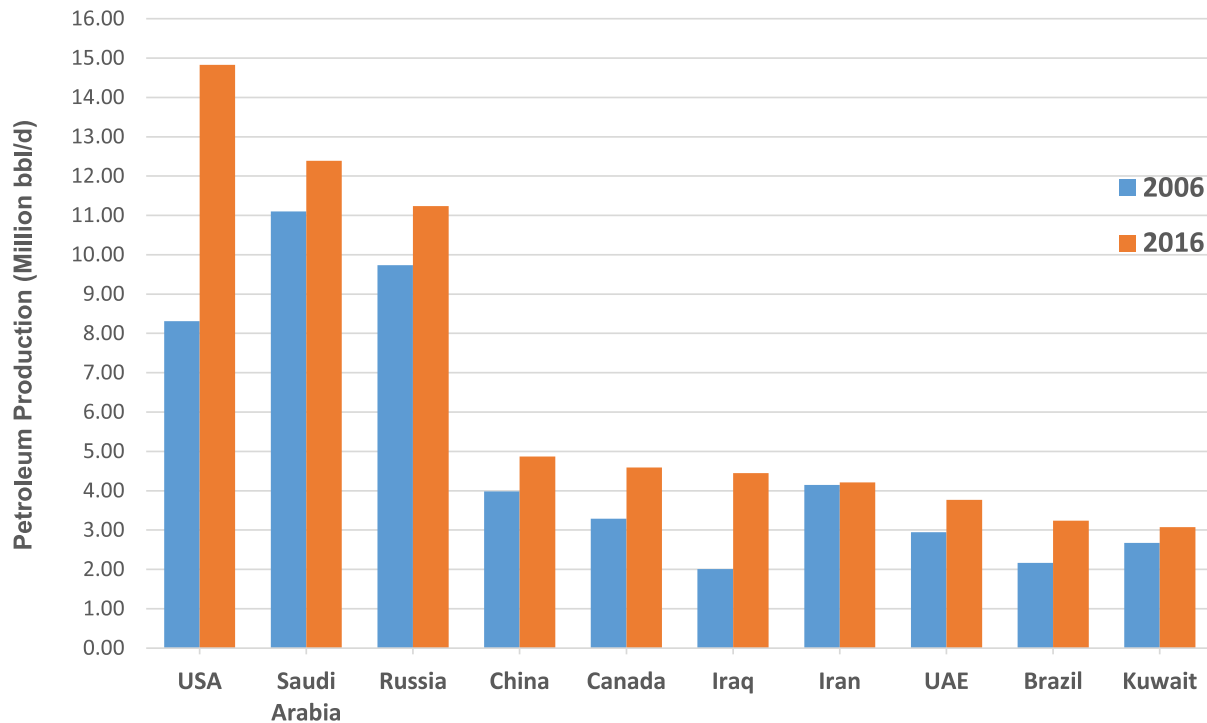


Top Ten Countries in Petroleum Consumption



2015 is the most recent year with sufficient data for rankings

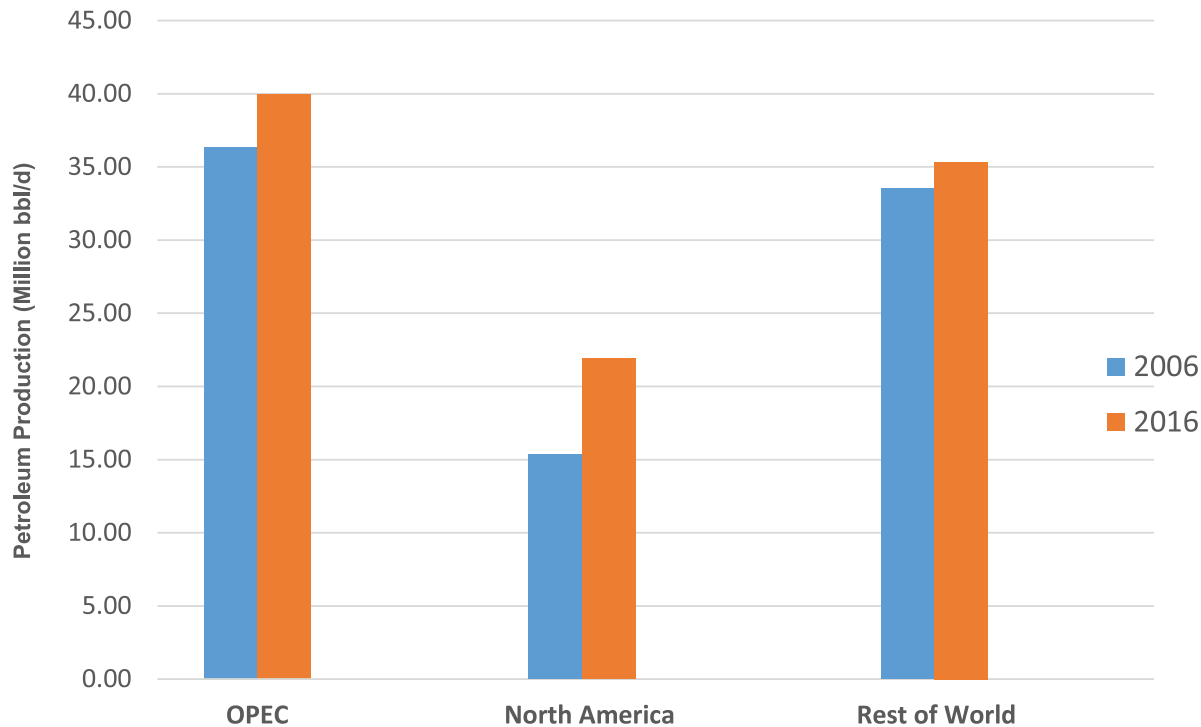
Top Ten Countries in Petroleum Production



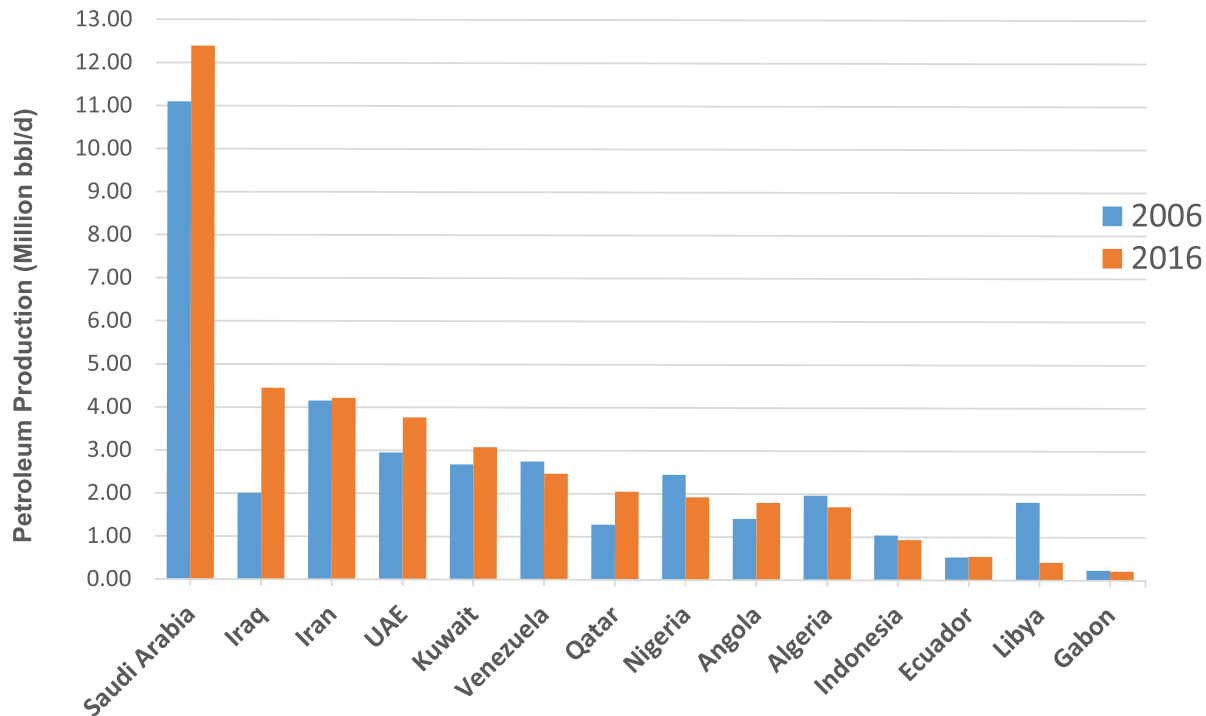
OPEC, NORTH AMERICA

And the Rest of the World

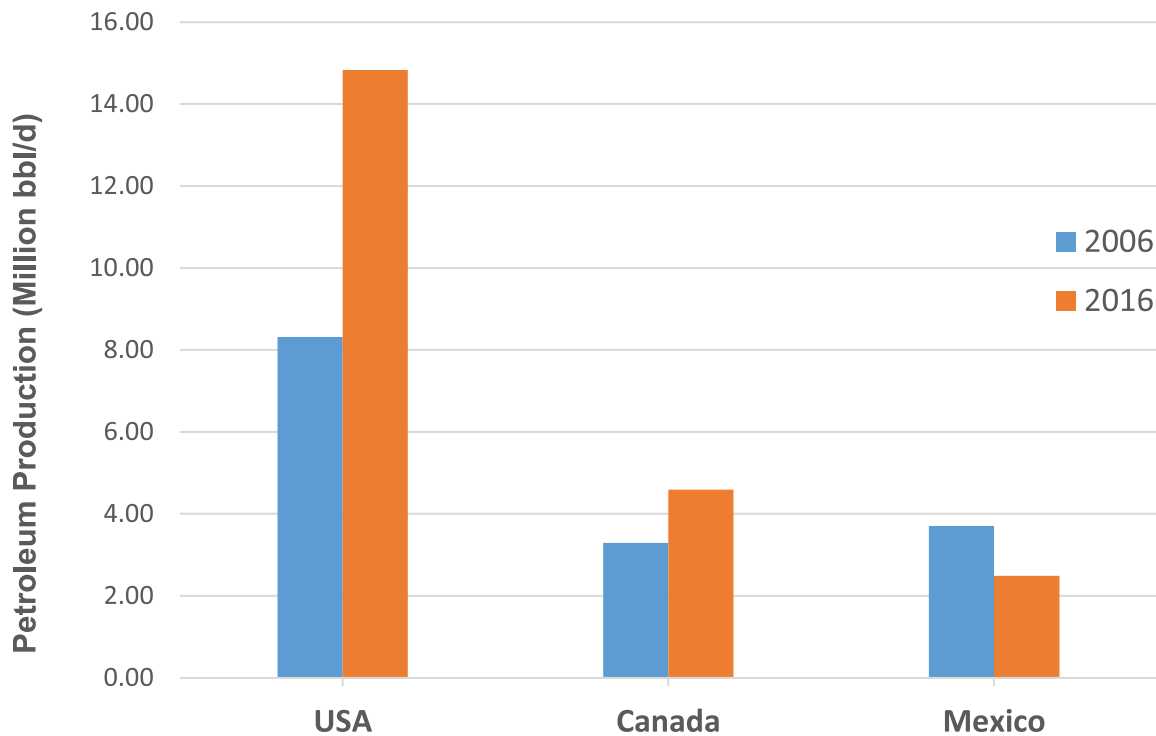
Total Petroleum Production



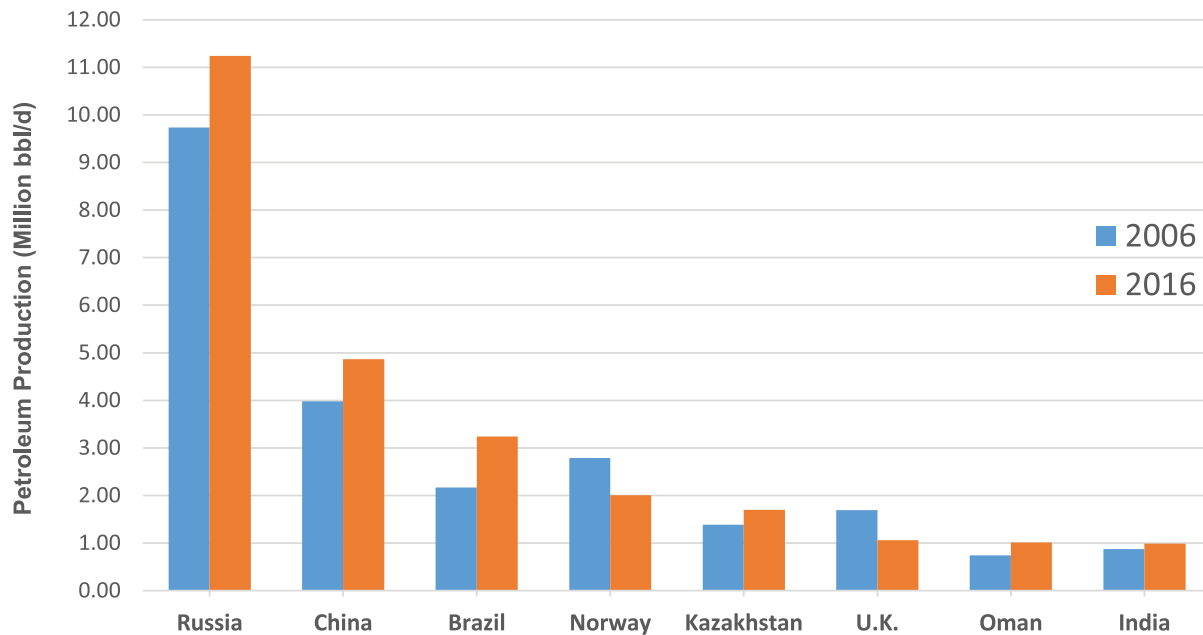
OPEC Petroleum Production



North American Petroleum Production

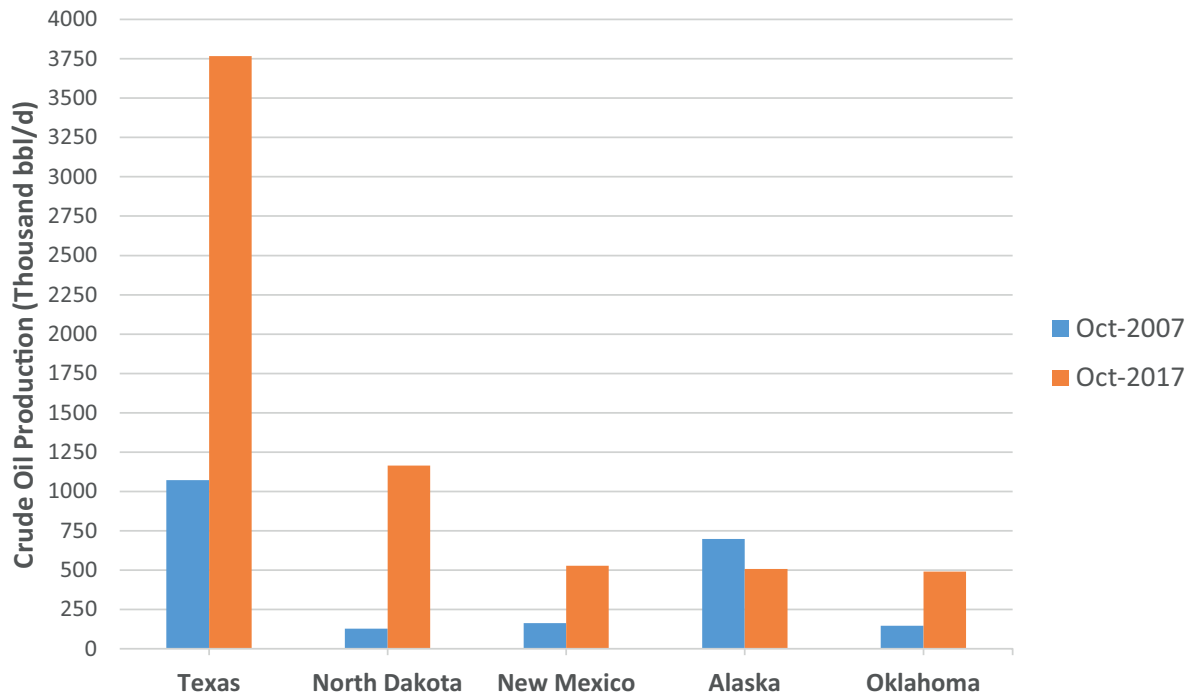


Top Petroleum Producers from the Rest of the World

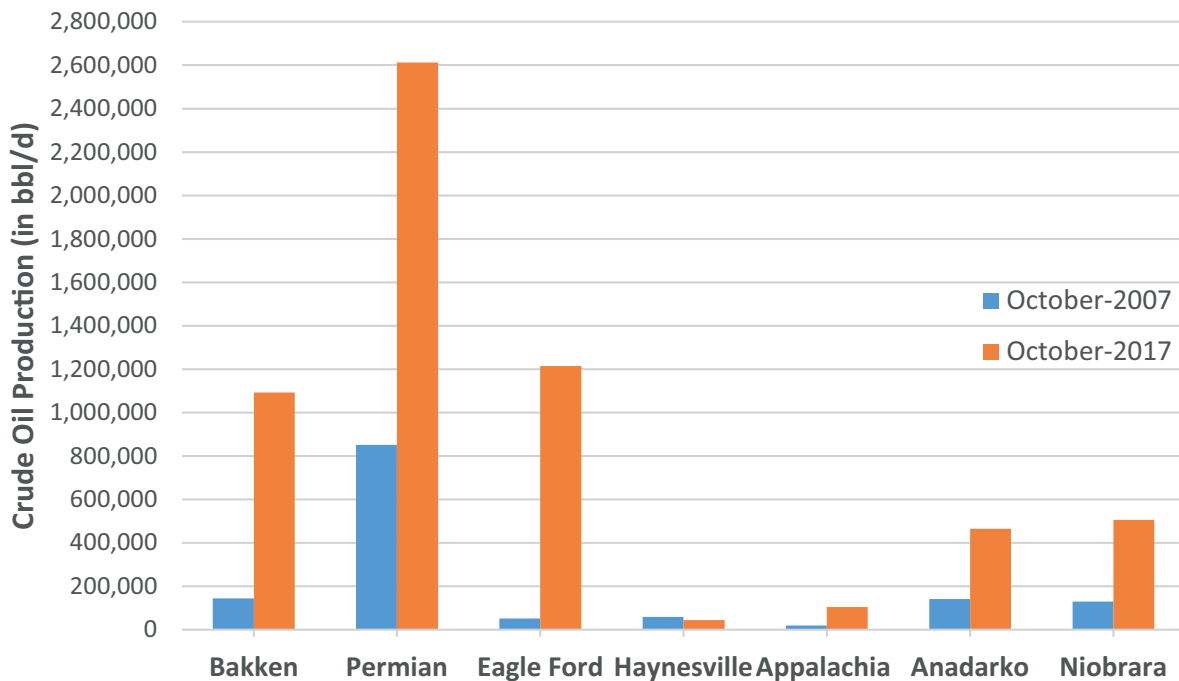


U.S. PRODUCTION

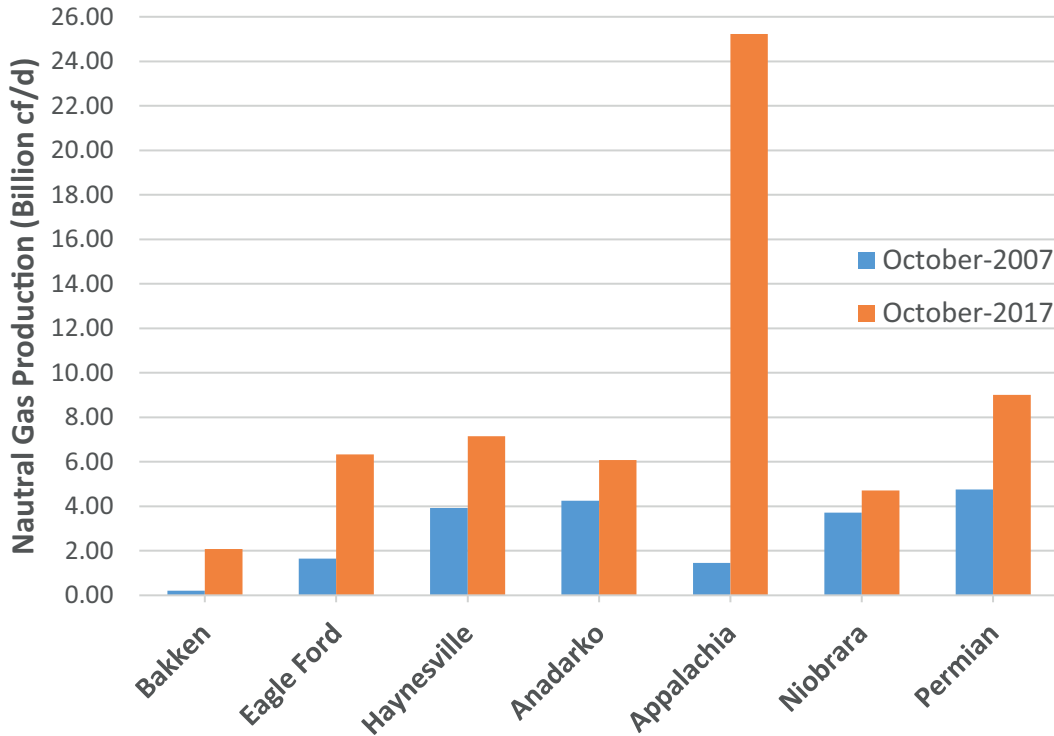
Top 5 U.S. States in Crude Oil Production



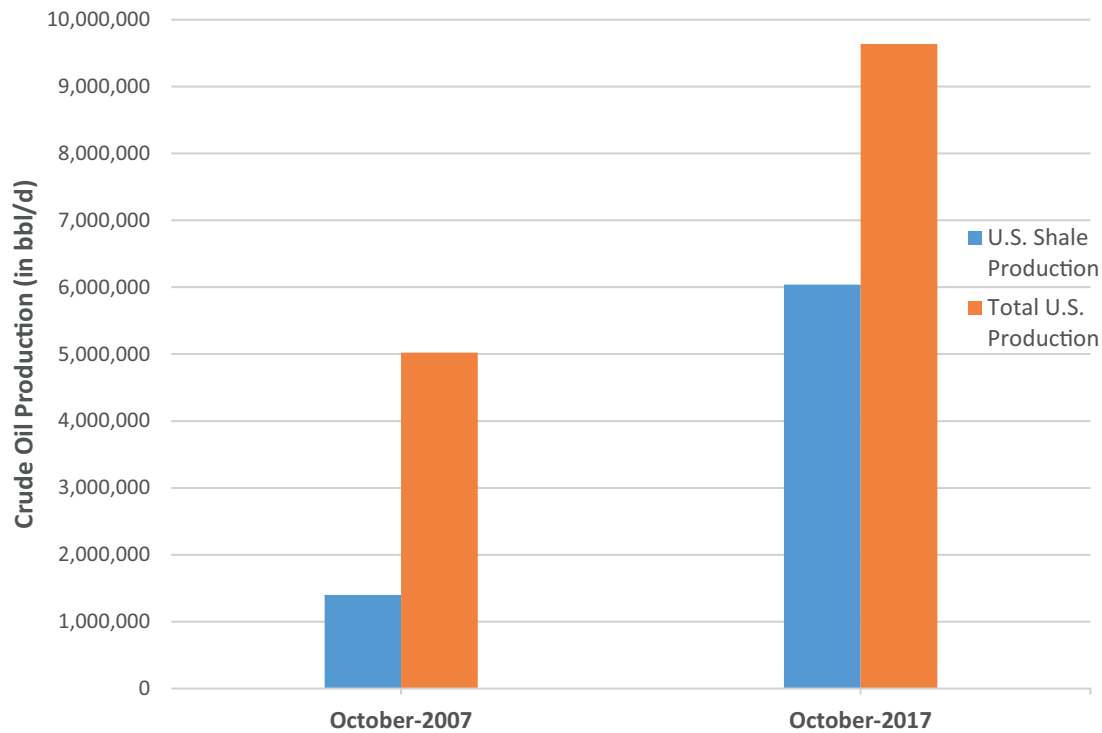
Crude Oil Production from U.S. Shale Basins



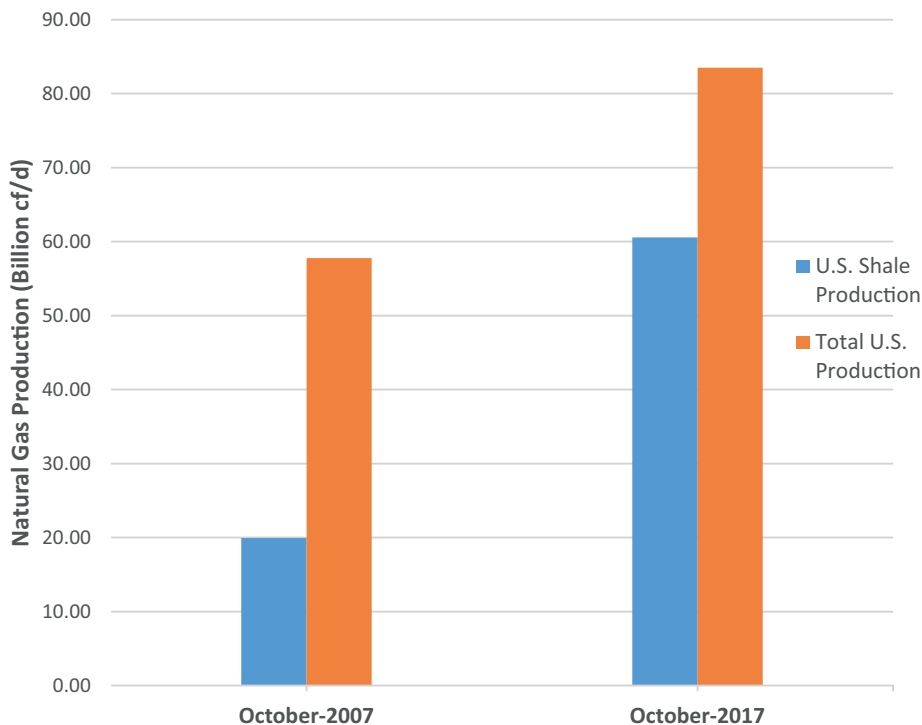
Natural Gas Production from U.S. Shale Basins



U.S. Shale Production vs. Total U.S. Production (Crude Oil)



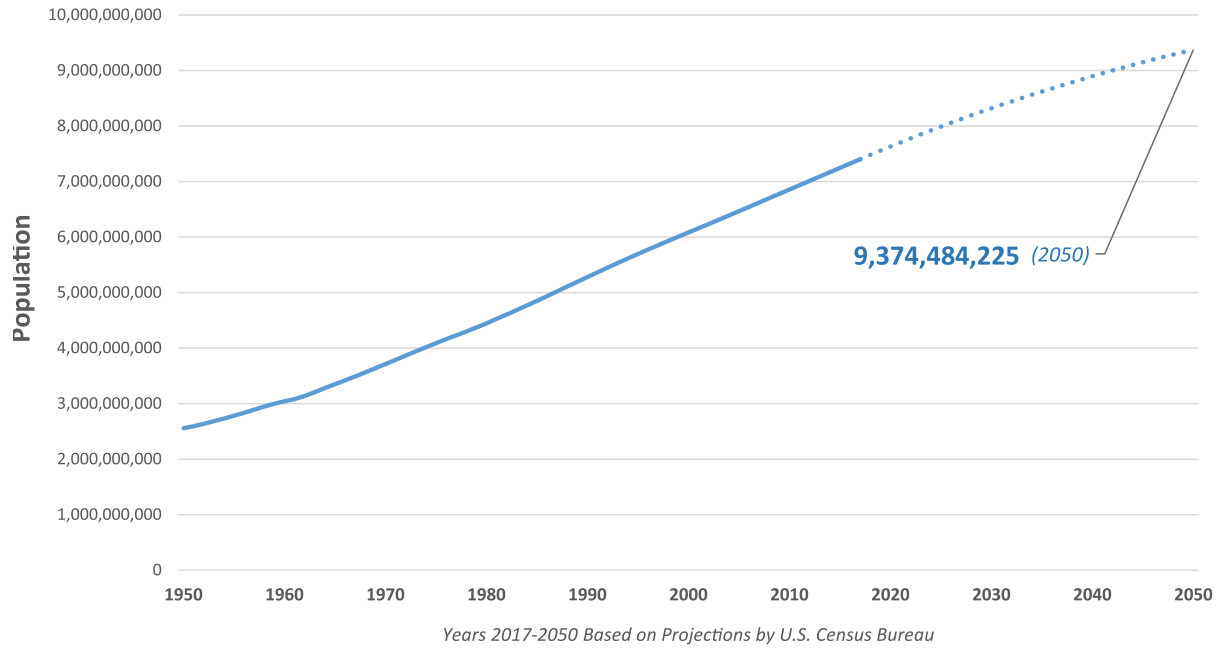
U.S. Shale Production vs. Total U.S. Production (Natural Gas)



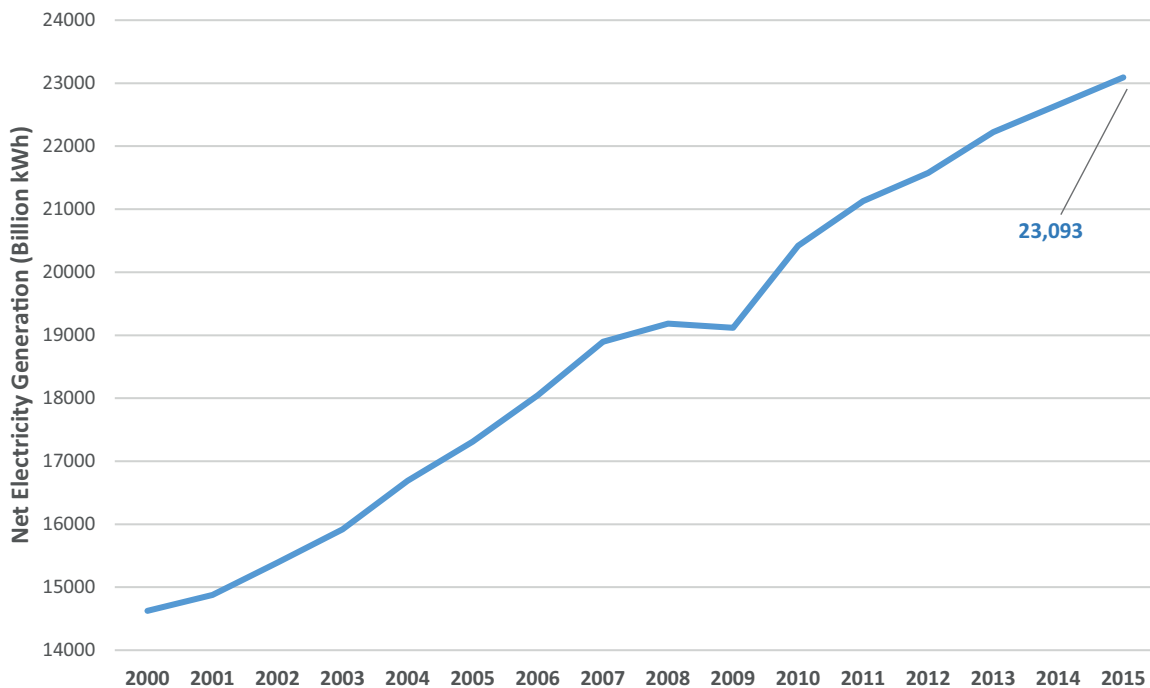
DEMOGRAPHICS

Emerging Middle Class

Growth of Worldwide Population

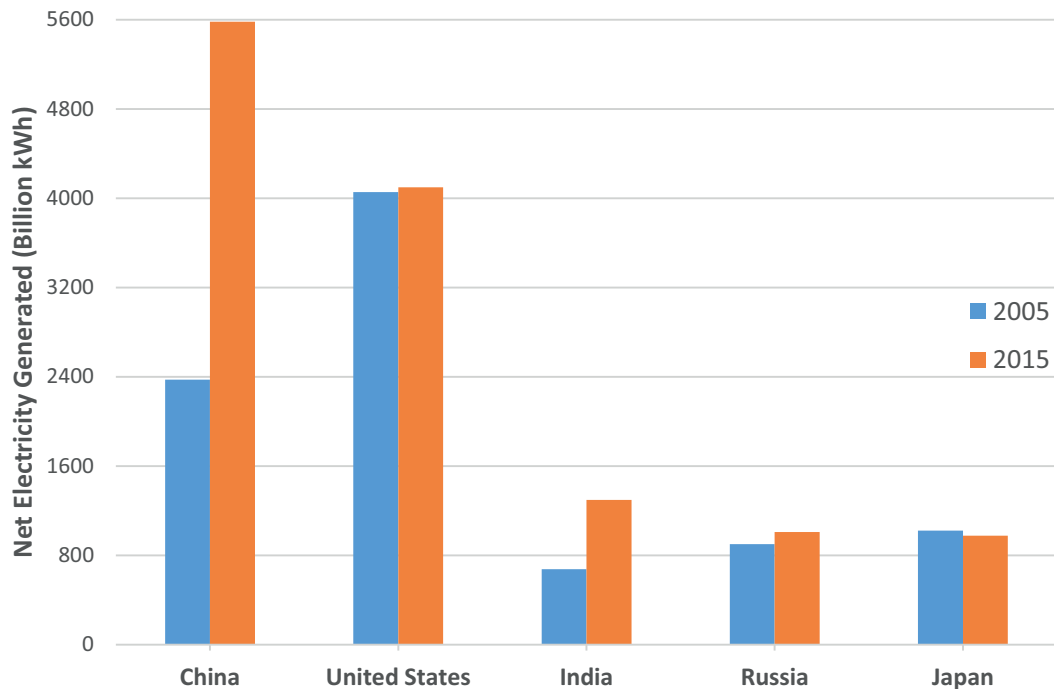


Worldwide Net Electricity Generation



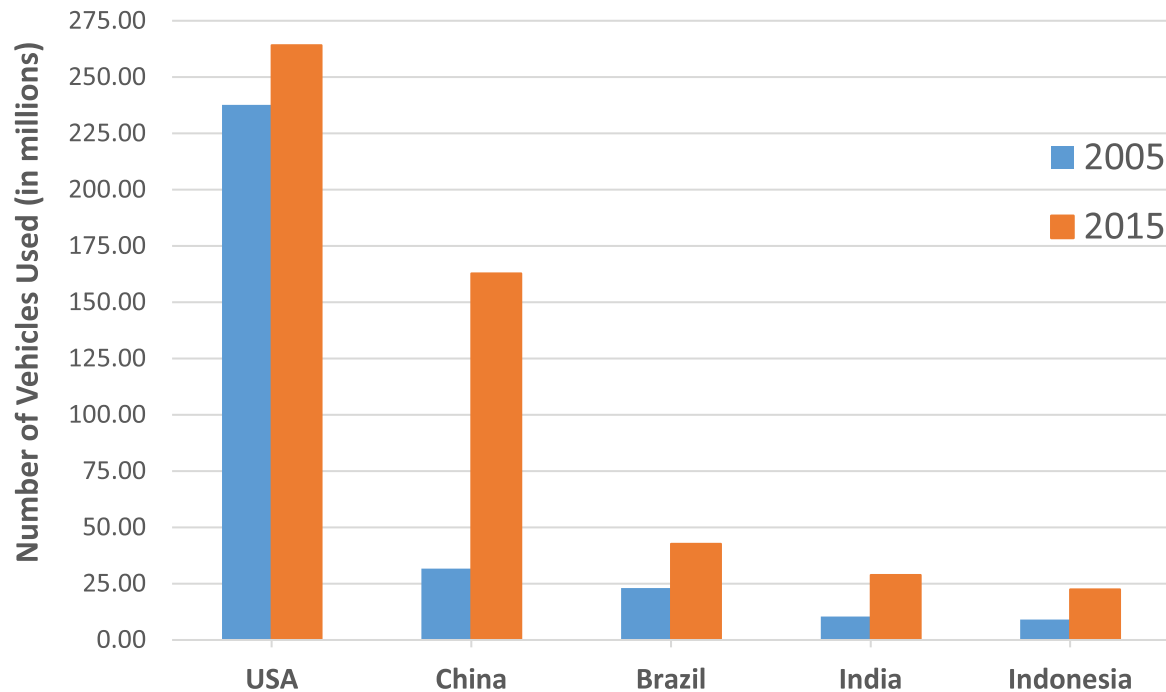
2015 is the most recent year with sufficient data

Net Electricity Generated - Top 5 Countries



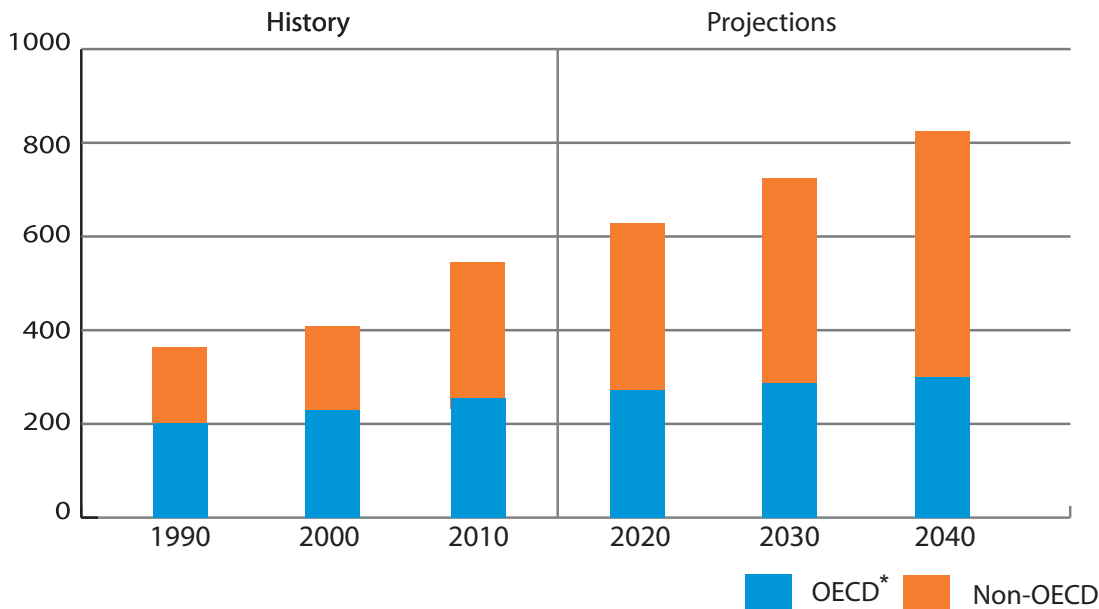
2015 is the most recent year with sufficient data

Vehicles Used by Most Populated Countries



2015 is the most recent year with sufficient data

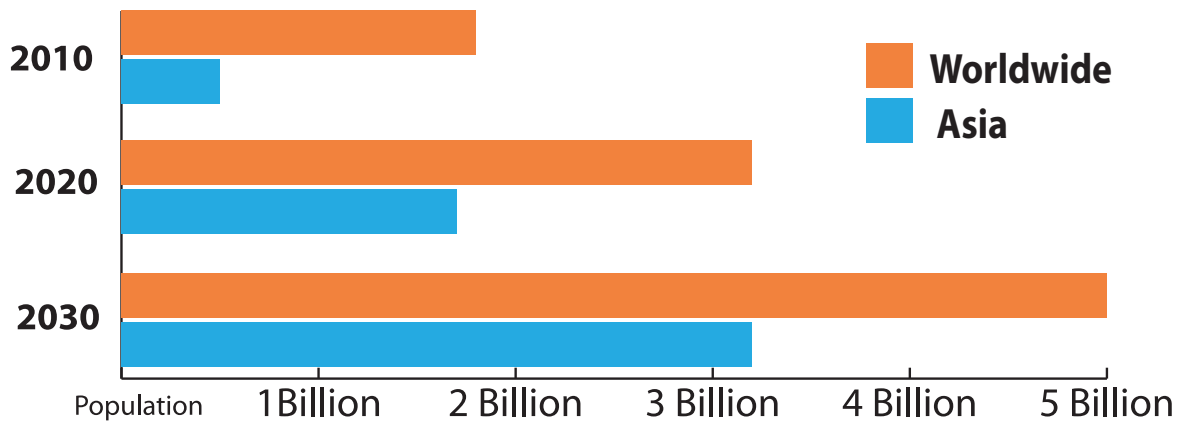
World Energy Consumption (quadrillion Btu)



*Organization for Economic Co-operation and Development

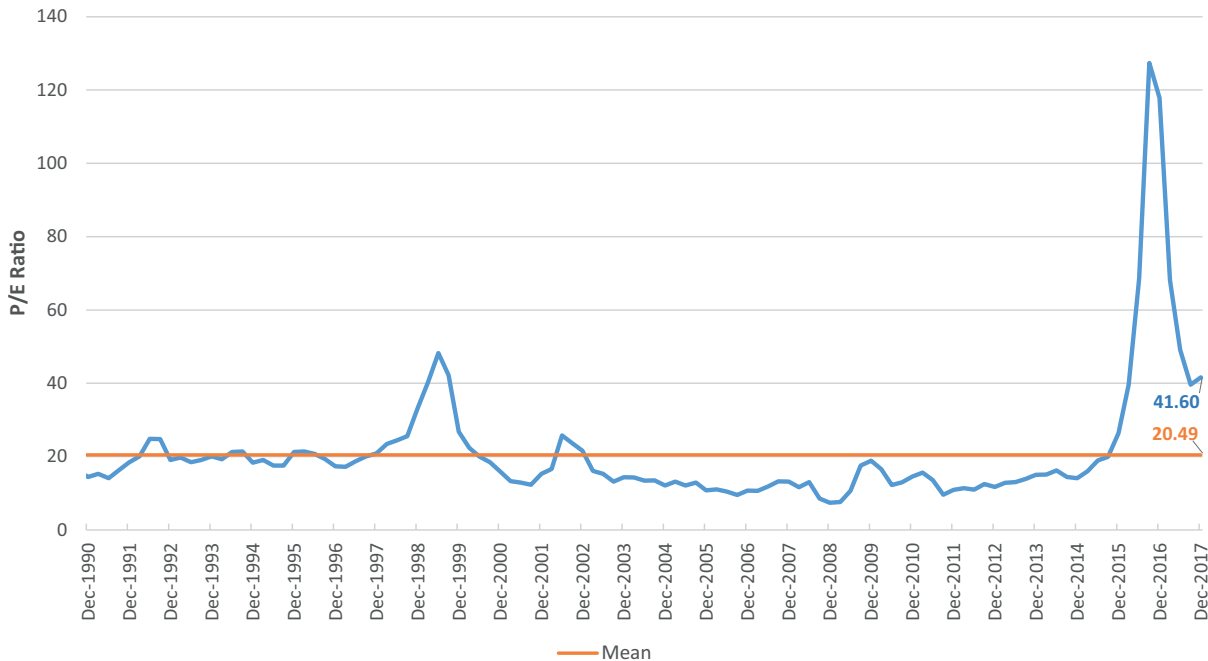
OECD member countries are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Switzerland, Turkey, United Kingdom, and the United States.

Projected Growth of the Middle Class

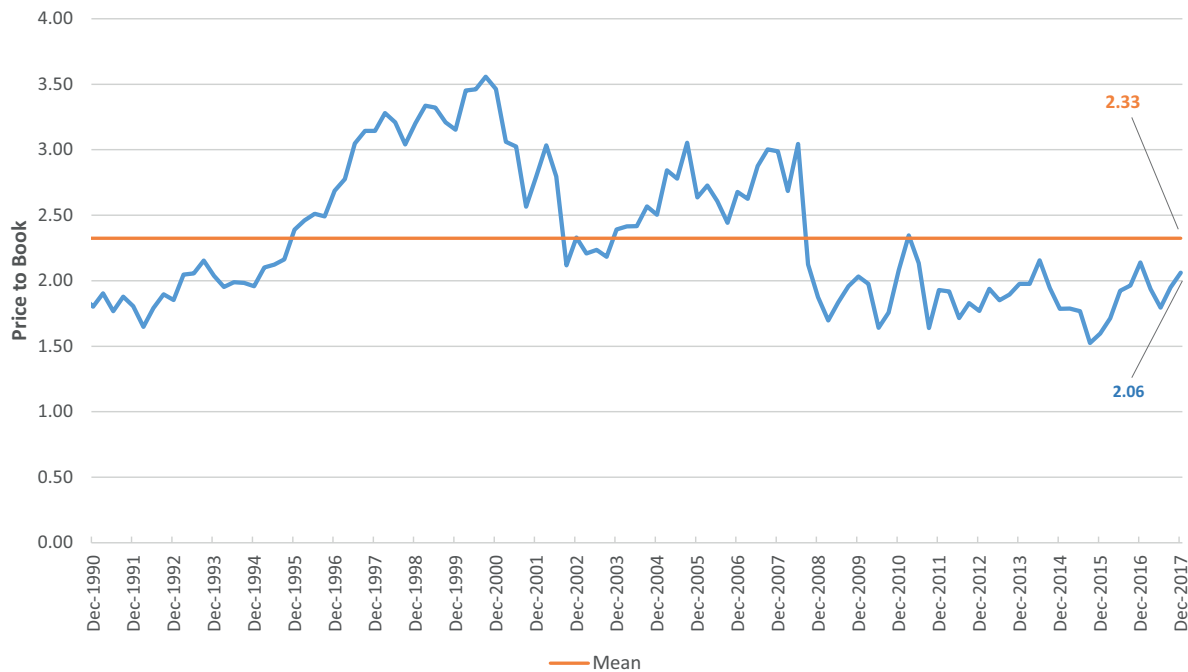


MARKET METRICS

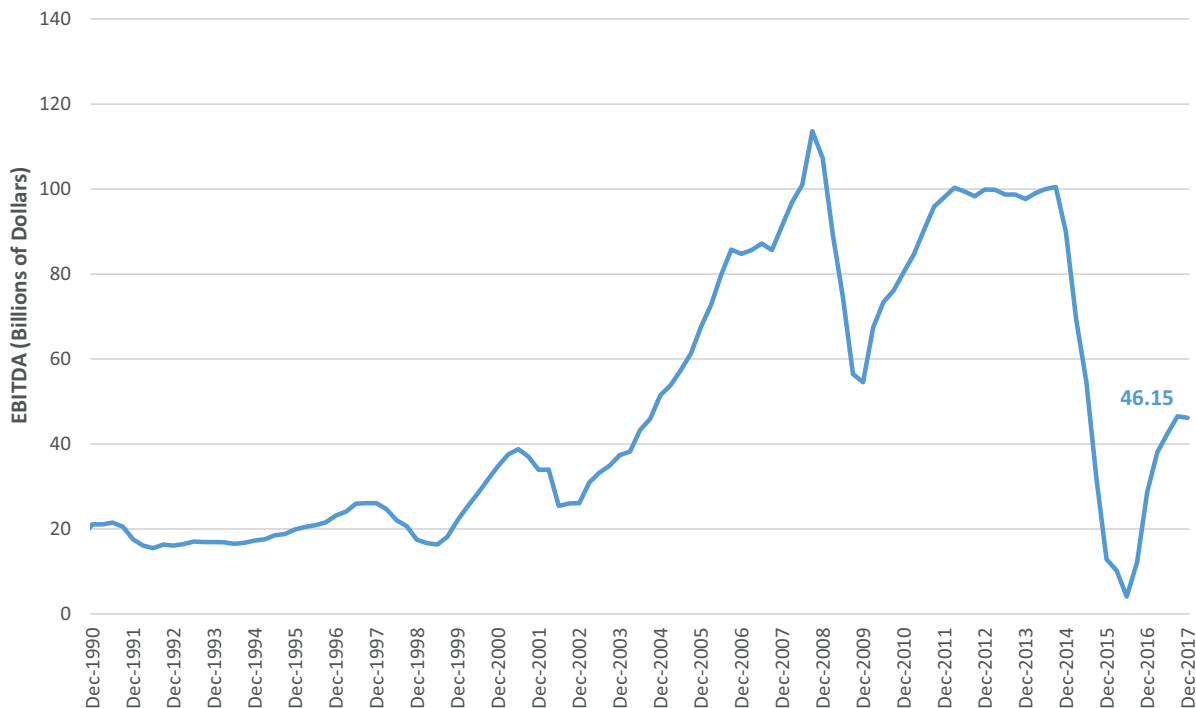
S&P 500 Energy Sector Trailing Price to Earnings Ratio (P/E)



S&P 500 Energy Sector Price to Book Ratio (P/B)



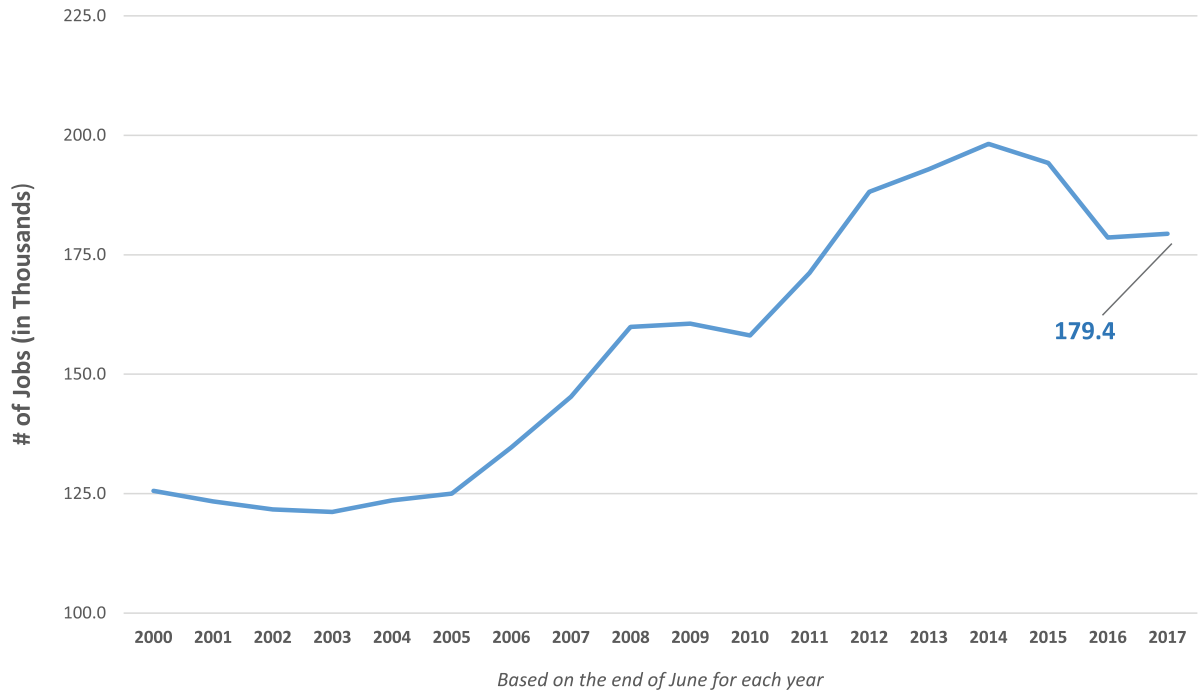
S&P 500 Energy Sector Earnings Before Interest, Taxes, Depreciation & Amortization (EBITDA)



S&P 500 Energy Sector Dividend Yield

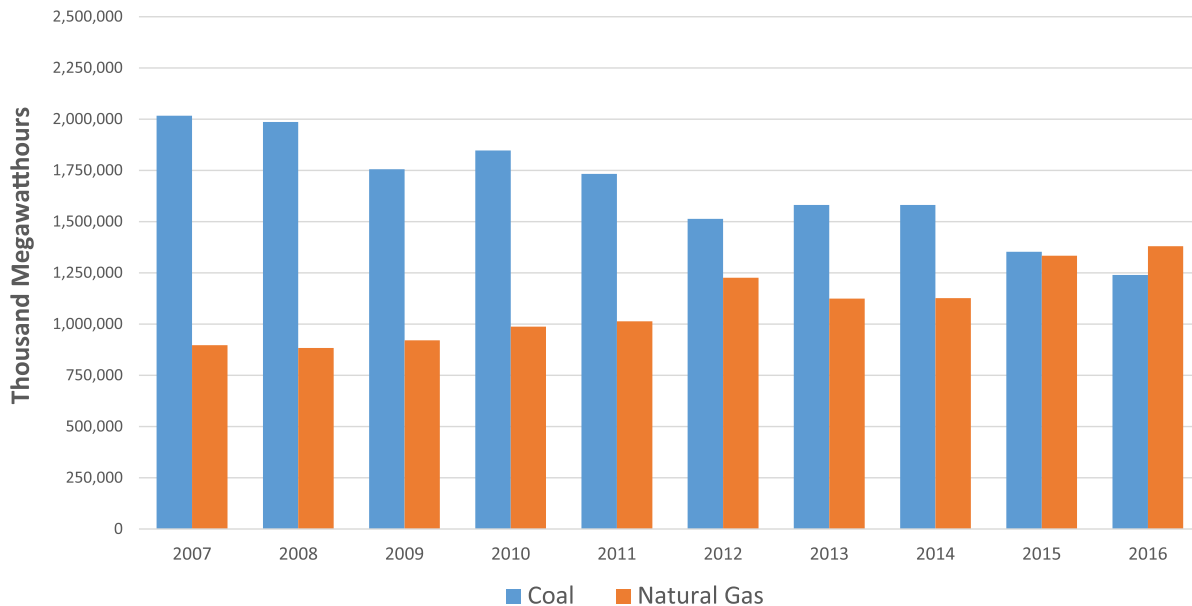


U.S. Oil and Natural Gas Extraction Employment

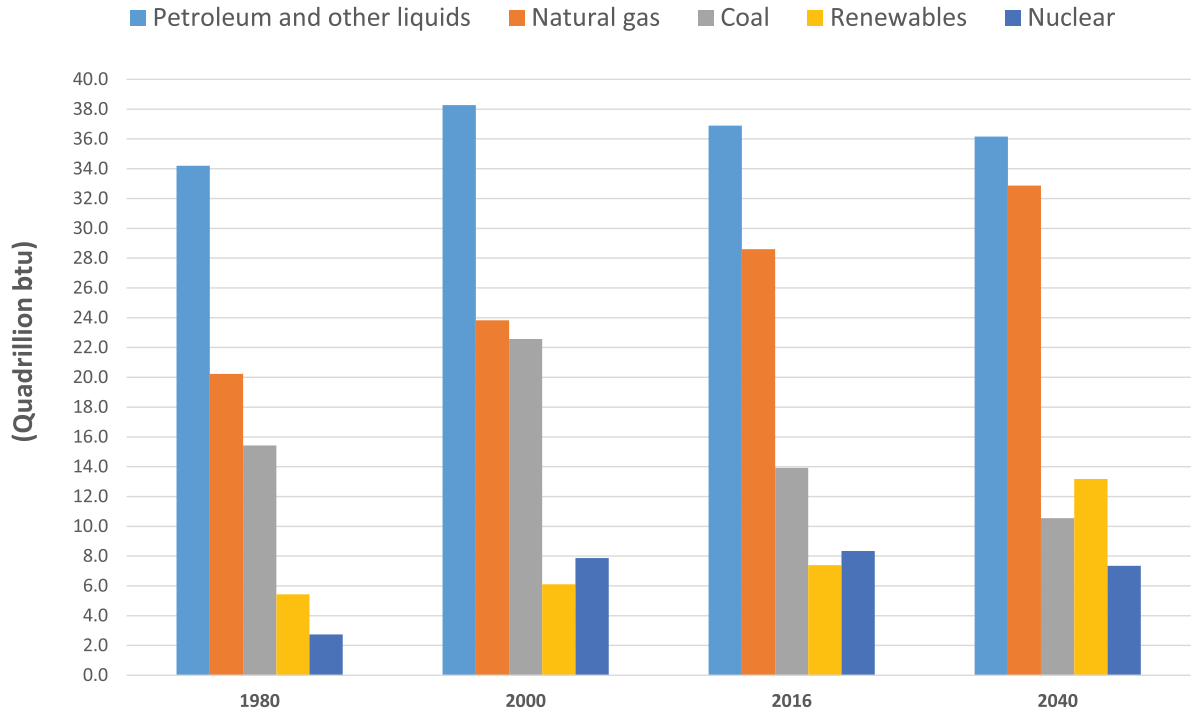


AT A GLANCE

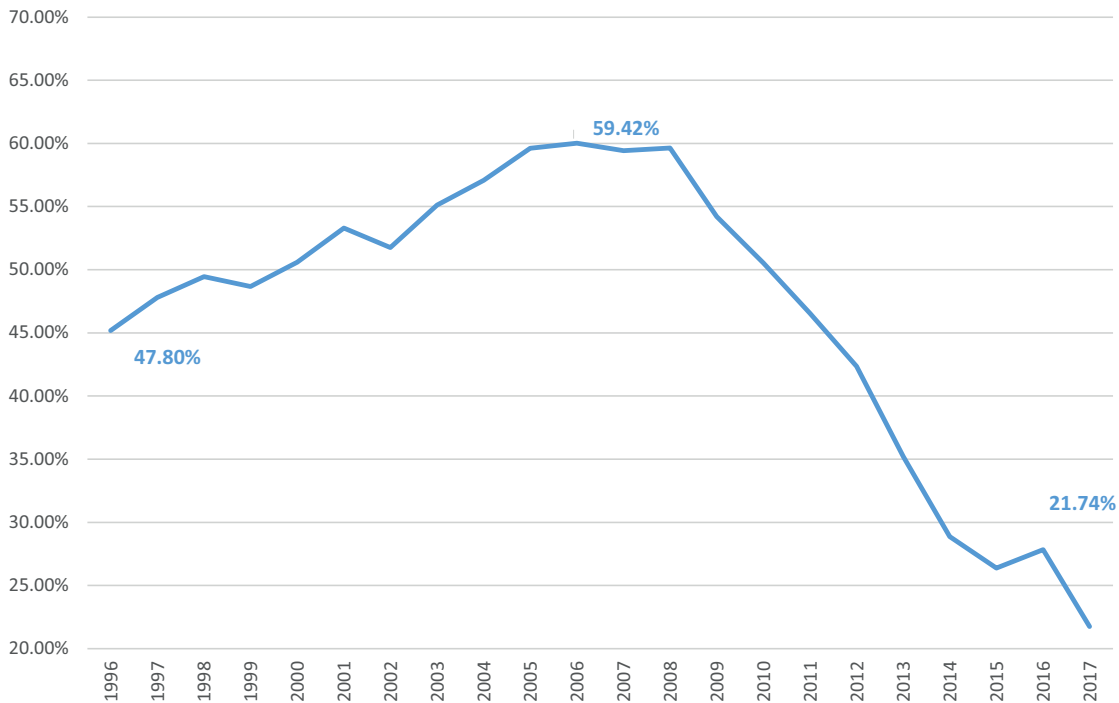
U.S. Net Generation of Coal and Natural Gas



World Energy Consumption by Primary Fuel

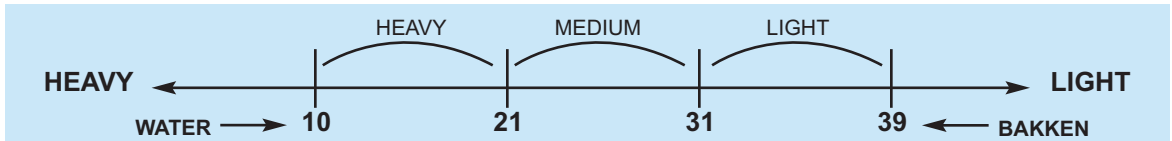


Net Petroleum Imports: Share of U.S. Consumption



Crude Oil Quality is Measured by Density and Sulfur Content

Density is measured by **API** (American Petroleum Institute) gravity.



API gravity is a measure of how heavy or light crude oil is compared to water which has a gravity of 10.

> 10 = lighter → floats on water

< 10 = heavier → sinks in water

API

- >31.1 = Light
- 22.3 - 31.1 = Medium
- 10 - 22.3 = Heavy
- <10 = Extra Heavy

Light Crude is generally more expensive than heavier crude as it takes less processing to refine.

Examples of Different API

API	BASIN
39-41	Bakken Crude
39	West Texas Crude
38	Brent Blend
33	Saudi Arabia
33	Nigeria (Bonny Light)
32	Russian Blend
20	Canada (Western Canadian Select)
13	California (Kern River)
10.5	Venezuela (Boscan)
8	Albert, Canada tar sand oil

Sulfur Content

Crude is defined as either **Sweet** or **Sour**.

Sweet = sulfur content less an 0.5%

Sour = sulfur content greater than 0.5%

Sweet is generally more expensive as it is easier to refine.

It is found in Western Texas, the Bakken of North Dakota and Saskatchewan, and the North Sea of Europe.

Sour is generally less expensive due to its corrosiveness and higher costs to refine. It can be found in Mexico, South America, Canada and most OPEC members.