

# Oil and natural gas supply and demand trends in North America and beyond



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*For*

*Energy Metro Desk Conference: New Risk in Energy II*

*April 7, 2015 / Houston, TX*

*By*

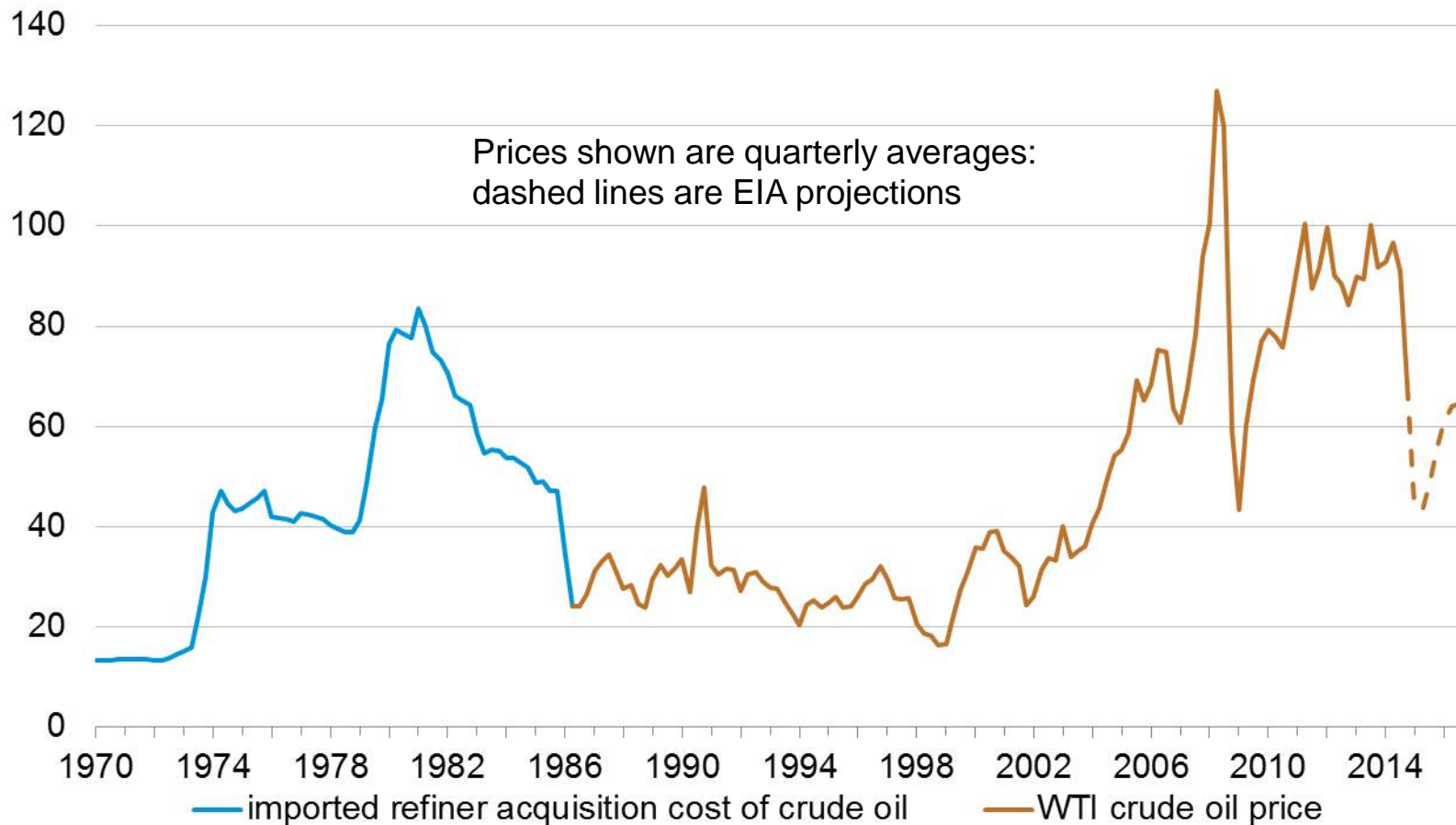
*Adam Sieminski*

*U.S. Energy Information Administration*

# Historical and projected oil prices

crude oil price

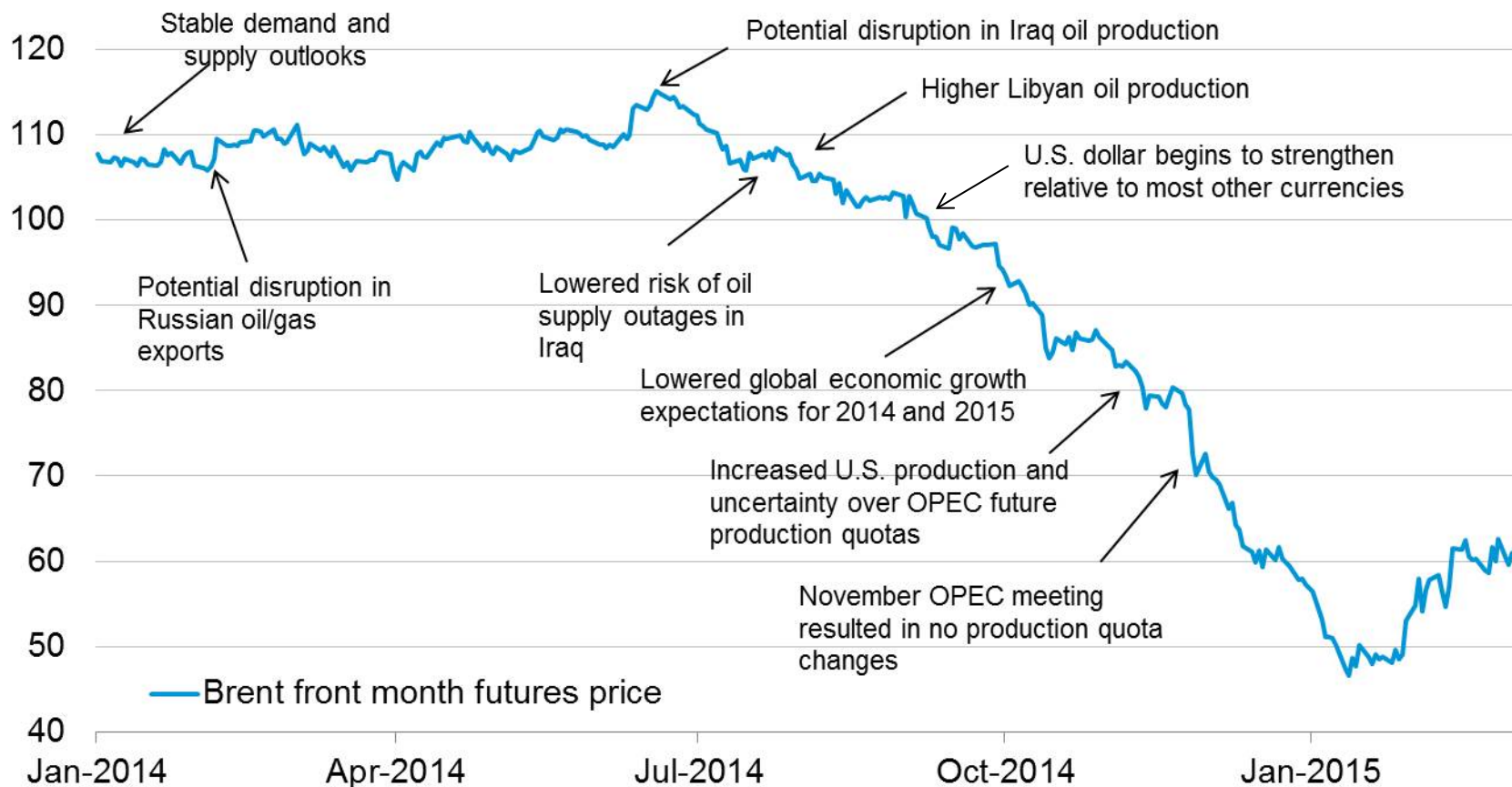
price per barrel (real 2010 dollars)



Sources: U.S. Energy Information Administration, Thomson Reuters

Brent crude oil prices were relatively stable through the first half of 2014; increased oil supply and lower global economic growth expectations lowered prices from July 2014 to January 2015

dollars per barrel

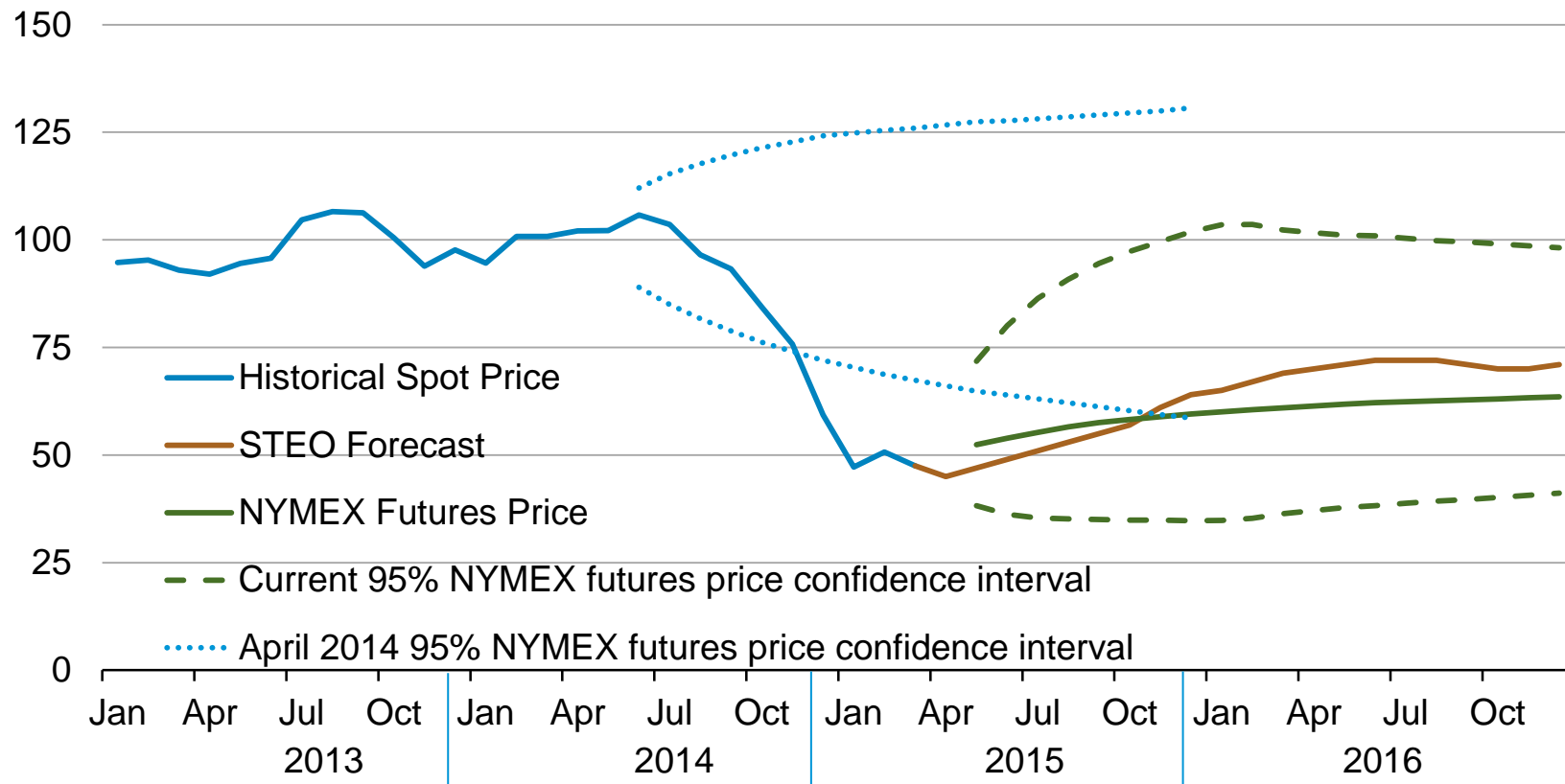


Source: EIA, Bloomberg

# Oil prices rise from mid-2015 through mid-2016 in EIA's forecast – however, the market-implied confidence band is very wide

WTI price

dollars per barrel

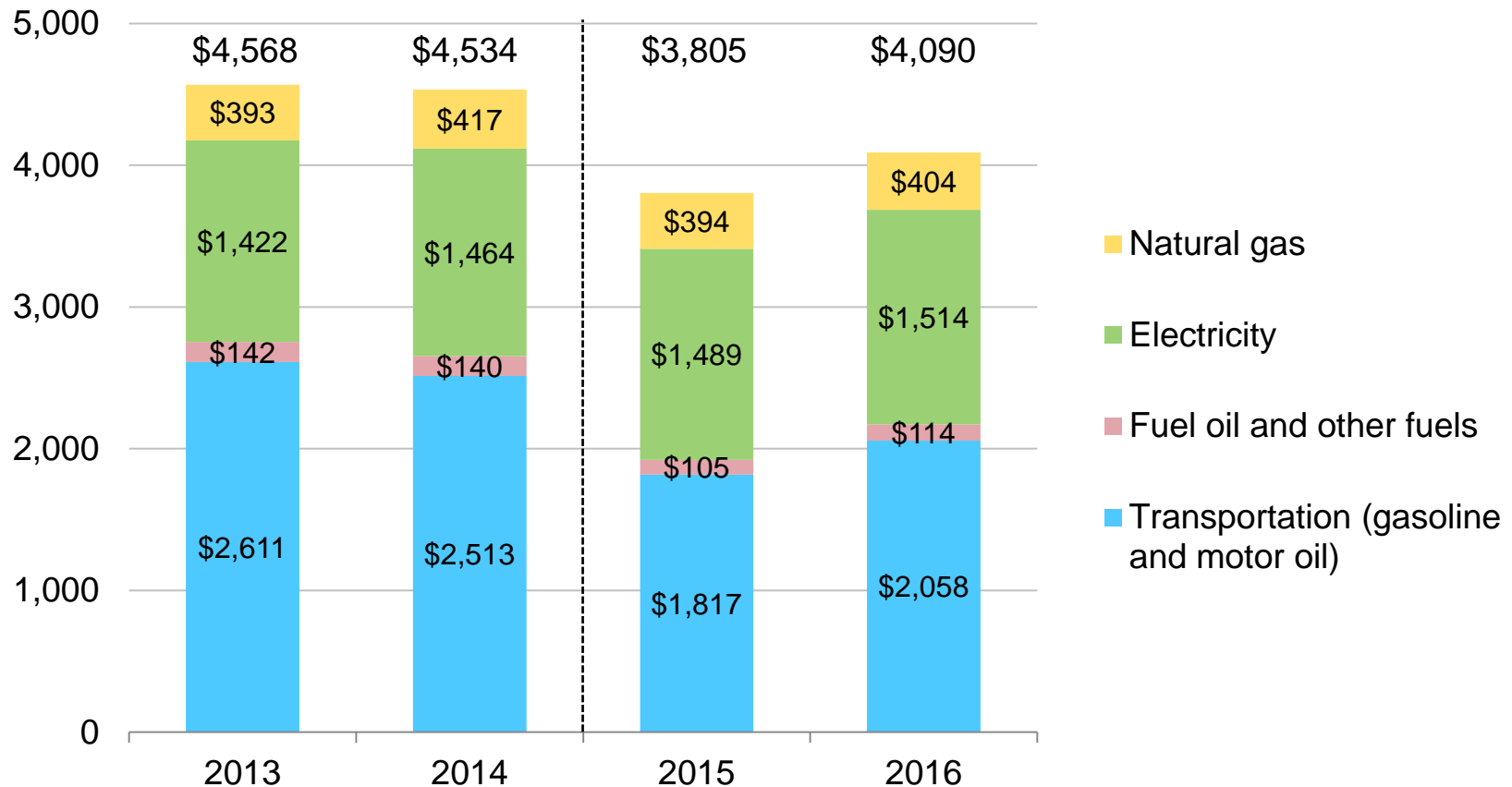


Source: EIA, Short-Term Energy Outlook, April 2015

# Average household energy expenditures fall by 16% in 2015, then increase somewhat in 2016 (based on EIA price forecast)

household energy expenditures

dollars



Sources: 2013 expenditures and income from BLS Consumer Expenditure Survey. The average household in the BLS survey (called a consuming unit) averages 2.5 people and 1.3 income earners. Expenditures for 2014-16 based on average prices from EIA Short-Term Energy Outlook, April 2015

Various events could lead to changes in global supply or demand that could push future crude oil prices higher or lower than the STEO forecast

## Increase Prices

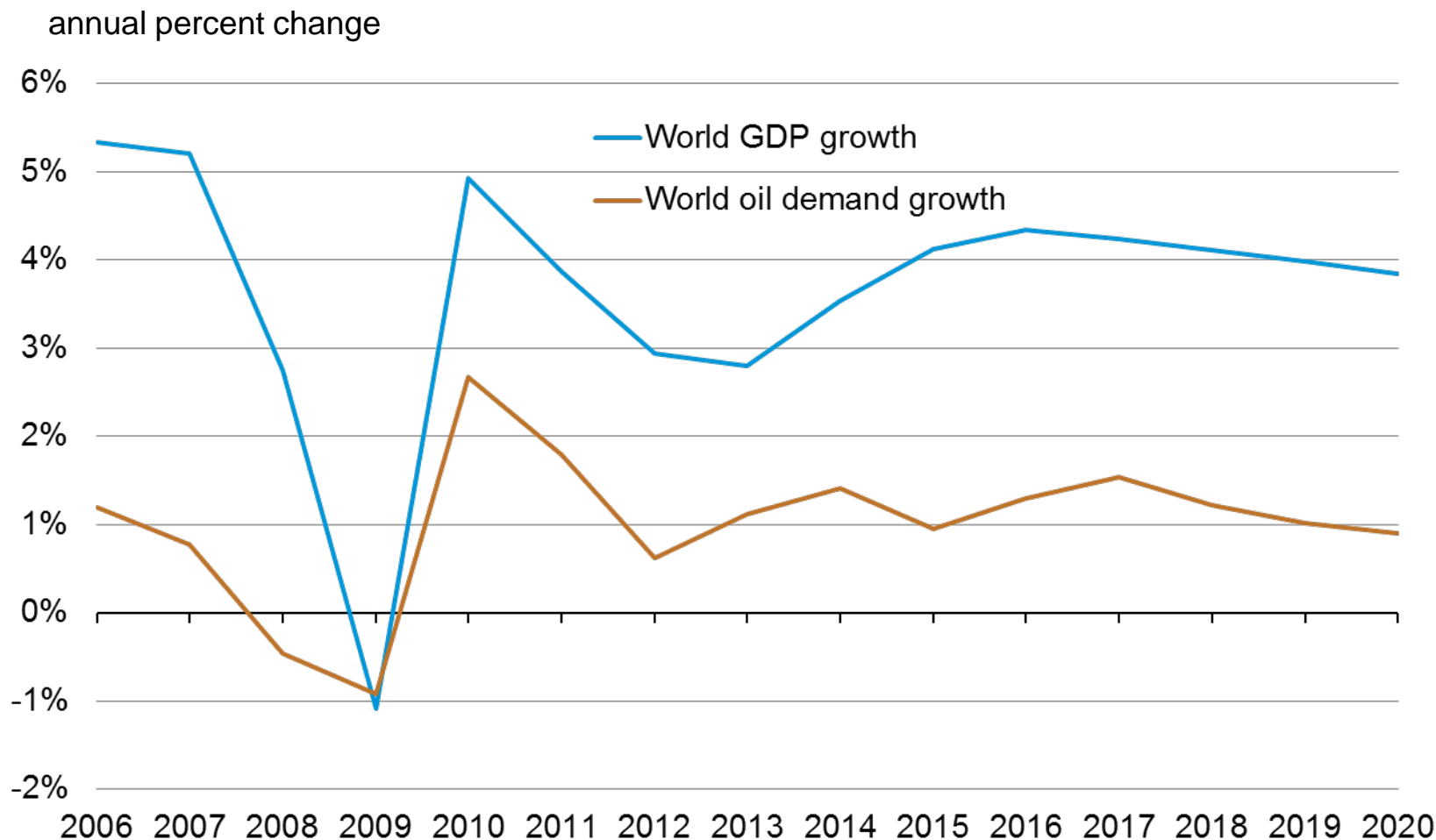
Event
Social unrest in Venezuela leads to supply disruptions
ISIL disrupts Iraqi exports
Iranian sanctions are tightened
Social unrest in oil-dependent countries leads to supply disruptions
OPEC cuts output more than projected

## Decrease Prices

World economic growth is lower than projected (e.g., China)
Saudi Arabia keeps production at 9.6-9.7 million bbl/d in 2016
Reduction in unplanned production outages
Iranian sanctions are lifted

# Oil

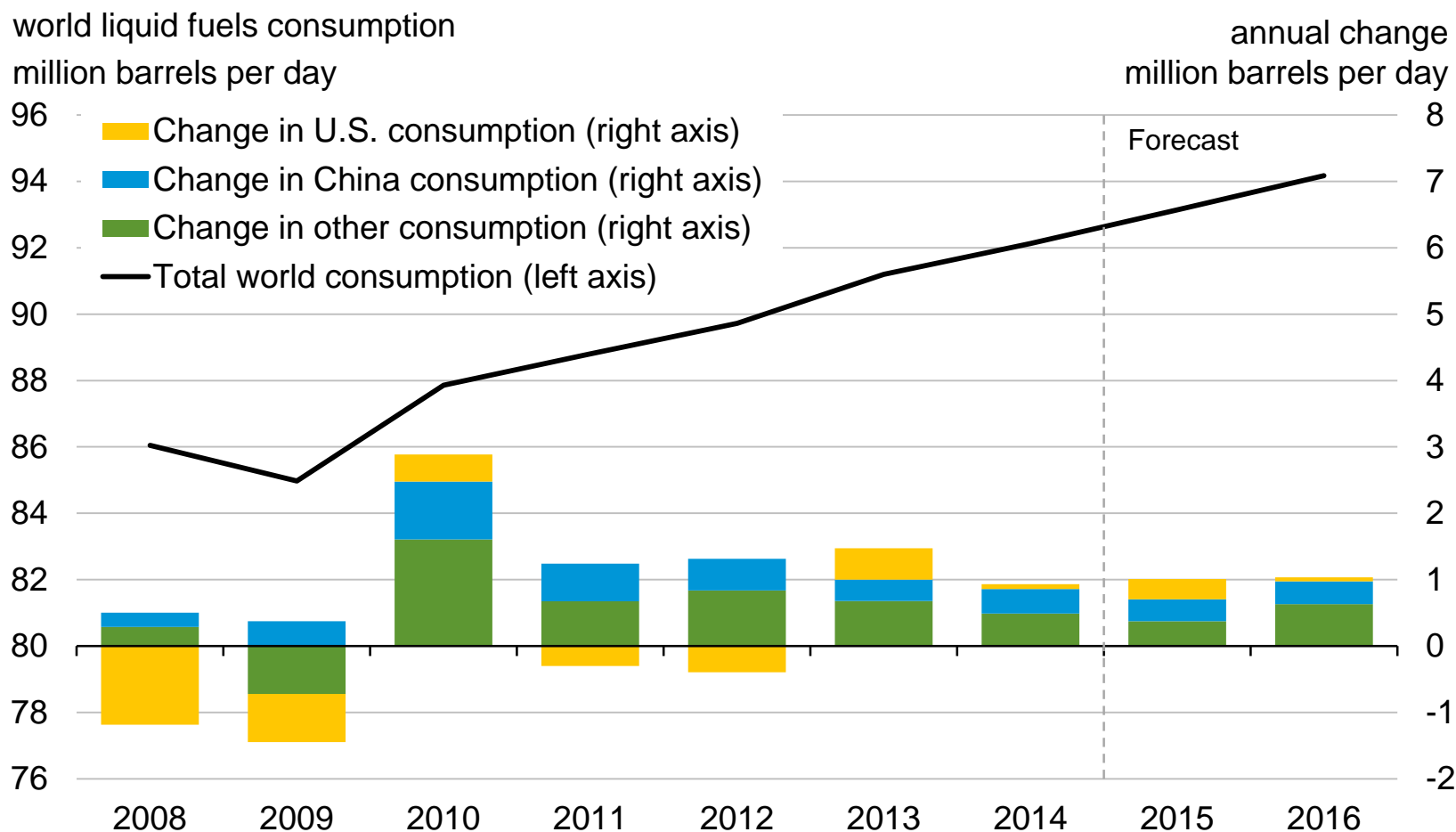
# Global oil demand tracks world GDP growth



Source: U.S. Energy Information Administration, *International Energy Outlook 2014*



## EIA forecasts global liquids consumption growth at 1.0 million bbl/d in 2015 and 1.1 million bbl/d in 2016

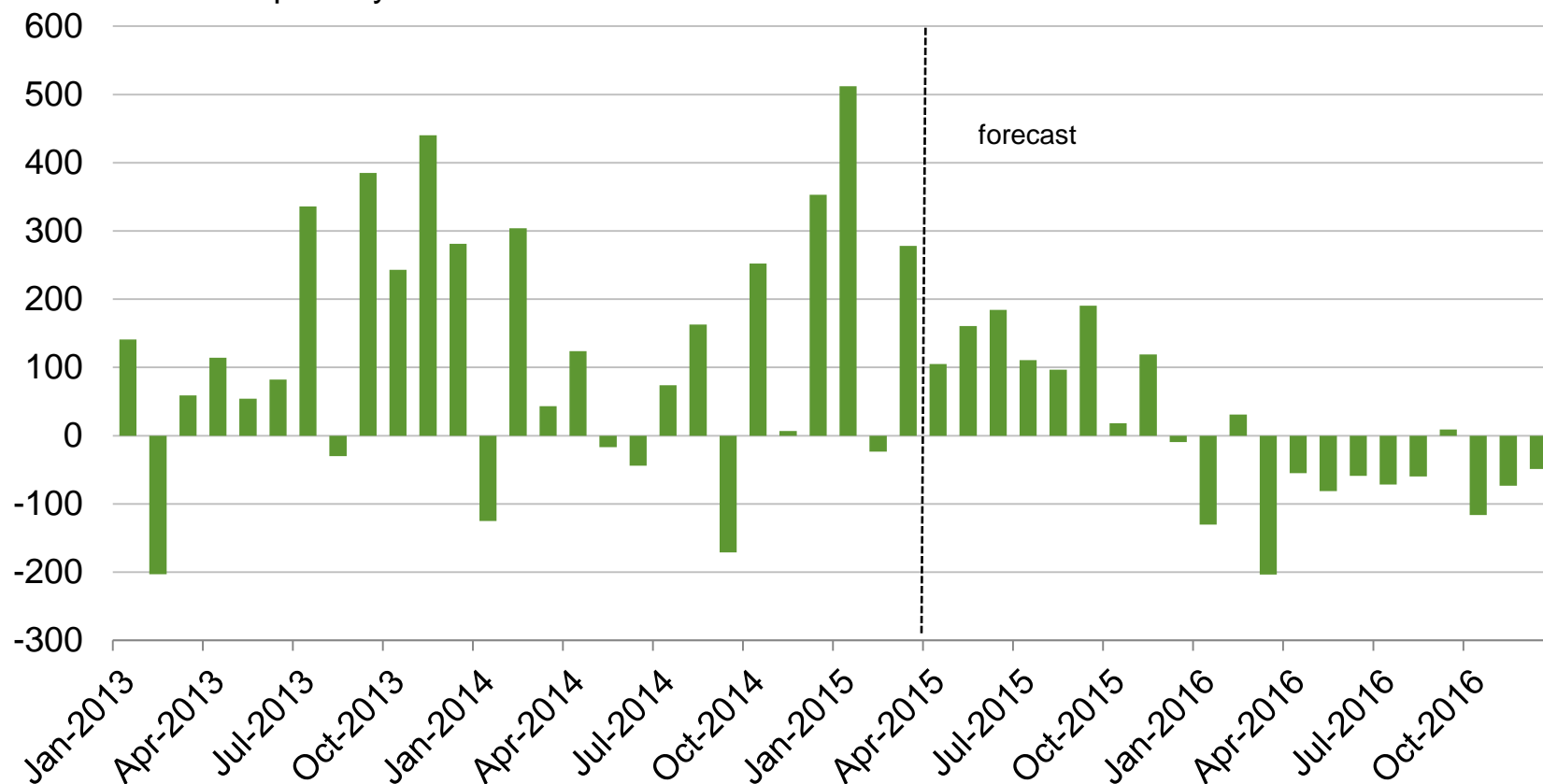


Source: EIA, Short-Term Energy Outlook, April 2015

# Employment growth and lower prices contributed to U.S. gasoline consumption increases from late-2013 through early 2015

monthly U.S. gasoline consumption (year-over-year change)

thousand barrels per day



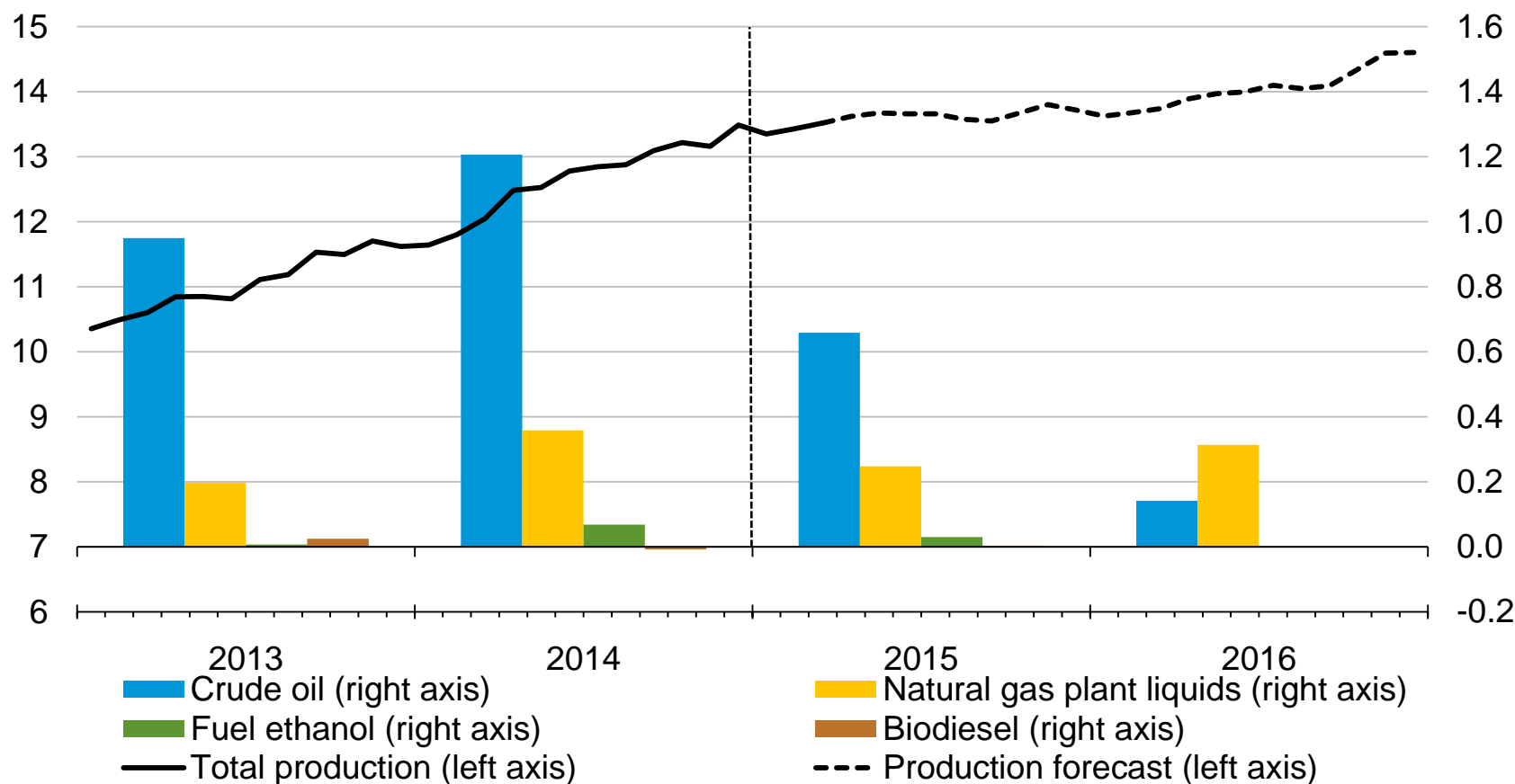
Source: EIA, Short-Term Energy Outlook, April 2015

U.S. crude oil production is expected to increase only 660 kb/d in 2015 and 140 kb/d in 2016; if prices do not recover to the mid-\$70s by mid-2016 as forecast by EIA, production would be lower

U.S. crude oil and liquid fuels production

million barrels per day

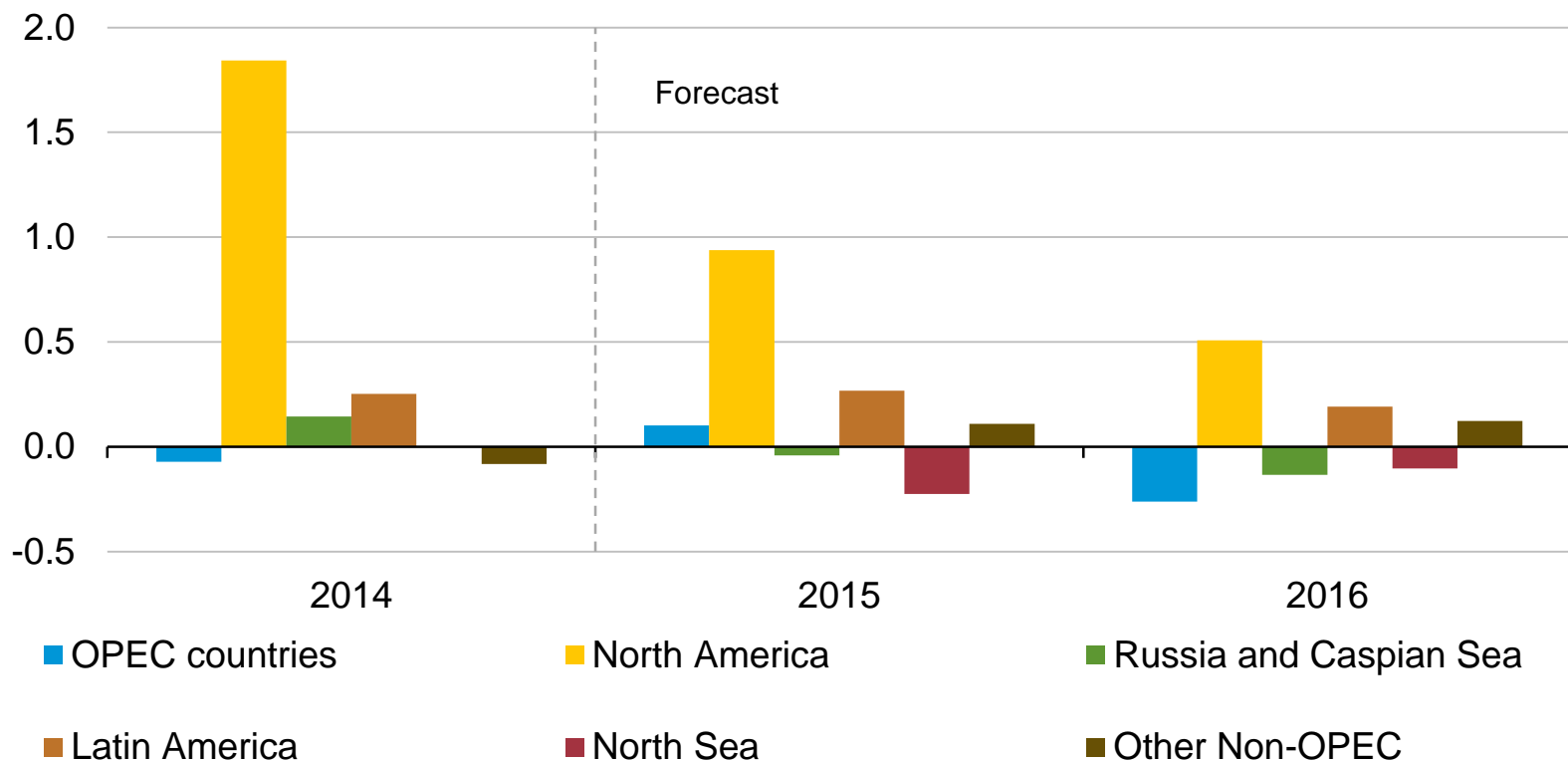
annual change  
million barrels per day



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

# North American oil production growth slows with lower oil prices but remains the main driver of global production growth

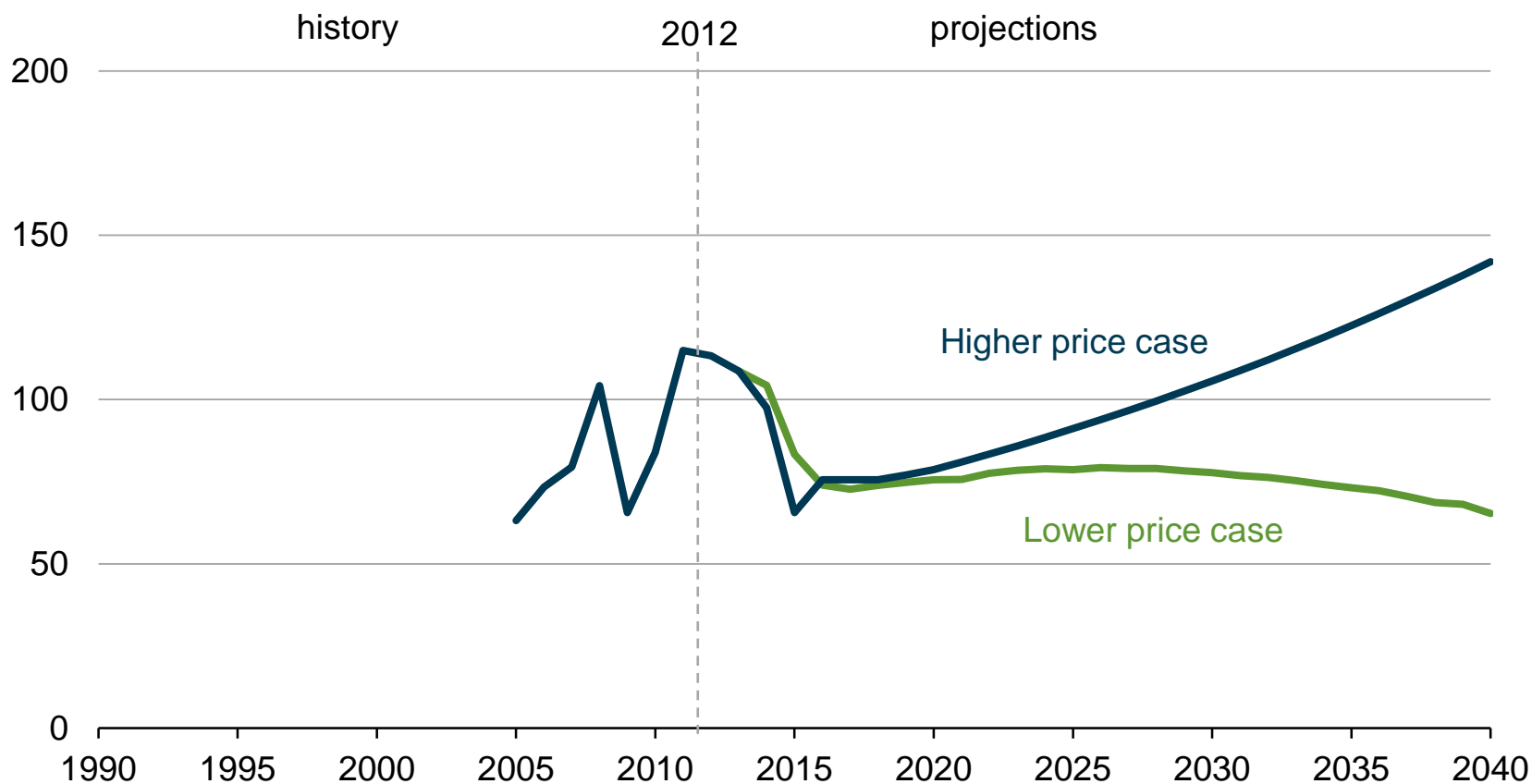
world crude oil and liquid fuels production growth  
million barrels per day



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

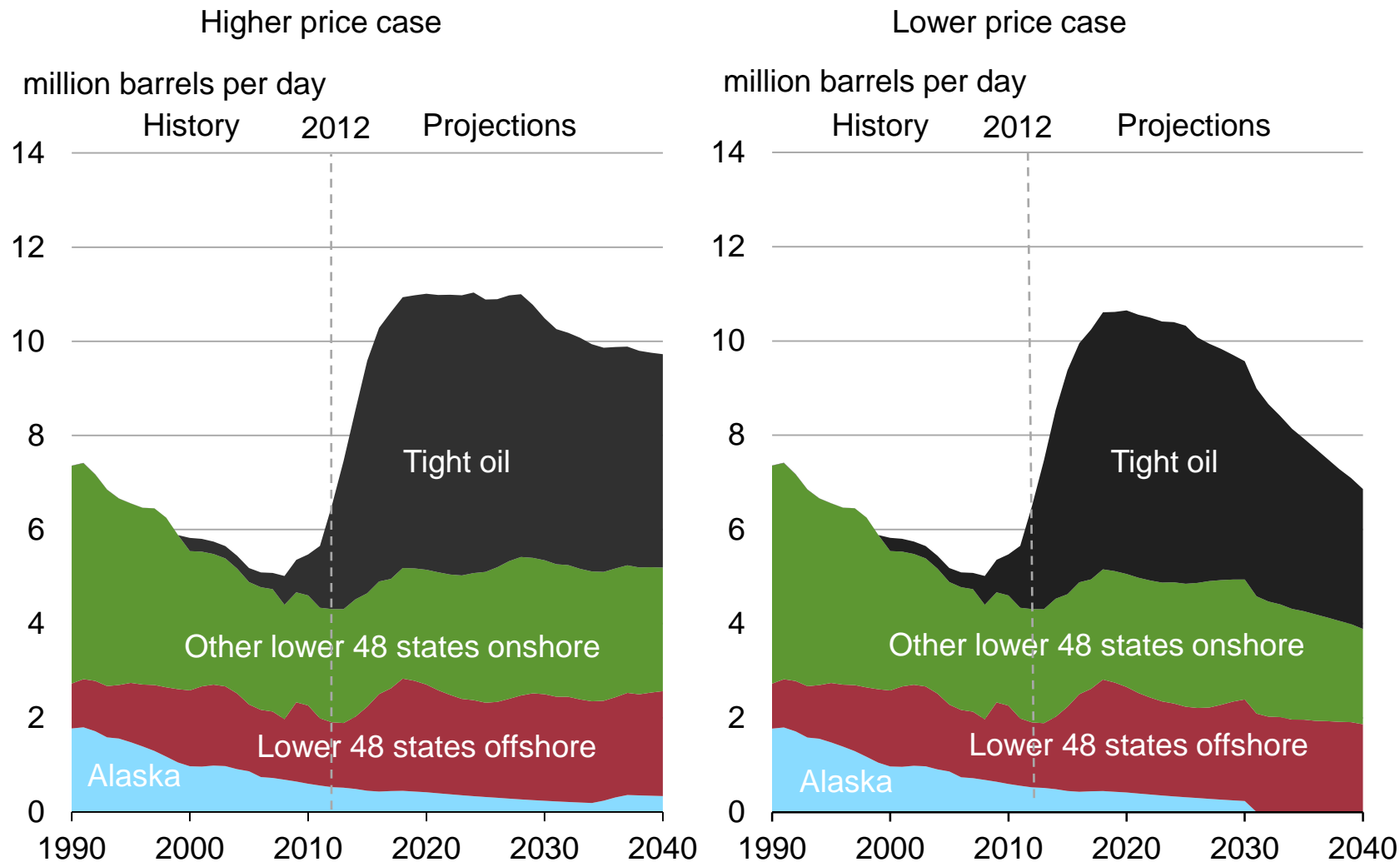
# Long-term price scenario

Brent crude oil spot price  
2013 dollars per barrel



Source: EIA, preliminary analysis

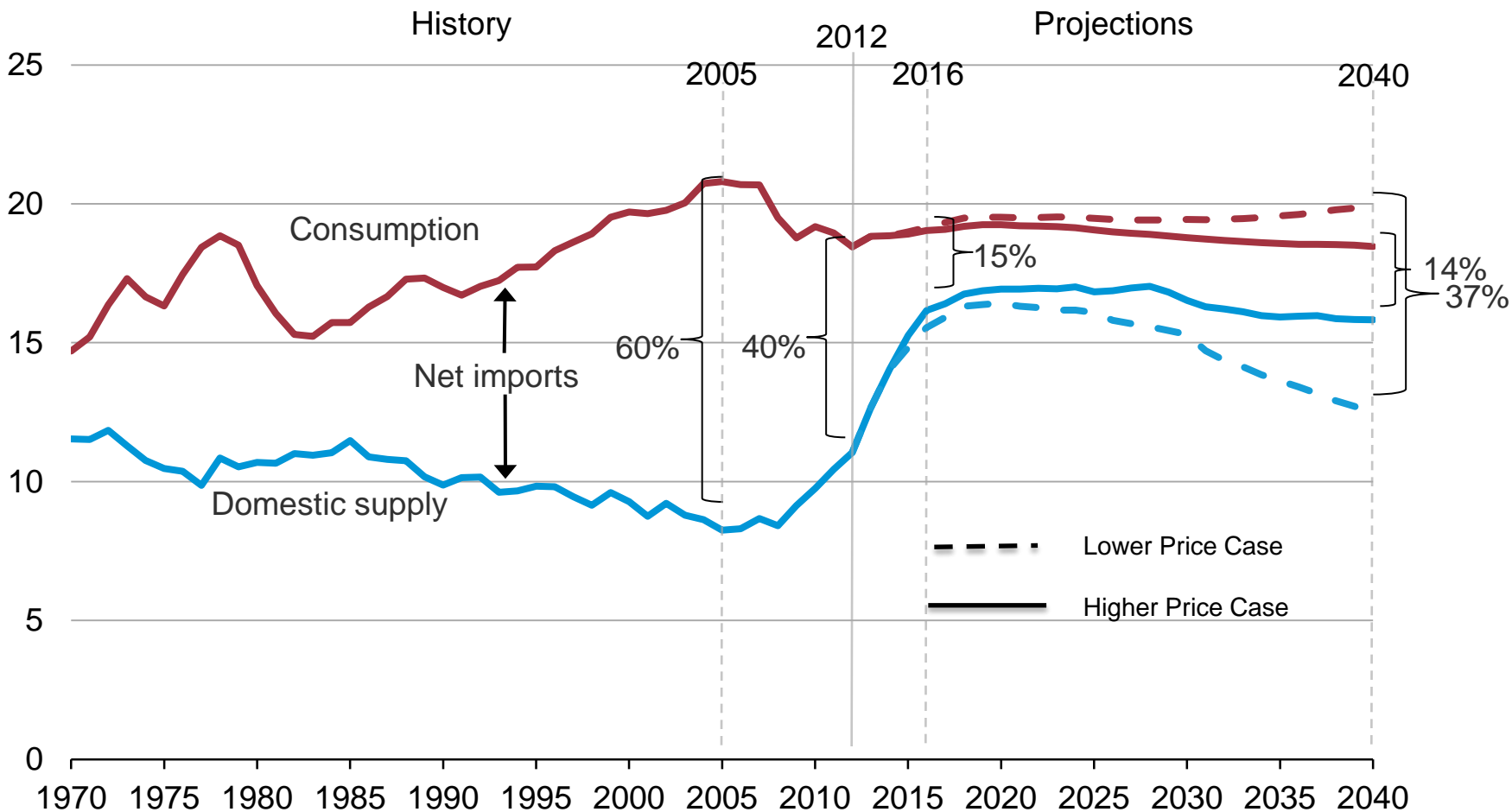
# Short-term lower oil prices have small impact on U.S. total oil production; 10 years of lower prices required for significant impact



Source: EIA, preliminary analysis

# U.S. dependence on imported liquids increases with lower oil prices

U.S. liquid fuel supply  
million barrels per day



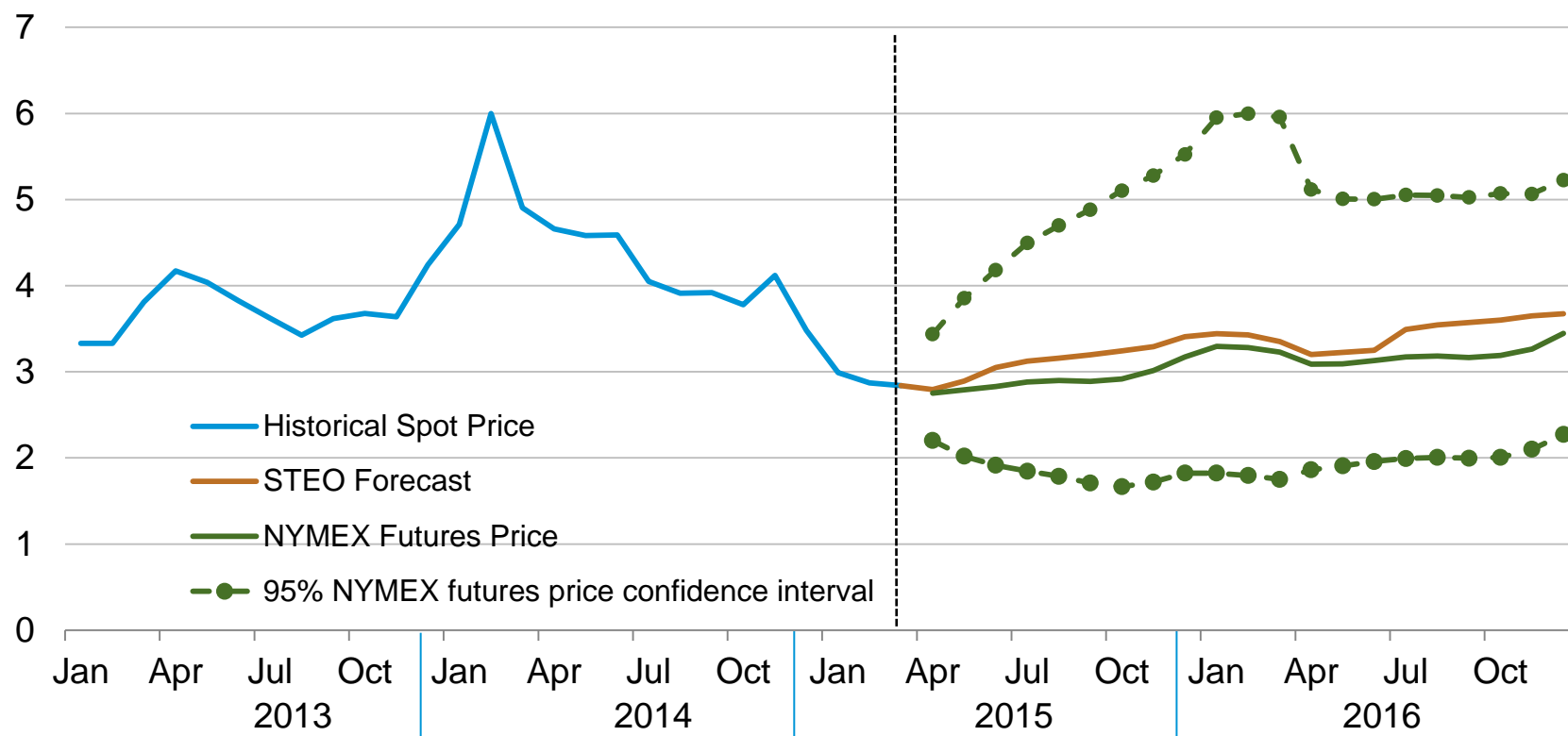
Source: EIA, preliminary analysis

# Natural gas



## Henry Hub spot prices are expected to average \$3.07/million Btu in 2015 and \$3.45/million Btu in 2016

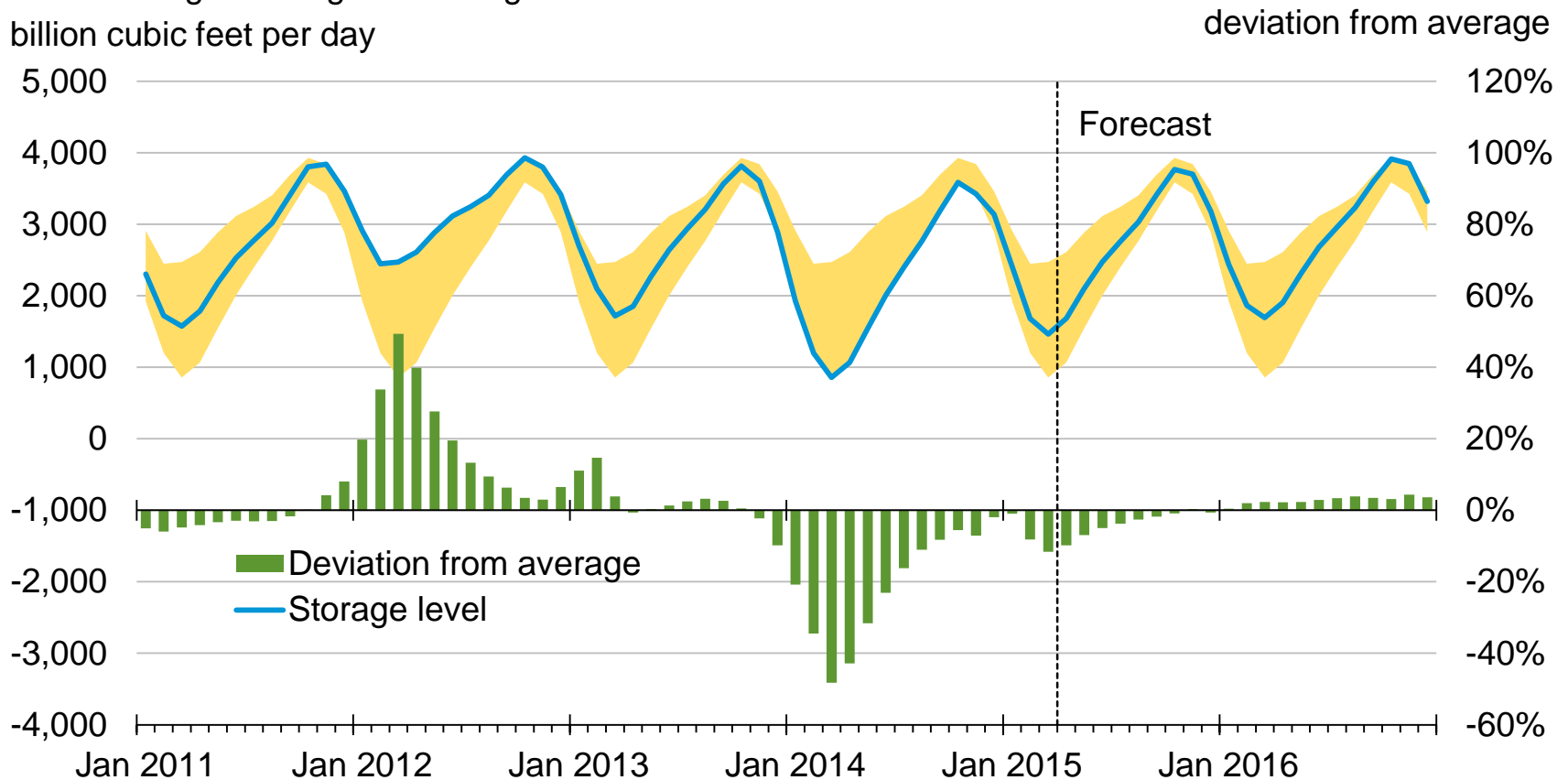
Henry Hub spot price  
dollars per million Btu



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

# After cold weather caused large natural gas storage withdrawals in 2014, inventories are expected to return to historical average levels in 2015 and 2016

U.S. working natural gas in storage  
billion cubic feet per day



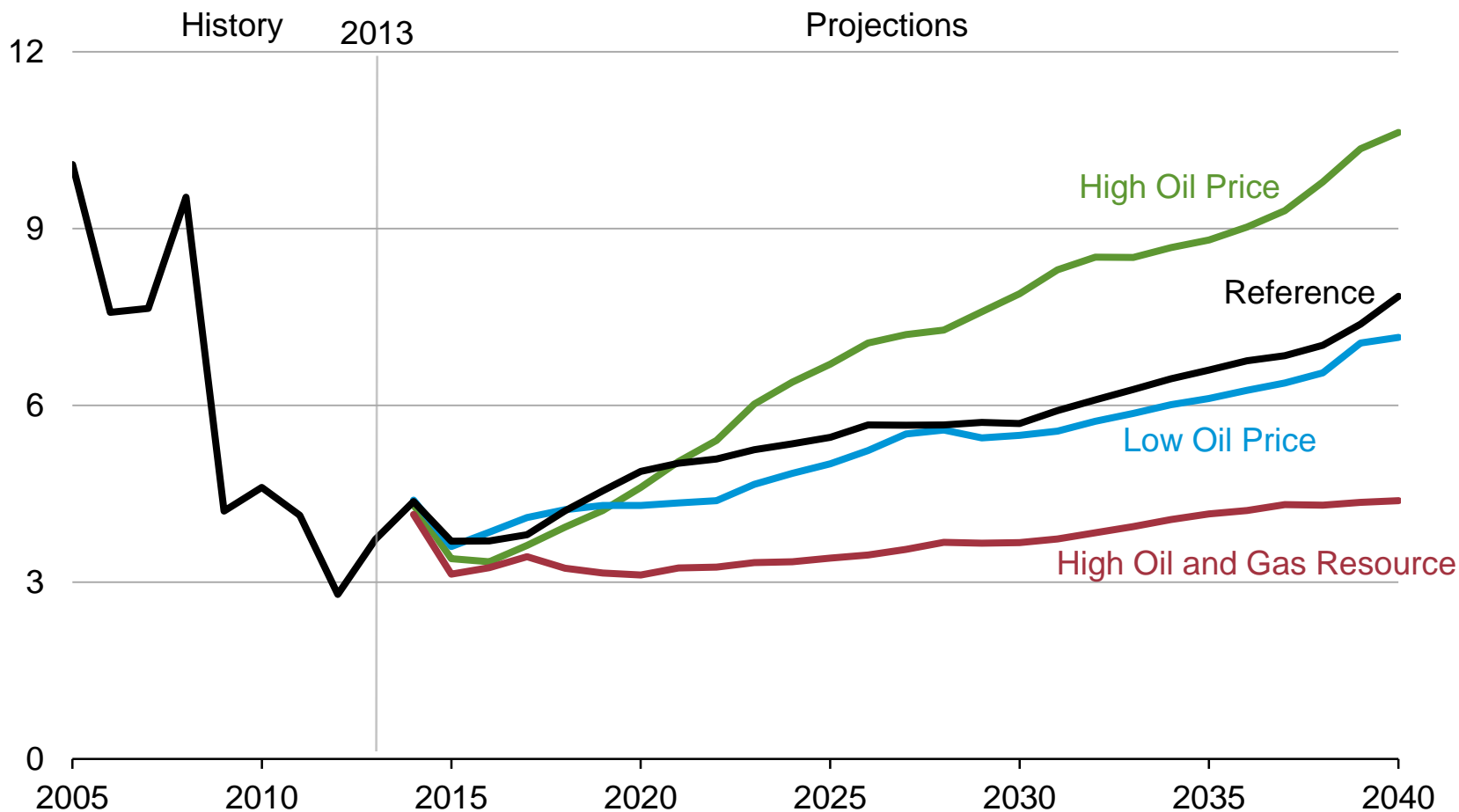
Note: Colored band around storage levels represents the range between the minimum and maximum from Jan. 2010 - Dec. 2014.

Source: EIA, *Short-Term Energy Outlook*, April 2015

# Future natural gas prices depend on world energy prices and domestic resource availability

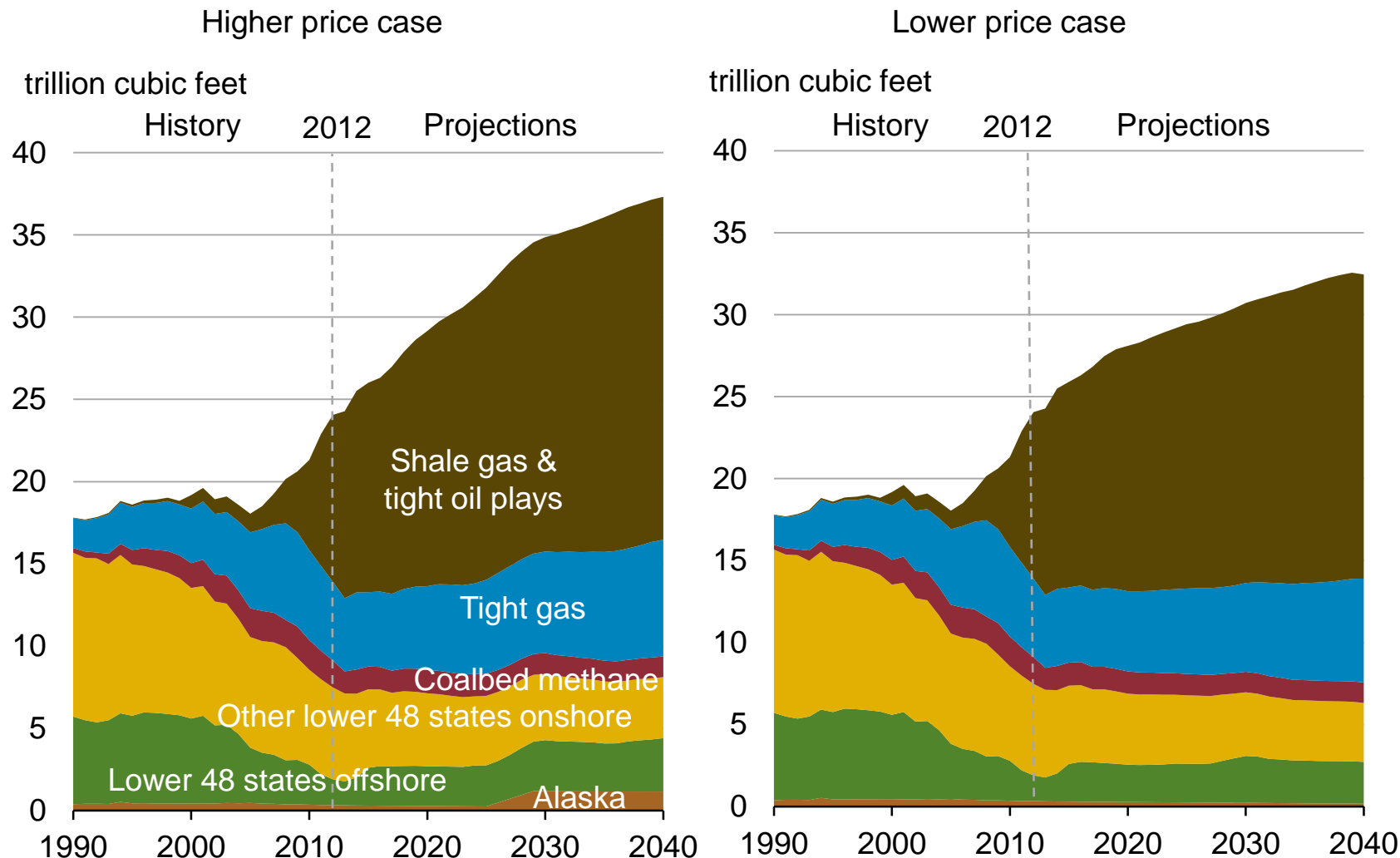
average Henry Hub spot prices for natural gas

2013 dollars per million Btu



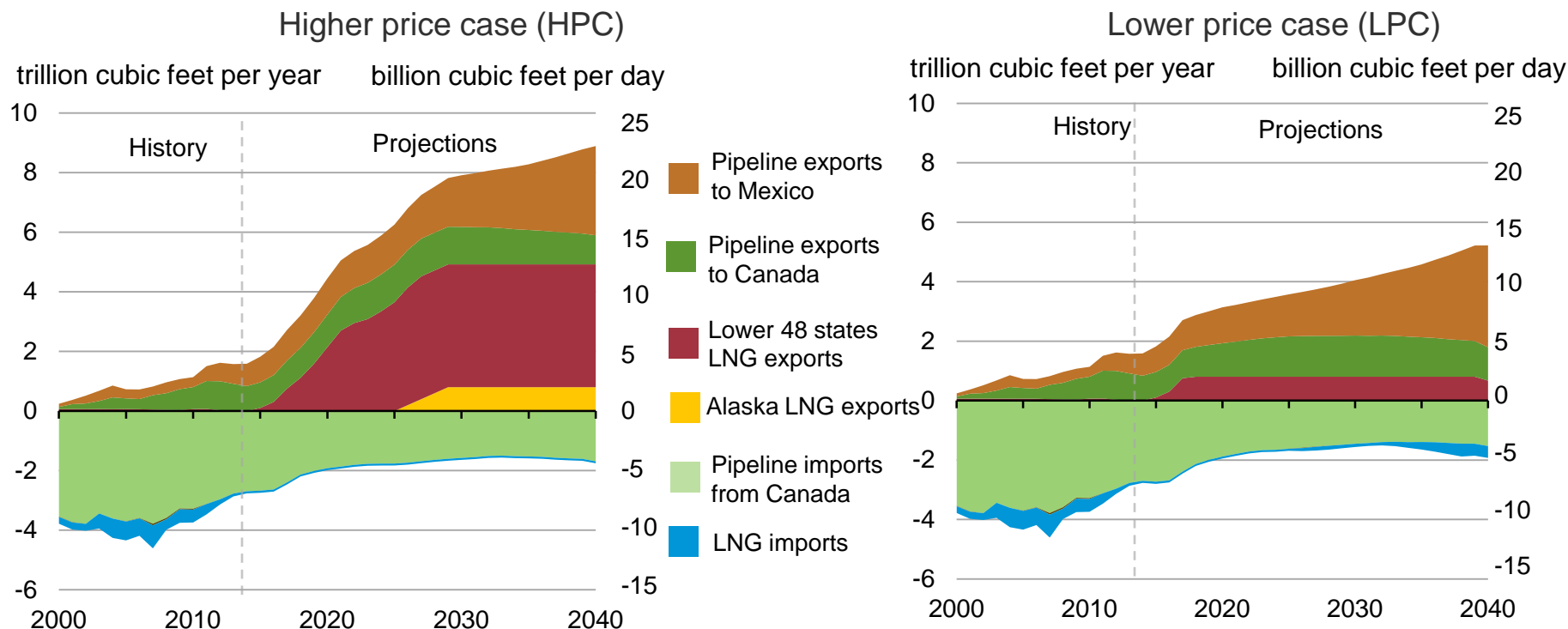
Source: EIA, Annual Energy Outlook

# U.S. dry natural gas production



Source: EIA, preliminary analysis

# Lower world oil prices affect the economics of U.S. LNG export projects, reducing the global demand for U.S. natural gas

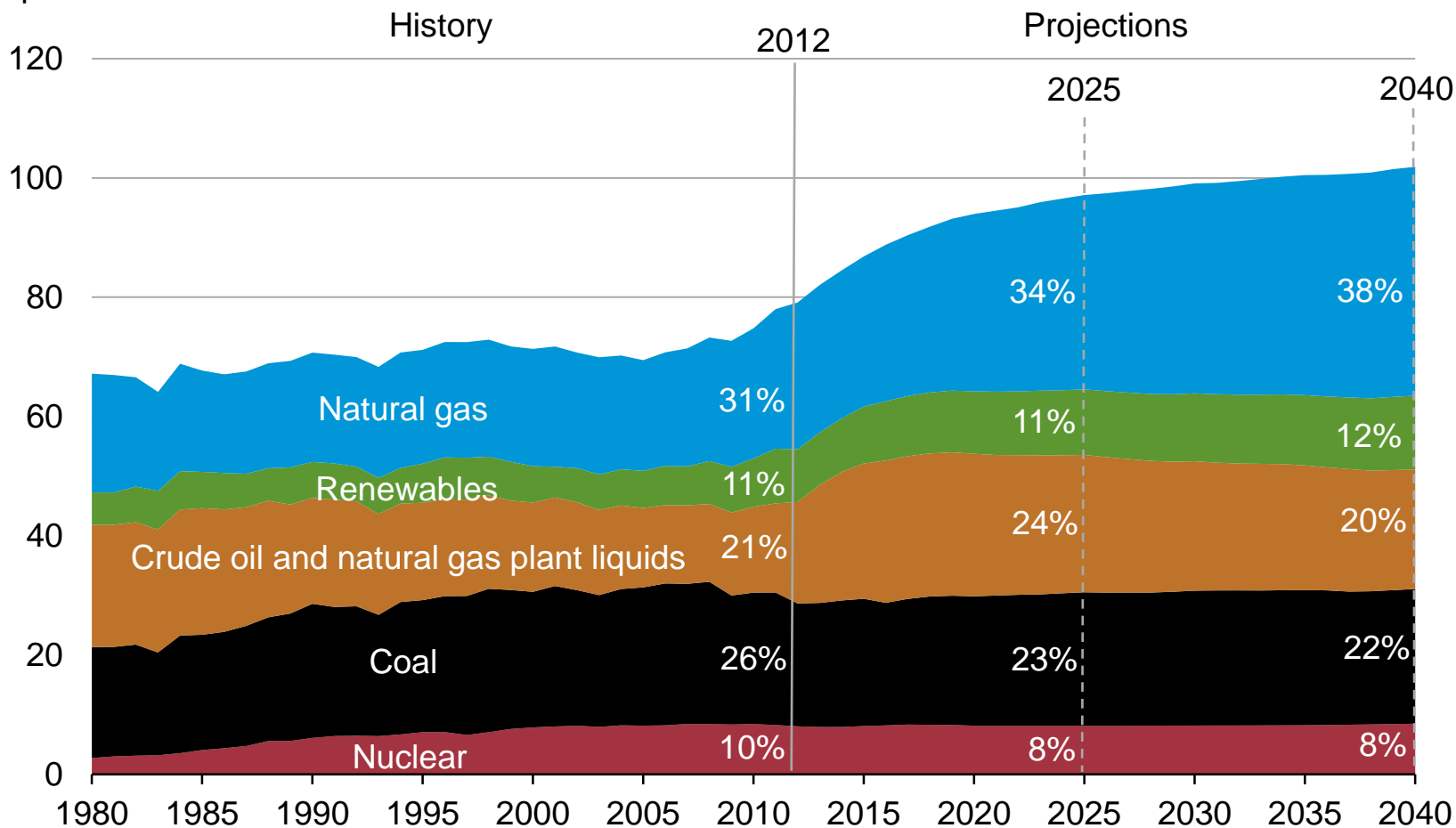


- In the LPC, LNG exports reach 0.8 Tcf (2.2 Bcf/d), and the only U.S. LNG export capacity that is built is currently under construction; in contrast, U.S. LNG exports in the HPC exceed 3.5 Tcf by 2025
- The lower growth of U.S. LNG exports in the LPC contributes to net export levels that only reach 3.3 Tcf by 2040, 54% below their level in the HPC

Source: EIA, preliminary analysis

# U.S. energy production grows rapidly, particularly natural gas, renewables, and liquids in the near term

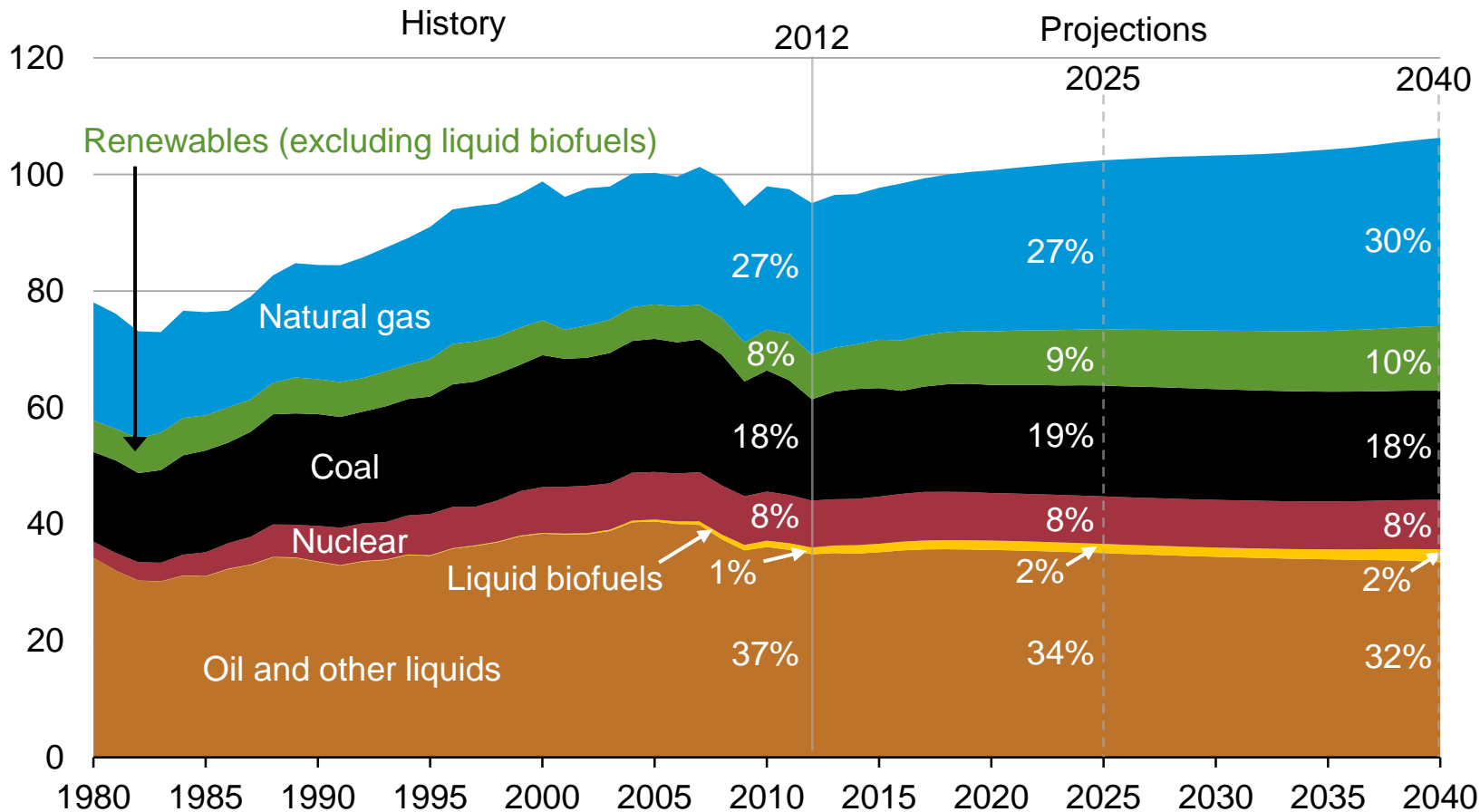
U.S. energy production  
quadrillion Btu



Source: EIA, Annual Energy Outlook 2014

# U.S. energy use grows slowly over the projection reflecting steady growth in GDP offset by improving energy efficiency

U.S. primary energy consumption  
quadrillion Btu



Source: EIA, Annual Energy Outlook 2014

# Preview of coming attractions



## Now playing: Crude by rail and EIA-914—data updates

- Both high priority
- Crude by rail due out with PSM, March 30
- Updated 914 expected in June with new data collection

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## U.S. Crude Oil By Rail Movements

With Data through January 2015 | Release Date: March 30, 2015 | Next Release Date: April 27, 2015

Summary table - mtbl/d	Summary table - mbbl	Graphic examples	PADD 1				
Crude oil movements by rail, 2014 thousand barrels/day							
Region from/to	PADD 1	PADD 2	PADD 3	PADD 4	PADD 5	Total U.S.	Canada
PADD 1	0	427	0	39	0	466	61
PADD 2	0	32	1	17	0	50	2
PADD 3	0	113	30	109	0	252	47
PADD 4	0	0	0	0	0	0	0
PADD 5	0	165	9	27	8	210	4
Total US shipped	0	737	41	192	8	978	12
Canadian imports	0	20	0	6	0	26	0
Total rail receipts	0	757	41	198	8	1,004	12

NA = data not available

Monthly crude oil, lease condensate, and natural gas  
EIA-914 monthly production report

Release Date: August 11, 2014 | Next Release Date: September 8, 2014

Production by state/area			API gravity by state/area		
XXXXXX			XXXXXX		
xxx 2014	xxx 2014	change	xxx 2014	xxx 2014	change
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
XXXXXX	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX
Total	X,XXX	X,XXX	X,XXX	X,XXX	X,XXX



Data tables:

- **sqll7 test** Detailed movements by rail between PAD Districts and Canada - monthly 2010-2014
- **sqll7 test** Detailed movements by rail between PAD Districts and Canada - annual 2010-2014
- **sqll7 test** Movements by pipeline, tanker, barge, and rail between PAD Districts
- **sqll7 test** Net receipts by pipeline, tanker, barge and rail between PAD Districts
- **sqll7 test** Movements of crude oil by pipeline, tanker, barge and rail between PAD Districts

### Report and documentation

- [Data methodology](#)
- [Trends in Crude Oil Movements by Rail](#)

## Related articles

- Rail shipments of oil and petroleum up 13% over Energy

### Previous issues

month: August 2014

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# Now playing: New Microsoft Excel add-in for Windows


- Enables spreadsheet users – inside and outside of EIA – to pull the most recent EIA data into their existing workbooks
- Includes FRED economic data from the St. Louis Federal Reserve

## U.S. Energy Information Administration (EIA) Excel Data Add-In

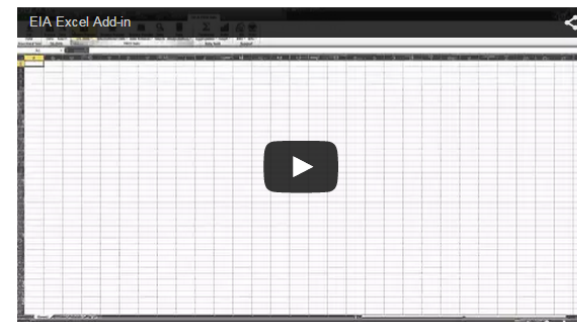
[Download the EIA Data Add-In for Microsoft Excel for Windows](#)

By adding an "EIA & FRED" tab to Microsoft Excel, our add-in allows you to download, directly into your spreadsheet, **energy data** from [EIA's data API](#) and **economic data** from the [St. Louis Federal Reserve's Economic Data \(FRED\) API](#). Spreadsheets with fetched data series can be saved, opened later, or refreshed with new data by simply clicking the "Get Data" button. This ability to save data and analysis and rerun it later with the latest data is an immense saving of time and effort for analysts performing periodic analyses of statistics and indicators.

Within the spreadsheet, you can browse each data repository by category or search by keywords to find data IDs and to download the series information and data. Once the desired data series are downloaded, all of Excel's rich functionality is available to create analyses and graph results.

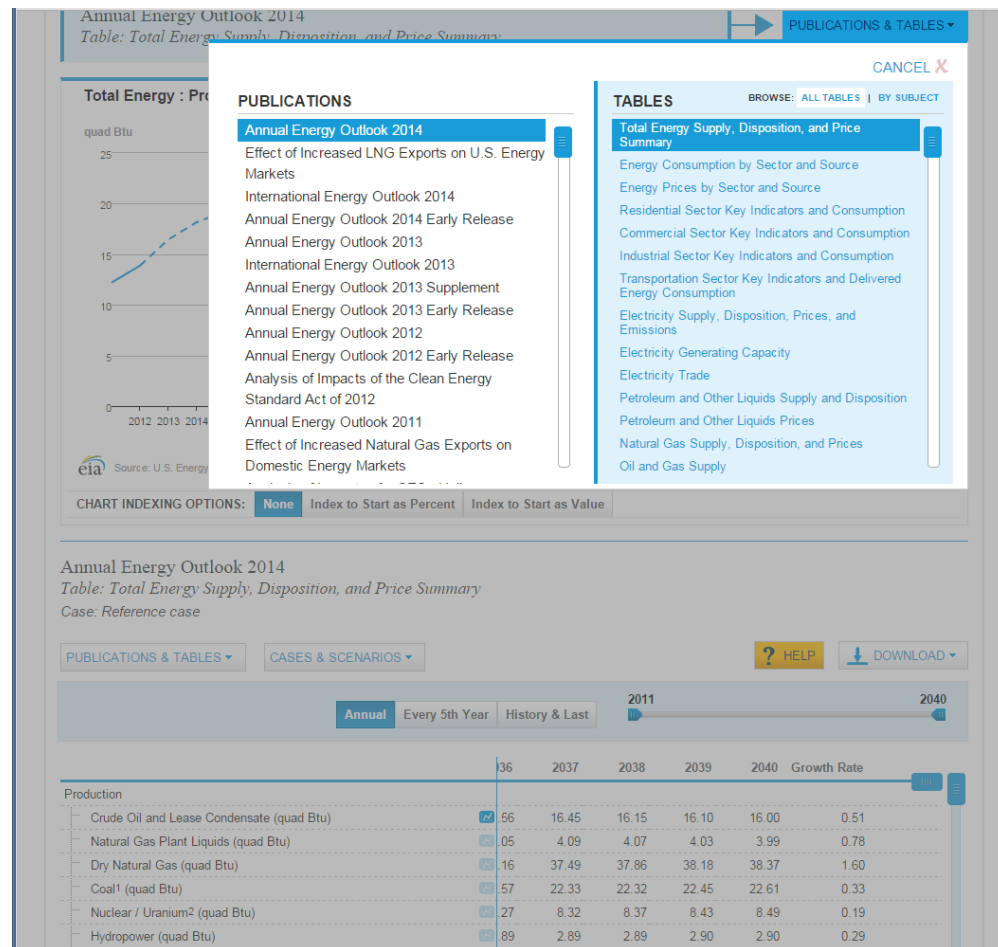
Throughout the EIA website, the symbol  is used to denote a link to a page with the series ID or source key and sample API calls. The series ID can be copied and pasted directly into Excel and the series data fetched with the EIA add-in. This is another way to load data series found on [www.eia.gov](http://www.eia.gov) into your workbook.

Currently, EIA's data API contains 1.2 million energy series. The St. Louis Federal Reserve's API contains 240,000 economic series. Both organizations offer the data APIs, bulk data downloads, and Excel add-ins free of charge as part of their commitment to open data.



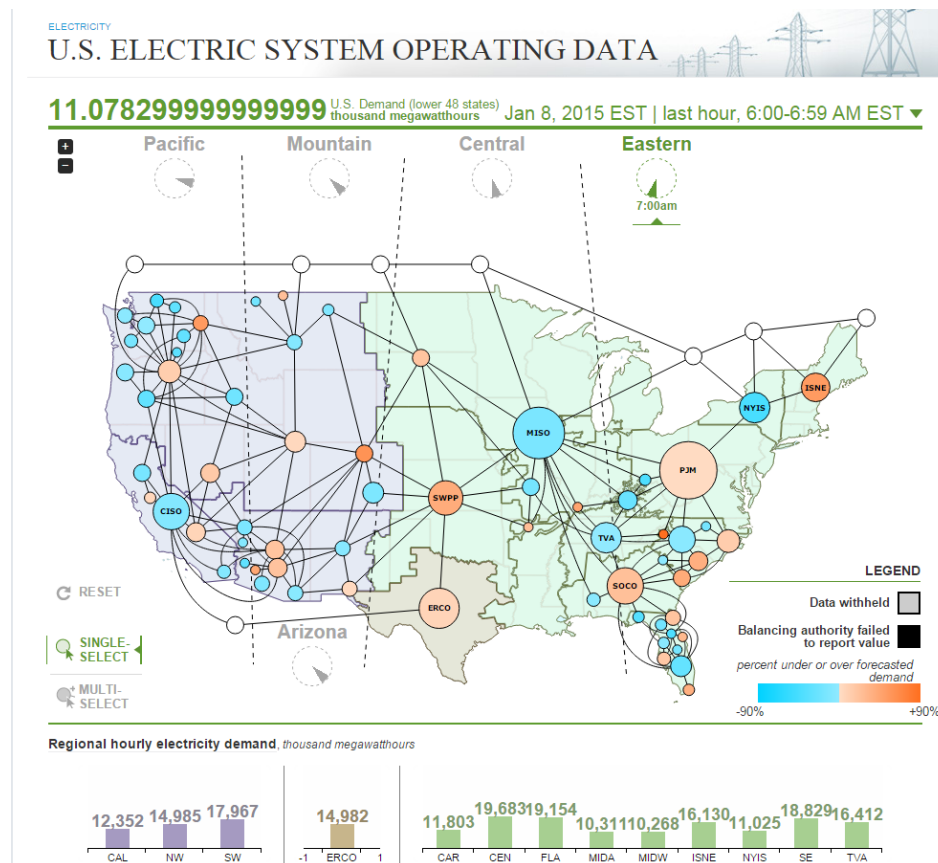
# Upcoming: New AEO table browser

- Signature product redeveloped for EIA's state-of-the-art table browser experience
- Compares up to 6 cases from AEO



# Upcoming: EIA-930—hourly survey of electricity balancing authorities

- First near-real time report for EIA
- Dashboard view of the U.S. power grid
- Highly anticipated by EIA customers
- Status: dev largely complete; awaiting OES data to continue
- Launch: TBD



## Upcoming: improved international energy web presence

- New data browser to replace IES
- Better map-based navigations and visualizations
- Consolidate CABs/CANs
- Launch: beta in April



## Tri-lateral cooperation: Canada, Mexico, & United States memorandum of understanding signed 12/15/2014

**1) Reconciliation of import and export information on energy flows.** The working group would develop a cross reference for terminology and a table of conversion factors across the three countries. EIA would propose subcategories of+ crude oil, refined products, natural gas and electricity.

**2) GIS mapping.** The working group would establish a standard format, sourcing protocols and a mechanism for file/data sharing. Each party would provide its public map layers to each partner, while asking them to provide theirs. It would then be up to each party to decide if and how they want to display the information they receive from the other parties.

**3) Outlooks for crossborder flows of fuels.** EIA would propose that we begin by sharing information among the three partners regarding recent historical data and outlooks for cross border flows of oil, natural gas, and electricity. The information exchange would also provide some brief information on broader energy measures -- production and consumption of the energy commodities – as well as information on some of the key outlook drivers – economic and population growth.



# North American border crossing points for electricity and oil and natural gas pipelines



## Upcoming: Final reports on EIA crude oil exports

Over the next two months, the final four reports will cover:

- 1) Technical options for U.S. refineries to facilitate the processing additional light tight oil
- 2) Implications of increasing light tight oil production for the overall U.S. refining system
- 3) Update to EIA's May 29, 2014, report on projections of U.S. crude oil production by API gravity
- 4) Effects on oil prices, oil production, and oil trade if restrictions on U.S. crude oil exports were removed



## For more information

U.S. Energy Information Administration home page | [www.eia.gov](http://www.eia.gov)

Annual Energy Outlook | [www.eia.gov/aeo](http://www.eia.gov/aeo)

Short-Term Energy Outlook | [www.eia.gov/steo](http://www.eia.gov/steo)

International Energy Outlook | [www.eia.gov/ieo](http://www.eia.gov/ieo)

Monthly Energy Review | [www.eia.gov/mer](http://www.eia.gov/mer)

Today in Energy | [www.eia.gov/todayinenergy](http://www.eia.gov/todayinenergy)

State Energy Profiles | <http://www.eia.gov/state>

Drilling Productivity Report | <http://www.eia.gov/petroleum/drilling/>