

An Energetic Decade: Economic Growth in the Western States, 2007 - 2017

Presentation for

WSATA

September 25, 2018

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Texas Comptroller of Public Accounts

Overview

- Shaming the Presenter: A Look Back at Last Year's Forecast
- A Brief History of Oil and Natural Gas Prices and Production
- Energy and Economic Growth Since 2007
- Economic Growth in WSATA States
- Yet Another Attempt to Accurately Forecast Oil and Gas Prices

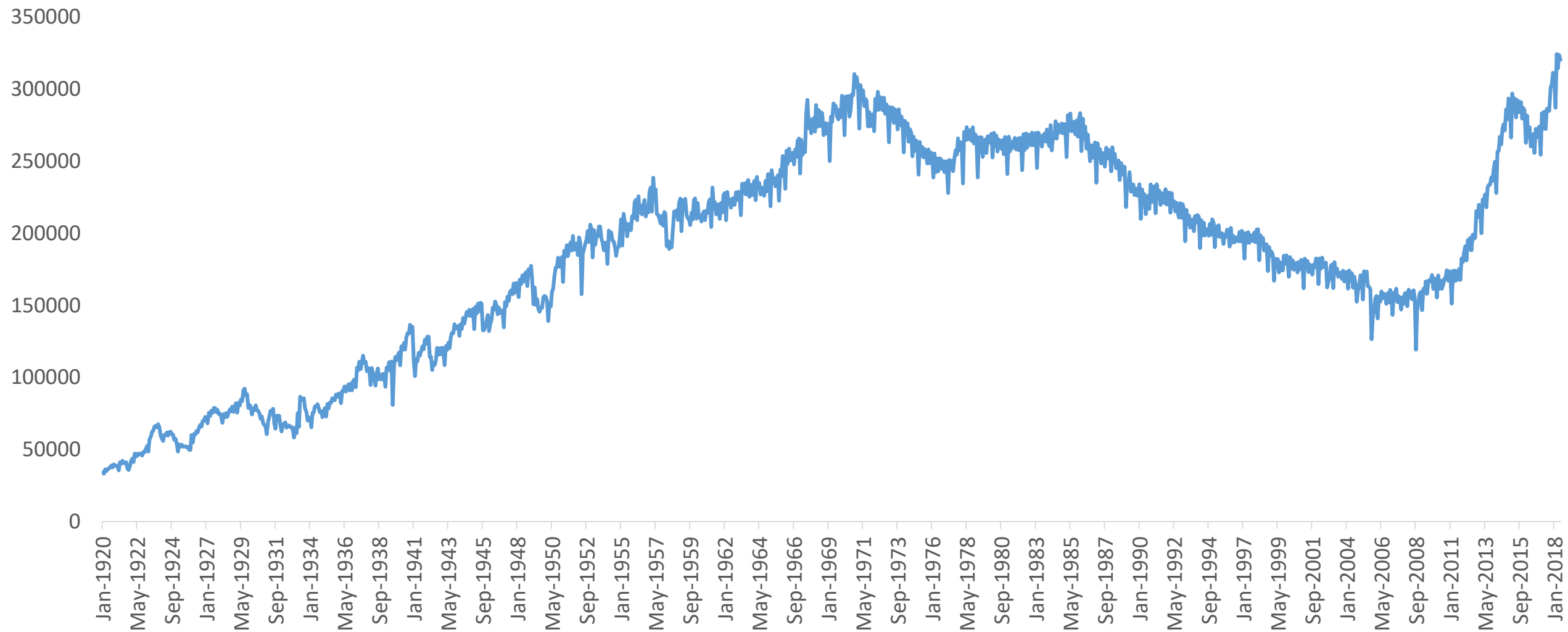
Forecast From 2017 WSATA Presentation

- Oil Prices rise to around \$55/bbl over next two years
- Natural Gas Prices remain relatively steady, around \$3/mmbtu in same period
- Ready supply likely to hold prices in check

Results

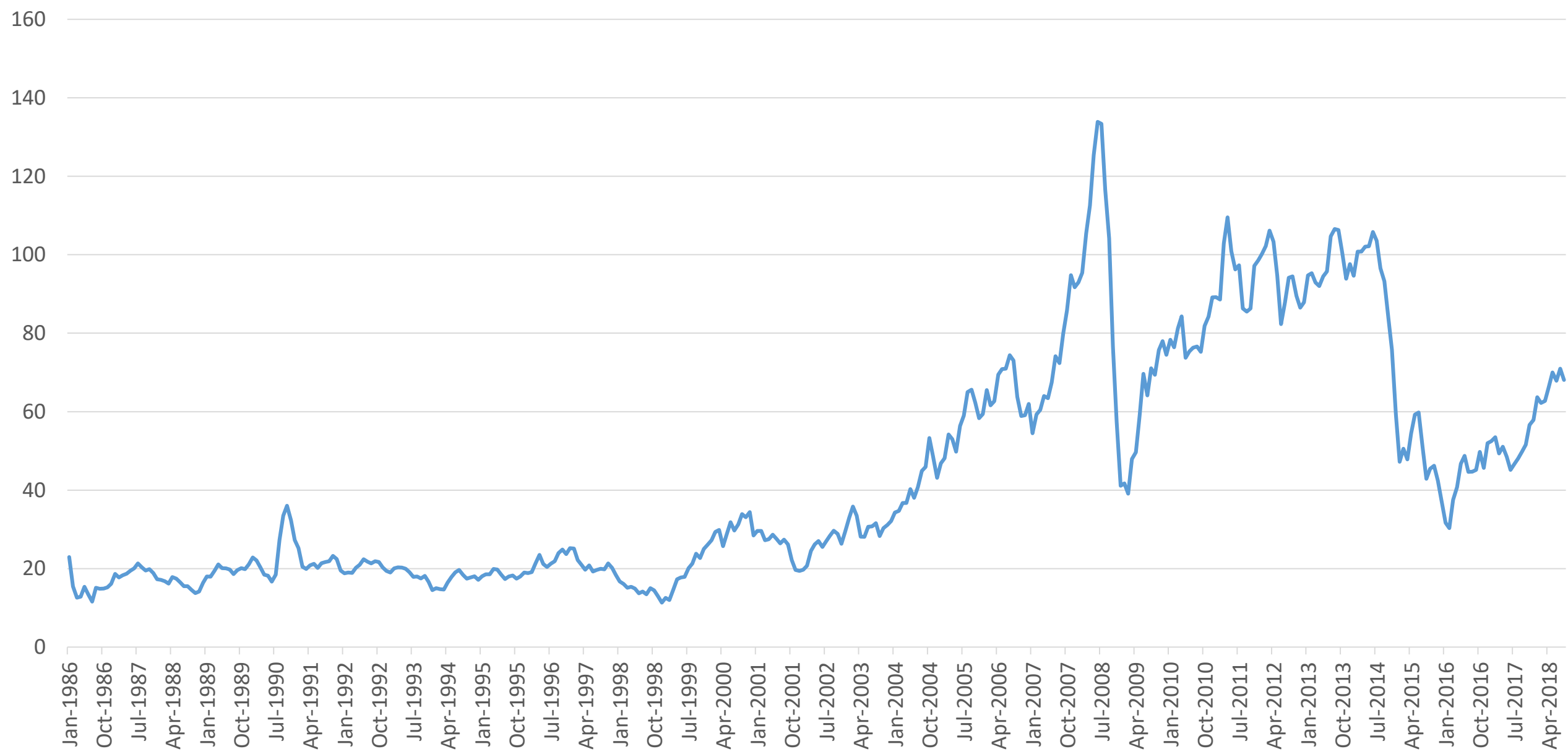
- 2017 Forecast: \$55/bbl over next two years
 - Average Price Last 12 Months: \$62.22
 - Average Price, August 2018: \$67.85
- Natural Gas Prices around \$3/mmbtu in same period
 - Average Price Last 12 Months: \$2.87
 - Average Price, August 2018: \$2.91

U.S. Field Production of Crude Oil (Monthly, Thousands of Barrels)

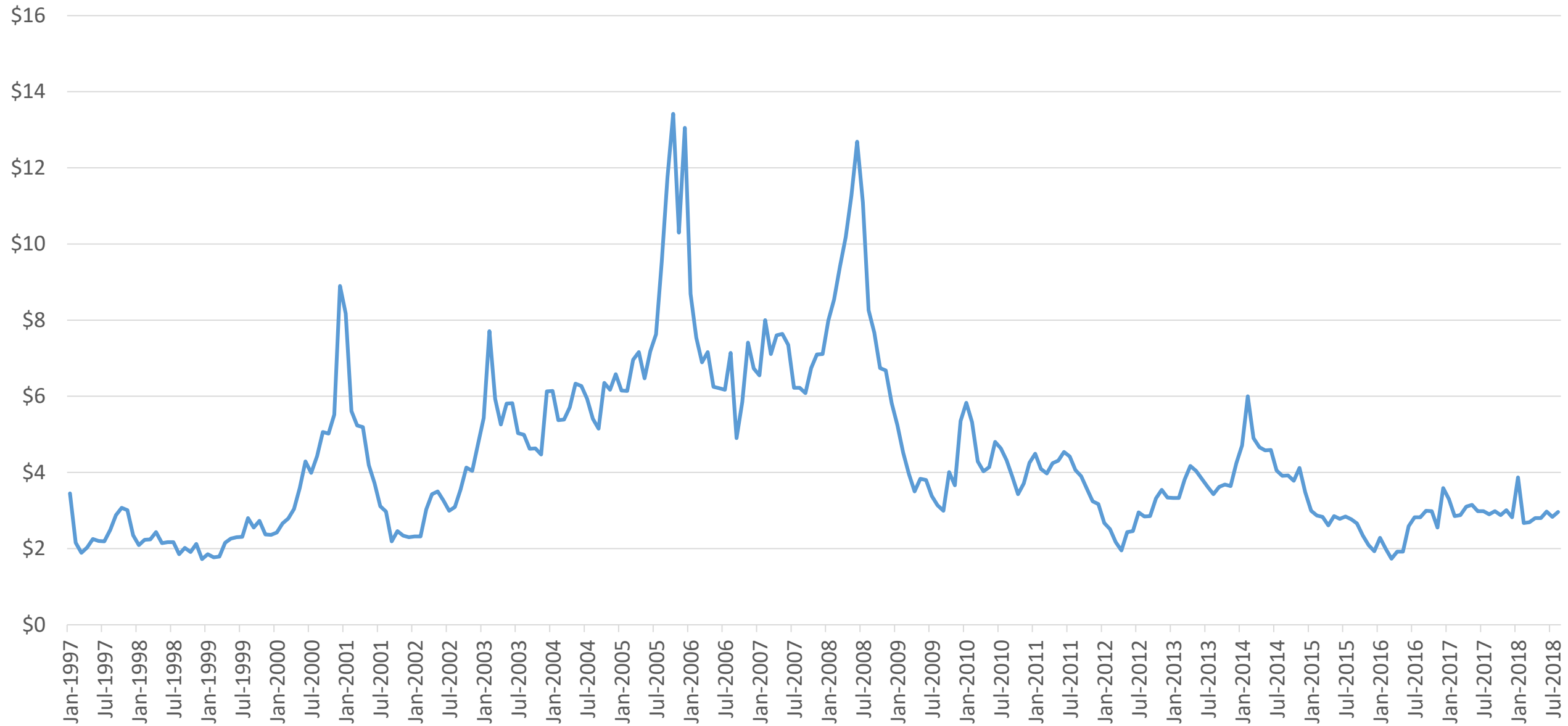


Data Source: U.S. Energy Information Administration

Oil Price, Monthly Average, \$bbl

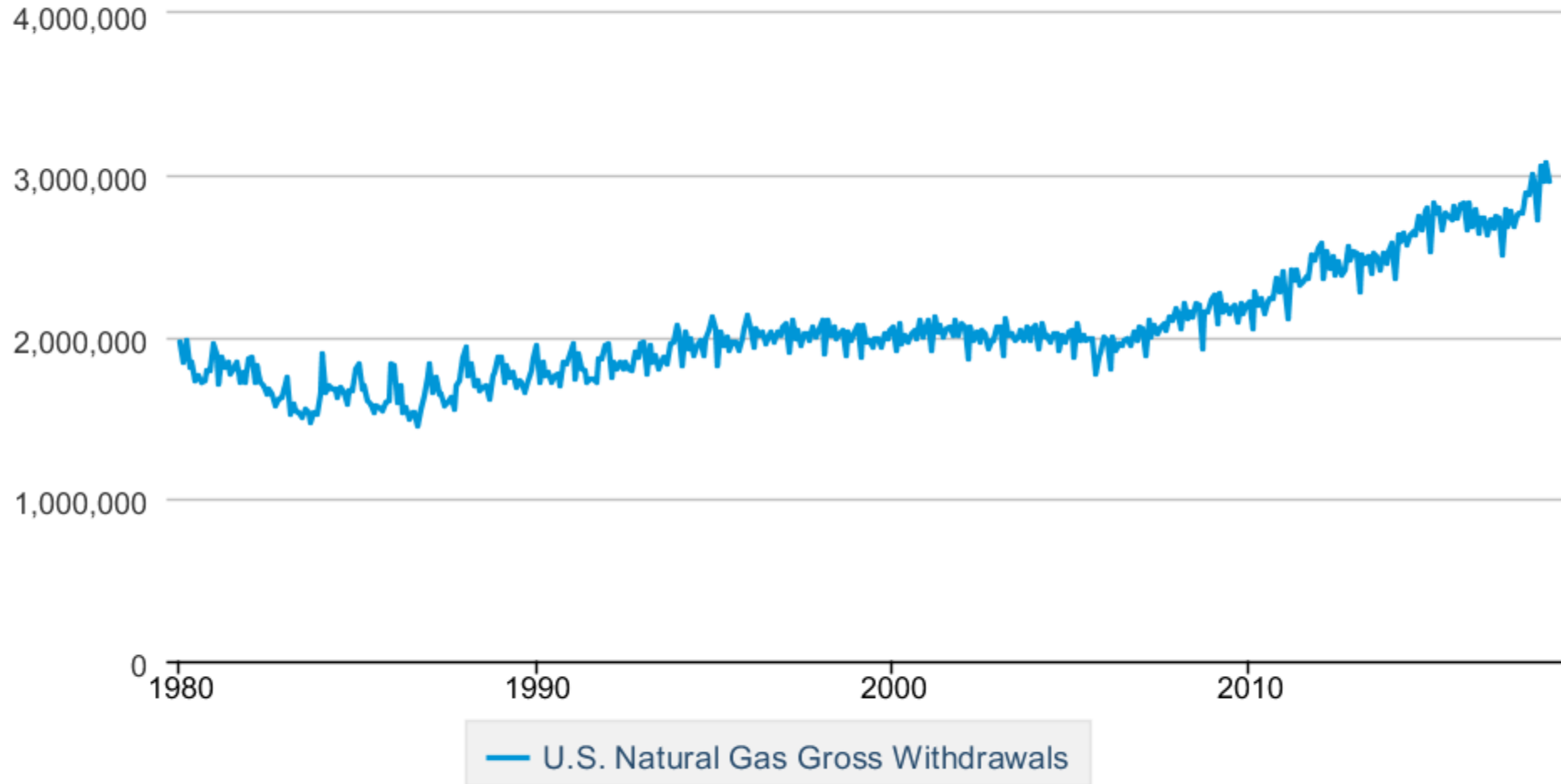


Natural Gas Prices, Monthly Average (\$ Million Btu)



U.S. Natural Gas Gross Withdrawals

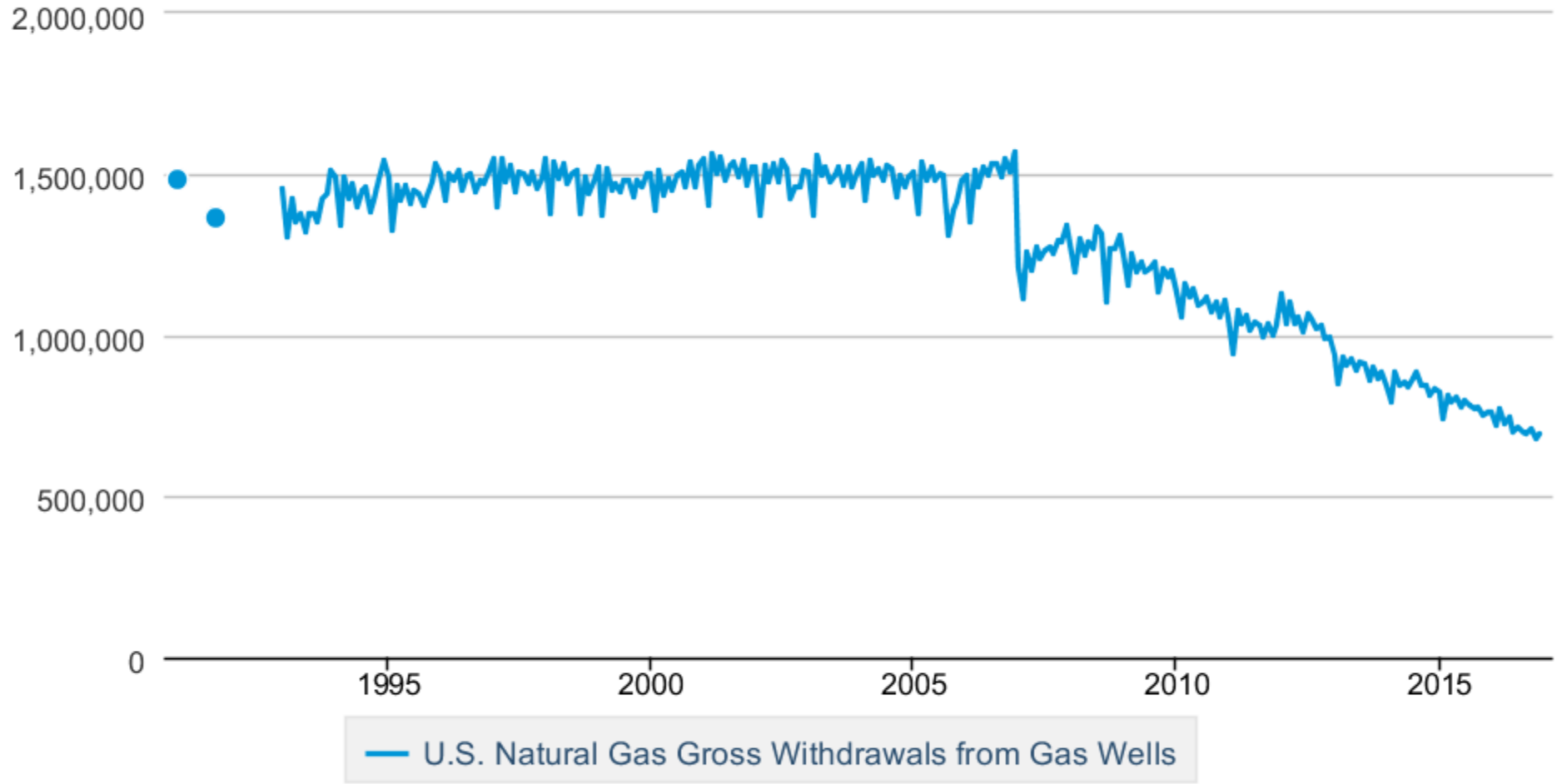
Million Cubic Feet



Source: U.S. Energy Information Administration

U.S. Natural Gas Gross Withdrawals from Gas Wells

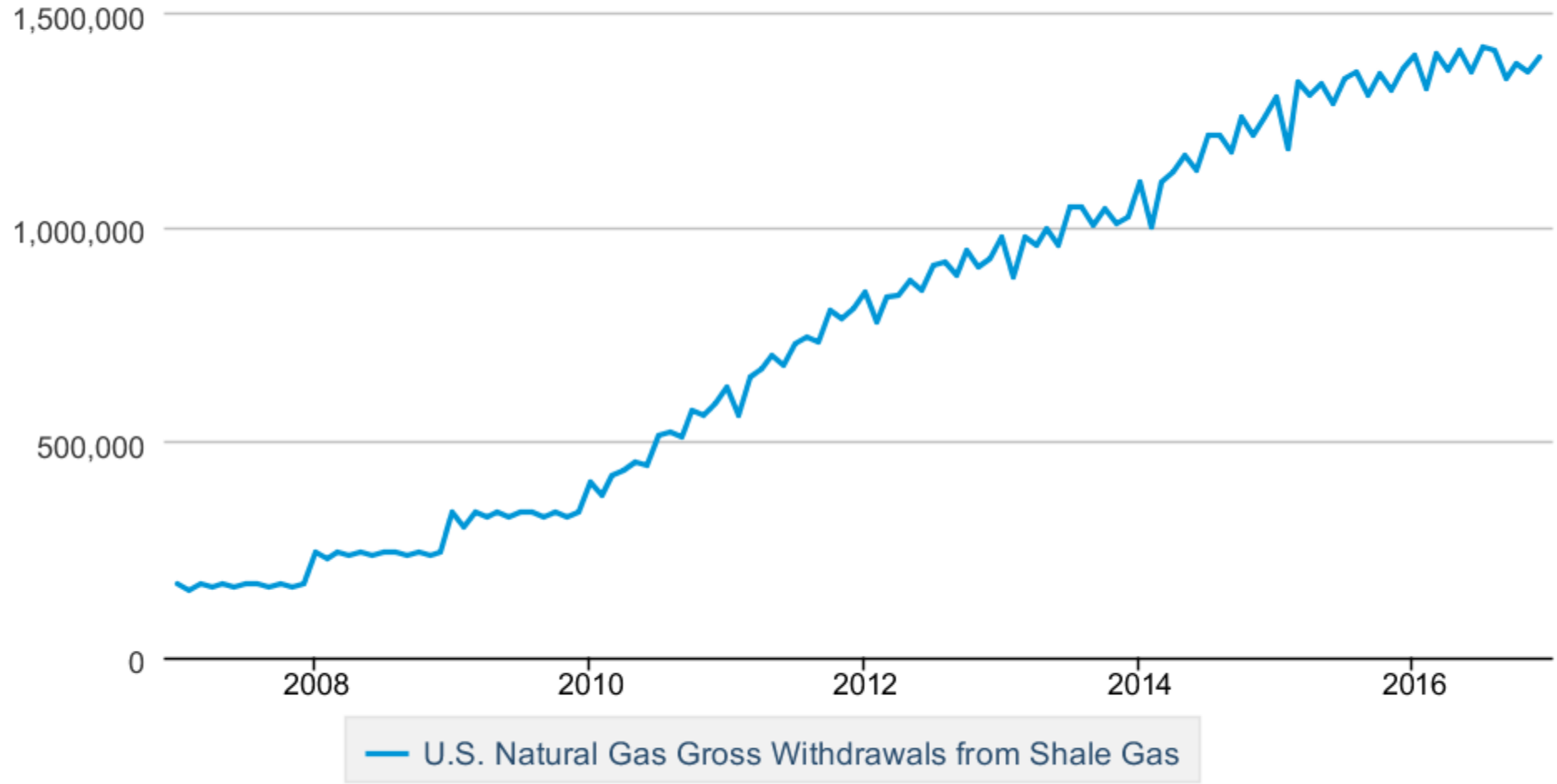
Million Cubic Feet



Source: U.S. Energy Information Administration

U.S. Natural Gas Gross Withdrawals from Shale Gas

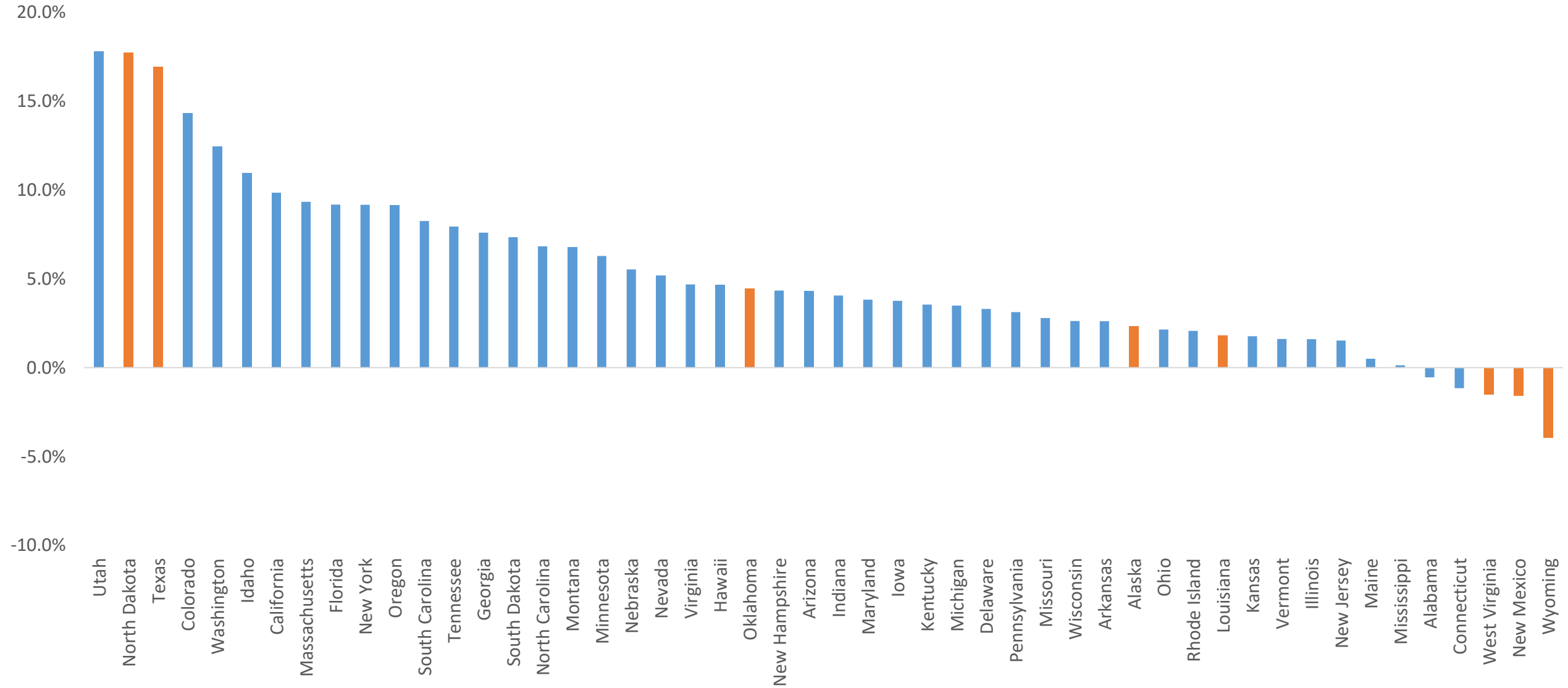
Million Cubic Feet



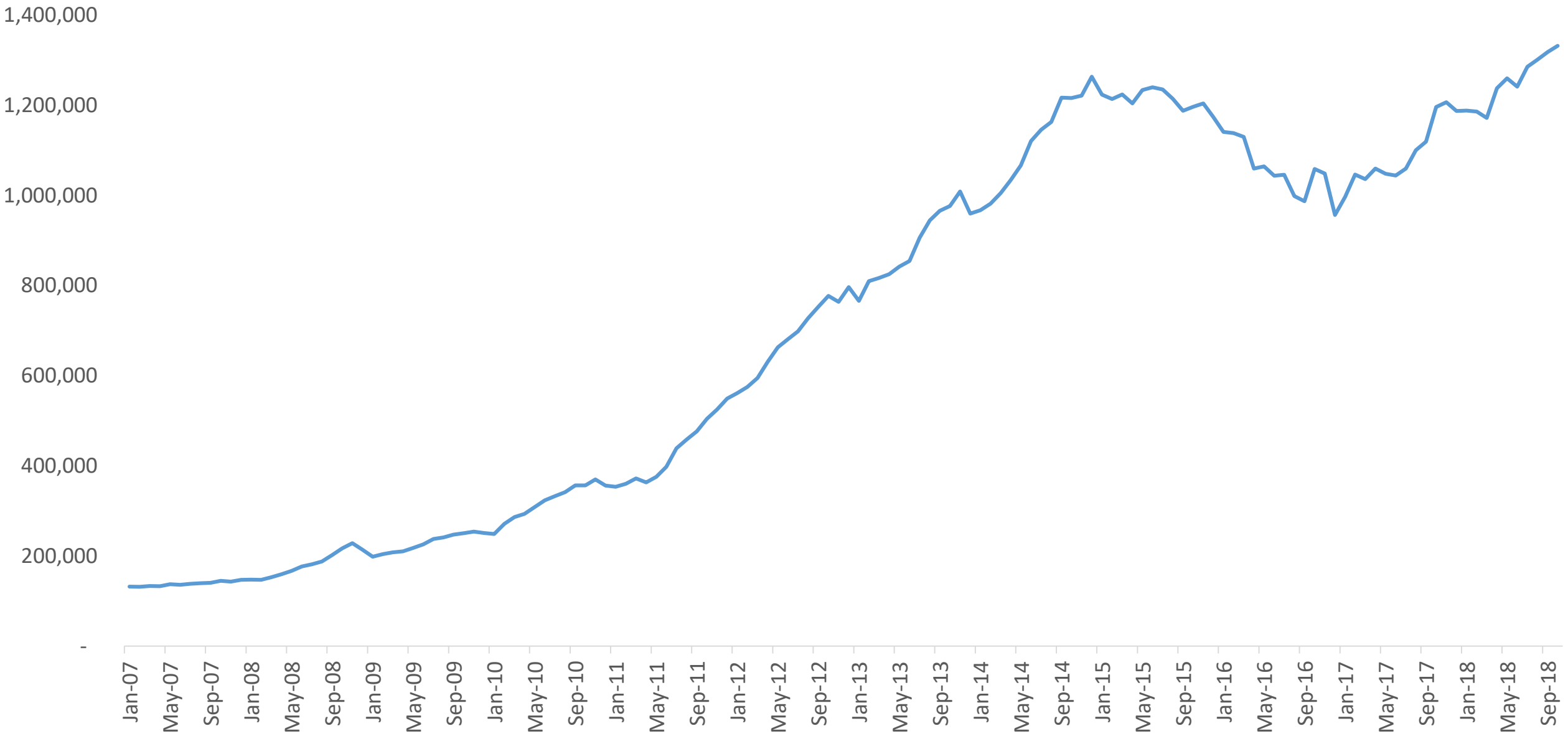
Source: U.S. Energy Information Administration

Job Growth, 2007 – 2017

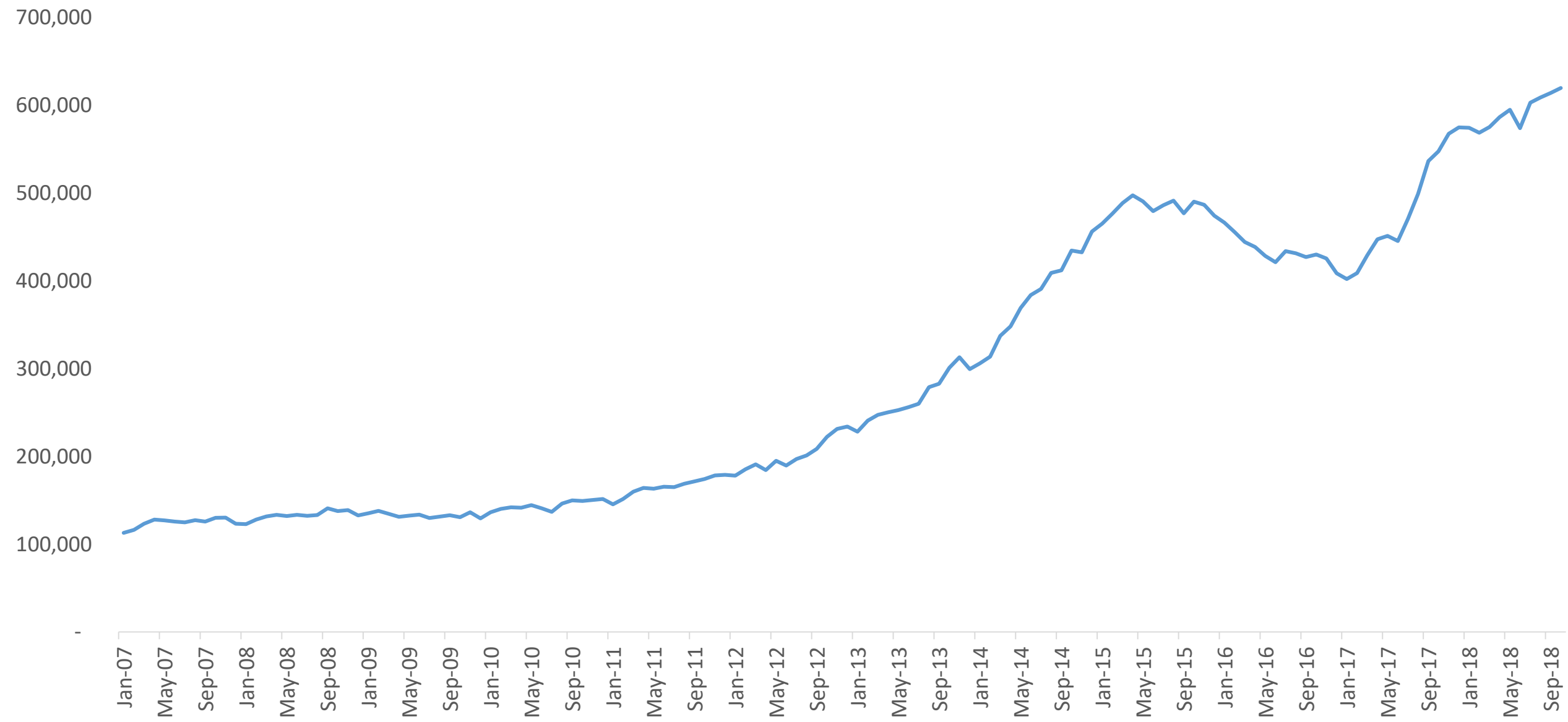
Orange Bars are Energy States



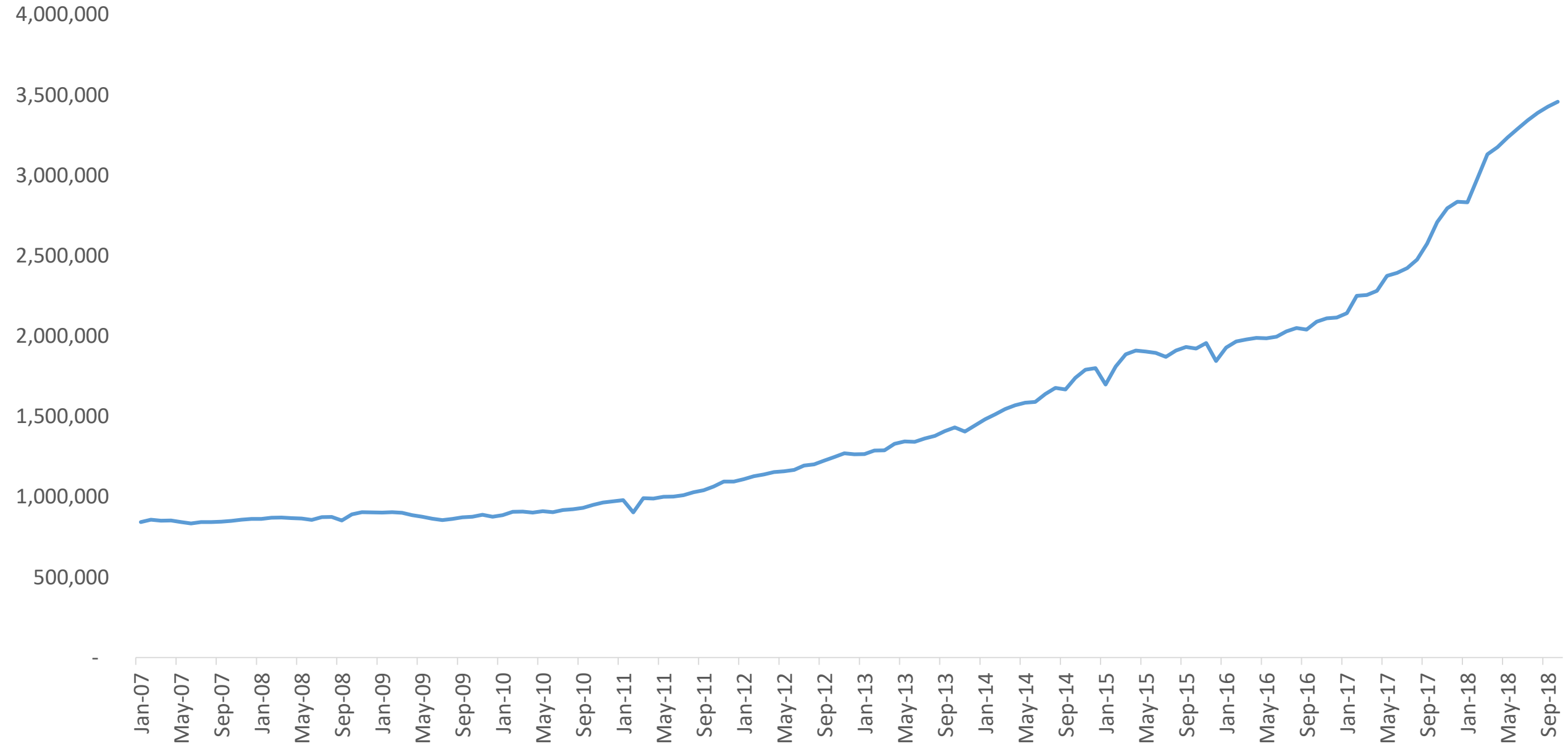
Bakken, Barrels of Oil Per Day



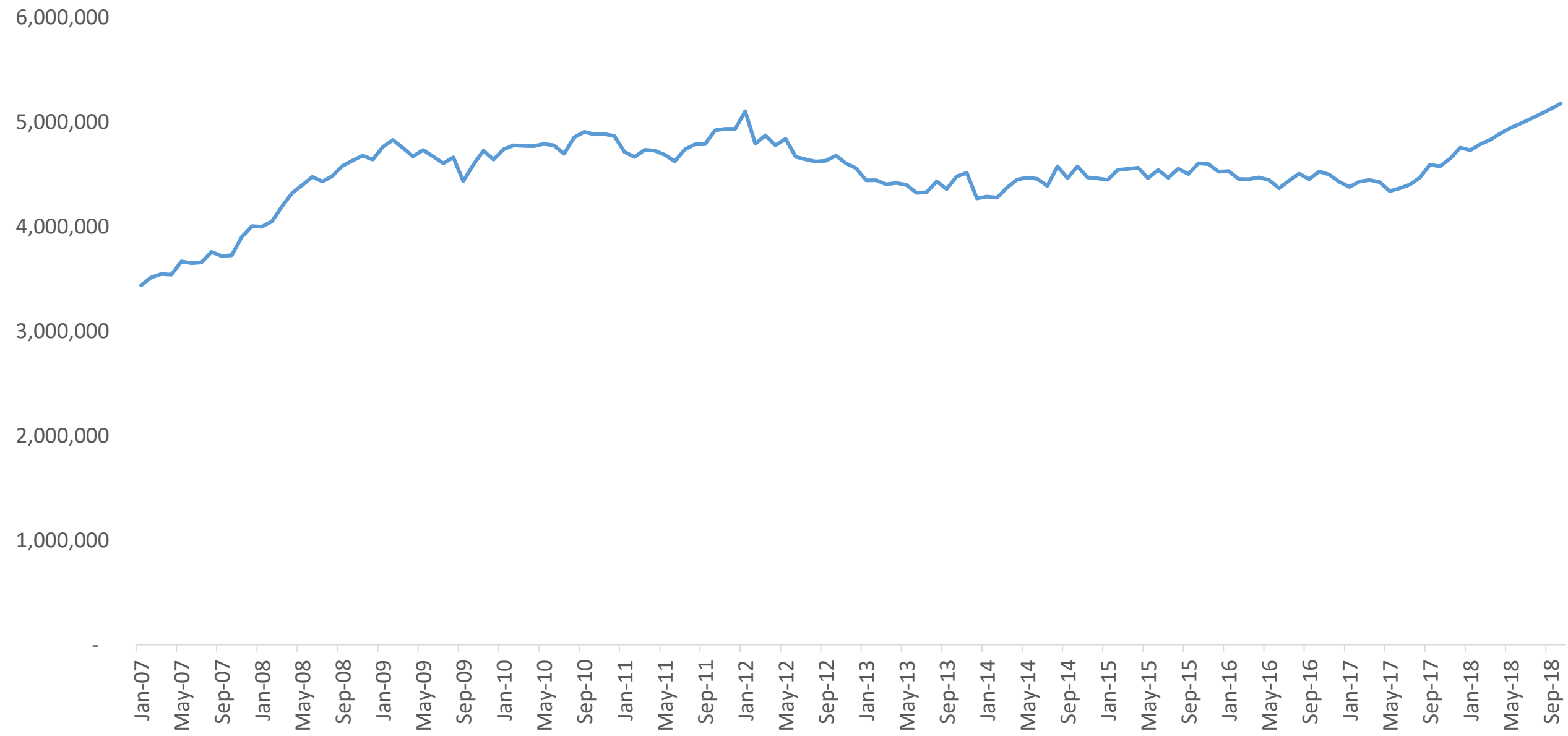
Niobrara, Barrels of Oil per Day



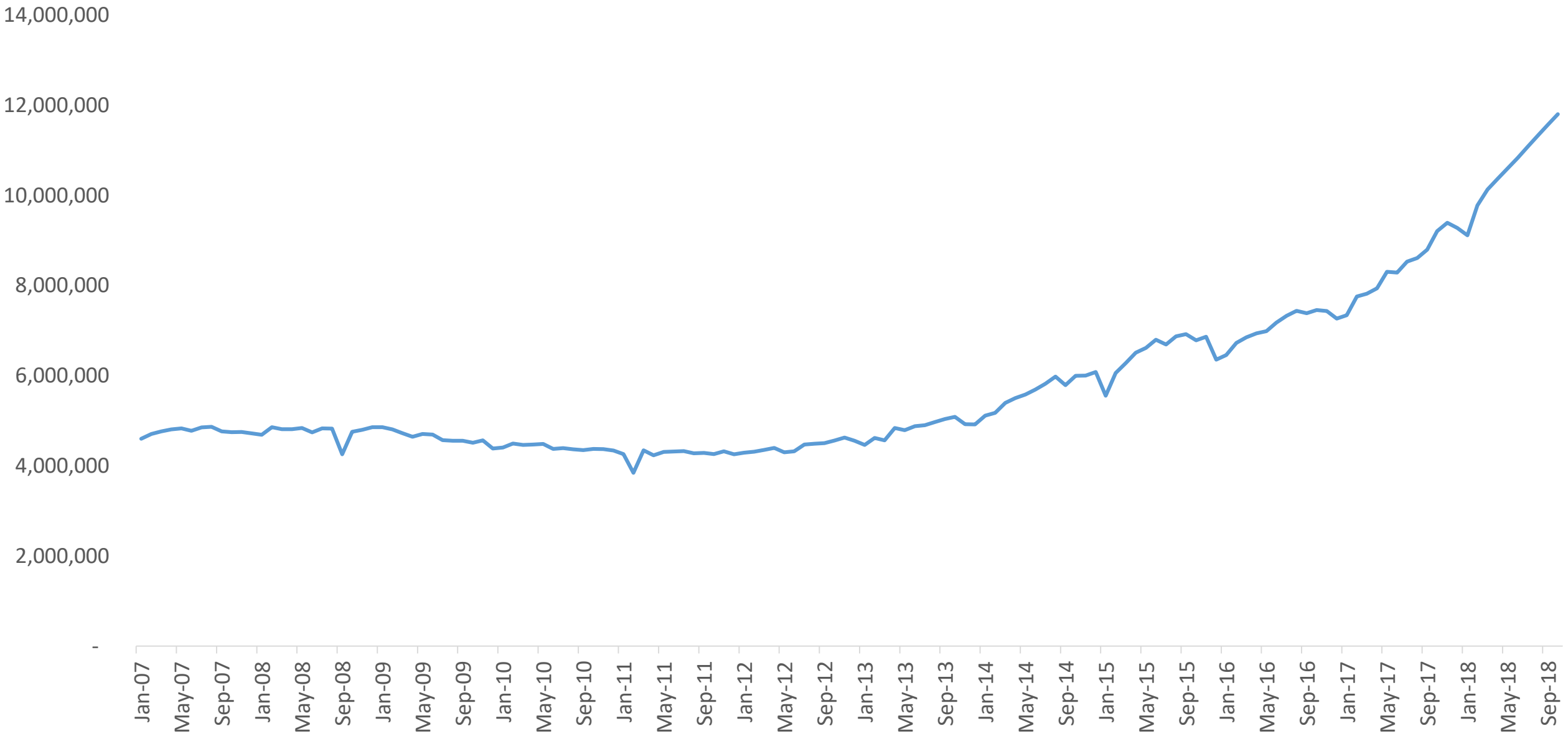
Permian Basin, Barrels of Oil Per Day



Niborara, Mcf of Natural Gas Per Day

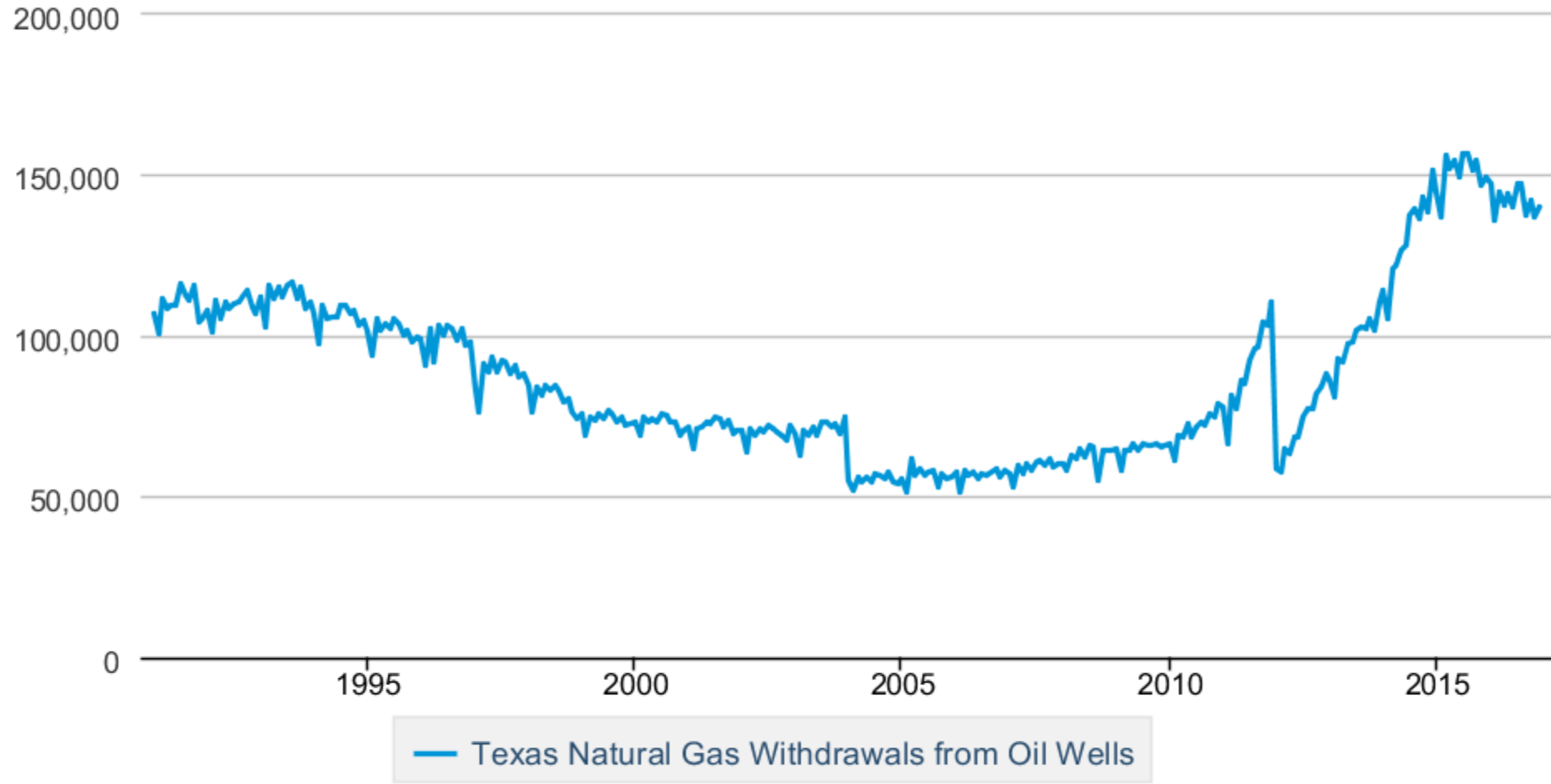


Permian, Mcf of Natural Gas per Day



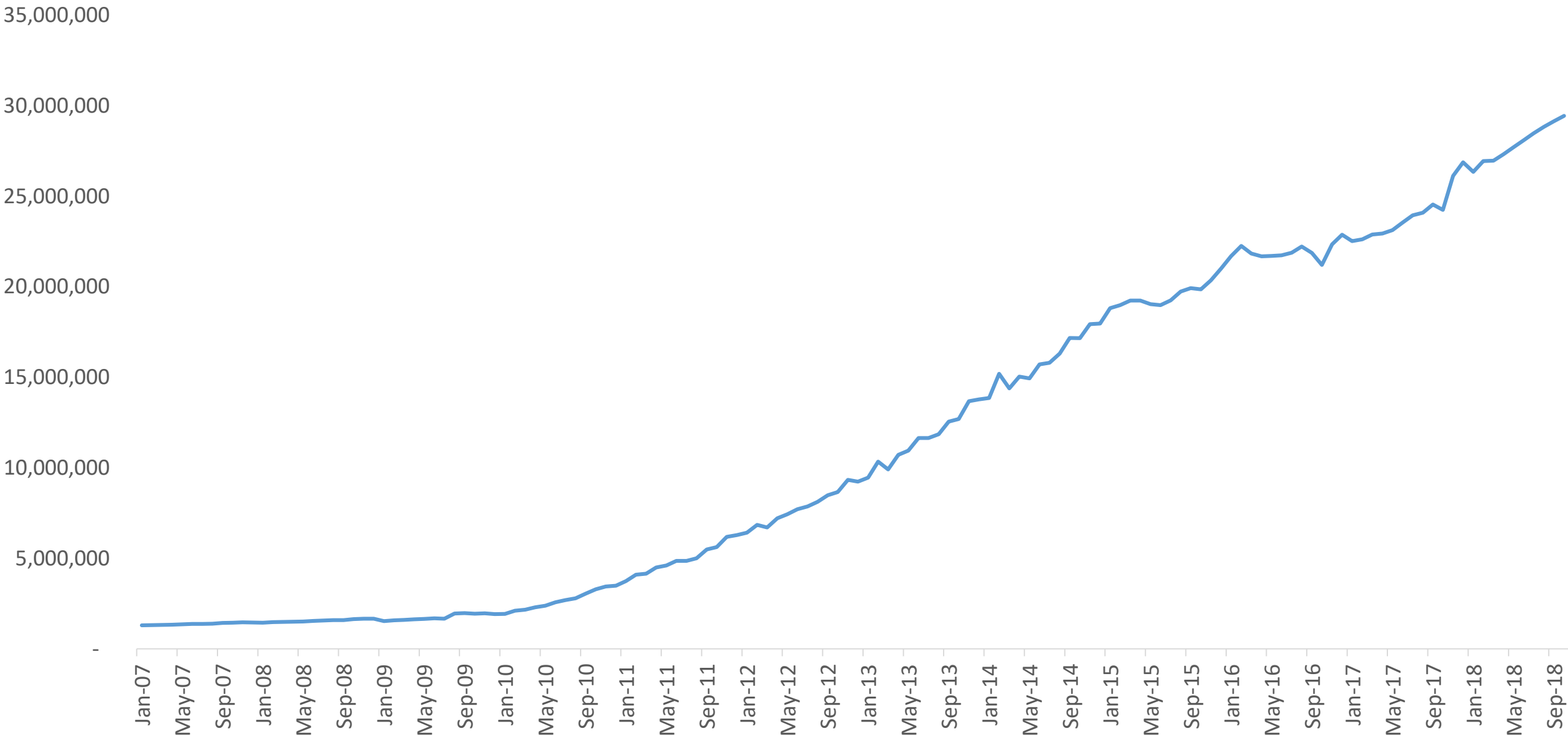
Texas Natural Gas Withdrawals from Oil Wells

Million Cubic Feet

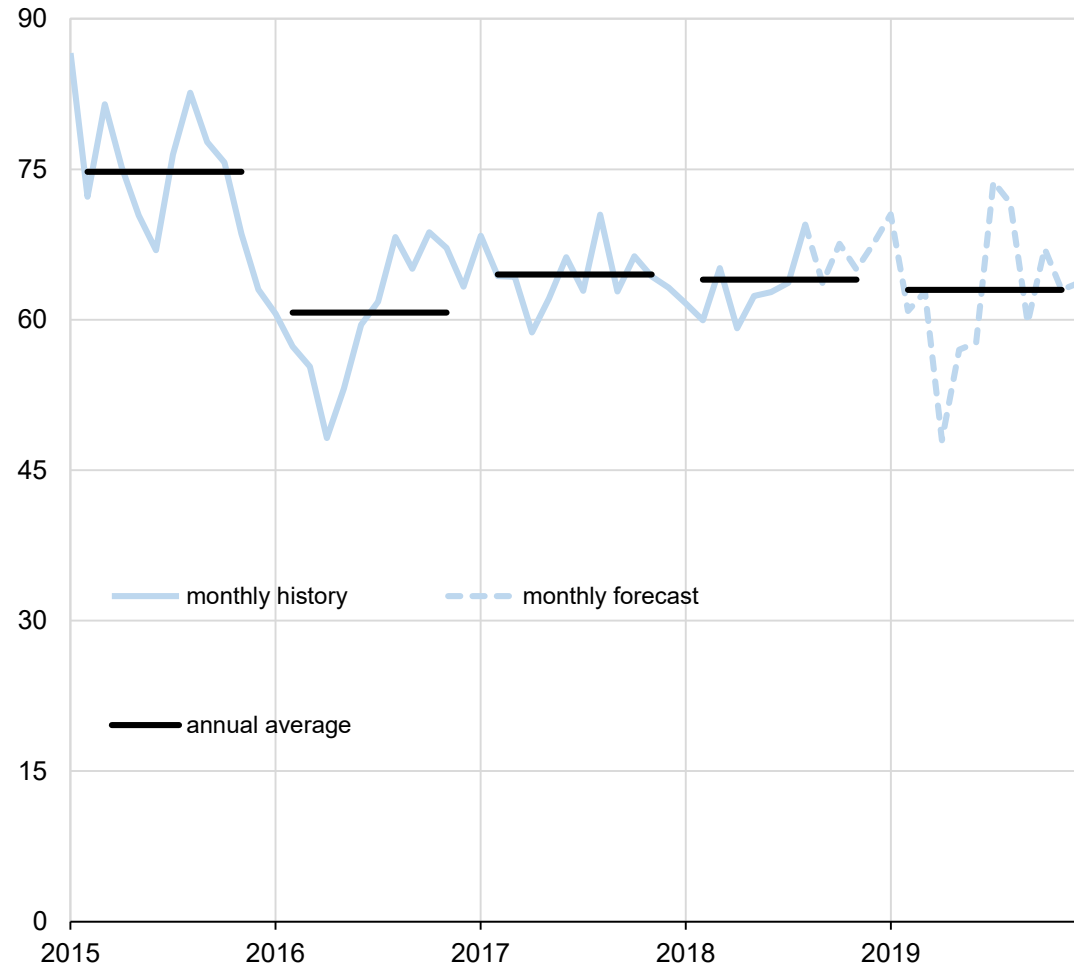


Source: U.S. Energy Information Administration

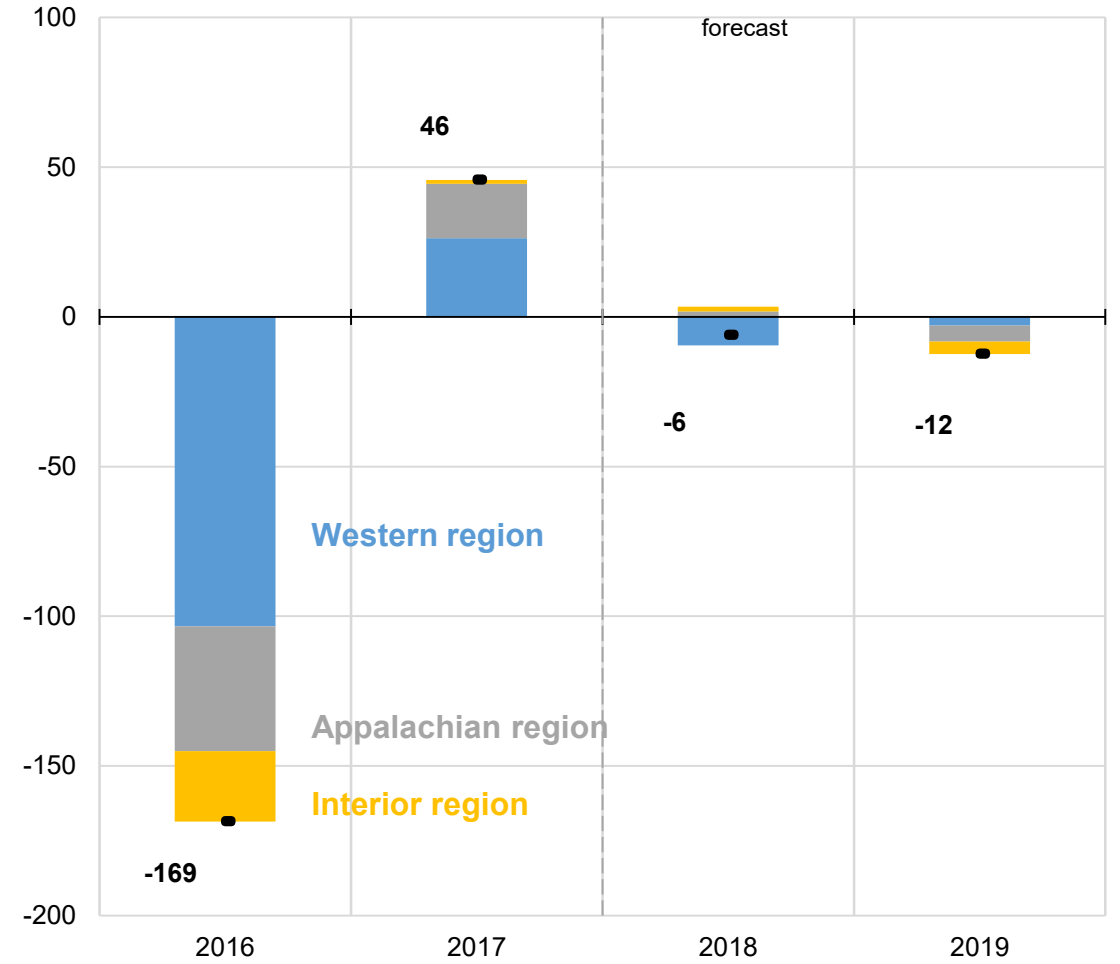
Appalachia, Mcf of Natural Gas per Day



U.S. coal production million short tons



Components of annual change million short tons

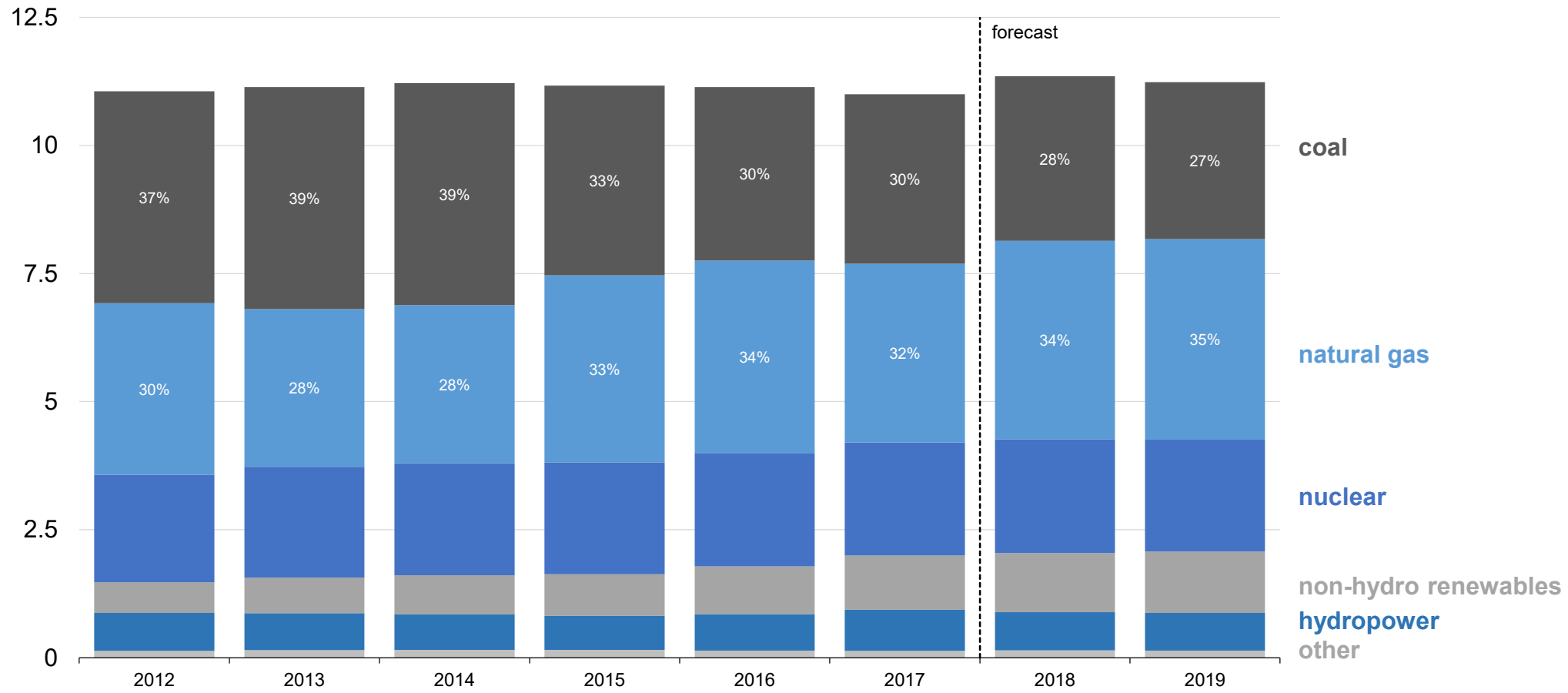


Source: Short-Term Energy Outlook, September 2018



U.S. electricity generation by fuel, all sectors

million megawatthours per day



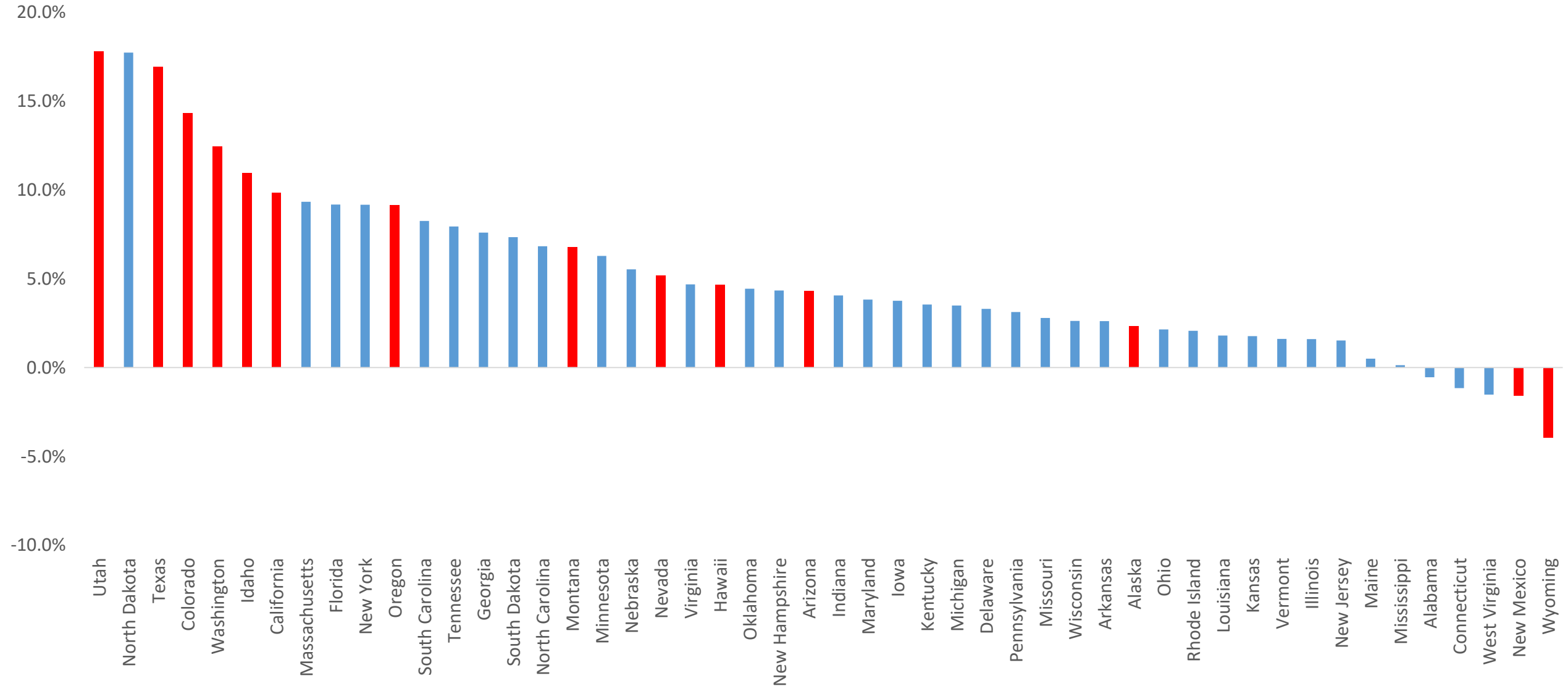
Note: Labels show percentage share of total generation provided by coal and natural gas.

Source: Short-Term Energy Outlook, September 2018

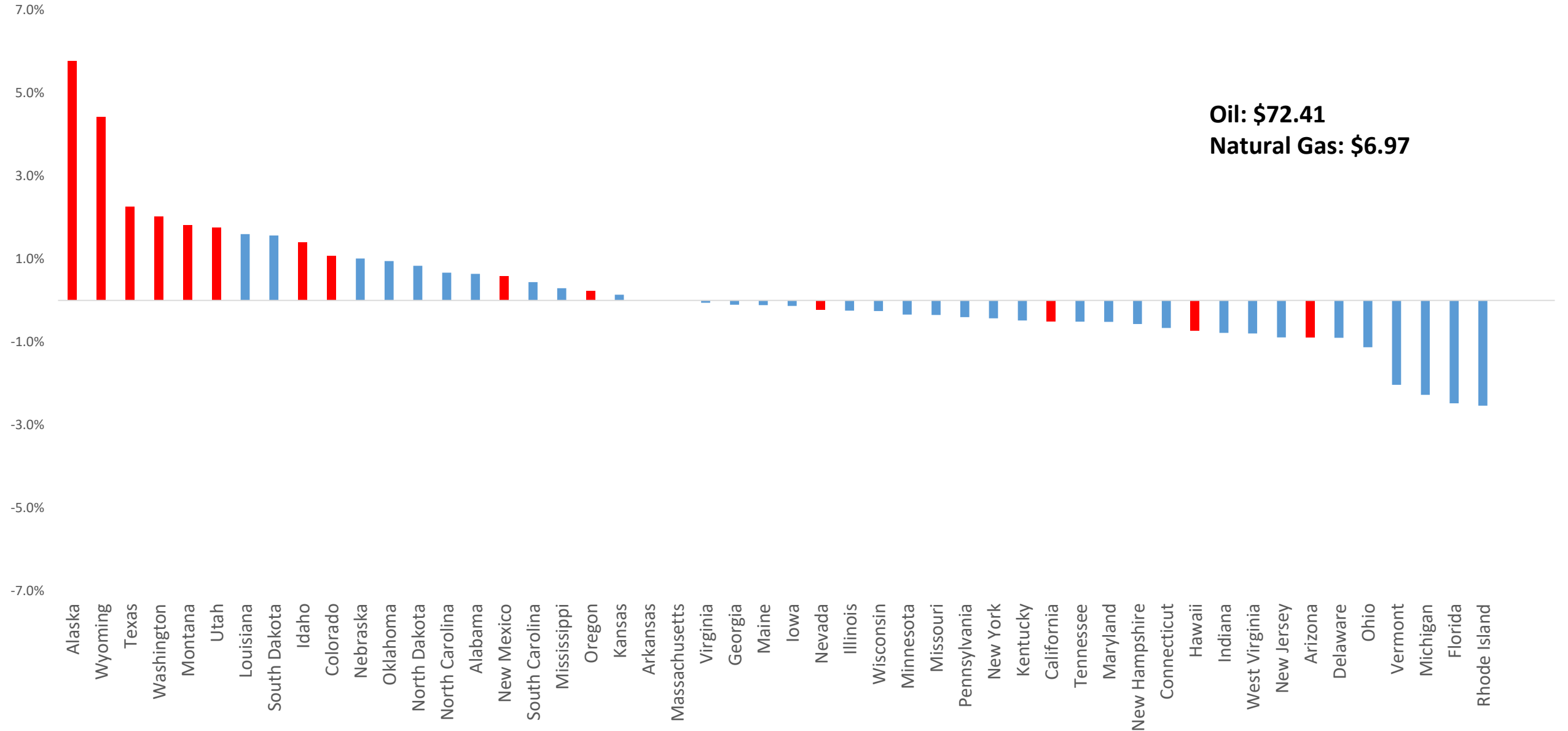


Job Growth, 2007 – 2017

Red Bars are WSATA States

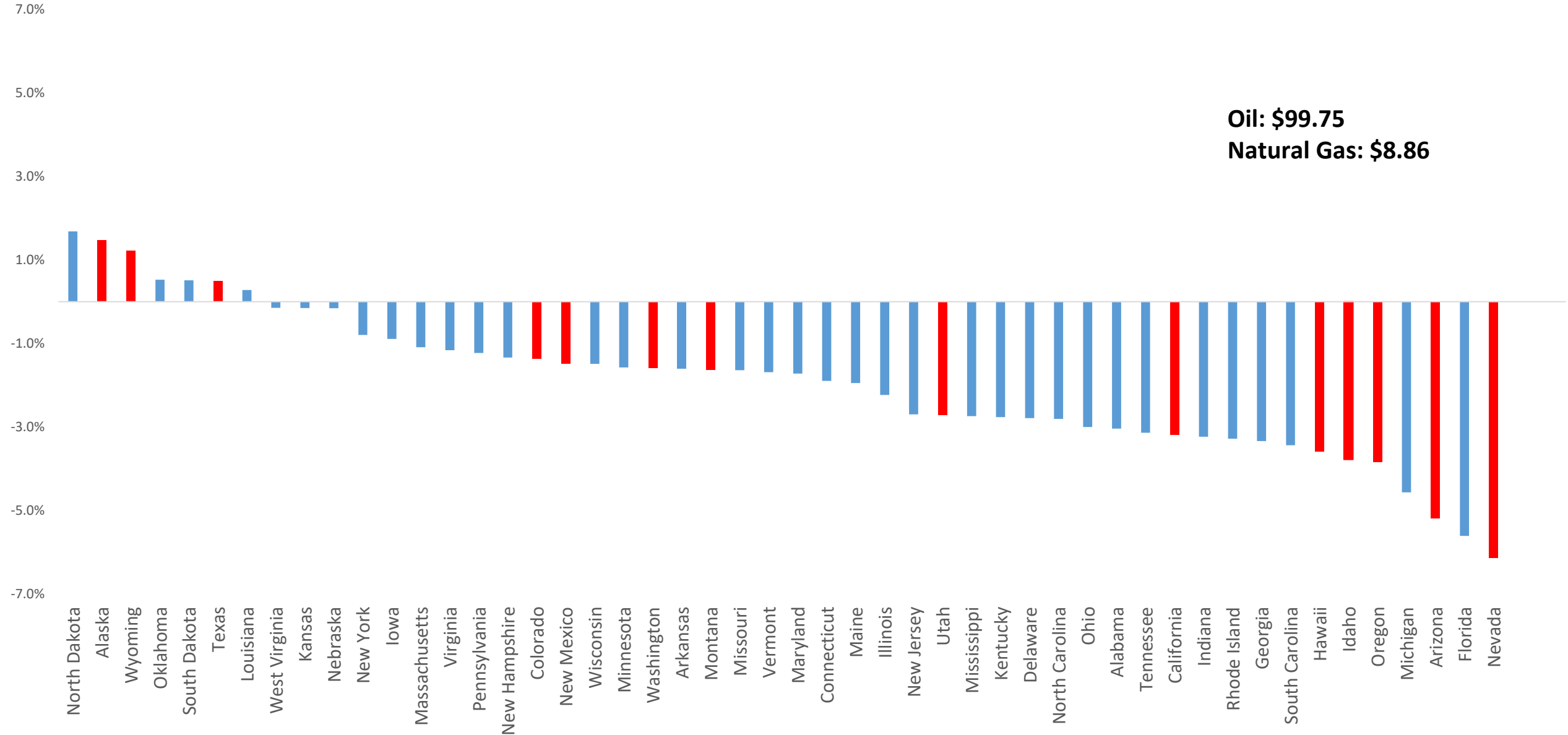


Job Growth, 2007

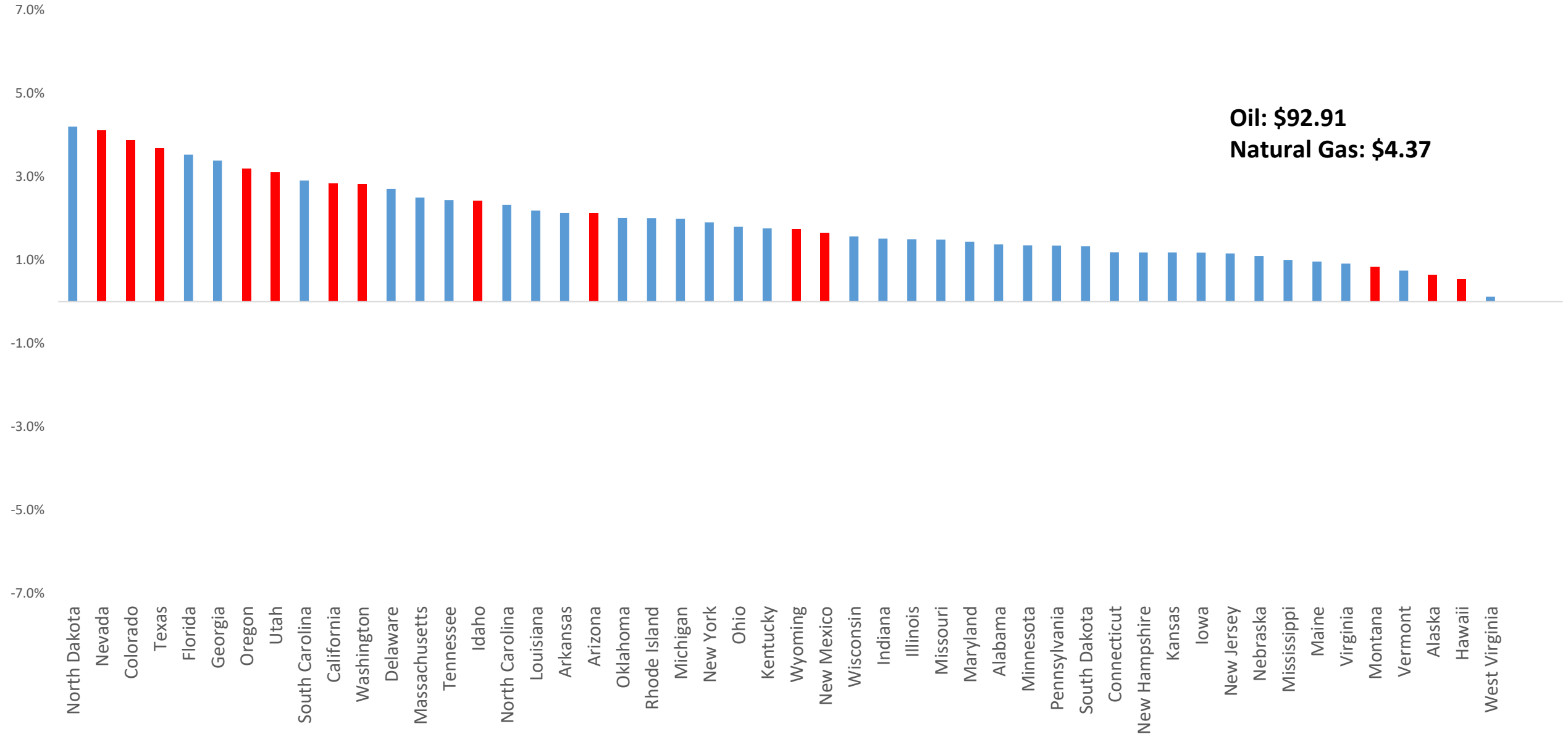


Job Growth, 2008

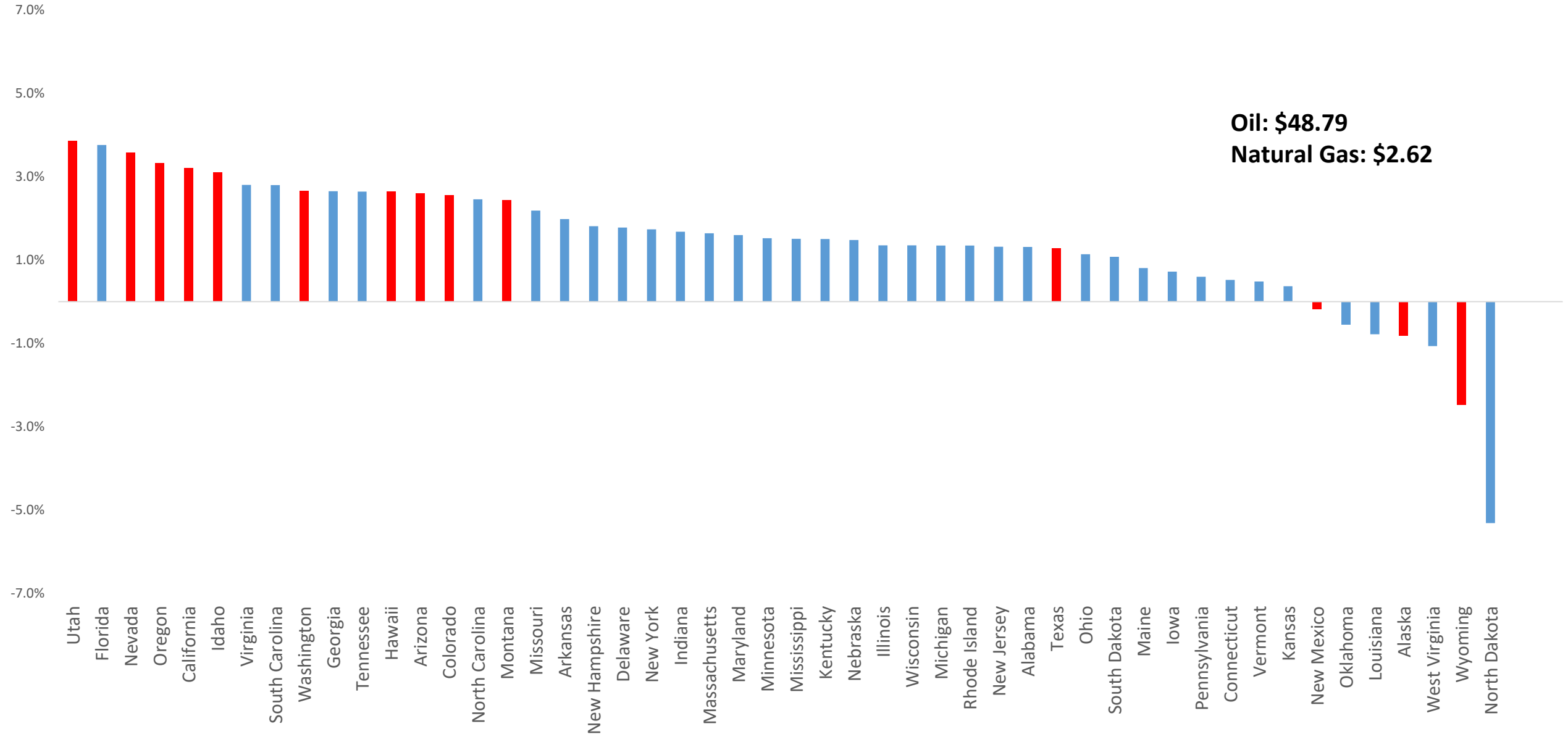
Oil: \$99.75
Natural Gas: \$8.86



Job Growth, 2014

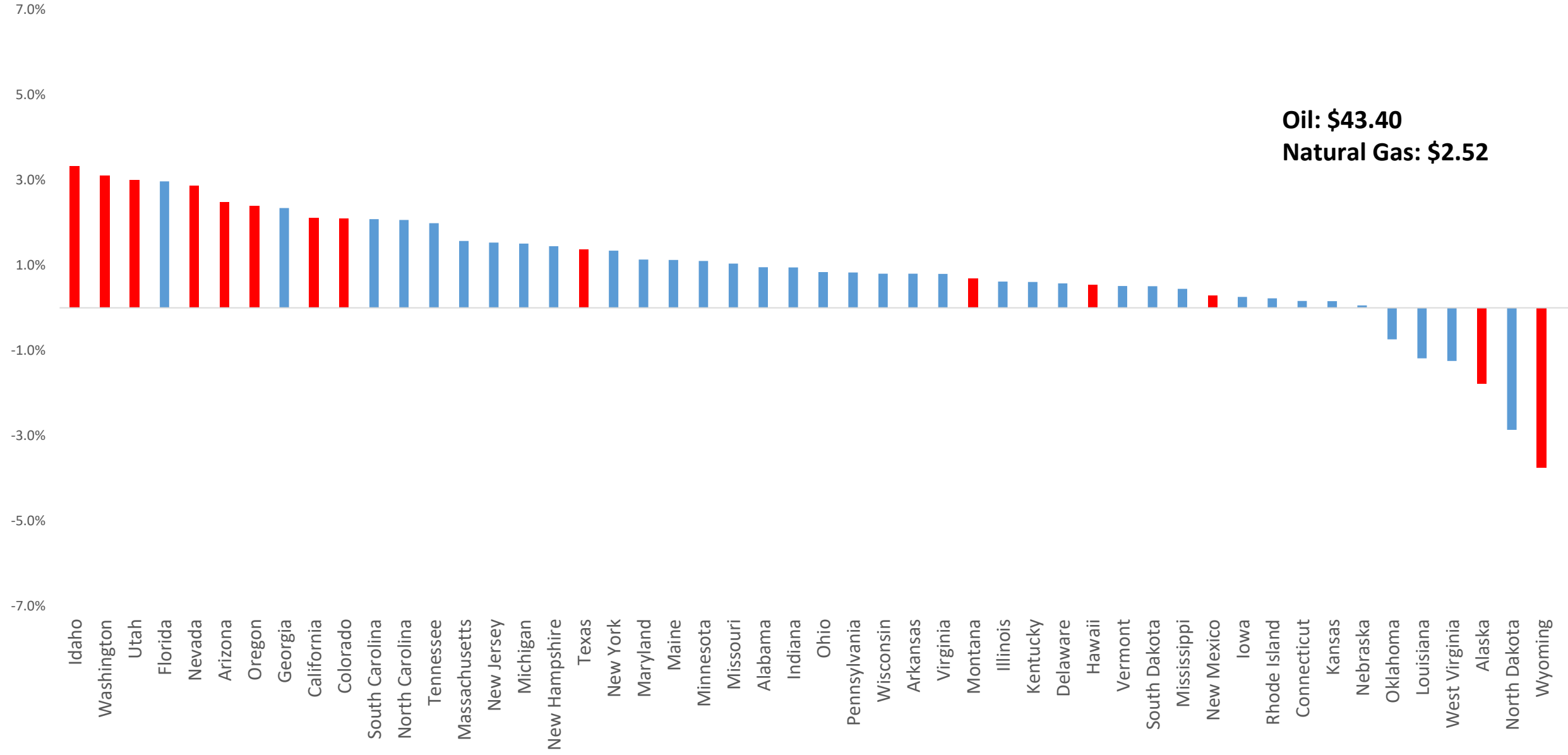


Job Growth, 2015

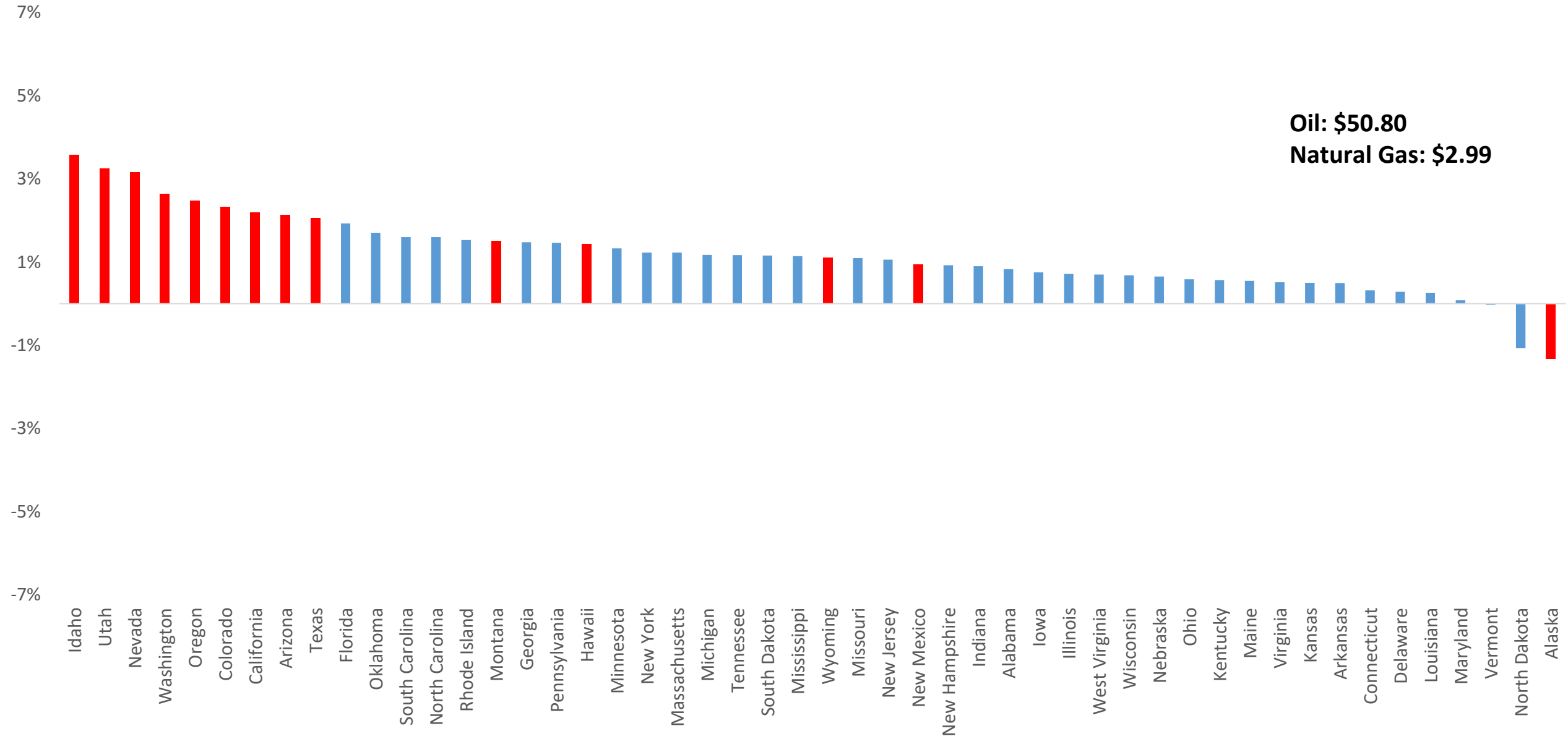


Job Growth, 2016

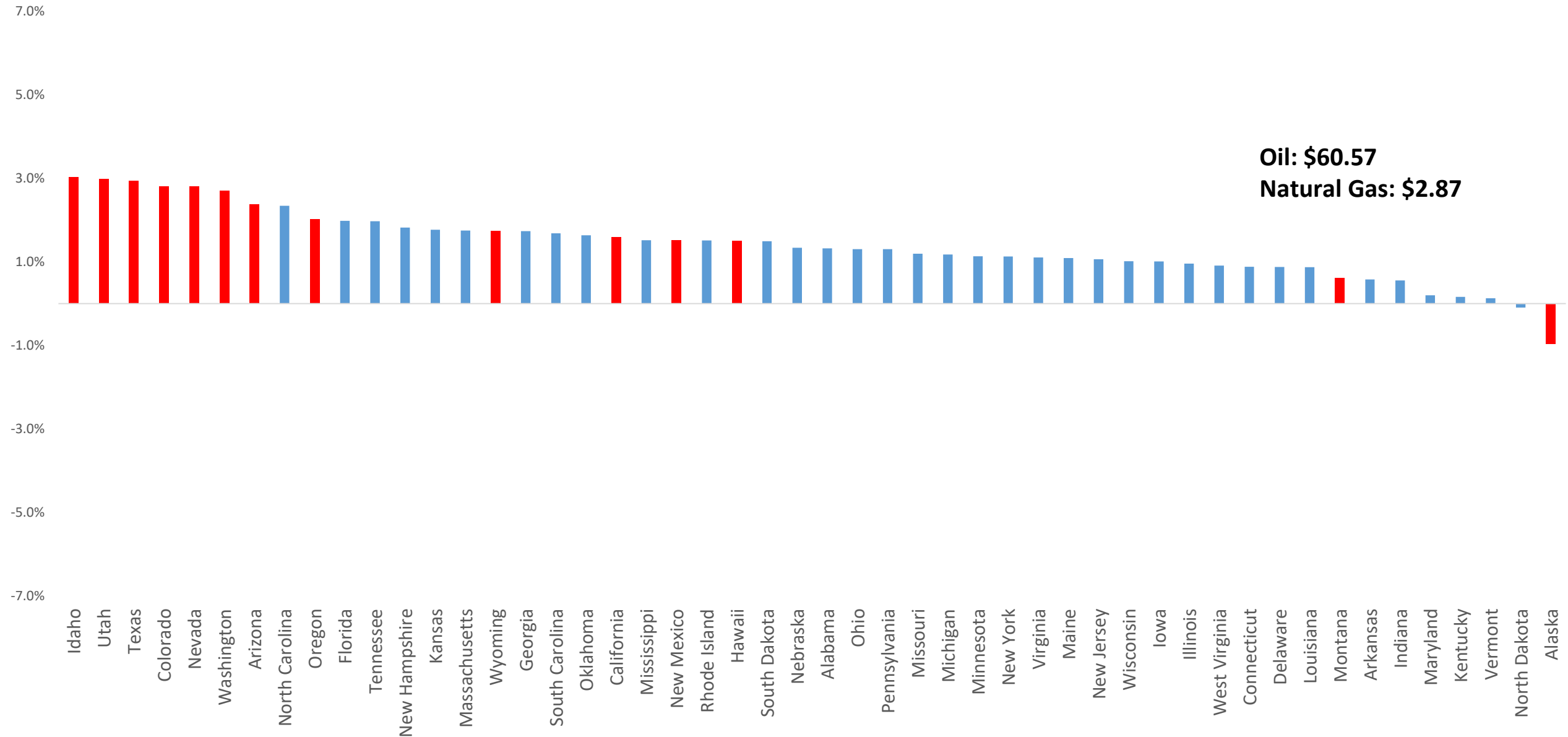
Oil: \$43.40
Natural Gas: \$2.52



Job Growth, 2017



Job Growth, July 2017 - July 2018



Jobs by Industry, WSATA States

(Seasonally Adjusted, in Thousands)

Industry	2017 Jobs
Trade, Transportation, and Utilities	8653.8
Government	7363.3
Education and Health Services	6698.7
Professional and Business Services	6547.5
Leisure and Hospitality	5490.5
Manufacturing	3296.6
Construction	2574.7
Financial Activities	2536.6
Other Services	1587.5
Information	1116.4
Mining and Logging	396.5

Jobs by Industry, WSATA States

(Seasonally Adjusted, in Thousands)

Industry	2007-2017 Change
Education and Health Services	1,644.0
Leisure and Hospitality	1,063.5
Professional and Business Services	960.5
Trade, Transportation, and Utilities	645.6
Government	384.3
Other Services	155.2
Financial Activities	137.4
Information	61.5
Mining and Logging	-5.3
Construction	-82.4
Manufacturing	-260.1

Jobs by Industry, WSATA States

(Seasonally Adjusted, in Thousands)

Industry	2007-2017 %Change
Education and Health Services	32.5%
Leisure and Hospitality	24.0%
Professional and Business Services	17.2%
Other Services	10.8%
Trade, Transportation, and Utilities	8.1%
Information	5.8%
Financial Activities	5.7%
Government	5.5%
Mining and Logging	-1.3%
Construction	-3.1%
Manufacturing	-7.3%

Forecast

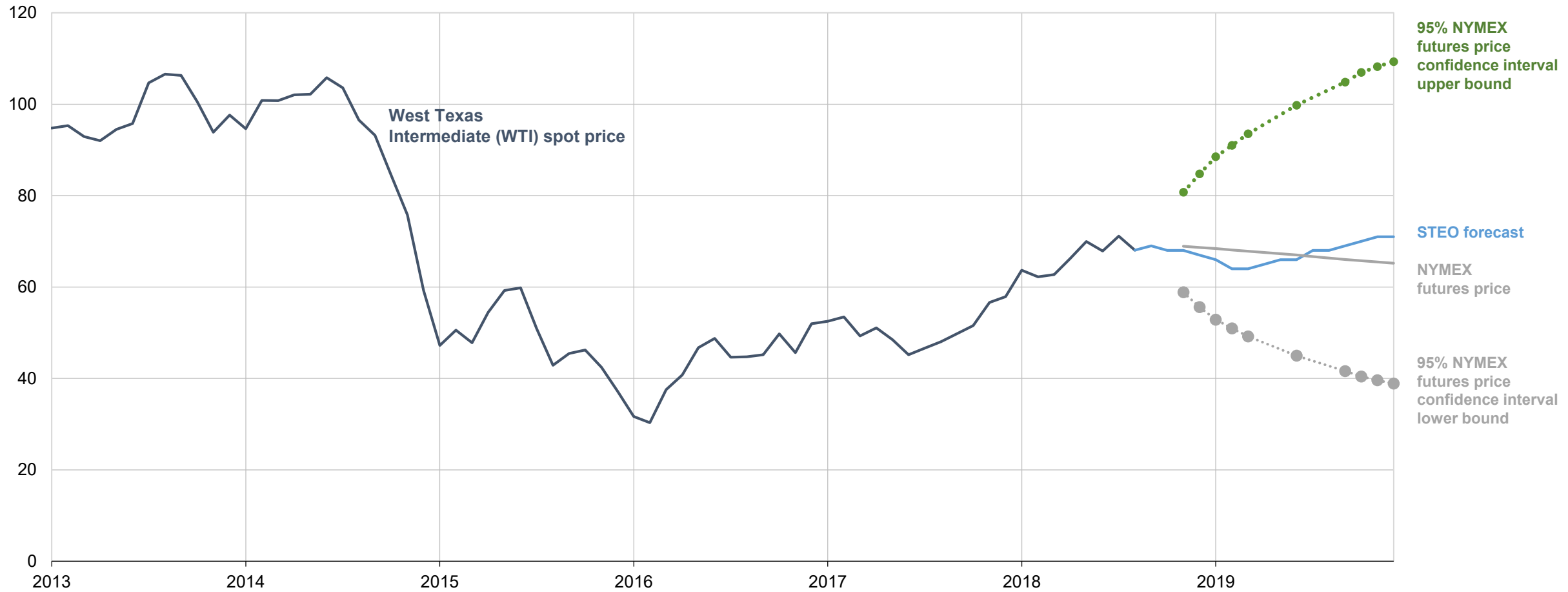
- Oil prices \$65 - 70/bbl over next two years
- Natural gas prices remain relatively steady, around \$3/mmbtu in same period
- Ready supply likely to hold prices in check

Conclusion

- We expect relative stability in prices, continued rise in production
- But this is a volatile sector and stability has been rare over the last twenty years
- Uncertainty around such forecasts is relatively high

West Texas Intermediate (WTI) crude oil price and NYMEX confidence intervals

dollars per barrel



Note: Confidence interval derived from options market information for the five trading days ending Sep 6, 2018. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Source: Short-Term Energy Outlook, September 2018, and CME Group



Job Growth, 2007 – 2017

