

Making Sense of Oil Prices

Presentation To The Uintah Basin Energy Summit

by Robert Rapier

September 1, 2016

Vernal, Utah

Outline

- Biography
- Why oil prices crashed
- Is oil demand peaking?
- ZHRO Overview

About Me

Robert Rapier Biography

- MS in chemical engineering; BS in chemistry and mathematics; passion for energy
- Over 20 years in the energy business
- Roles in oil and natural gas production, refining, petrochemicals, renewable energy
- Five patents granted
- Director of Alternative Fuels for ZHRO in Chandler, Arizona



Media & Publications

- Appeared on 60 Minutes, The History Channel, CNBC, Business News Network, and PBS
- Written for Forbes, The Wall Street Journal, Washington Post, and The Economist
- Author of Power Plays – a layman's guide to the energy industry
- Chief Energy Strategist for Investing Daily

Forbes / Energy

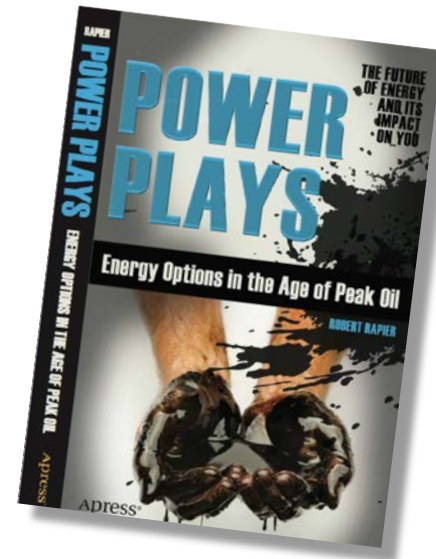
JAN 8, 2016 @ 08:30 AM 179,369 VIEWS

OPEC's Trillion-Dollar Miscalculation



Robert Rapier
CONTRIBUTOR

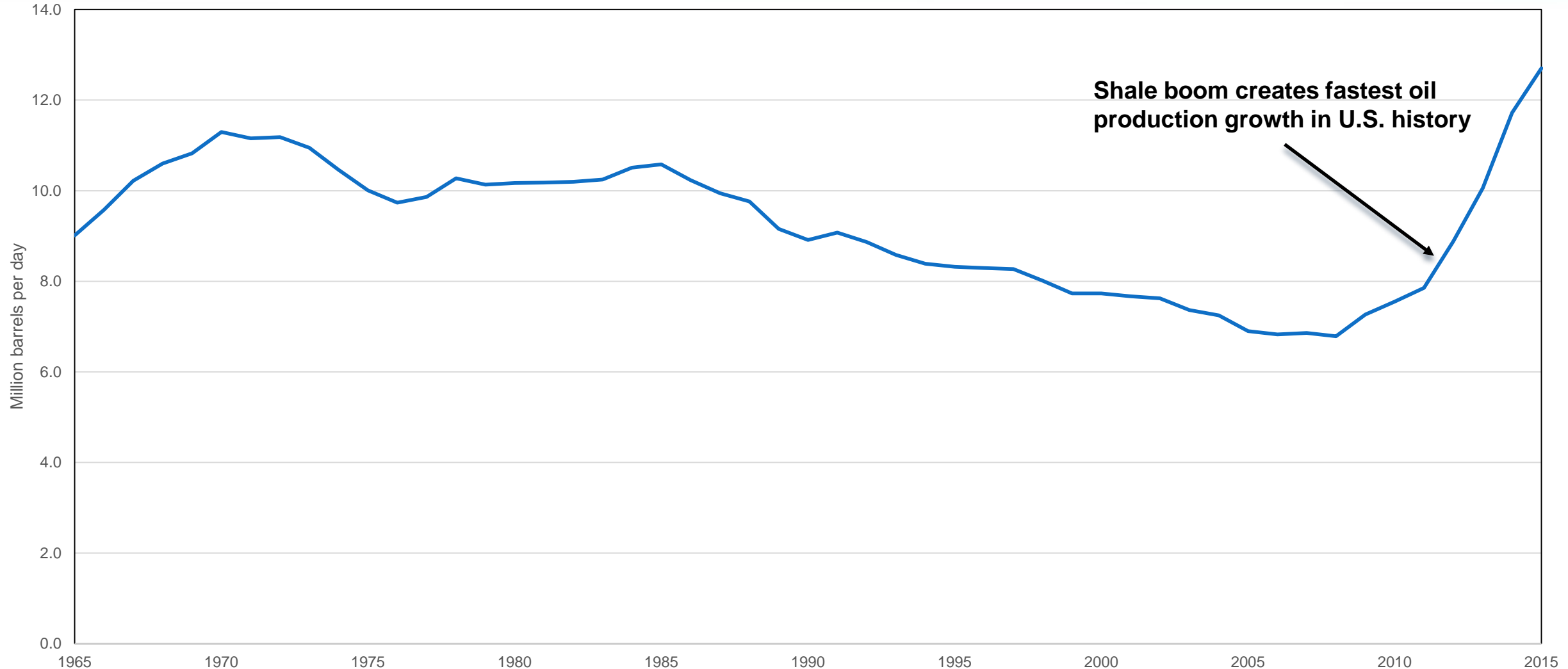
I write about energy, the environment, and the economy.



The Supply Side

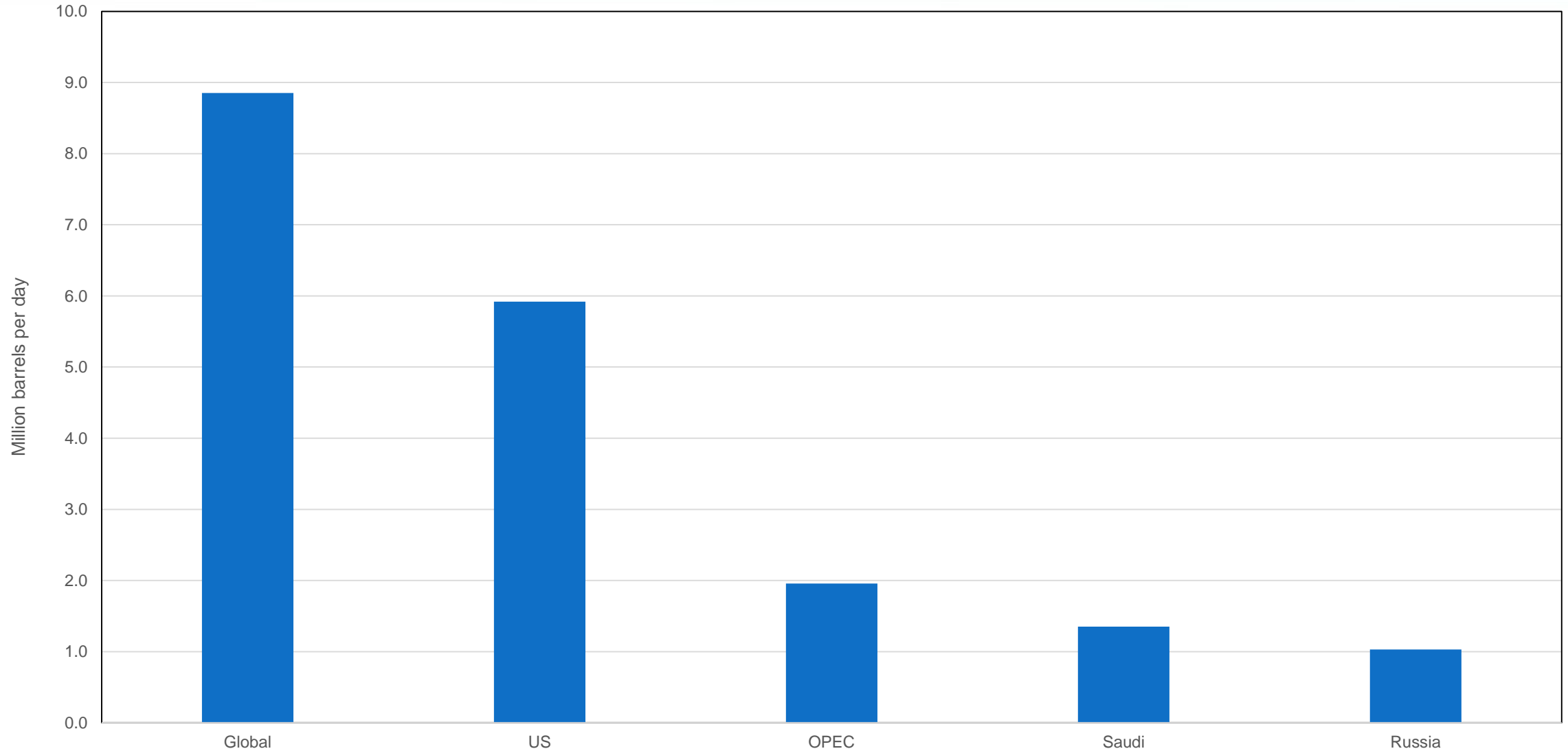
U.S. Oil Production Grew Nearly 5 Million BPD From 2008 To 2014

U.S. Crude Oil Production 1965 to 2014



U.S. Production Grew By More Than All Other Major Oil Producers

Change in Oil Production 2008-2015

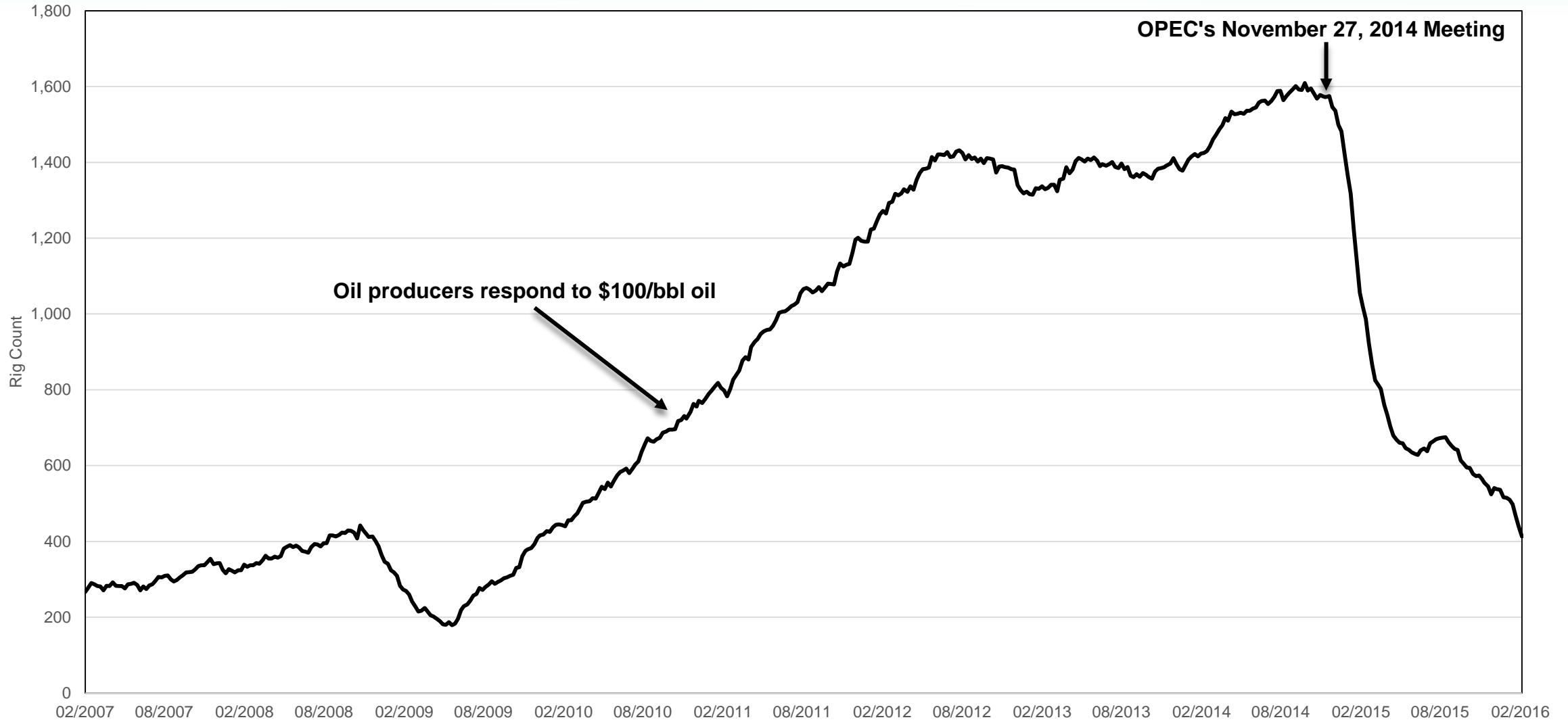


Data source: BP Statistical Review of World Energy 2016

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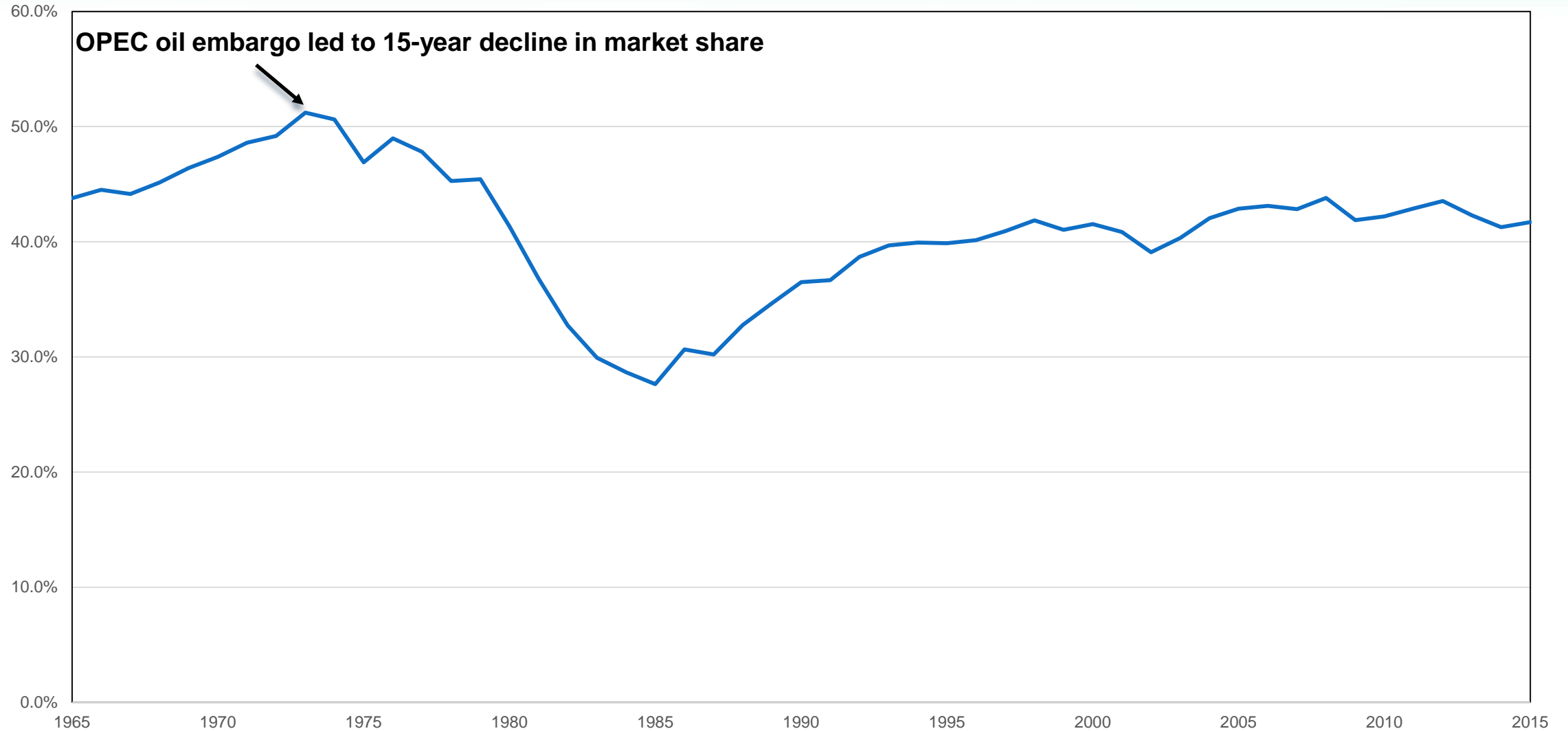
OPEC Responded

Rigs Drilling for Oil in North America 2007-2016



OPEC Fears Loss Of Market Share

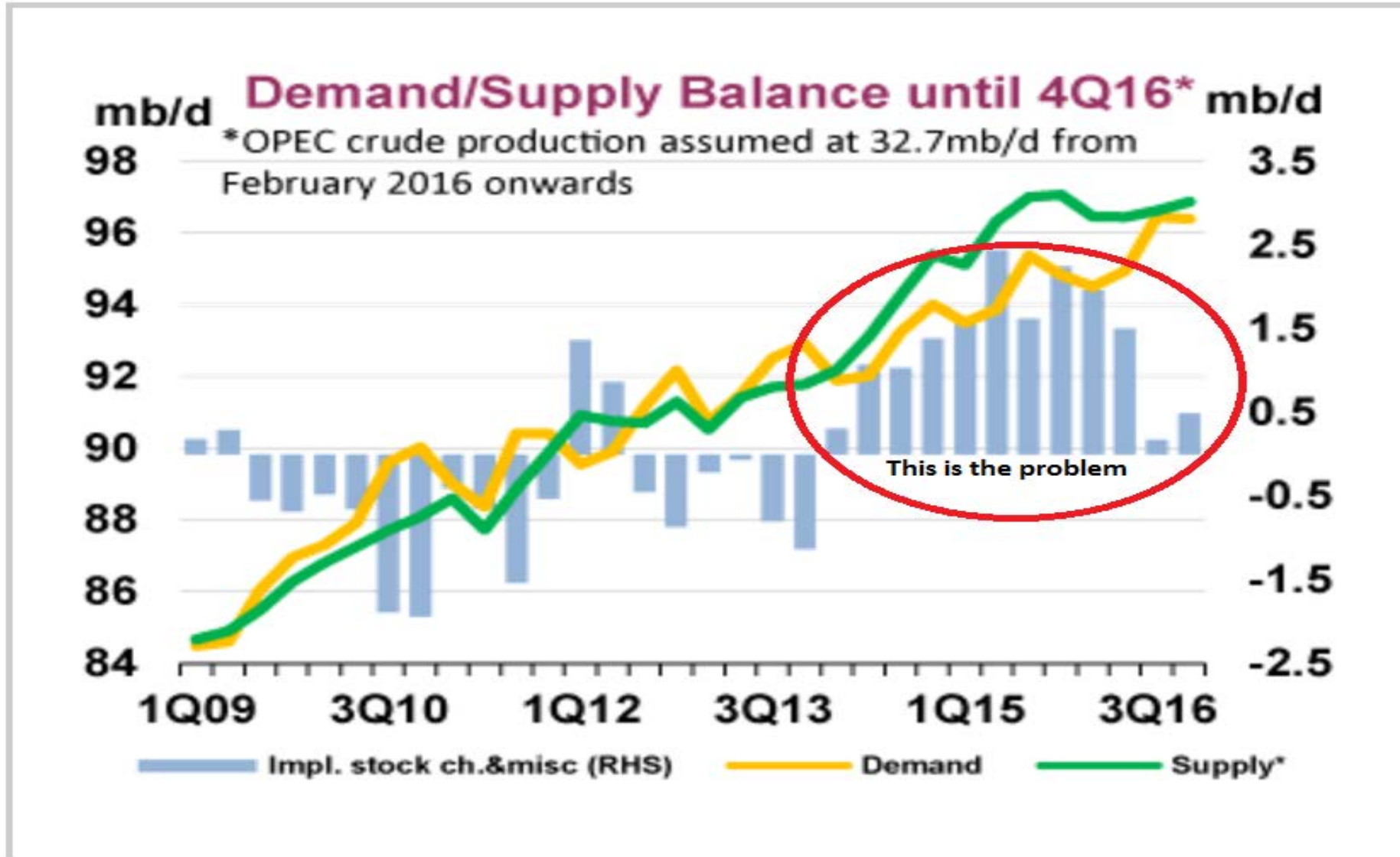
OPEC Share Of Global Production 1965-2015



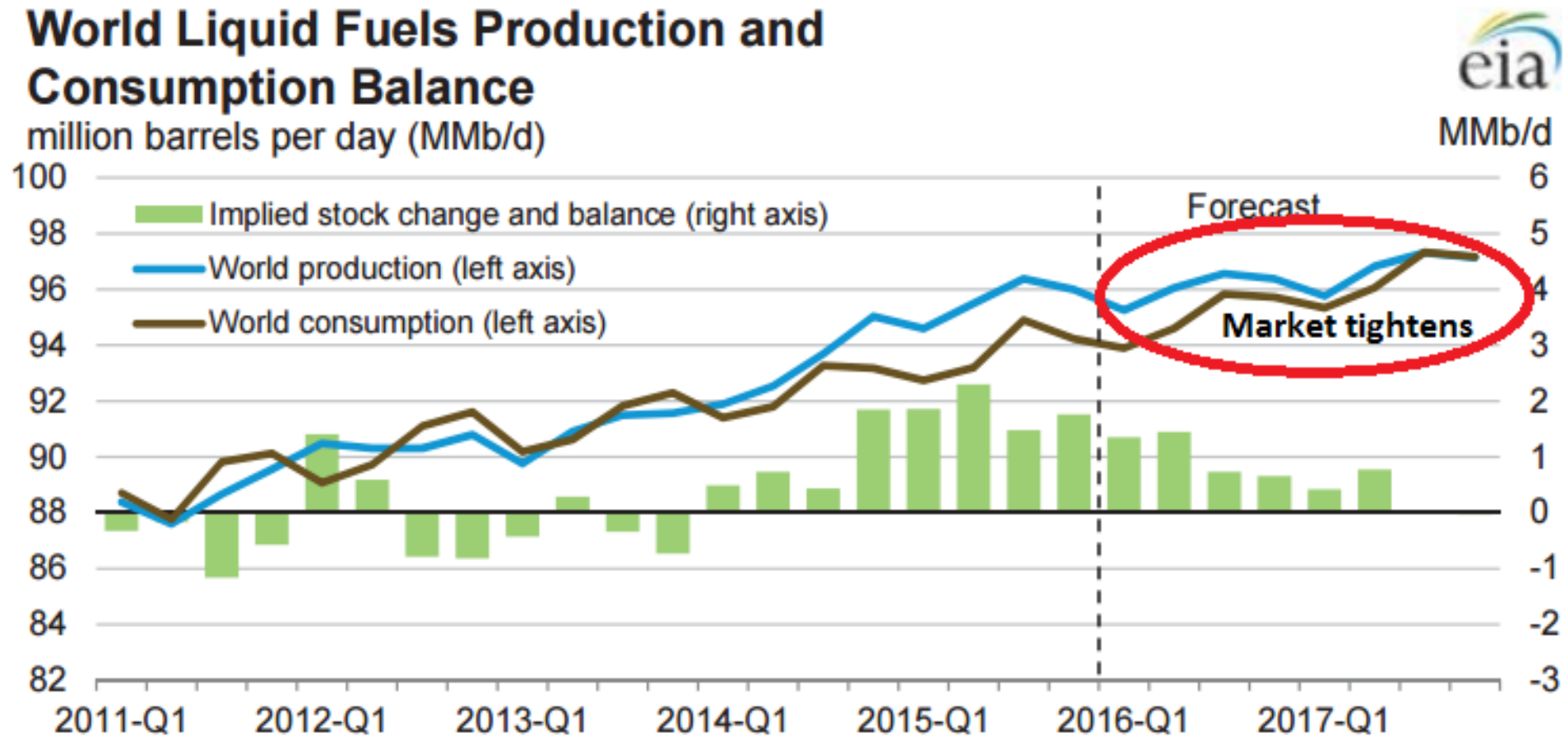
Data source: BP Statistical Review of World Energy 2016

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Global Inventories Swelled As OPEC Boosted Production 1.8 Million BPD



Supply Surplus Expected To Diminish 2nd Half 2016



Source: Short-Term Energy Outlook, February 2016.

Is Oil Demand Waning?

Peak Oil Demand?

- We are bombarded by warnings that the end of the oil age is at hand

**Bloomberg
Business**

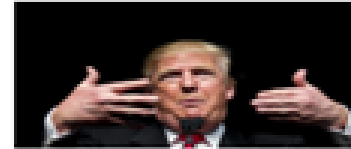
Here's How Electric Cars Will Cause the Next Oil Crisis

A shift is under way that will lead to widespread adoption of EVs in the next decade.

By Tom Randall | Feb. 25, 2016

CLIMATE PROGRESS

HOME CLIMATE ECONOMY HEALTH JUSTICE LGBT WORLD CULTURE



The Story Behind Donald Trump's Undocumented Polish Workers

BREAKING NEWS

Mass Shooting in Kansas Leaves At Least 3 Dead, Up To 20 Wounded



Florida Officials Drain Lake Full Of 'Toilet' Water To Coast

CLIMATE

Peak Oil Returns: Why Demand Will Likely Peak By 2030

BY JOE ROMM FEB 22, 2016 8:00 AM



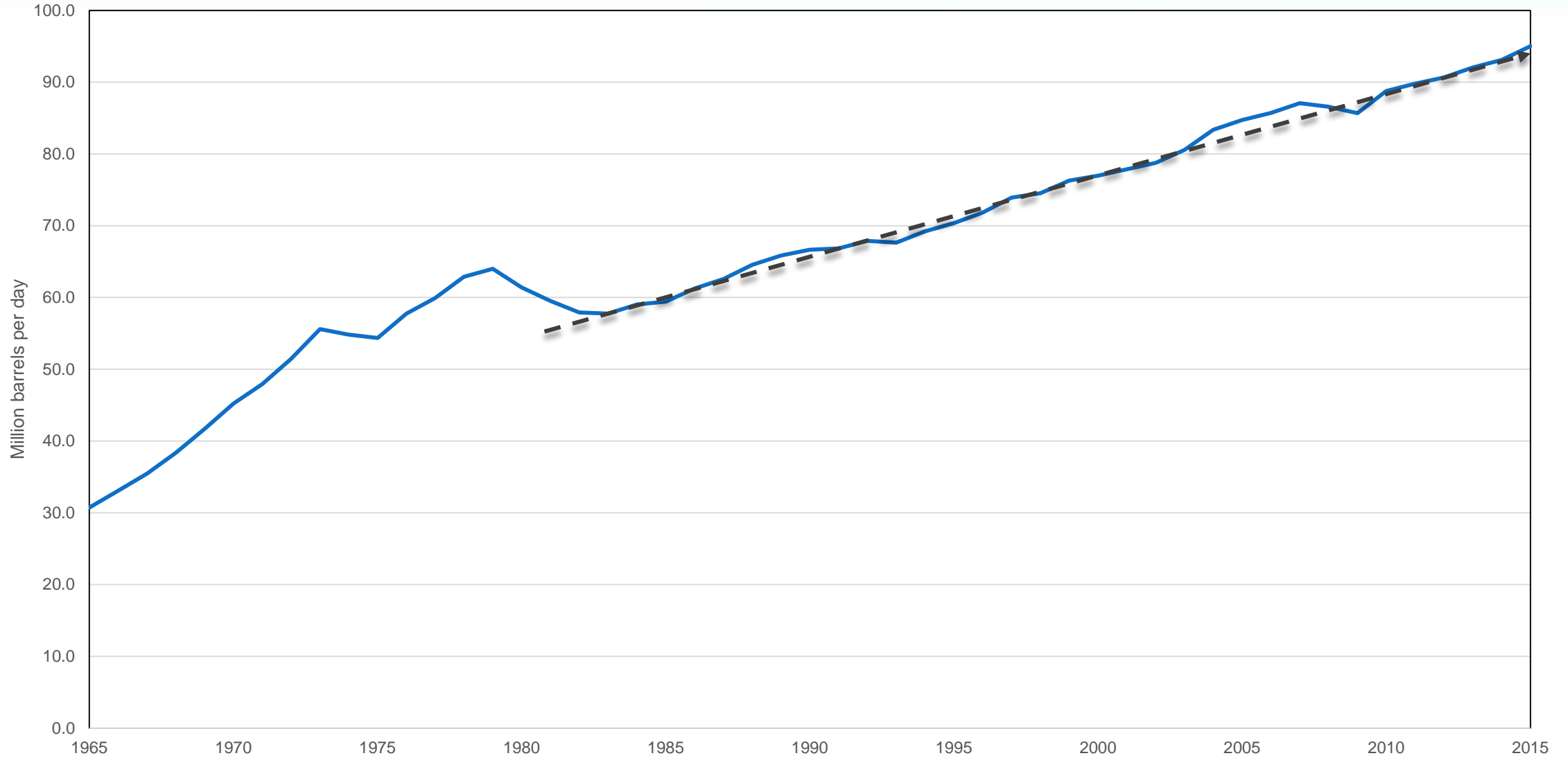
Yesterday's fuel



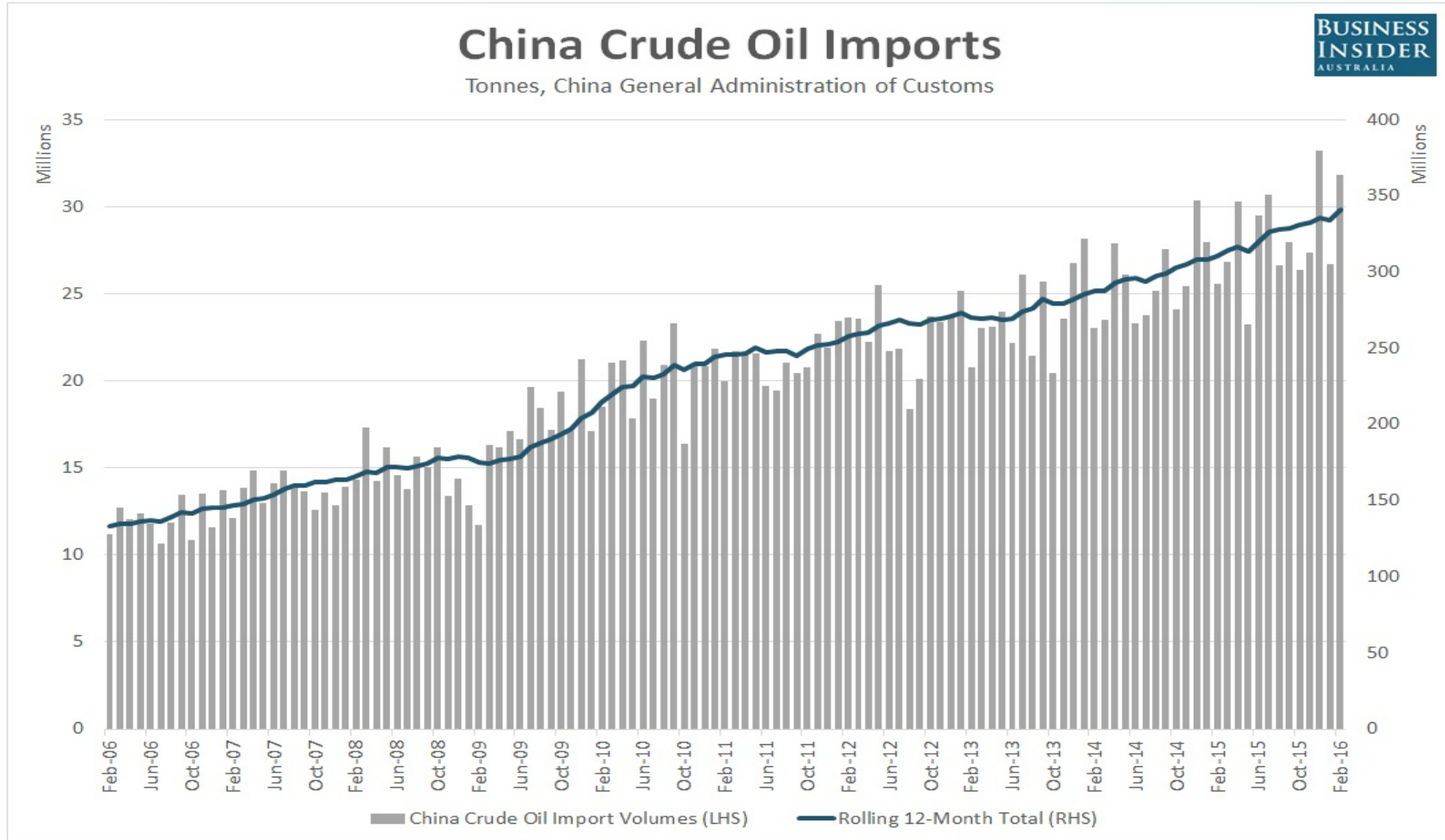
Why demand for oil will fall

Global Crude Demand Has Grown ~1 Million BPD Each Year For > 30 Years

Global Crude Oil Demand 1965-2015



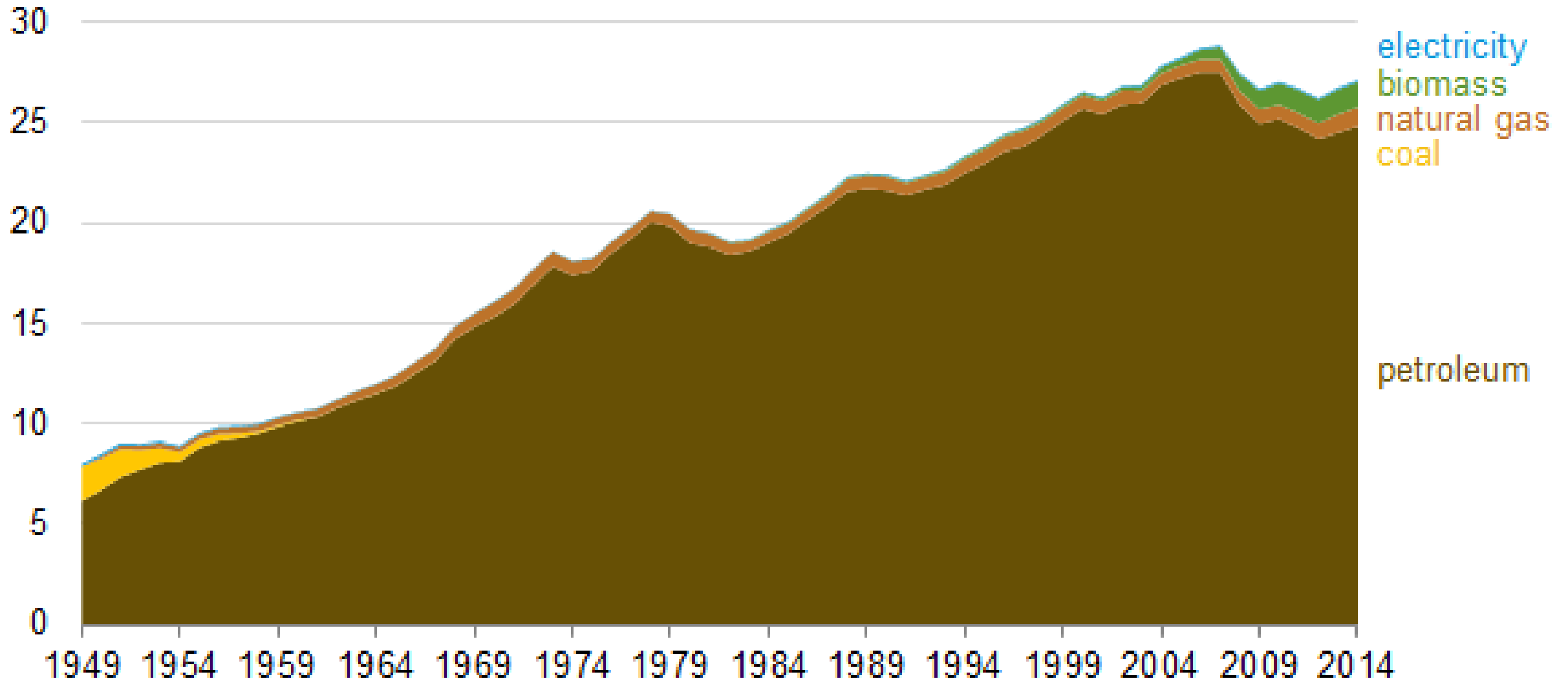
Weakening Chinese Demand?



Petroleum Has 92% Share Of The U.S. Transportation Market

Energy consumption in the transportation sector (1949-2014)

quadrillion Btu

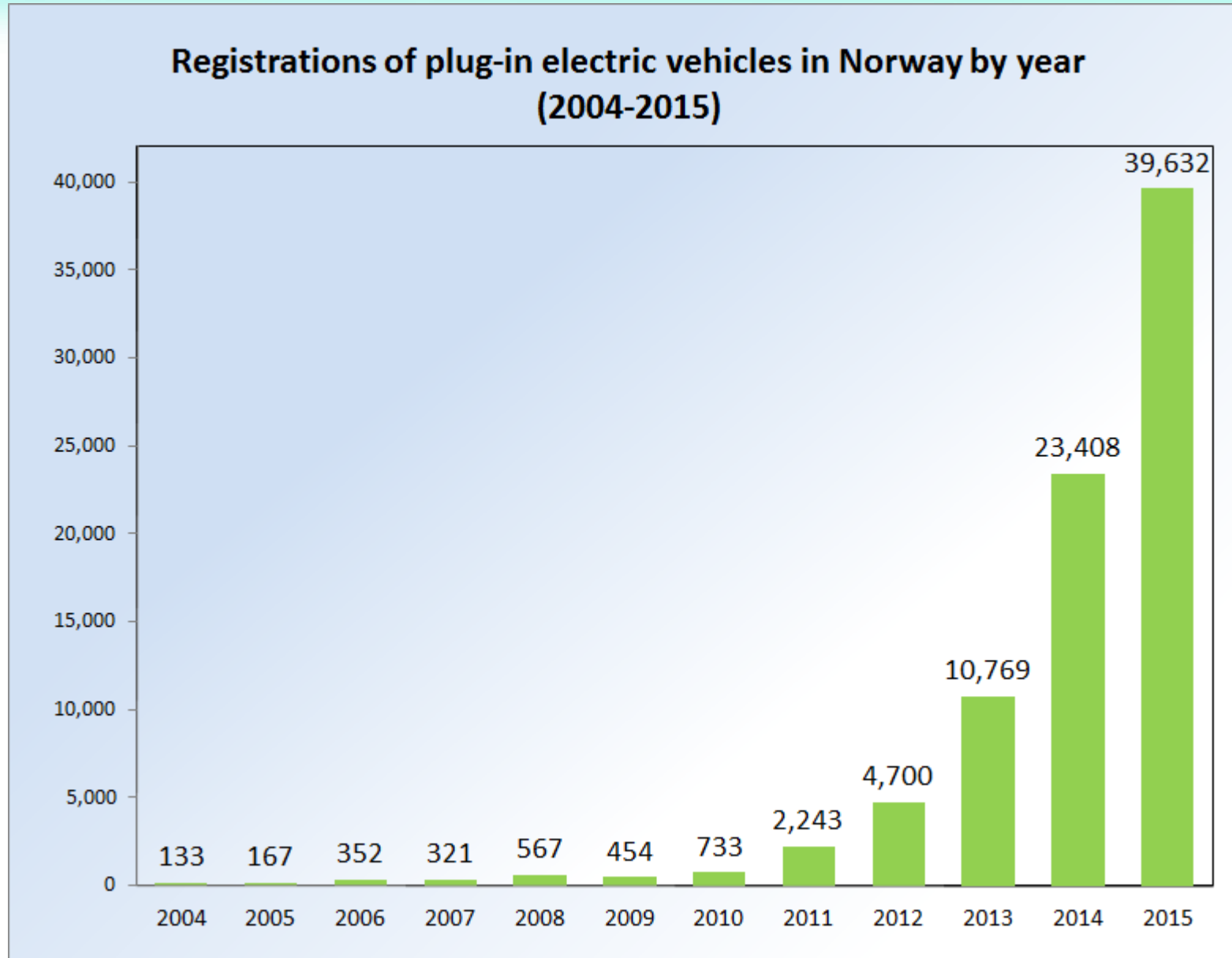


Electric Vehicles Have Failed To Capture 1% Of The U.S. Market

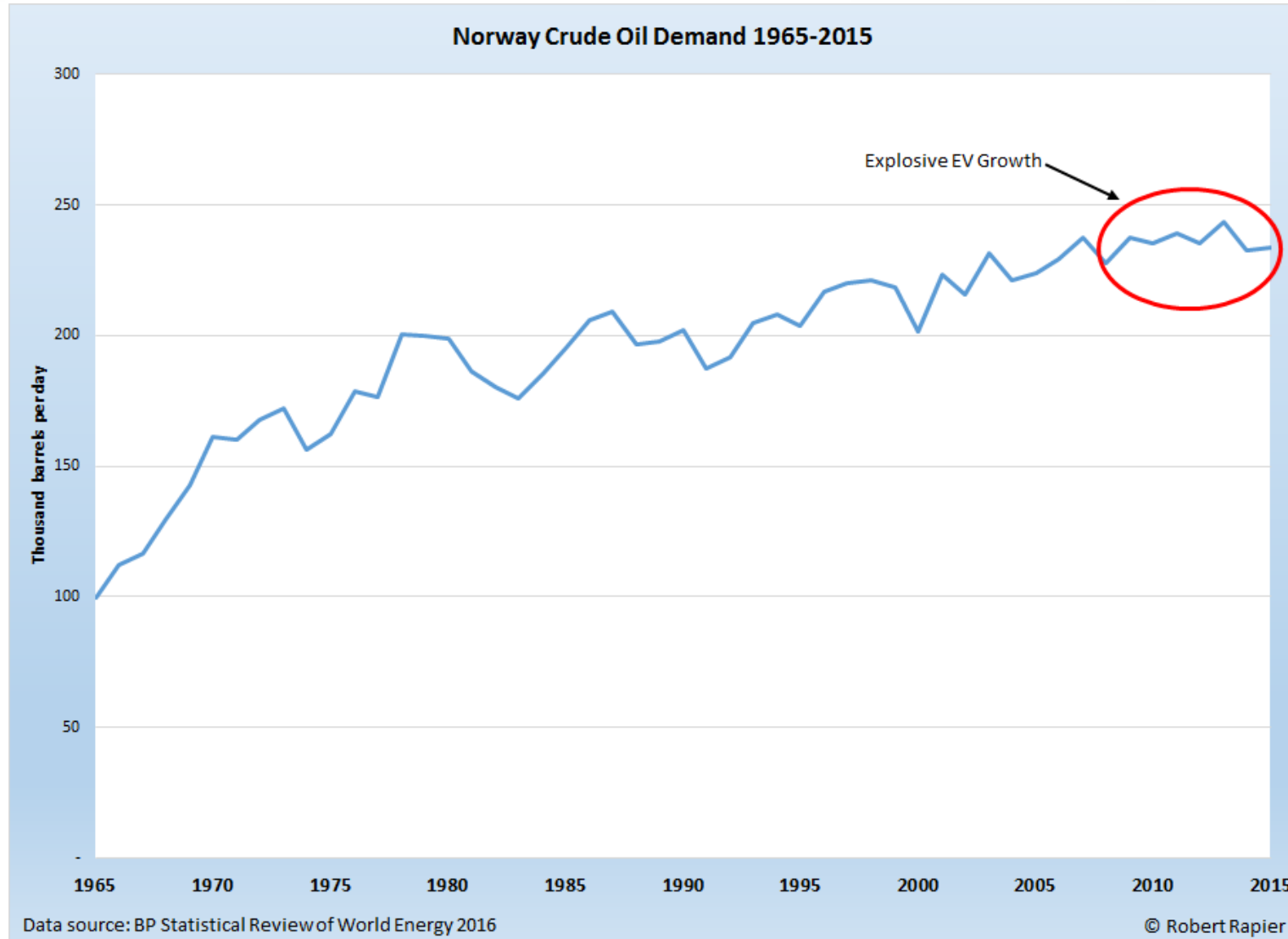
- 2014 sales figures in the U.S.
 - 16.5 million gasoline cars
 - 122,438 electric cars (0.74% of all sales)
- 2015 sales figures in the U.S.
 - 17.5 million gasoline cars
 - 116,099 electric cars (0.66% of all sales)
- In Norway EVs have grown to 12.5% market share
 - Oil consumption still rose by 6%

The near-term impact of EVs on the crude oil market is grossly overestimated

Despite Explosive EV Growth In Norway...



Oil Demand Slightly Increased



Conclusions

- The U.S. has been the world's most important new source of oil
- Global oil demand growth remains robust
- Oil prices crashed due to oversupply; markets are rebalancing
- Threats to oil's market share have been overblown
- Oil is very unlikely to soon follow coal into the sunset

Introduction To ZHRO



Associated Gas Flaring

Problem:

Associated gas that is flared due to its low commodity value, lack of infrastructure, or rich/inconsistent composition



Solution:

Convert to a consistent methane stream suitable for on-site power production

That solution can take different forms depending on local needs



ZHRO CMT Gas Conversion System

- **Catalytic – Gas Reforming System**
- **No NGL separation**
- **Reforms entire gas stream into pipeline quality methane**
- **Remote monitor**
- **GPS tracking**
- **Clean 90%+ methane**
- **Virtual pipeline of clean methane**
- **Powering 200kW – 1MW**



ZHRO 1500CMT



Well Site Integration

Flare Gas:

Methane CH_4

NGLs

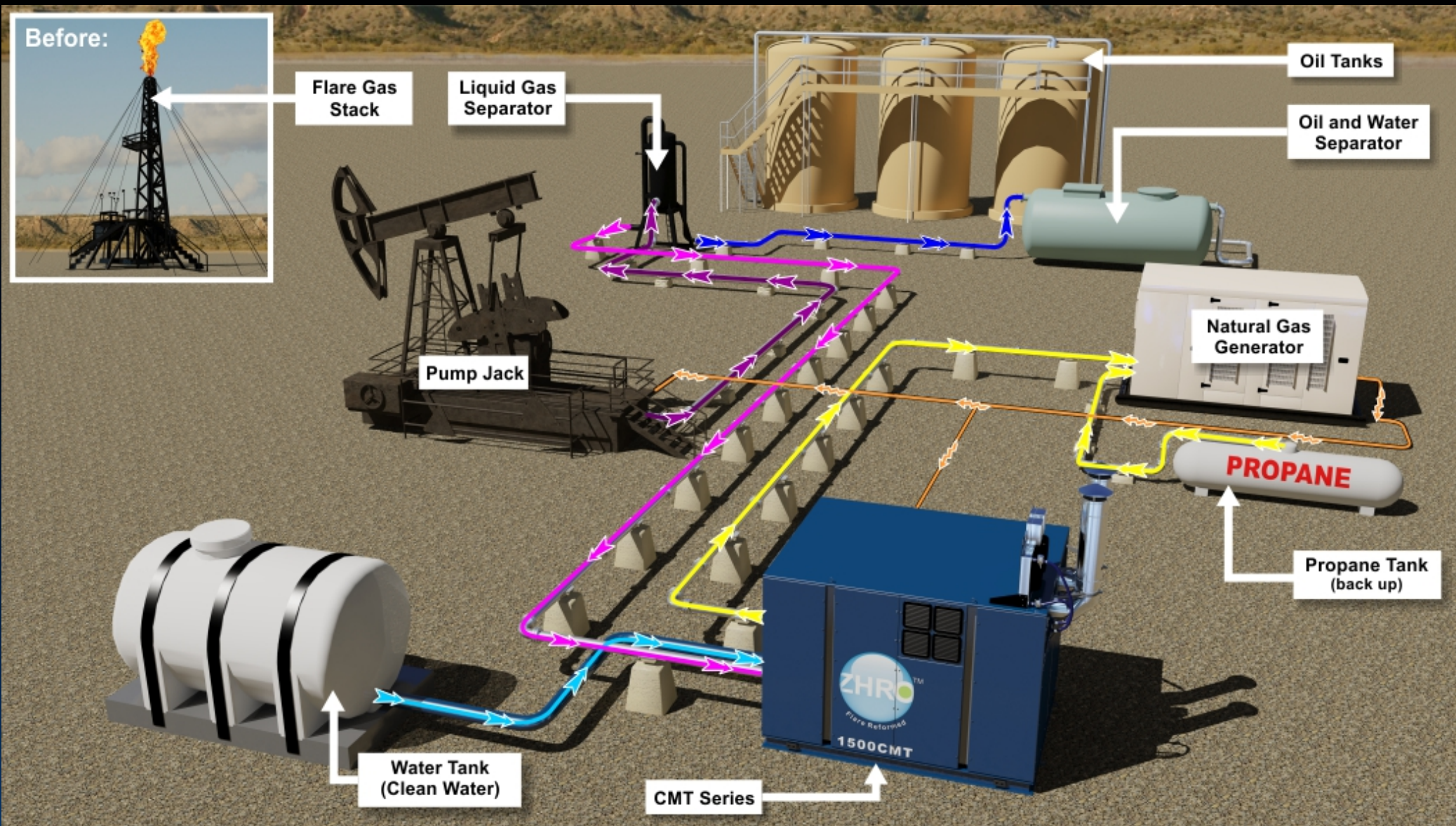
Ethane C_2H_6

Butane C_4H_{10}

Pentane C_5H_{12}

Propane C_3H_8

Hexane C_6H_{14}





9000CMT System





Future of Flare – Anticipated Verticals



Flare to Electricity

On Site Power Generation

Micro refinery

Grid Support



Flare to Distributed NG

Frack Rig: 800 – 900 Diesel Gallons / Hr. Displace with up to 70% ZHRO Gas

Distributed Natural Gas to businesses not on the Natural Gas Grid



Flare to Liquids

Feed stock virtually free – Energy is Free

Output can be methanol or synthetic fuels

Questions?

For more info on ZHRO: <http://www.zhro.com/associated-gas>

info@zhro.com