

Oil and gas outlook



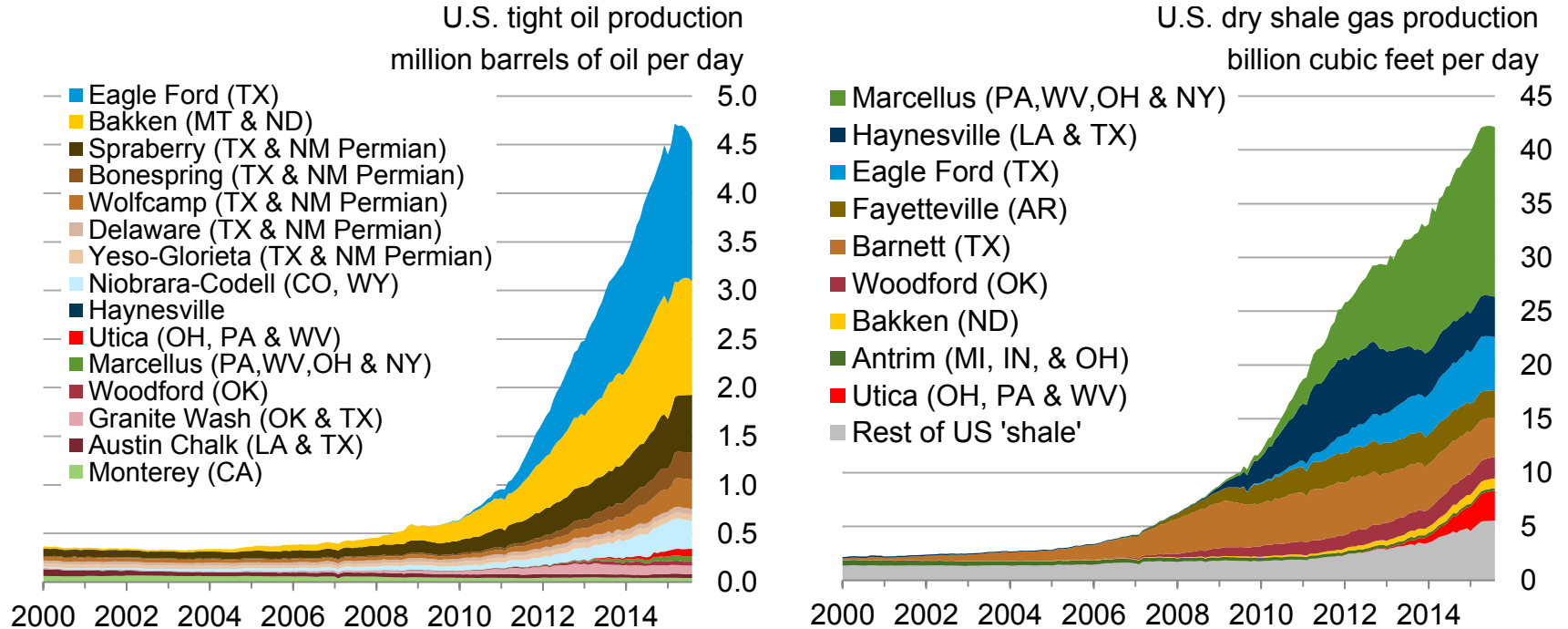
For

*National Capital Area Chapter of the U.S. Association for Energy Economics
October 16, 2015 | Washington, DC*

By

*Adam Sieminski, Administrator
U.S. Energy Information Administration*

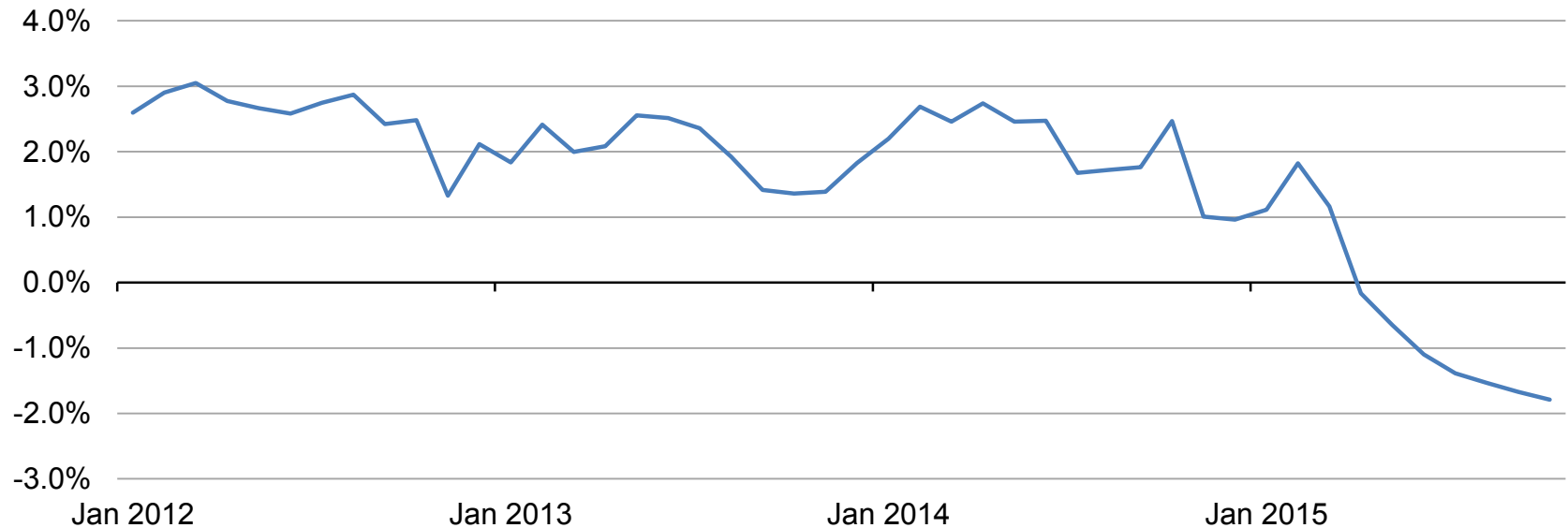
The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources



Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through August 2015 and represent EIA's official tight oil & shale gas estimates, but are not survey data. State abbreviations indicate primary state(s).

Production growth in top U.S. crude producing regions (Permian, Bakken, Niobrara, and Eagle Ford) reversed in early 2015

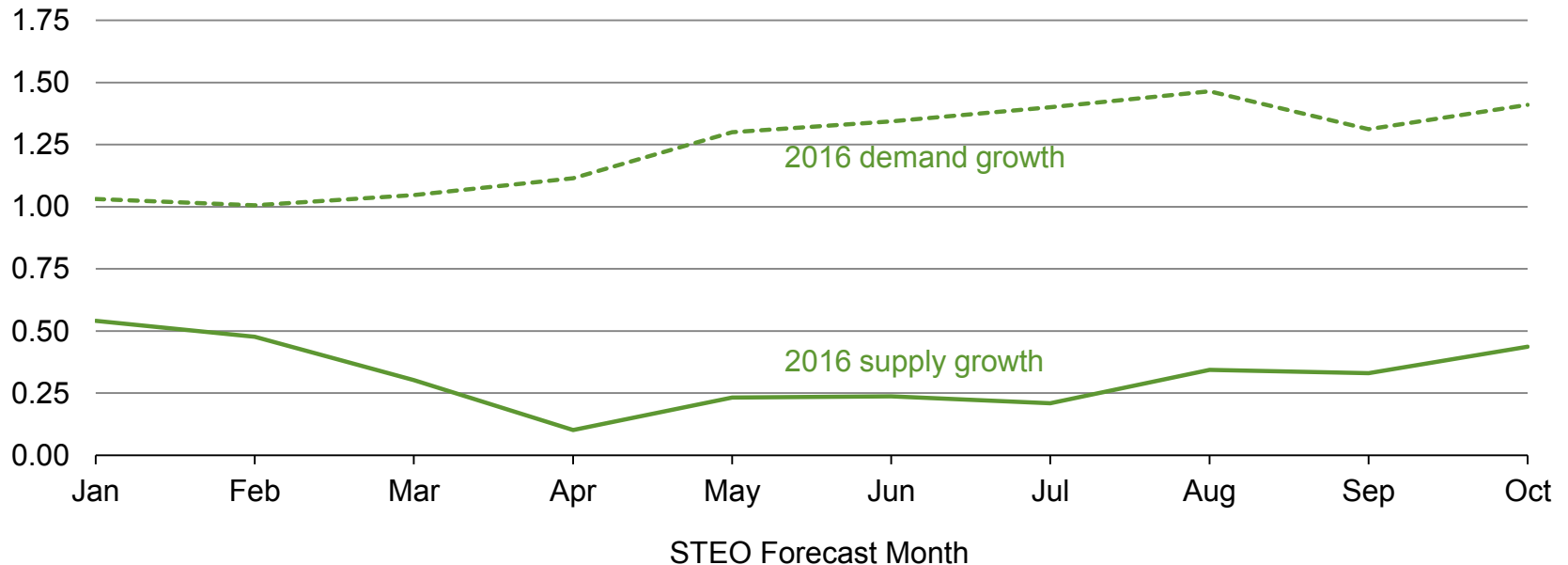
monthly percent change
three month rolling average



Source: Energy Information Administration, *Drilling Productivity Report*, October 2015 (chart extends to November 2015)

Forecasts for 2016 global demand have increased faster than supply forecasts

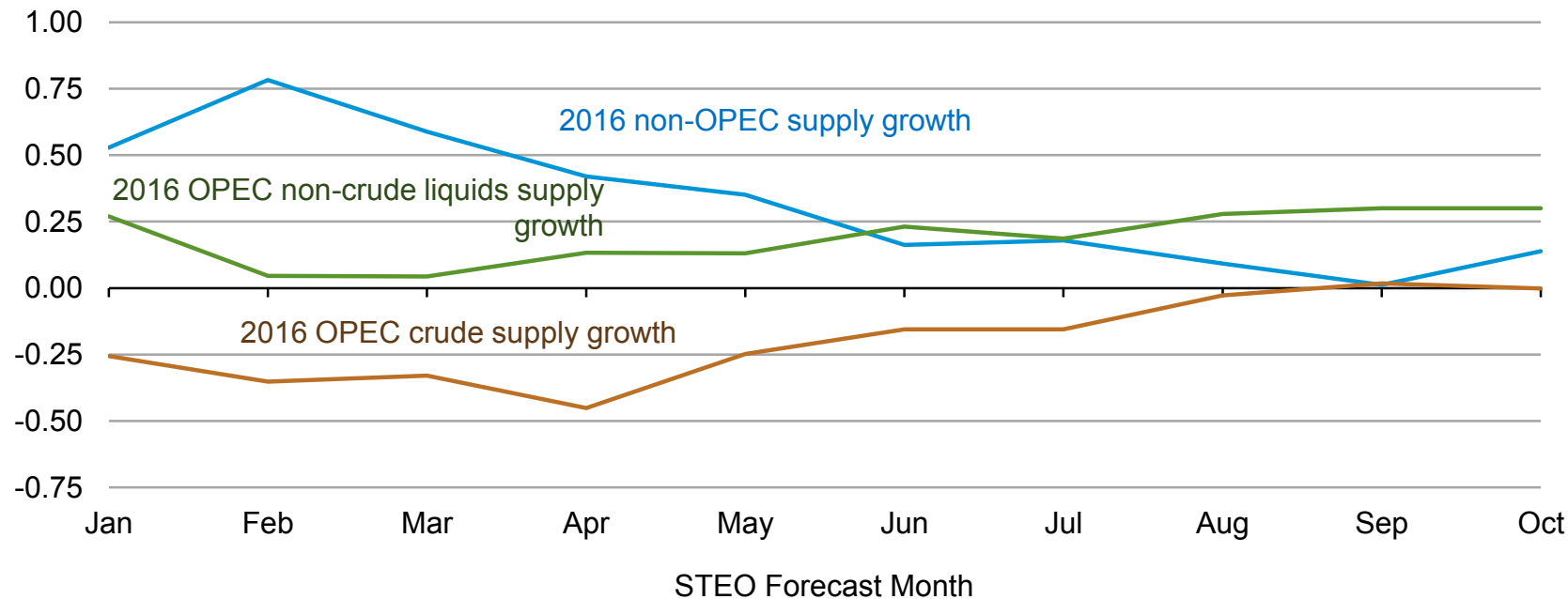
2016 year-over-year supply and demand growth by STEO forecast month
million barrels per day



Source: Energy Information Administration, Short-Term Energy Outlook

Forecasts for 2016 OPEC supply have risen on the Iran deal, while non-OPEC forecasts have declined - driven by lower U.S. growth

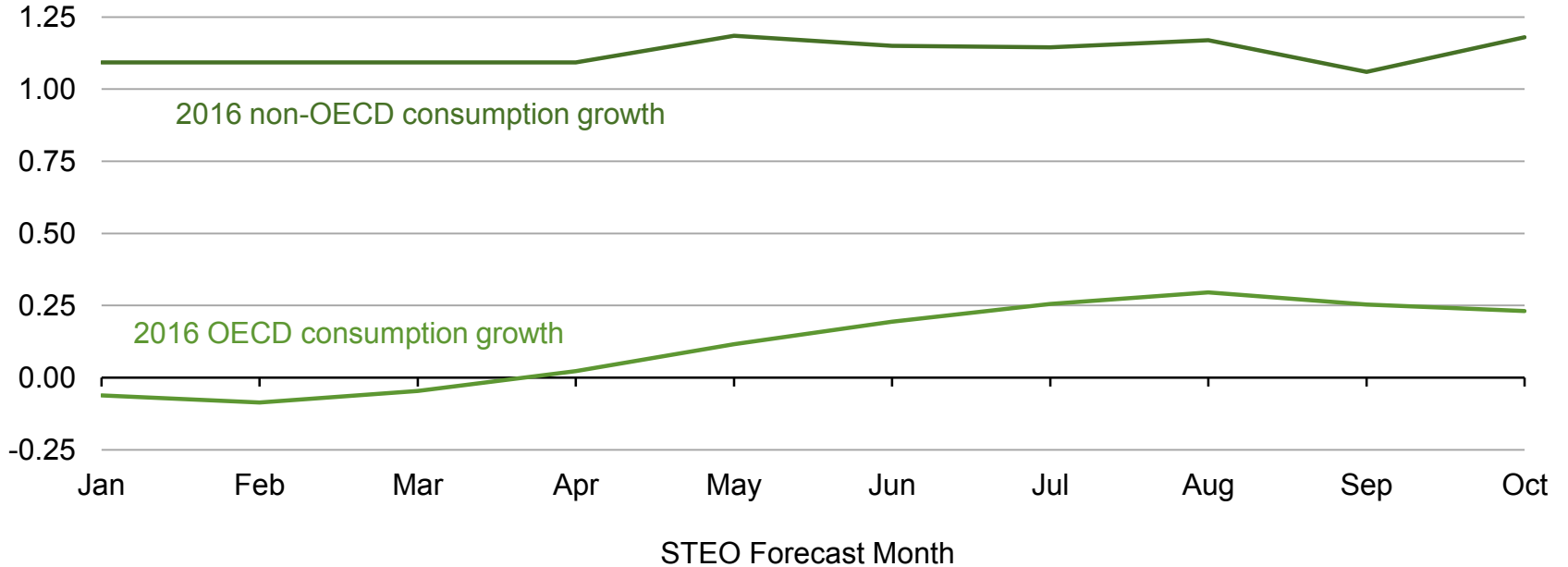
2016 year-over-year supply growth by STEO forecast month
million barrels per day



Source: Energy Information Administration, Short-Term Energy Outlook

Forecast OECD demand growth for 2016 have flattened

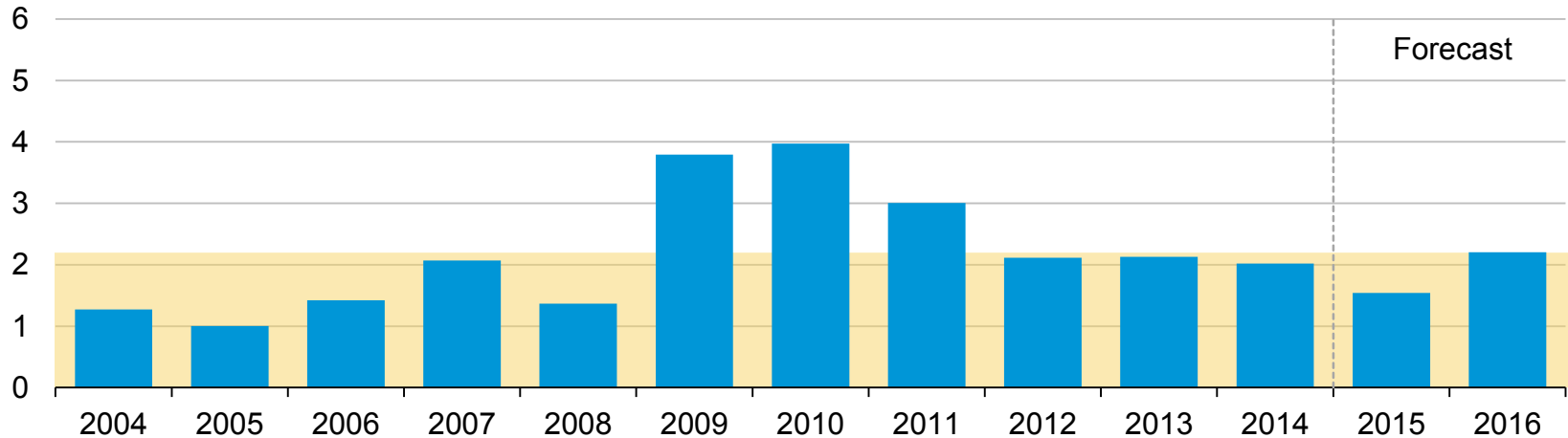
2016 year-over-year demand growth by STEO forecast month
million barrels per day



Source: Energy Information Administration, Short-Term Energy Outlook

OPEC surplus production capacity in 2015 is the lowest since 2008

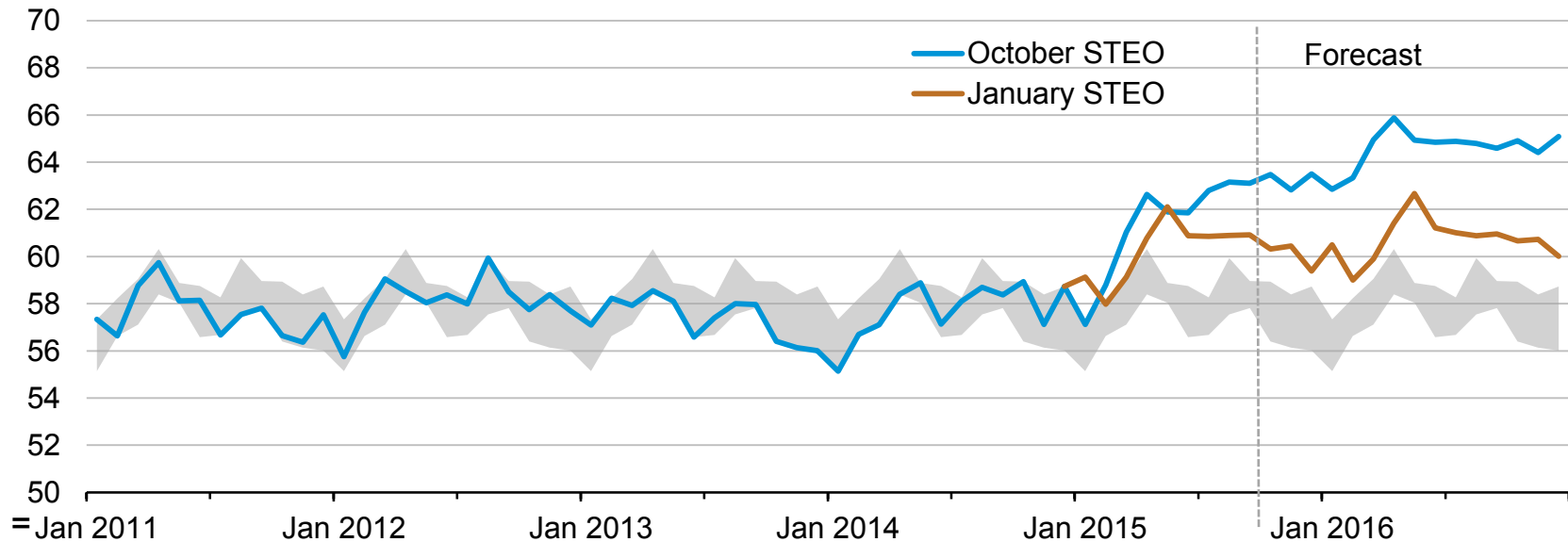
OPEC surplus crude oil production capacity
million barrels per day



Source: Energy Information Administration, Short-Term Energy Outlook, October 2015

OECD oil inventories are very high on a days of supply basis and are projected to continue increasing in 2016

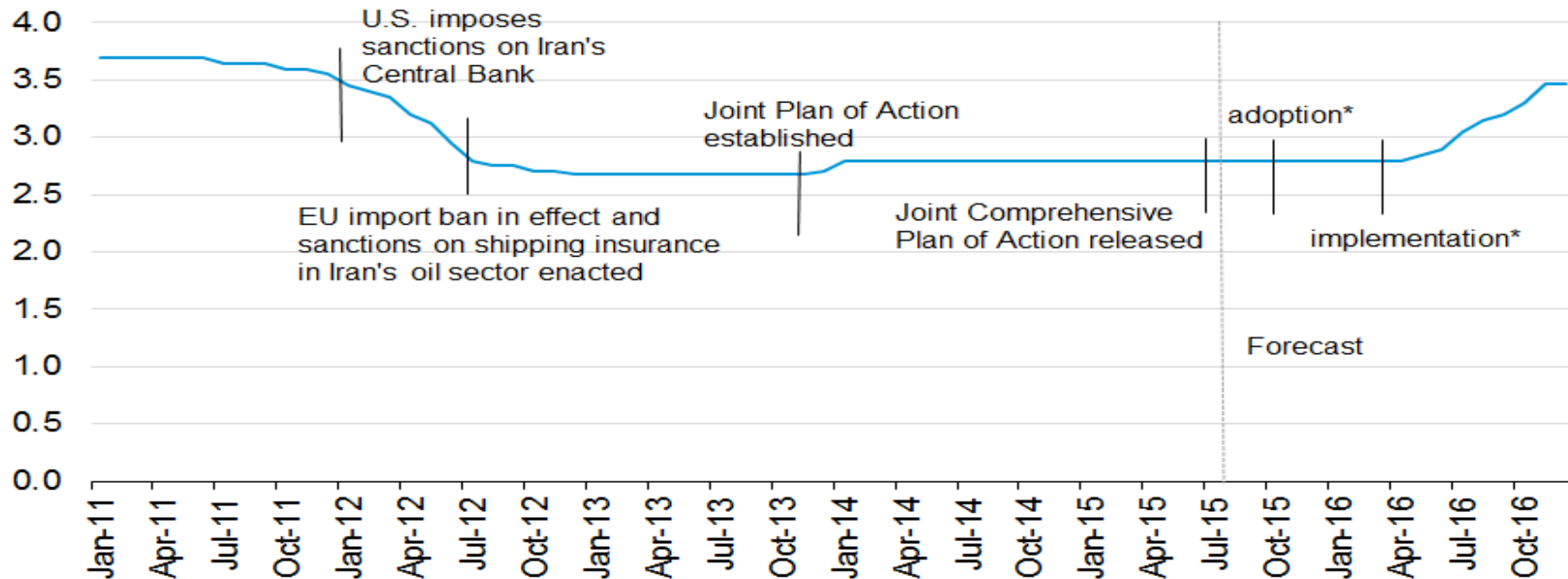
OECD commercial oil inventories
days of supply



Note: Colored band around days of supply represents the range between the minimum and maximum from Jan. 2010 - Dec. 2014
Source: Energy Information Administration, Short-Term Energy Outlook

Iranian crude oil production is expected to begin increasing in the 2Q 2016, inventory sales could be sooner

Iranian crude oil production
million barrels per day



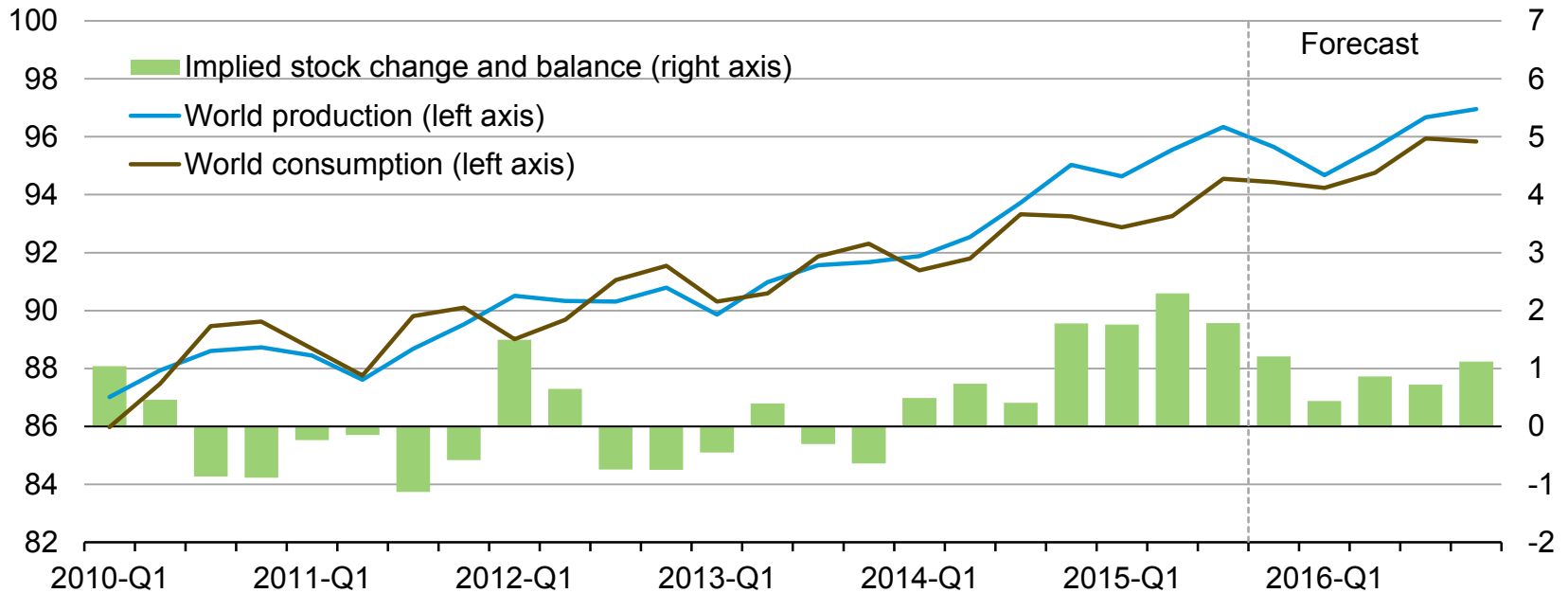
Source: Energy Information Administration

*EIA's assessment

Oil supply and demand begin to rebalance in 2016

World supply and demand
million barrels per day (MMb/d)

Implied stock change
million barrels per day

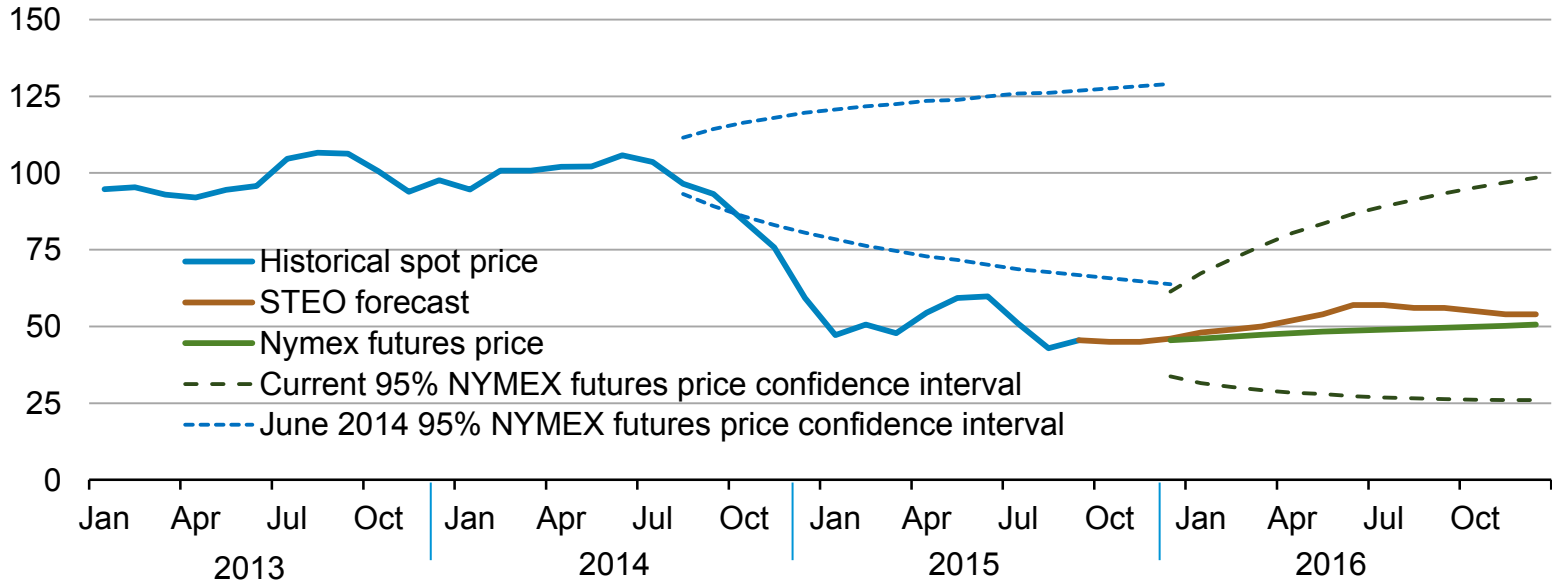


Source: EIA, Short-Term Energy Outlook, October 2015

The market-implied confidence band for oil prices is very wide

WTI price

dollars per barrel



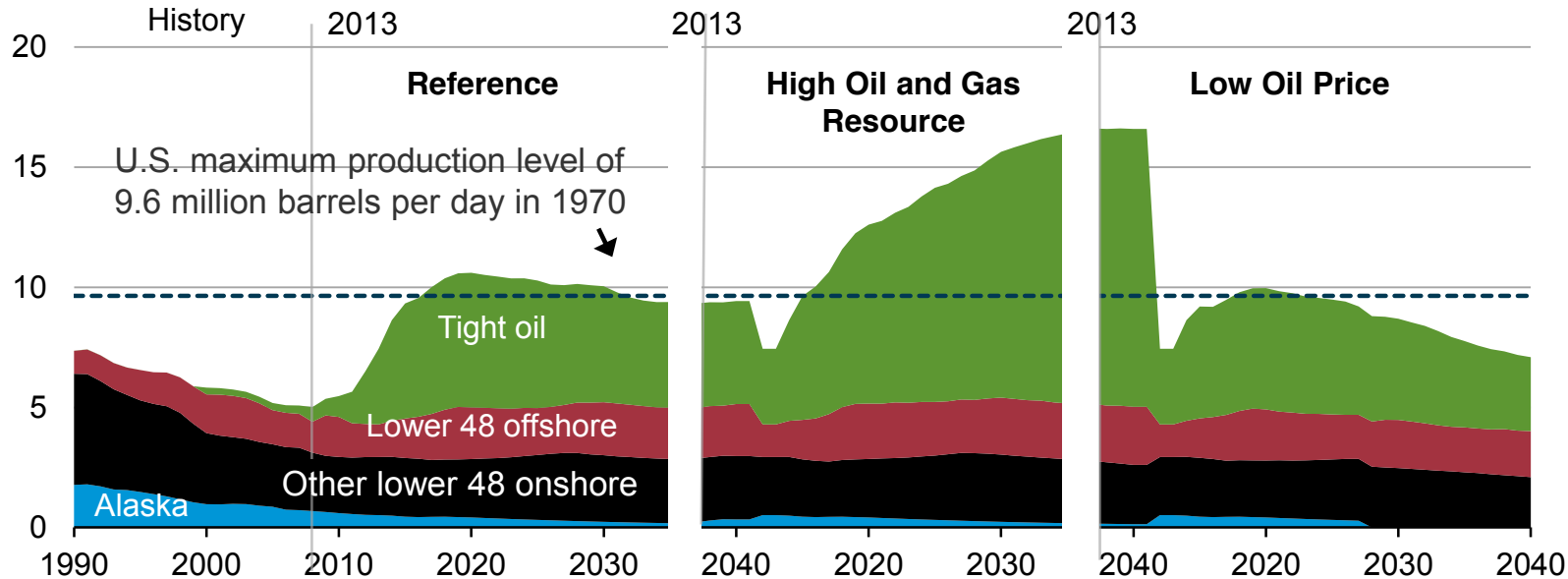
Source: EIA, Short-Term Energy Outlook, October 2015

Long-term outlook for the United States

U.S. crude oil production: Supply rises above previous historical highs before 2020 in all AEO2015 cases, with a range of longer-term outcomes dependent on prices, resources and technology

U.S. crude oil production

million barrels per day (MMb/d)

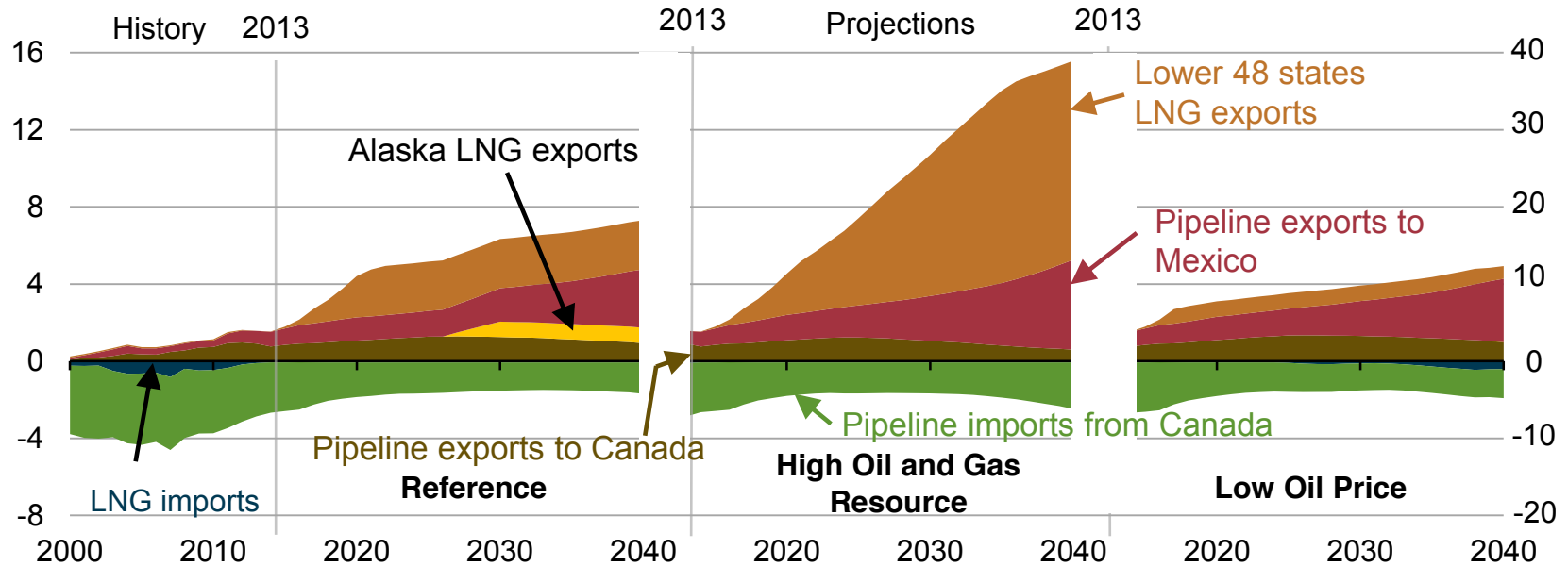


Source: EIA, Annual Energy Outlook 2015

U.S. natural gas trade: Projected U.S. natural gas trade reflects the spread between domestic natural gas prices and world energy prices, along with resource outcomes

U.S. natural gas imports and exports
trillion cubic feet

billion cubic feet per day

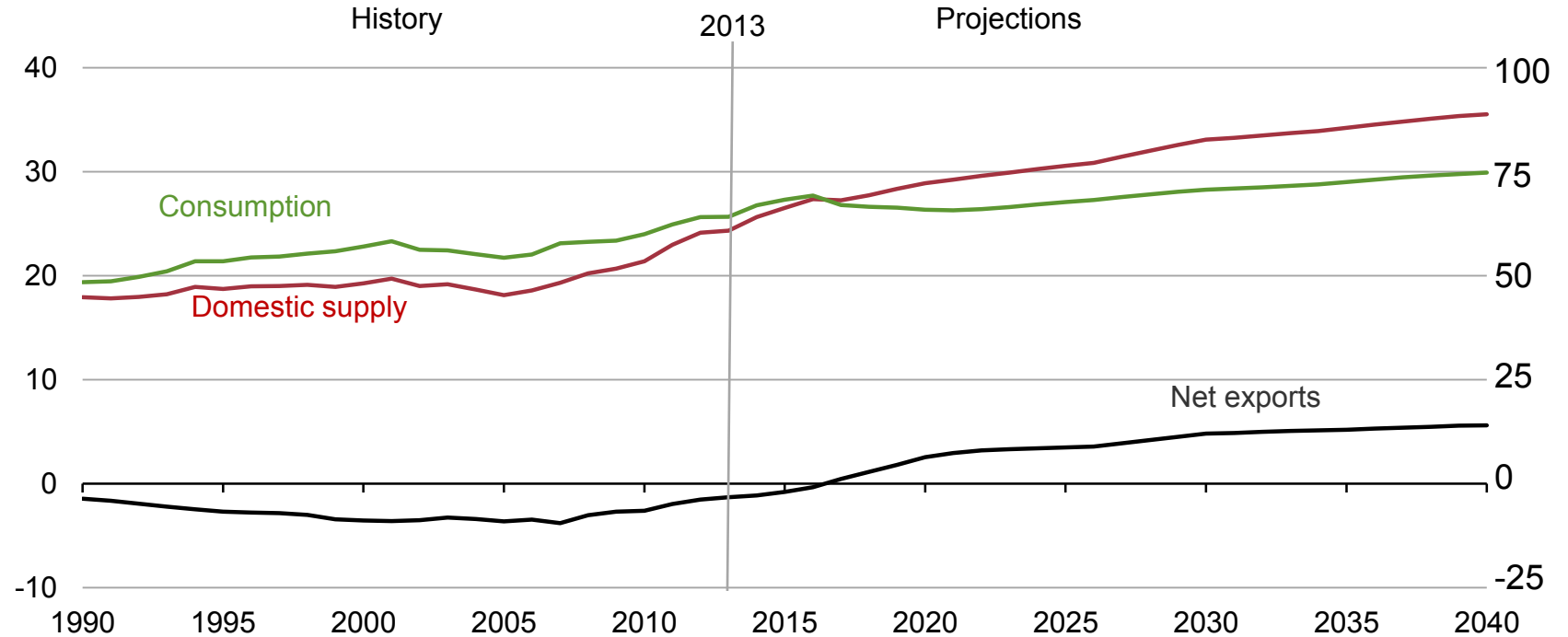


Source: EIA, Annual Energy Outlook 2015

U.S. becomes a net exporter of natural gas in the near future

U.S. dry natural gas
trillion cubic feet per year

billion cubic feet per day



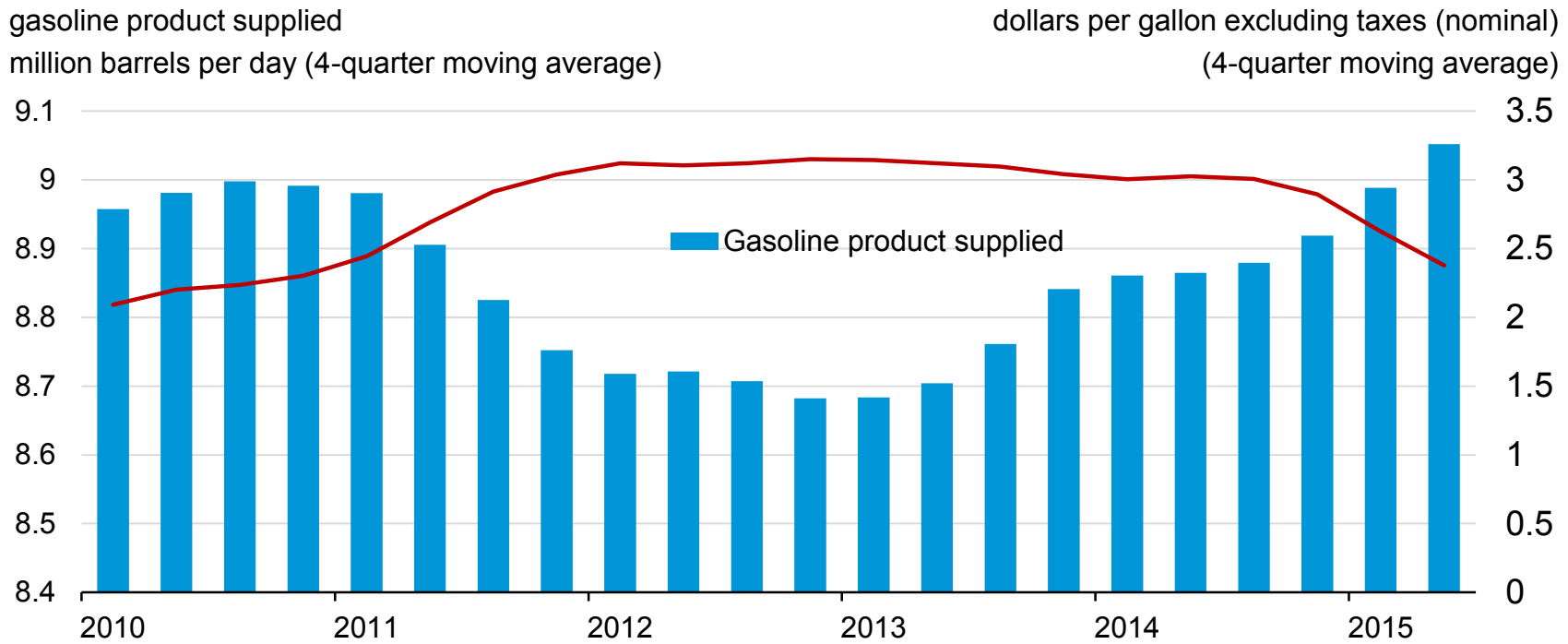
Source: EIA, Annual Energy Outlook 2015

Key takeaways - Oil

- Tight oil clearly matters for measures of U.S. oil import dependence and ability to pressure OPEC
- Policy debate over removing restrictions on exports of U.S. crude oil
 - Recent EIA analysis shows no significant effects for consumers, producers, or refiners in cases where domestic production remains below 11 million barrels per day (b/d)
 - If U.S. production were to approach or exceed 12 million b/d, as might occur under high resource assumptions, U.S. consumers realize a small reduction in gasoline prices and crude producers, modestly raise output if crude export restrictions are removed; however, the largest effects (in opposite directions) are felt by producers and refiners
- The Middle East remains the center of “easy oil” and will remain key to the future of the global oil market

How much will low prices stimulate oil demand?

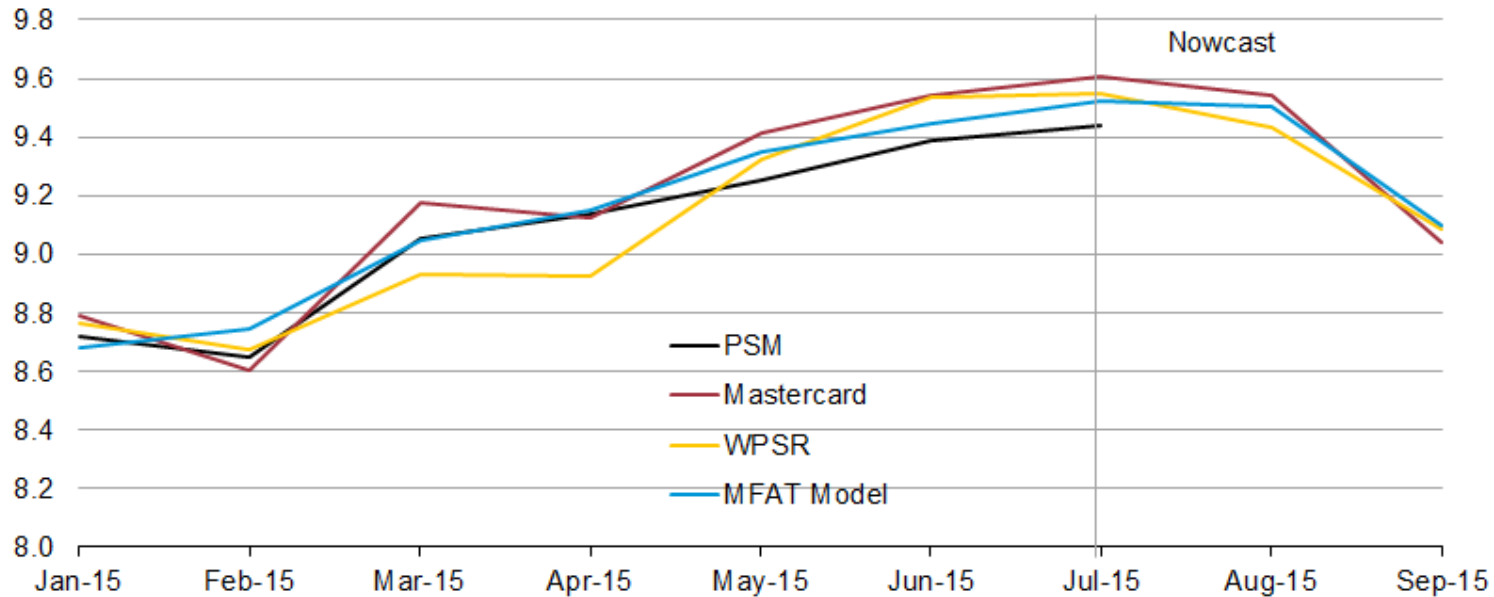
The direct price effects can raise gasoline demand---as occurred recently in the United States



Source: Energy Information Administration, Petroleum Supply Monthly and Petroleum Marketing Monthly (as of September 2015)

Gasoline demand estimates vary

gasoline product supplied
million barrels per day

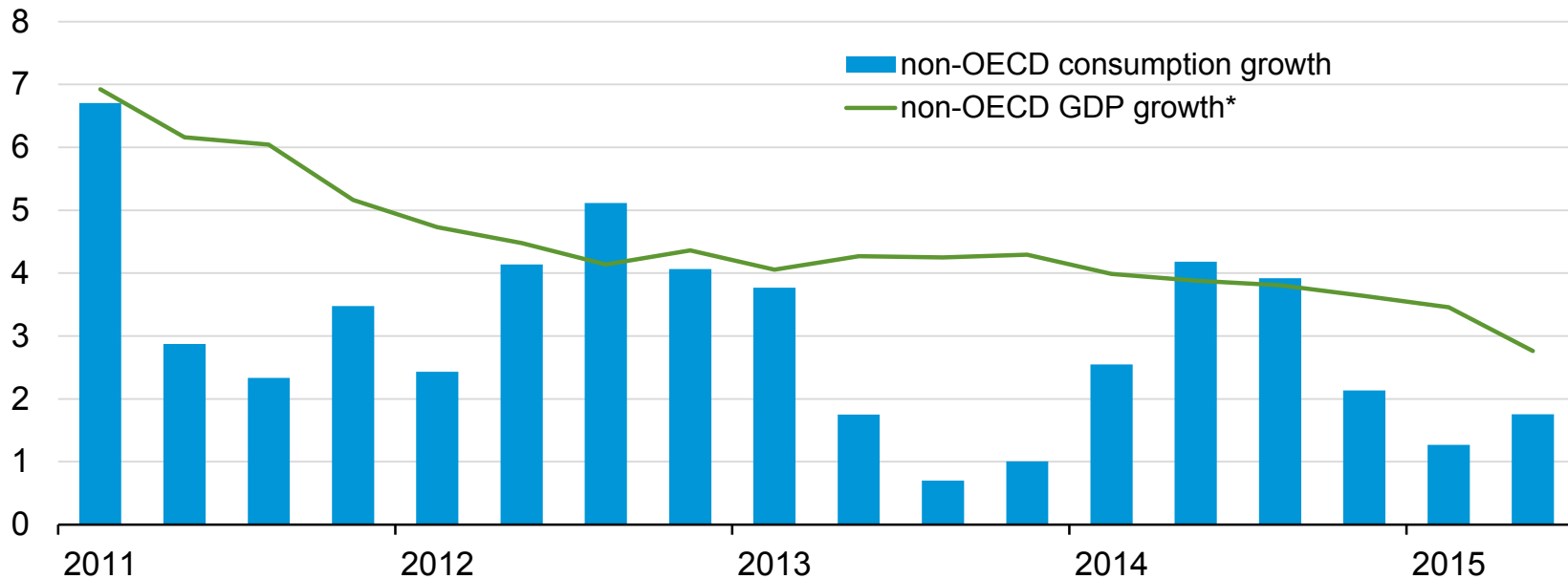


Sources: *Petroleum Supply Monthly*, *Weekly Petroleum Status Report*, and *Mastercard* (as of September 25, 2015)

The macro impacts are also important---Non-OECD oil consumption growth declined recently as GDP growth slowed

oil consumption

percent change (year-on-year)



Source: Energy Information Administration, IHS Global Insight (as of September 2015)

* Oil consumption weighted GDP

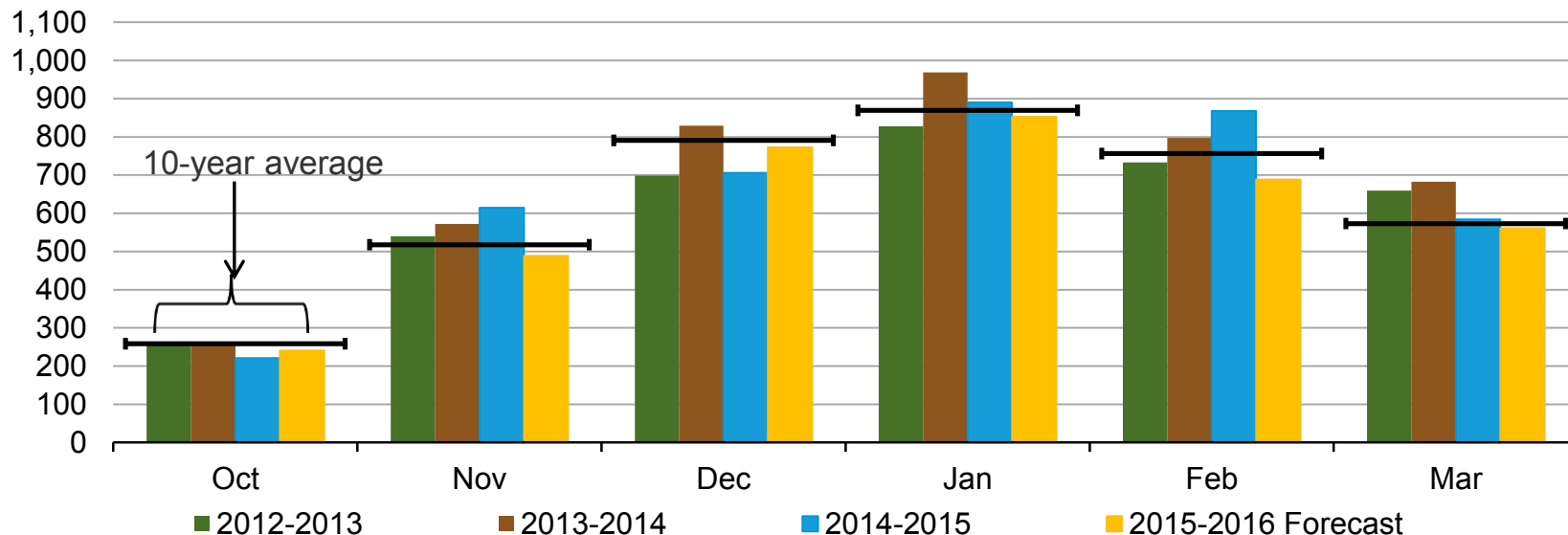
Prices and economic growth are important, but policy, preferences, and technology may have a bigger long-term impact

- What types of consumption and pricing policies will be enacted across the world?
 - Fuel subsidies
 - Environmental policies
 - Domestic security policies
- What will light-duty vehicle trends look like?
 - Ownership rates
 - Efficiency and emissions standards
 - Technology/alternative fuels
- Where will goods be produced and how will they be moved?
- Will there be major industrial sector efficiency improvements or fuel switching?

2015 – 2016 Winter Fuels Outlook

NOAA forecasts U.S. heating degree days this winter to be 7% lower than last winter and below the 10-year average

U.S. current population-weighted heating degree days

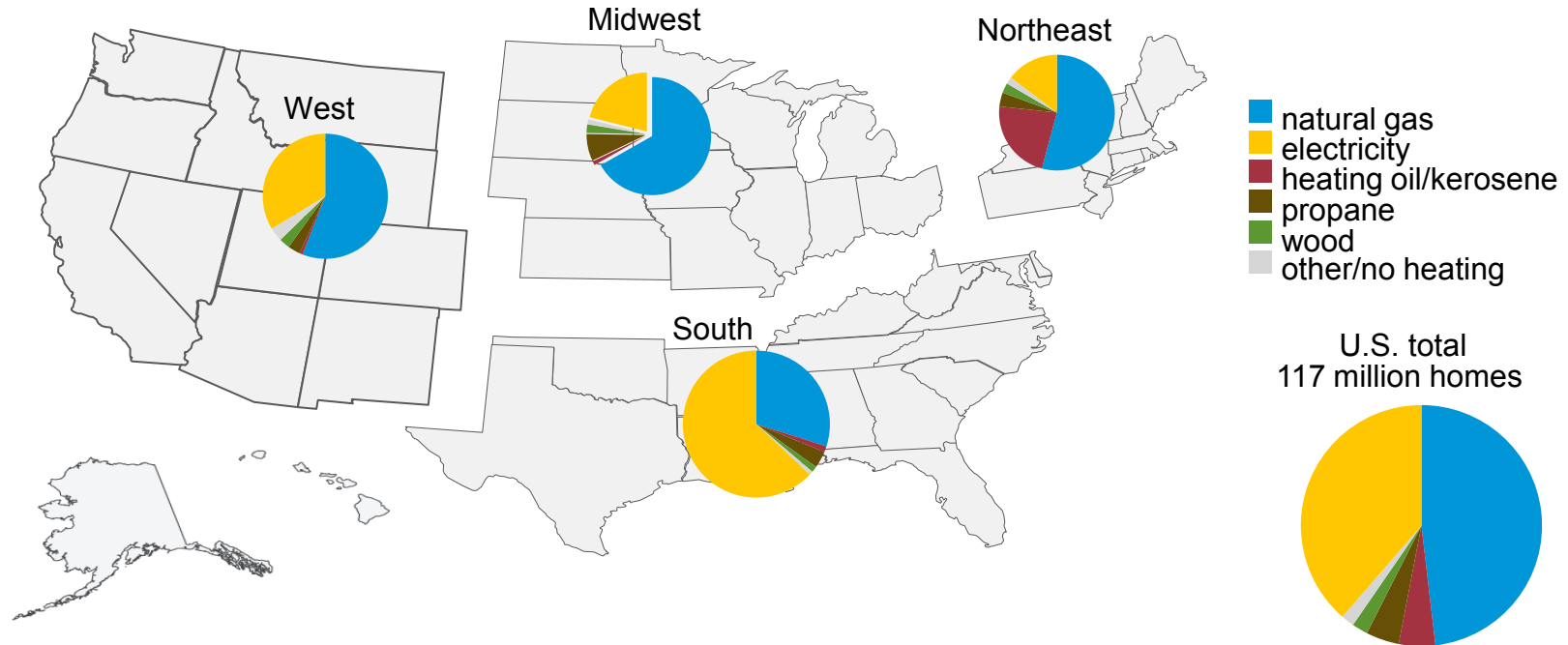


Note: EIA calculations based on National Oceanic and Atmospheric Administration (NOAA) data. Horizontal lines indicate 10-year average over the period Oct. 2005 – Mar. 2015. Projections reflect NOAA's 14-16 month outlook.

Source: EIA Short-Term Energy Outlook, October 2015.

Heating fuel market shares vary across U.S. regions

Share of homes by primary space-heating fuel and Census Region



Source: U.S. Energy Information Administration based 2014 American Community Survey

Expenditures are expected to be lower this winter (October 1–March 31) even if weather is significantly colder than currently forecast

Percent change in fuel bills from last winter (forecast)

Fuel bill	Base case forecast	If 10% warmer than forecast	If 10% colder than forecast
Heating oil	-25	-33	-16
Natural gas	-10	-17	-4
Propane *	-18	-30	-3
Electricity	-3	-7	0

Note: * Propane expenditures are a volume-weighted average of the Northeast and Midwest regions. All others are U.S. volume-weighted averages. Propane prices do not reflect prices locked in before the winter heating season starts.

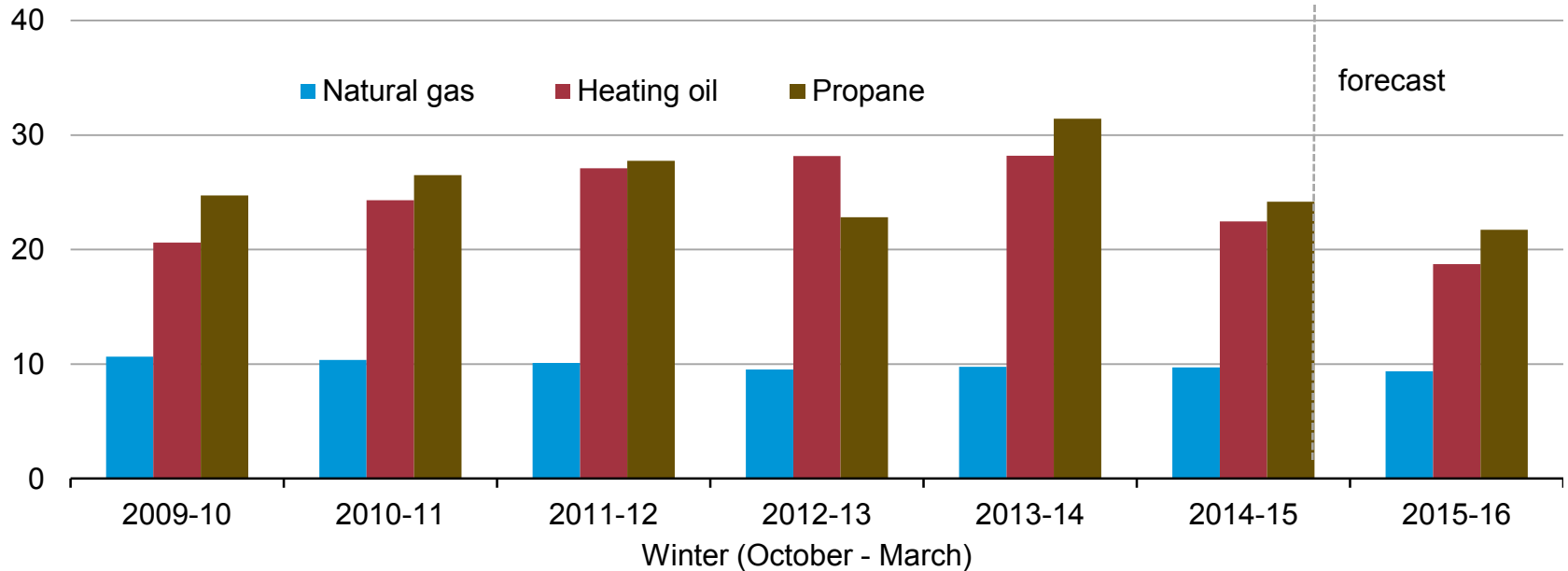
Source: EIA Short-Term Energy Outlook, October 2015.

Key takeaways – winter fuels

- EIA expects heating fuel prices for homes that heat with natural gas, propane, and heating oil to be lower than prices last winter; residential electricity prices are expected to be about the same as last winter
- The latest outlook from government weather forecasters expects winter temperatures east of the Rocky Mountains to be warmer than last winter, with projected heating degree days in the Northeast, Midwest, and South respectively about 13%, 11%, and 8% lower; in the West, this winter is expected to be 12% colder than last winter
- Projected changes in average U.S. household heating fuel expenditures from last winter are:
 - 10% lower for homes that heat primarily with natural gas
 - 25% lower for homes using oil heat
 - 18% lower for homes using propane heat
 - 3% lower for homes that heat with electricity

Heating oil prices are forecast to be 15% lower than last winter, propane prices are forecast to be 10% lower, and natural gas prices are forecast to be 4% lower

U.S. average residential winter heating fuel prices
dollars per million Btu



Source: EIA Short-Term Energy Outlook, October 2015.

EIA has expanded the depth and breadth of its program, with more on the way

- International Energy Portal
- Monthly crude-by-rail data
- Analysis of the impacts of the Clean Power Plan
- Excel add-in tool for automatic data updates
- Report on federal subsidies in energy markets
- Ground Water Protection Council data collaboration
- Winter fuels prices for more states
- Domestic oil and gas production (EIA-914)
- Hourly electricity load data (EIA-930)
- Effects of Removing Restriction on U.S. Crude Oil Exports

Coming soon

- Drilling cost data
- Distributed solar generation data and analysis
- Integrating Customs and Border Protection exports data received on a more timely basis into EIA products

For more information

U.S. Energy Information Administration home page | www.eia.gov

Annual Energy Outlook | www.eia.gov/aeo

Short-Term Energy Outlook | www.eia.gov/steo

International Energy Outlook | www.eia.gov/ieo

Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy

State Energy Profiles | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling/

International Energy Portal | www.eia.gov/beta/international/?src=home-b1