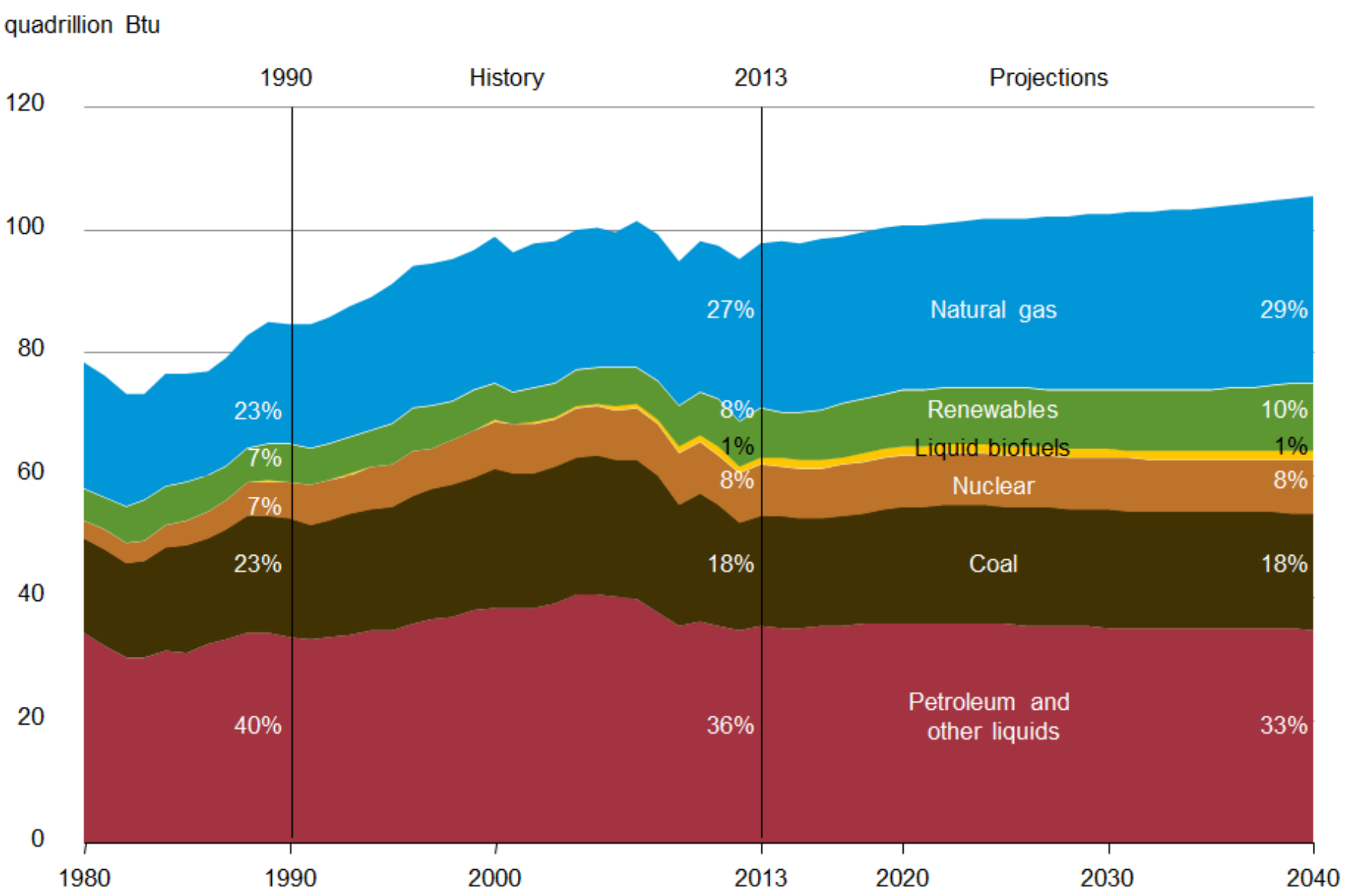
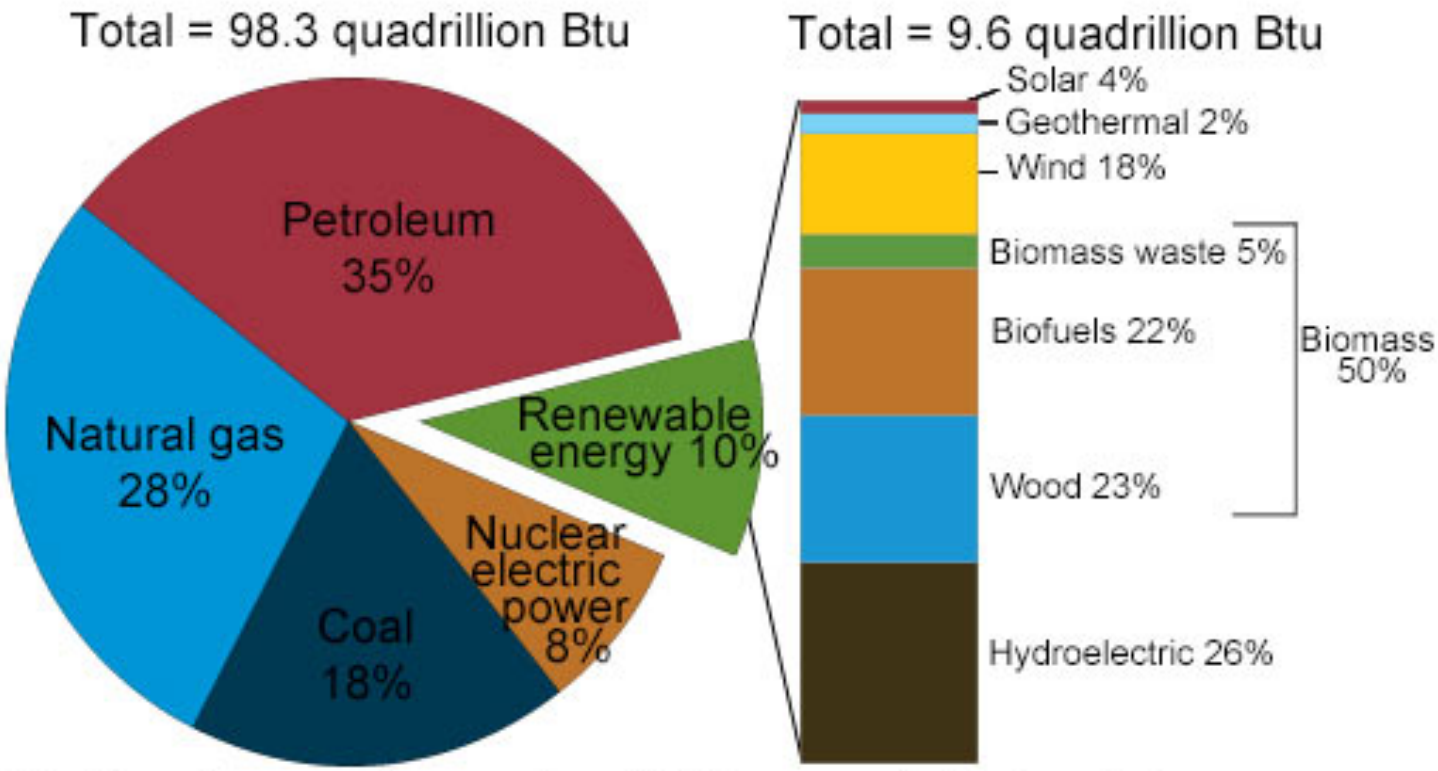
Energy trends and outlooks

January 27, 2016

Figure 18. Primary energy consumption by fuel in the Reference case, 1980-2040



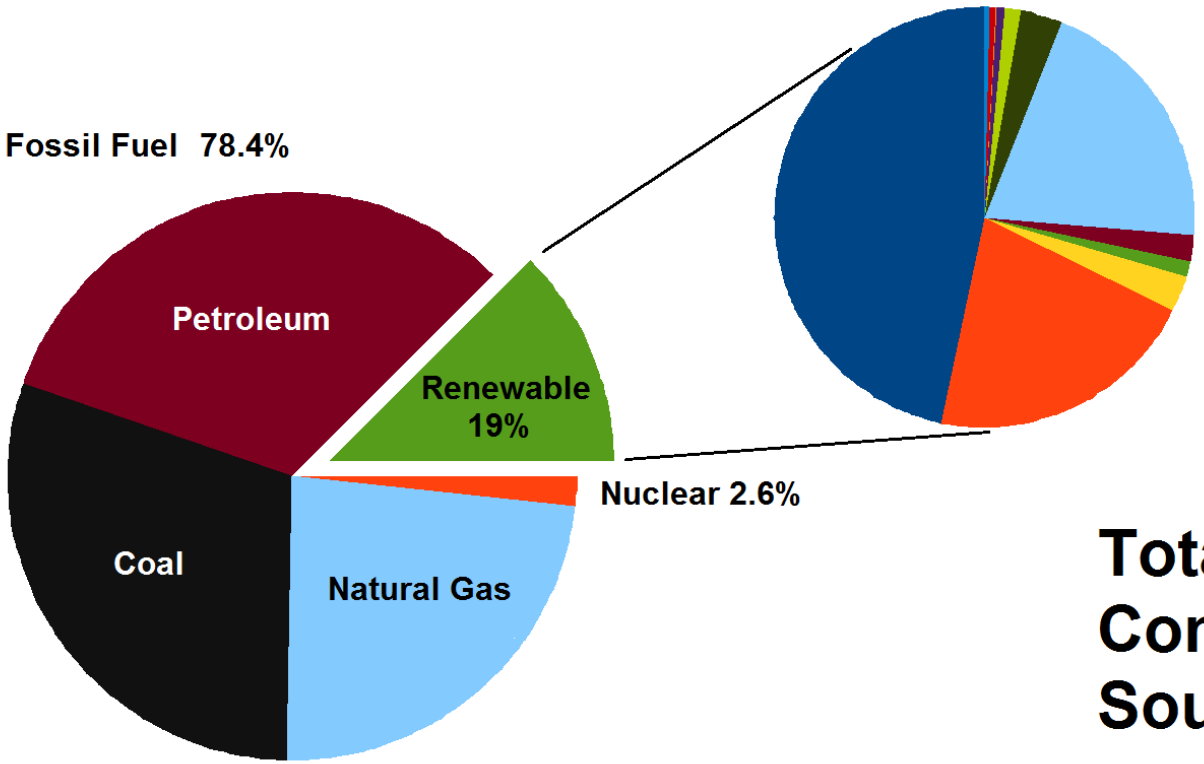
U.S. energy consumption by energy source, 2014



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

eia



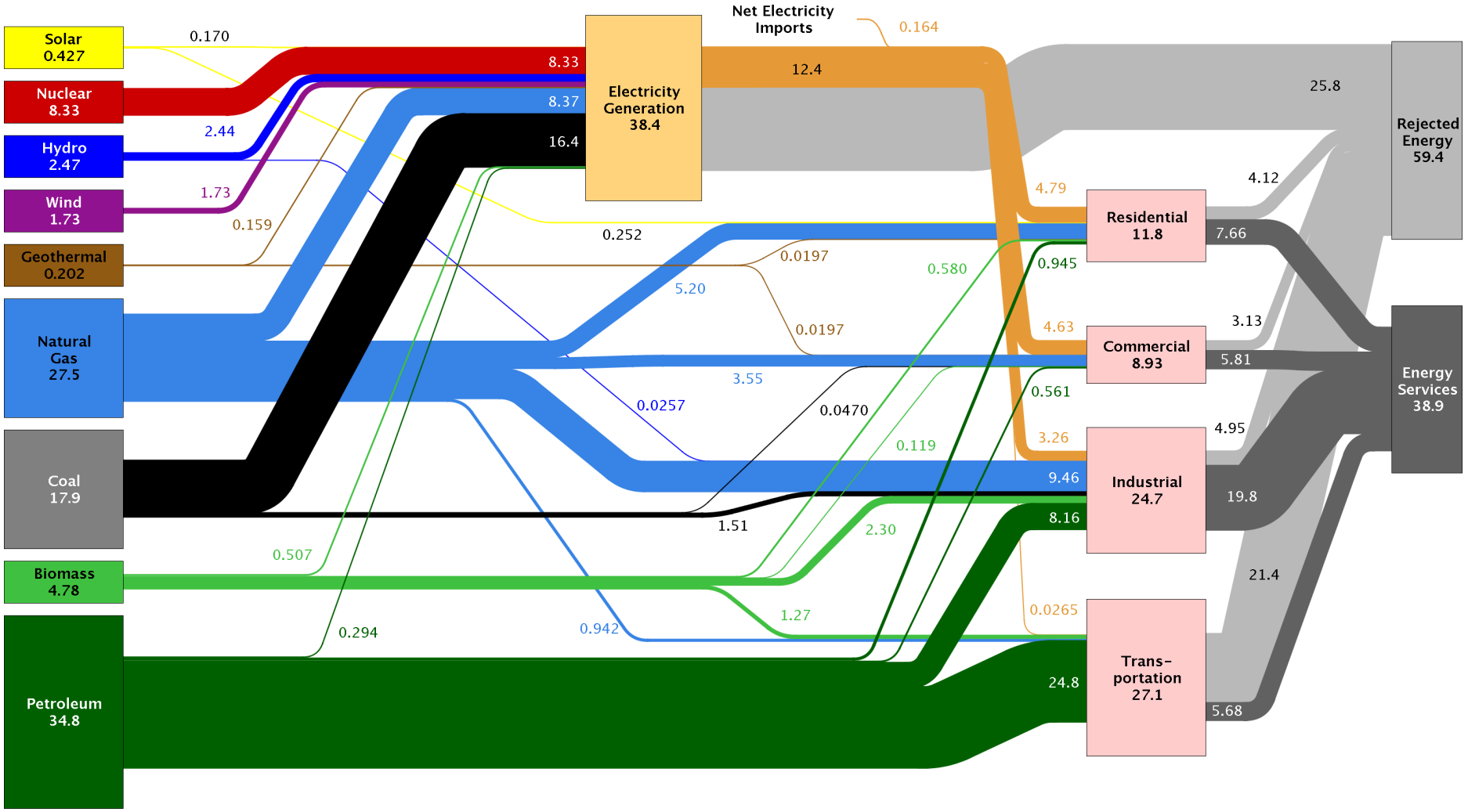
Renewable

Traditional biomass	9%
Bio-heat	2.6%
Ethanol	0.34%
Biodiesel	0.15%
Biopower generation	0.25%
Hydropower	3.8%
Wind	0.39%
Solar heating/cooling	0.16%
Solar PV	0.077%
Solar CSP	0.0039%
Geothermal heat	0.061%
Geothermal electricity	0.049%
Ocean power	0.00078%

Total World Energy Consumption by Source (2013)

Estimated U.S. Energy Use in 2014: ~98.3 Quads

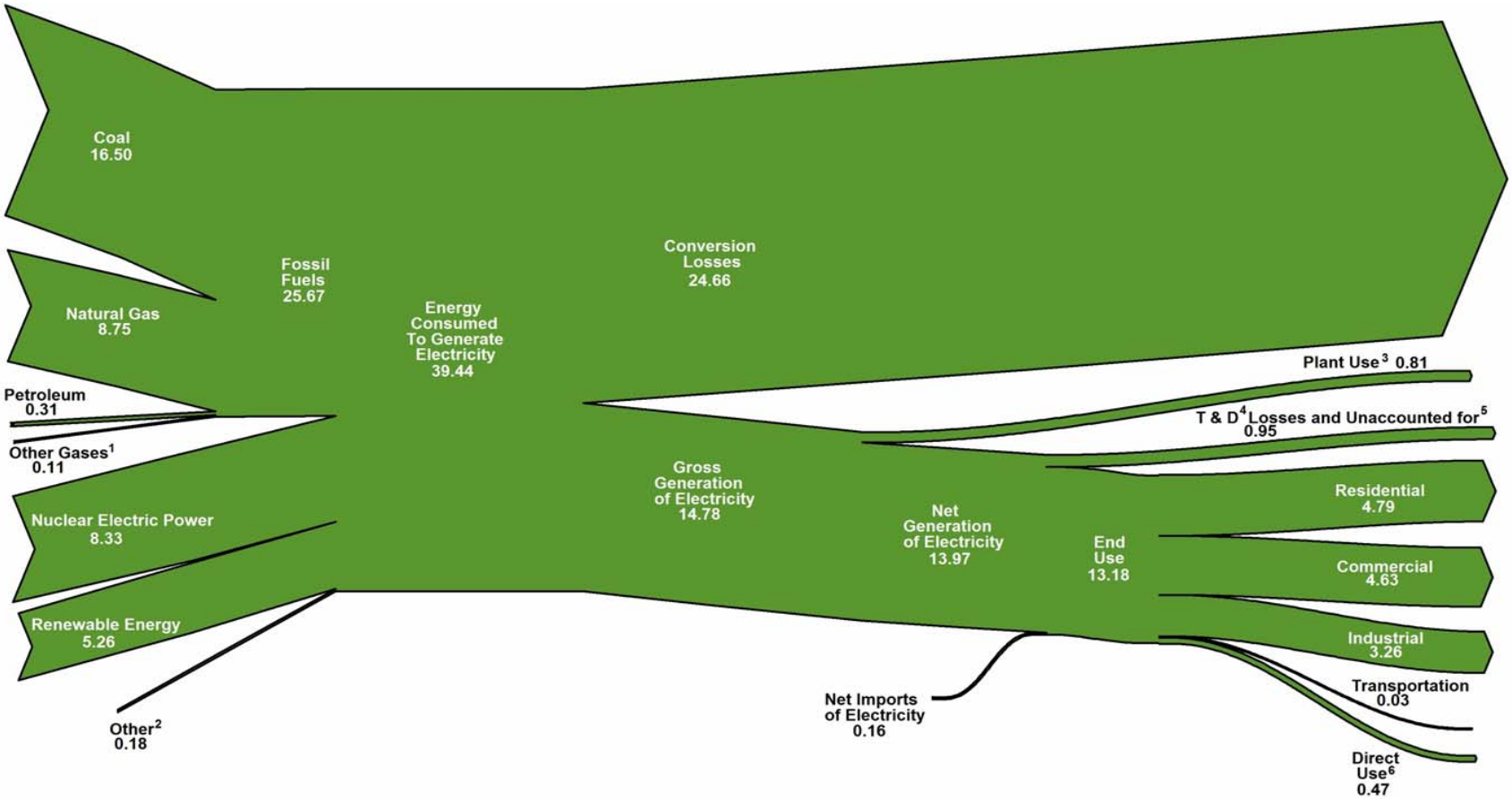
Lawrence Livermore National Laboratory



Source: LLNL 2015. Data is based on DOE/EIA-0035(2015-03), March, 2014. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports consumption of renewable resources (i.e., hydro, wind, geothermal and solar) for electricity in BTU-equivalent values by assuming a typical fossil fuel plant "heat rate." The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 65% for the residential and commercial sectors 80% for the industrial sector, and 21% for the transportation sector. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527

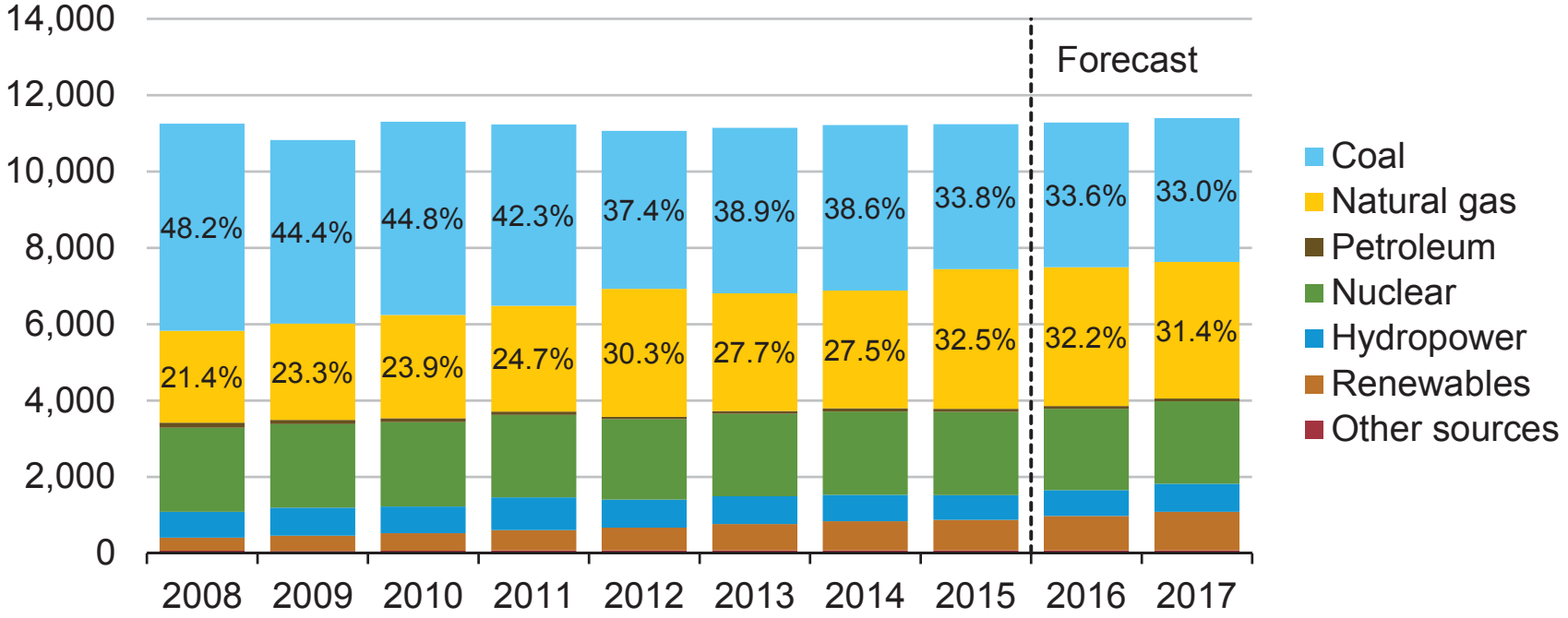
U.S. Electricity Flow, 2014

(Quadrillion Btu)



U.S. Electricity Generation by Fuel, All Sectors

thousand megawatthours per day

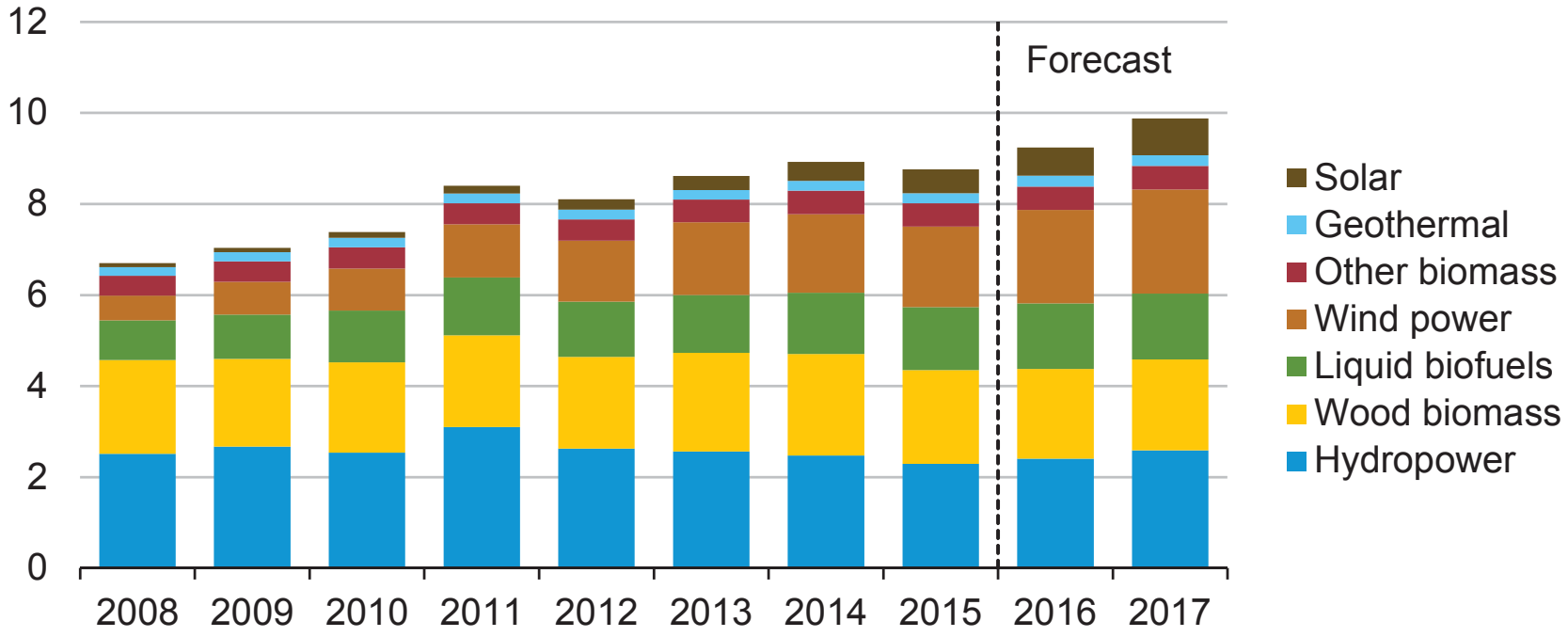


Note: Labels show percentage share of total generation provided by coal and natural gas.

Source: Short-Term Energy Outlook, January 2016.

U.S. Renewable Energy Supply

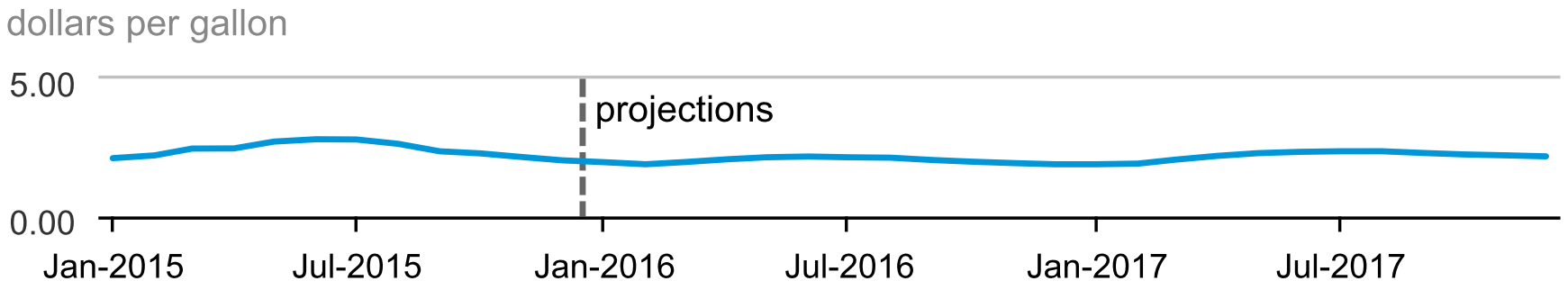
quadrillion British thermal units (Btu)



Note: Hydropower excludes pumped storage generation. Liquid biofuels include ethanol and biodiesel. Other biomass includes municipal waste from biogenic sources, landfill gas, and other non-wood waste.

Source: Short-Term Energy Outlook, January 2016.

Gasoline Regular Grade Retail Price Incl Taxes, U.S. Average

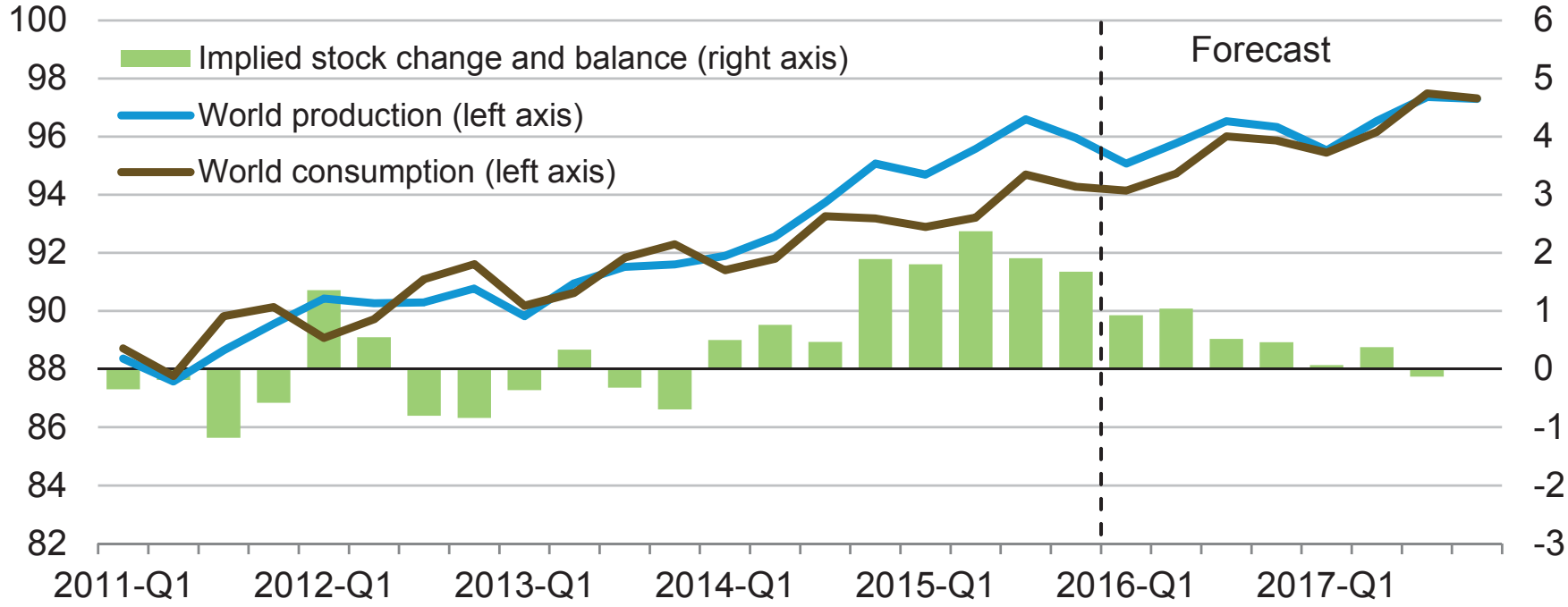


Source: Short-Term Energy Outlook

What sets the price of energy fuels?

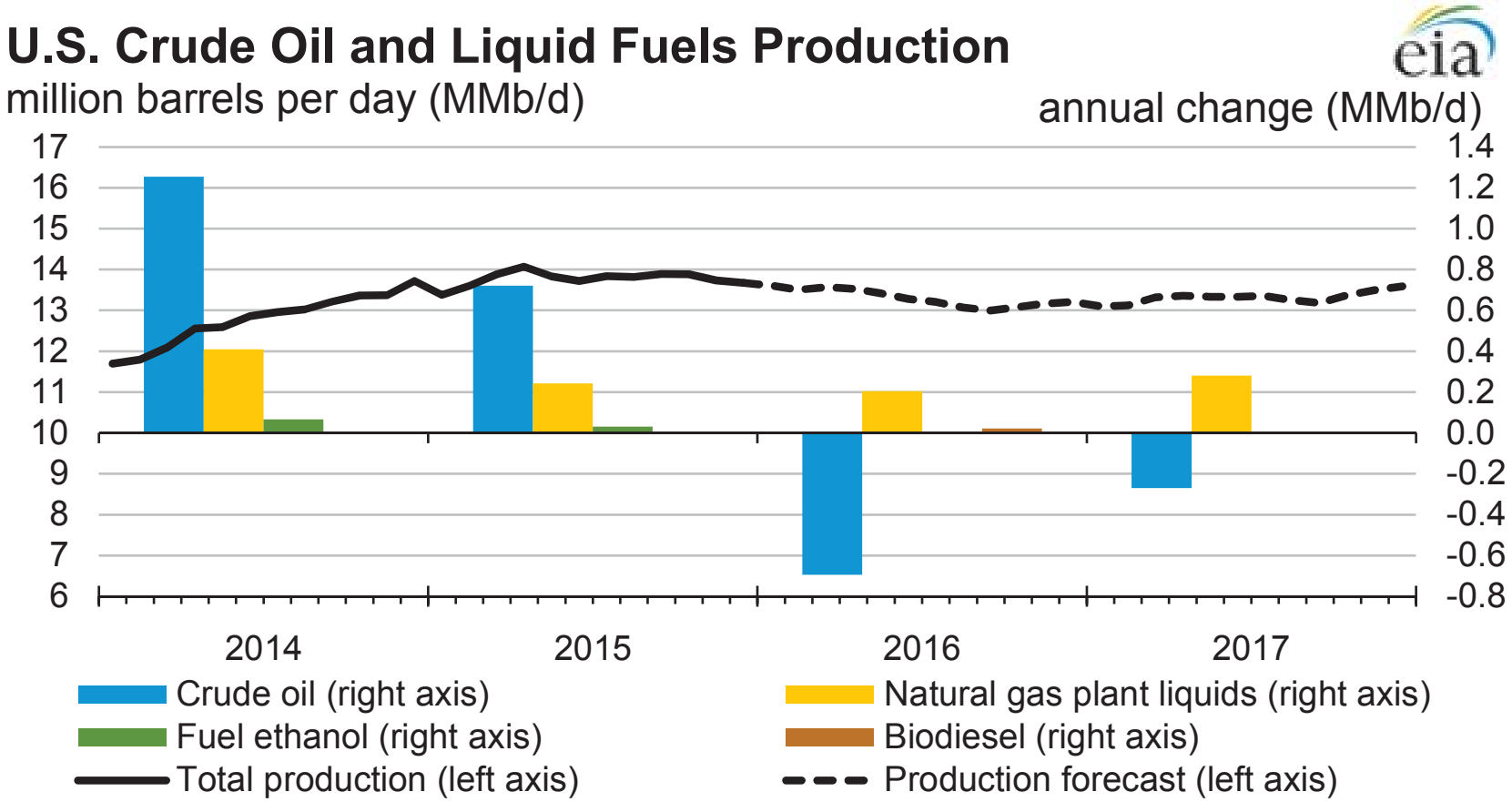
World Liquid Fuels Production and Consumption Balance

million barrels per day (MMb/d)



Source: Short-Term Energy Outlook, January 2016.

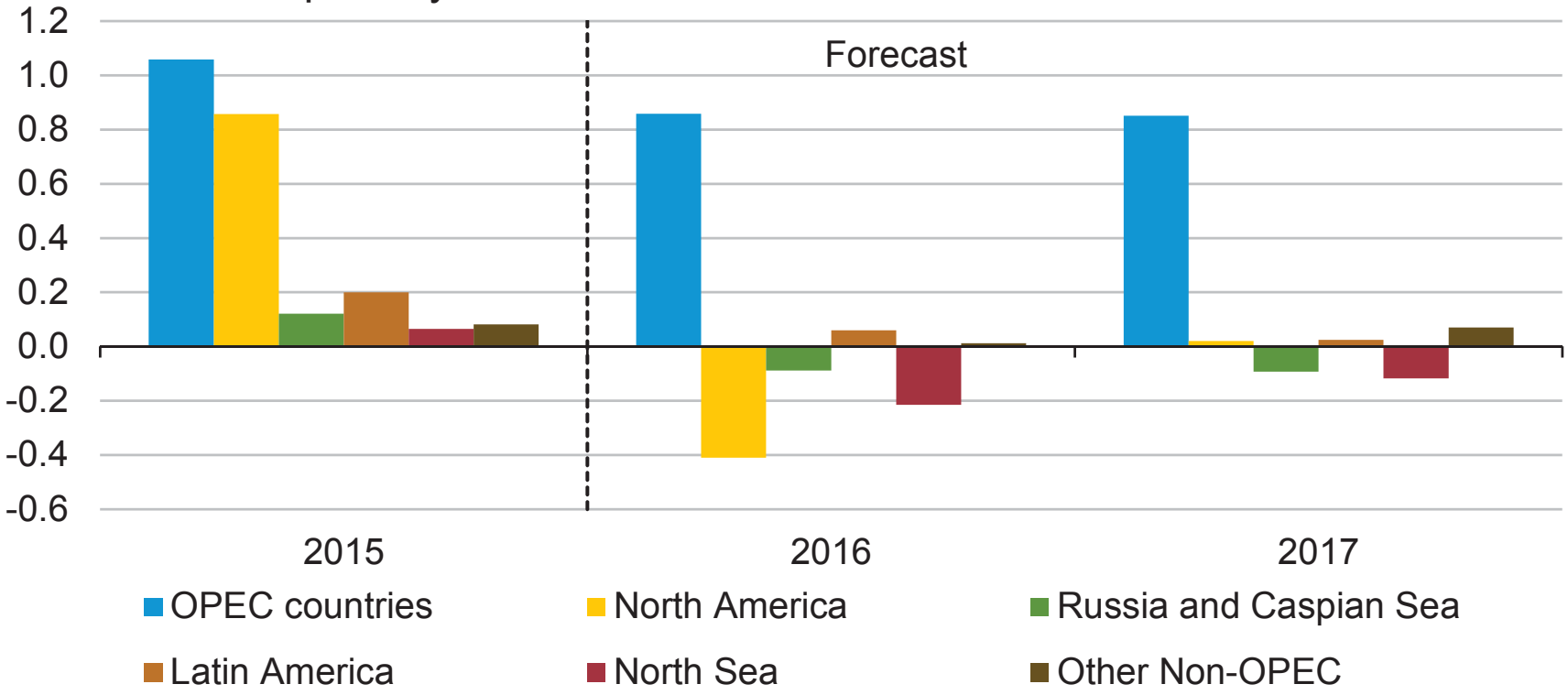
U.S. Crude Oil and Liquid Fuels Production



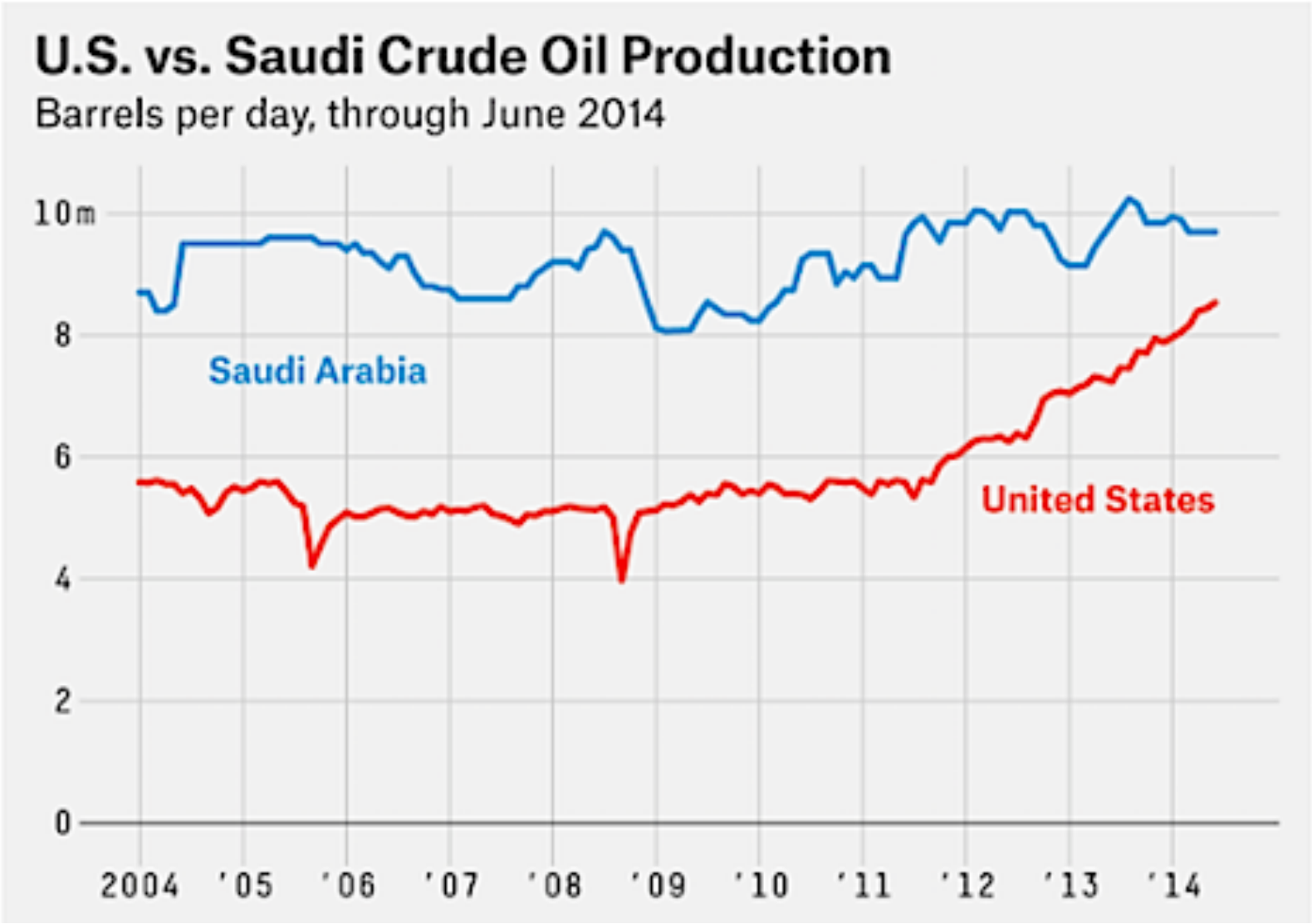
Source: Short-Term Energy Outlook, January 2016.

World Crude Oil and Liquid Fuels Production Growth

million barrels per day



Source: Short-Term Energy Outlook, January 2016.



http://www.biofuelsdigest.com/bdigest/2015/01/13/shale-vs-opec-whats-going-on-with-oil-prices-will-the-bleeding-stop-and-when/

Half of US shale drillers may go bankrupt: Oppenheimer's Gheit

Tom DiChristopher | @tdichristopher
Monday, 11 Jan 2016 | 3:42 PM ET

CNBC

Swift Energy Co., Shale Oil Driller, Files for Chapter 11 Bankruptcy in Delaware

BY CARL NEFF ON JANUARY 4, 2016

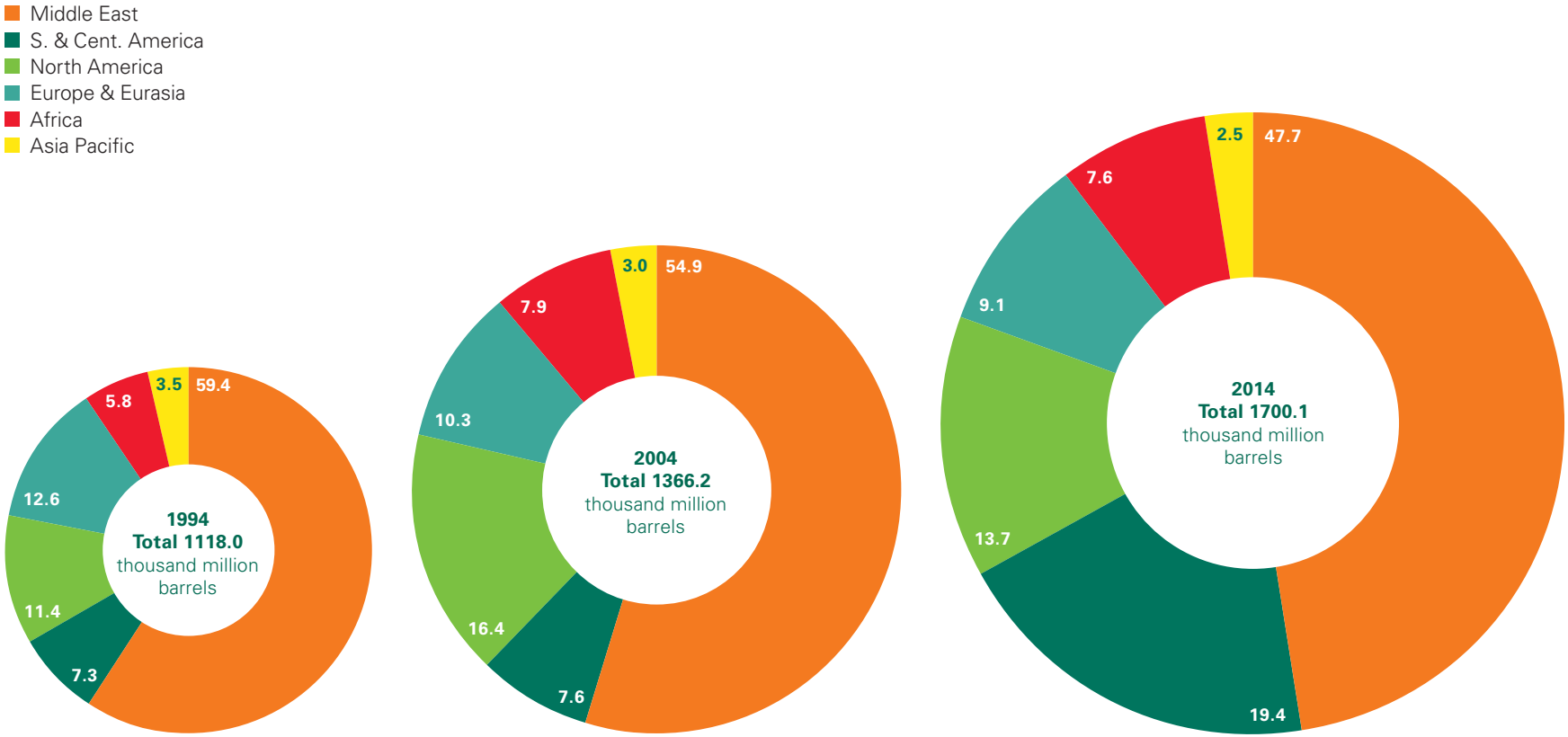
POSTED IN BANKRUPTCY CASE SUMMARIES

Swift Energy Co. ("Swift") has become the latest U.S. shale driller to file for Chapter 11 bankruptcy, filing a voluntary petition on December 31, 2015. Swift pumps oil in the Eagle Ford Shale in South Texas and in Louisiana fields.

According to the first day declaration of Dean Swick, Swift's chief restructuring officer and a restructuring consultant at Alvarez & Marsal, "[t]he recent collapse in oil prices is among the most severe on record." Swick went on to state that "[i]ndependent exploration and production companies like Swift have been particularly hard hit because they rely primarily on sales of oil and gas to generate revenue."

Distribution of proved reserves in 1994, 2004 and 2014

Percentage

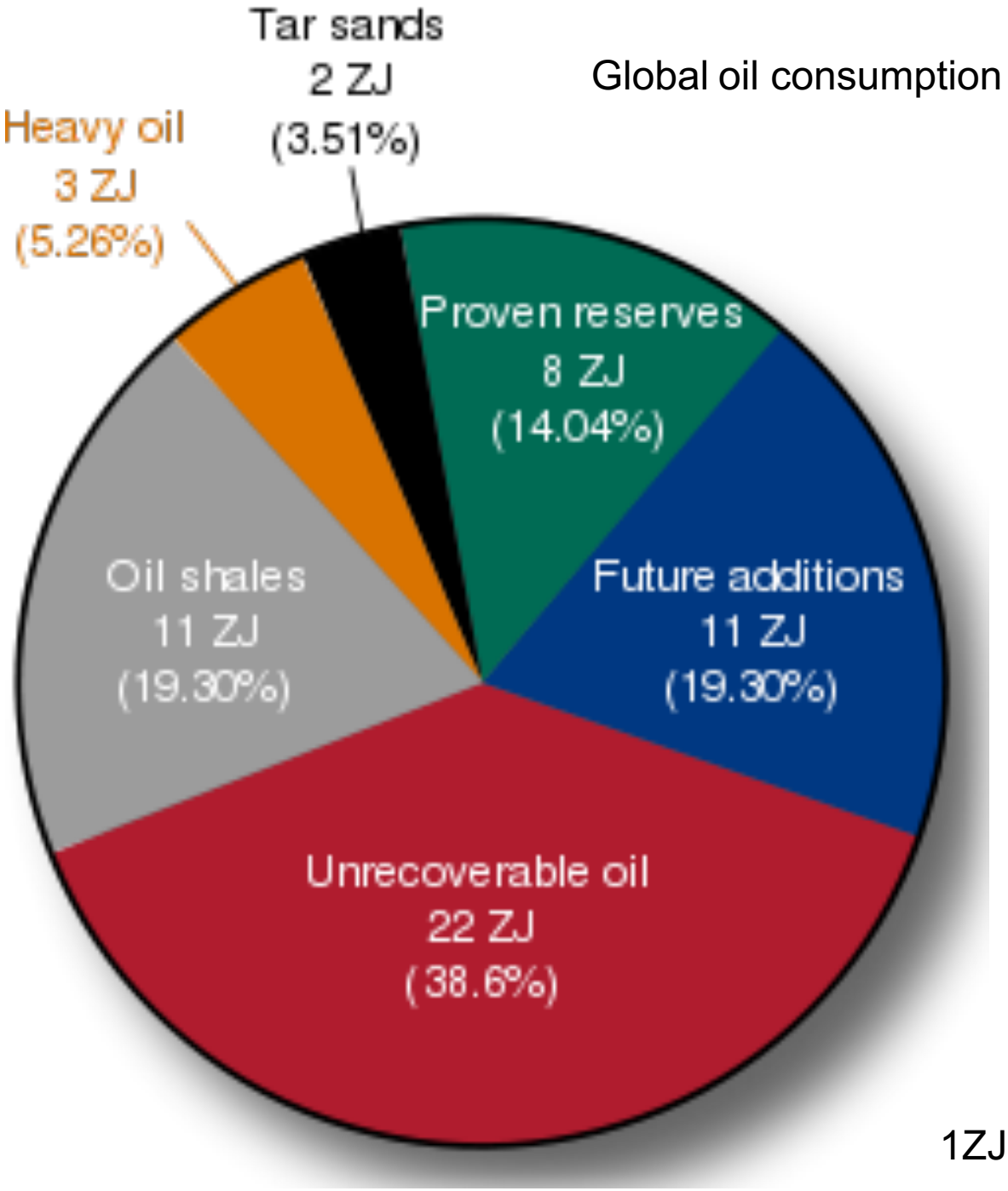


BP Statistical Review of World Energy June 2015

bp.com/statisticalreview

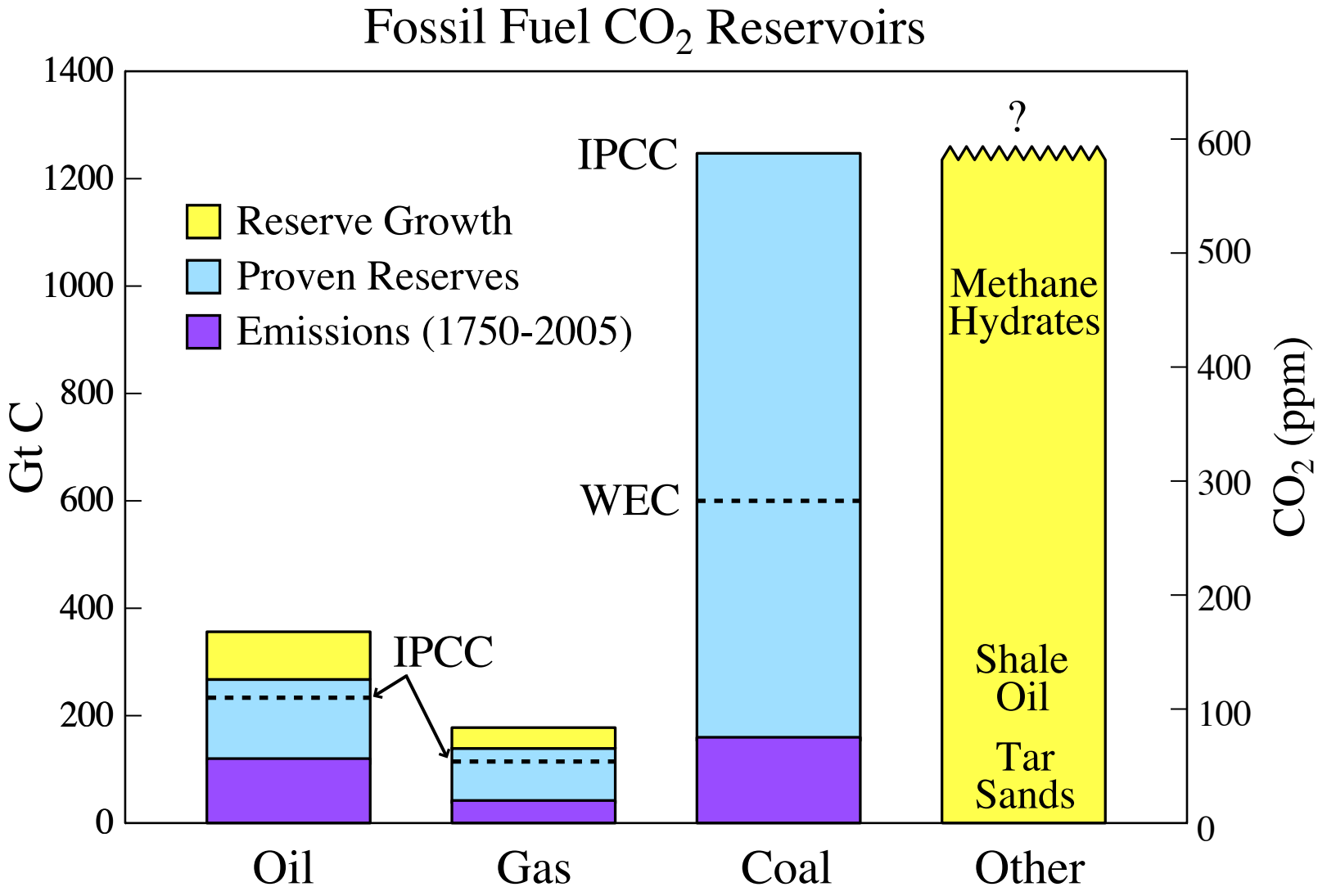
#BPstats

bp



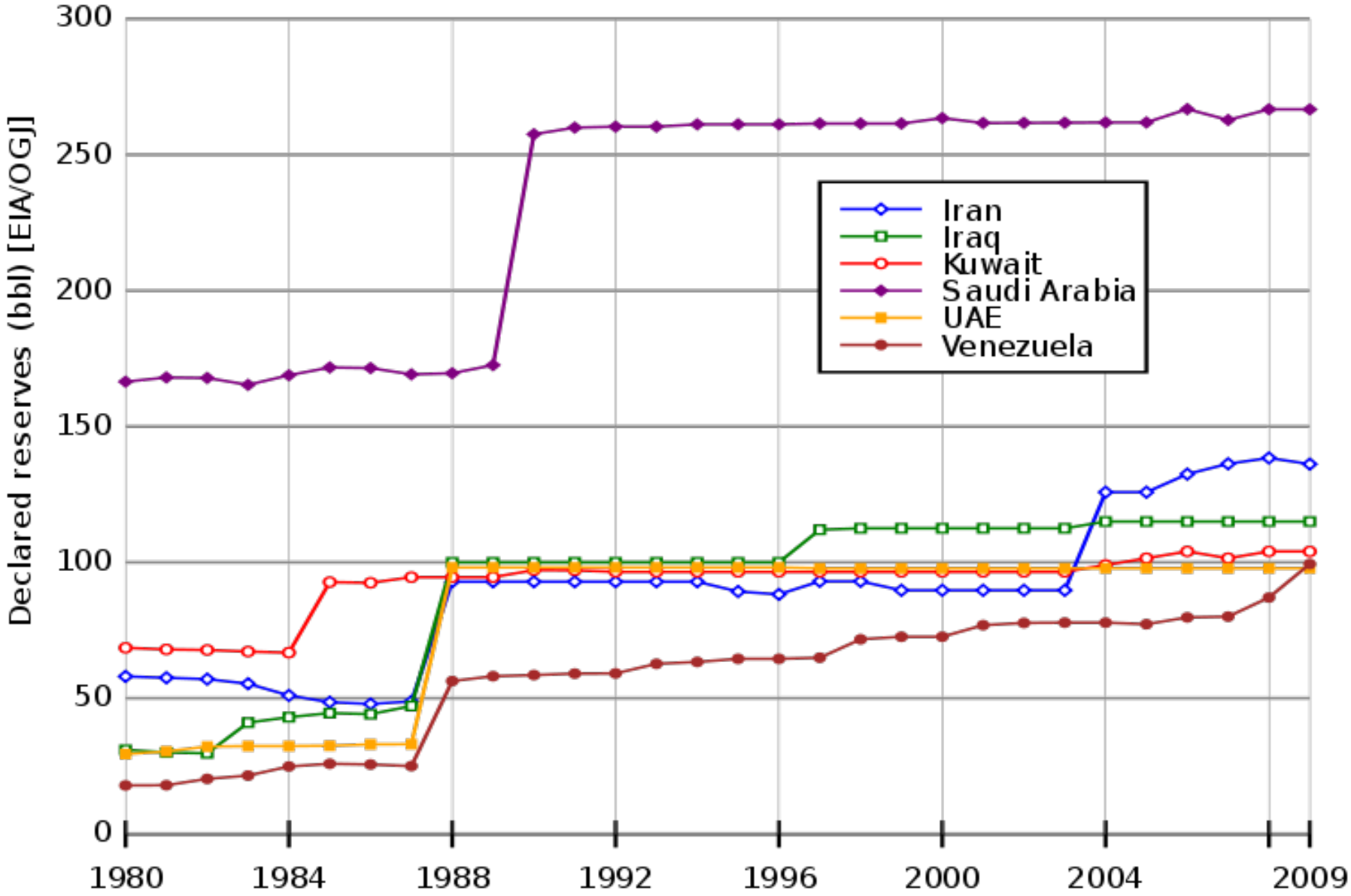
Global oil consumption = 0.18 ZJ/yr;

$1ZJ = 10^{20}$ J

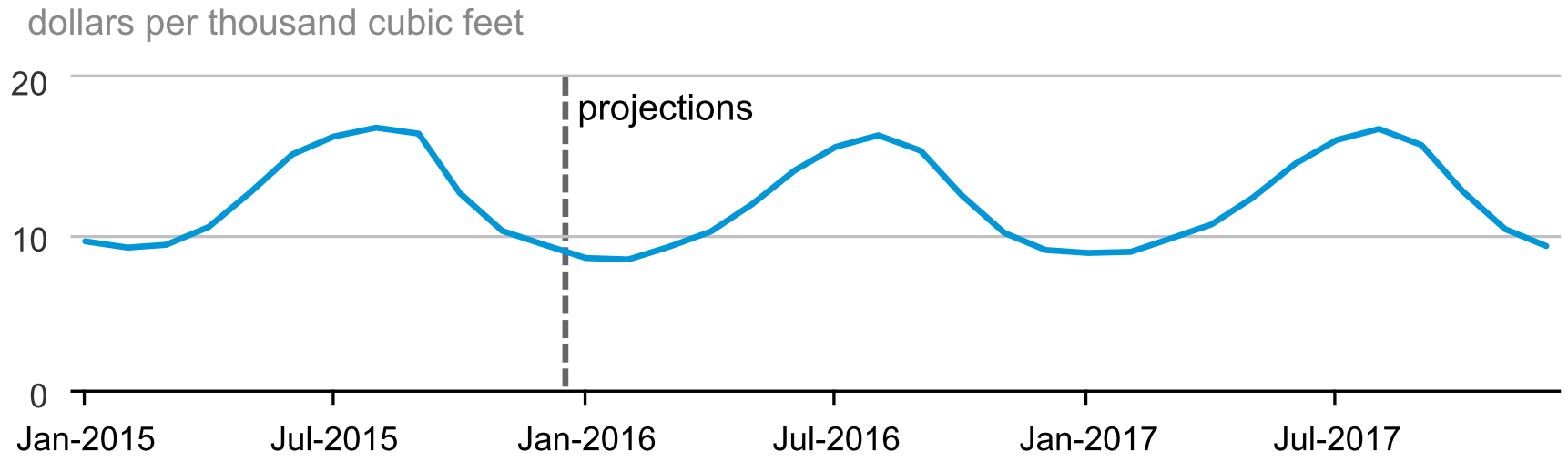


www.giss.nasa.gov/research/briefs/kharecha_01/Fig1.pdf

Quantifying OPEC oil reserves is a shell game! Nobody knows….

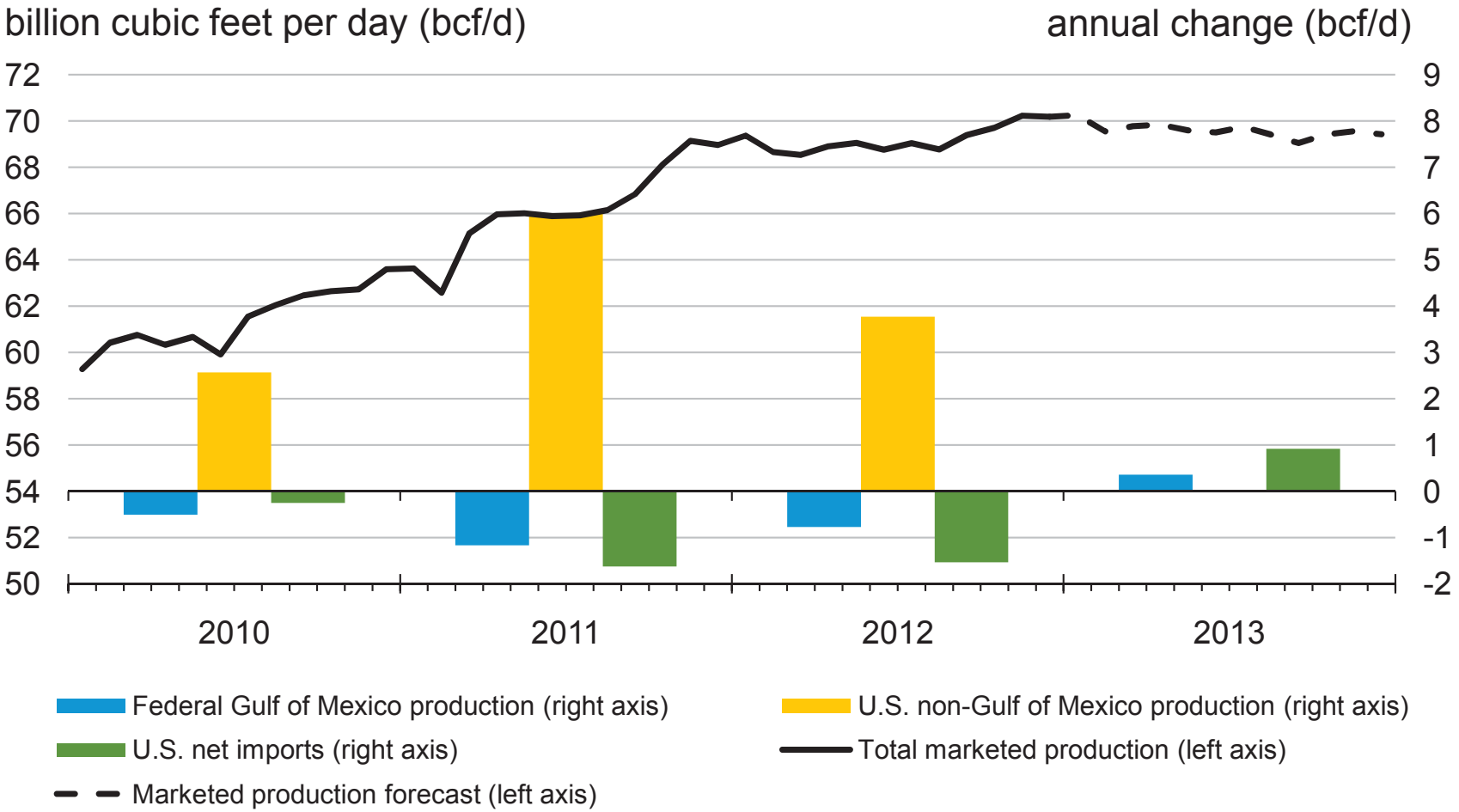


Natural Gas Price Residential Sector, U.S. Average



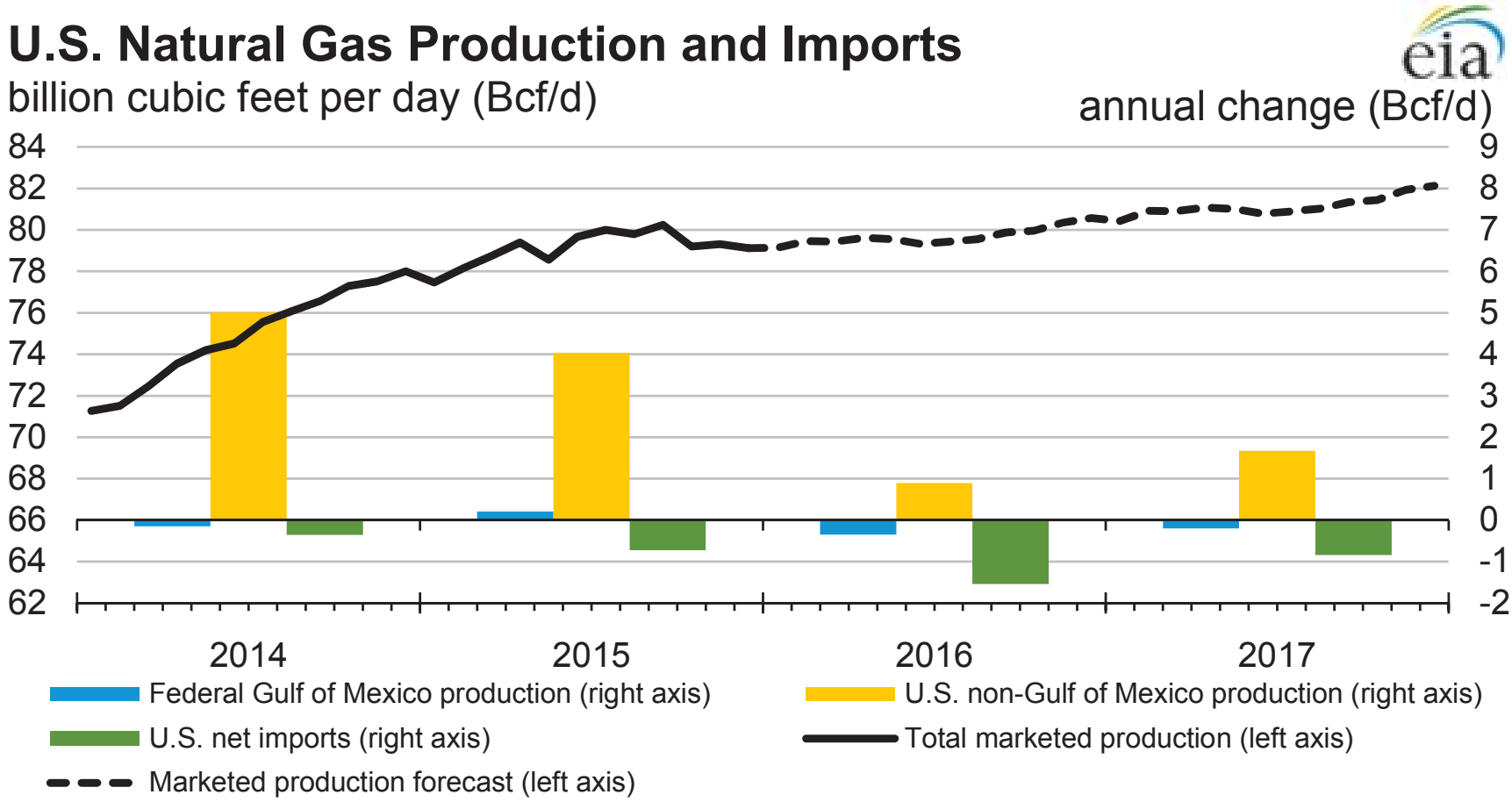
Source: Short-Term Energy Outlook

U.S. Natural Gas Production and Imports



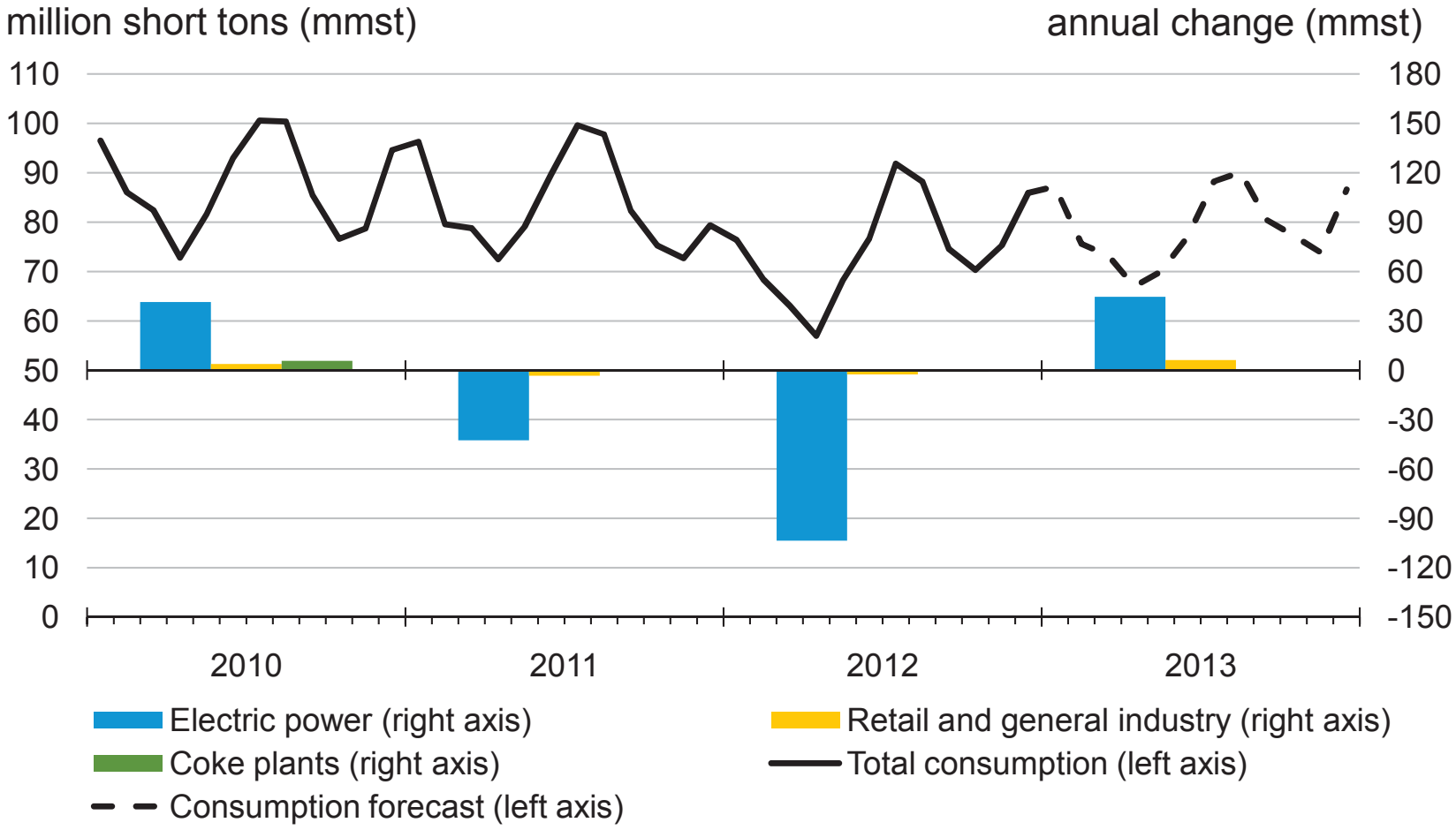
Source: Short-Term Energy Outlook, December 2012

U.S. Natural Gas Production and Imports



Source: Short-Term Energy Outlook, January 2016.

U.S. Coal Consumption

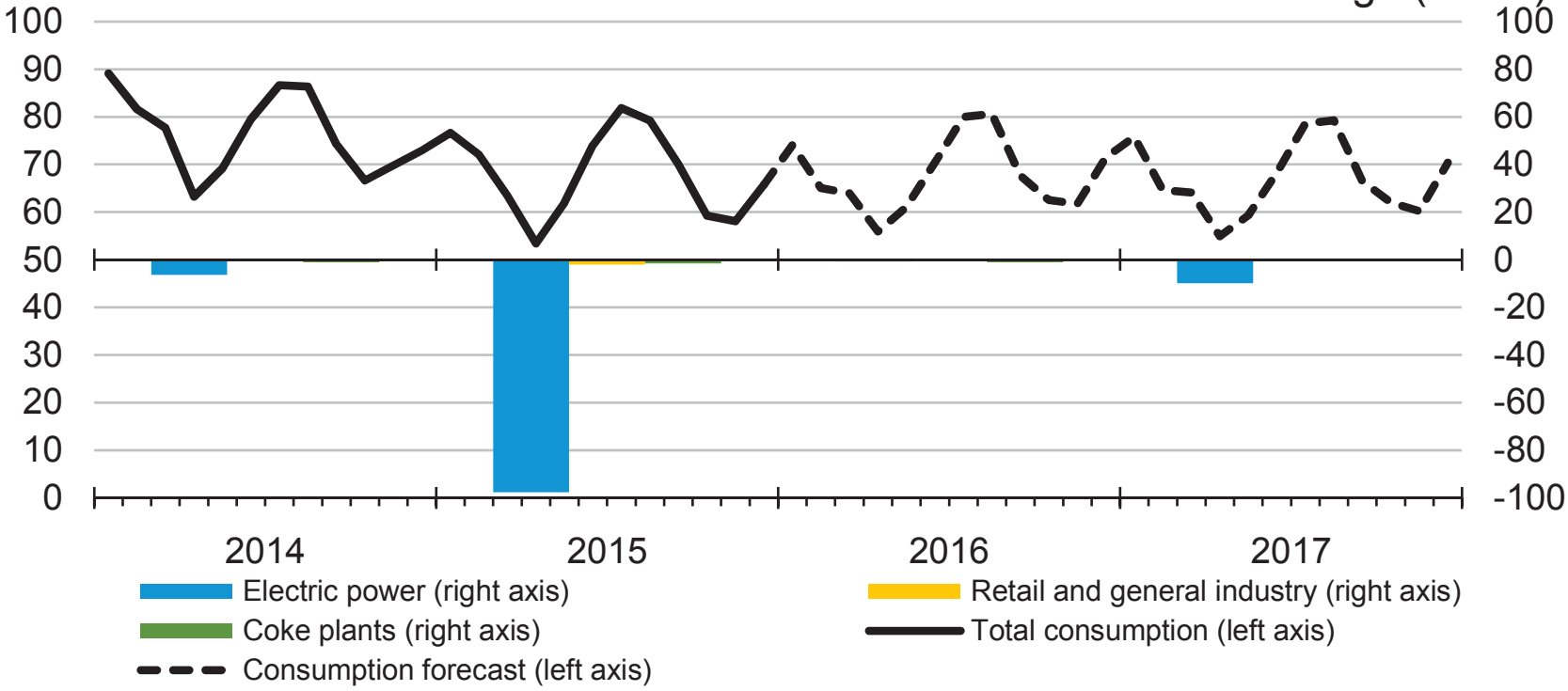


Source: Short-Term Energy Outlook, December 2012

U.S. Coal Consumption

million short tons (MMst)

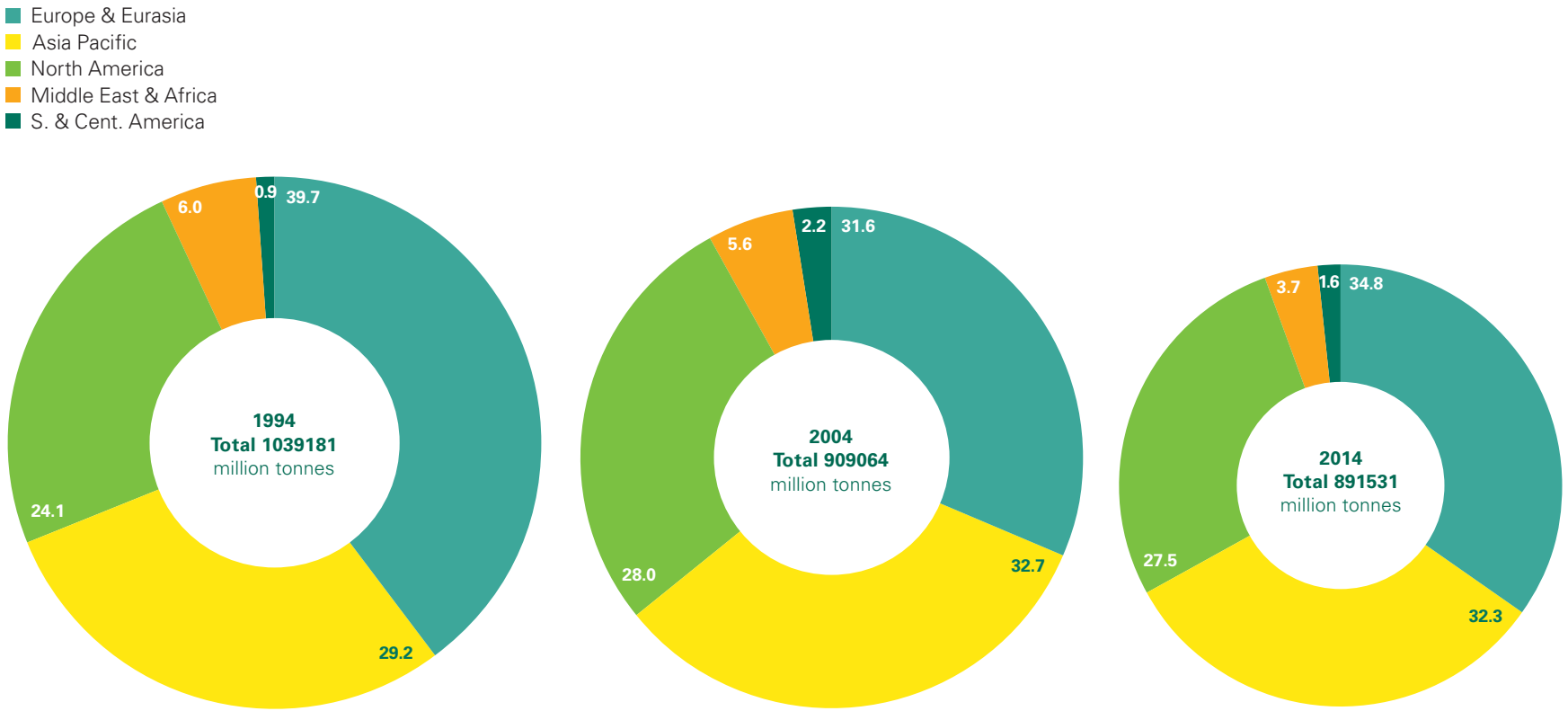
annual change (MMst)



Source: Short-Term Energy Outlook, January 2016.

Distribution of proved reserves in 1994, 2004 and 2014

Percentage



BP Statistical Review of World Energy June 2015

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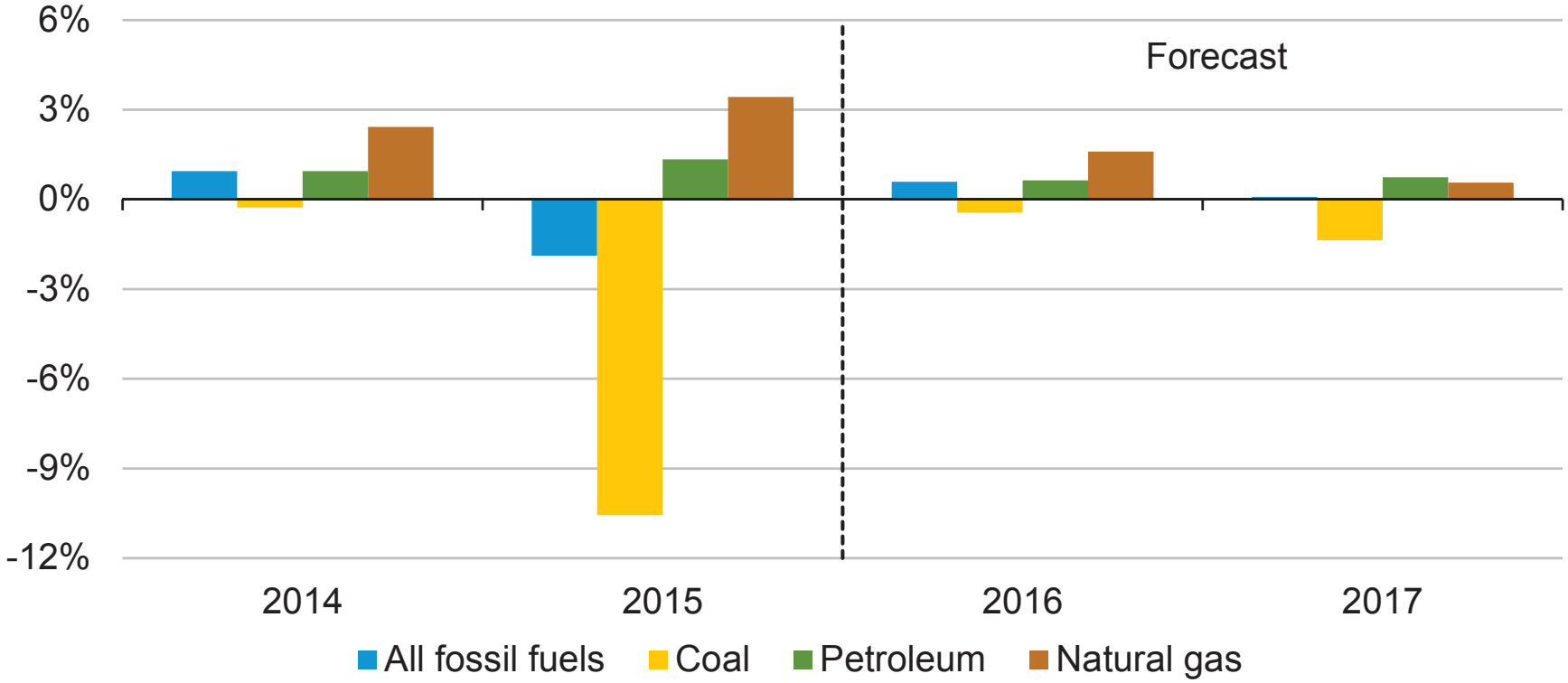
#BPstats

bp

U.S. Energy-Related Carbon Dioxide Emissions

annual growth



Source: Short-Term Energy Outlook, January 2016.