



Forum on Global Energy, Economy and Security Outlook and Impacts of a Changing US Energy Policy

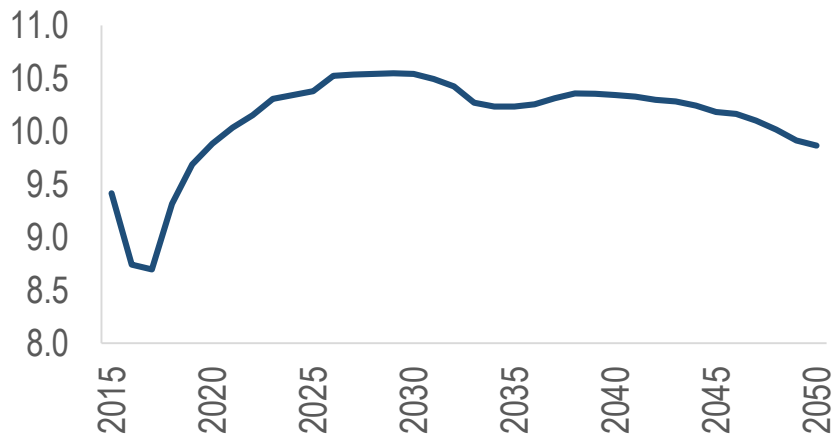
Jason Bordoff

*July 24, 2017
Aspen, CO*

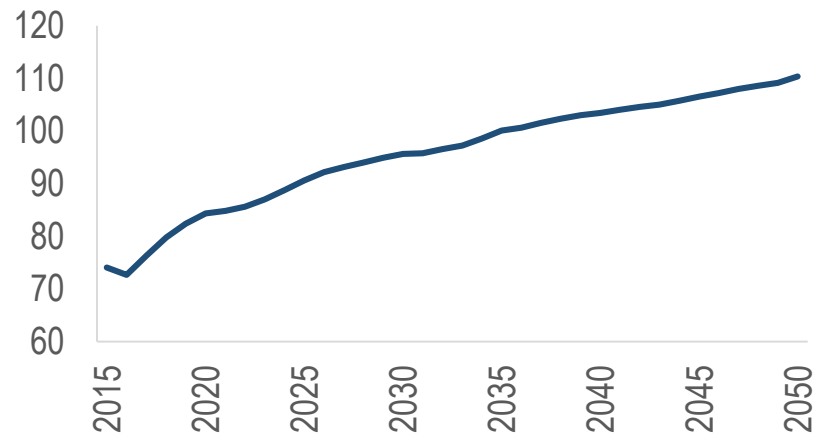


US Energy Outlook

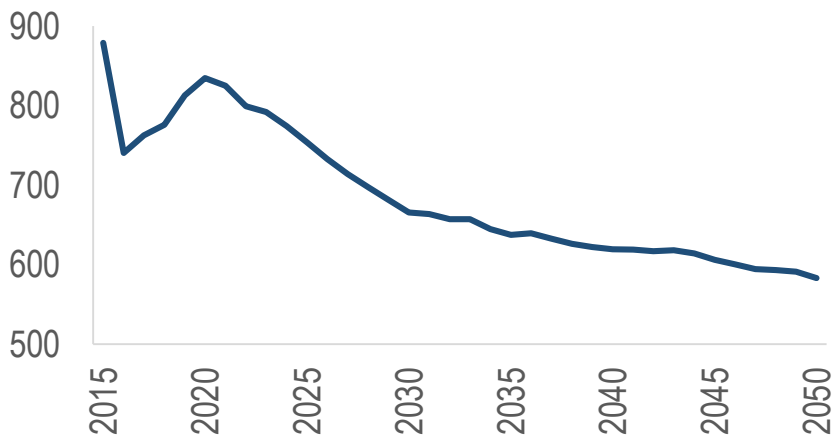
US Crude Oil Production (million b/d)



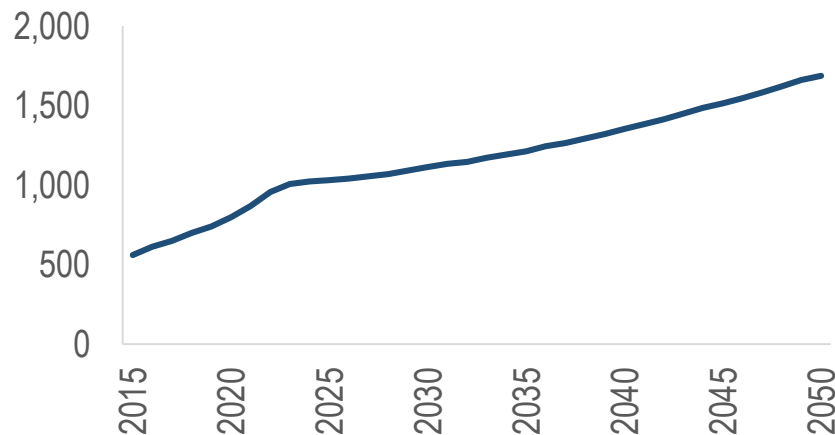
US Dry Natural Gas Production (Bcf/d)



US Coal Production (million short ton)



US Renewable Electricity Generation (TWh)

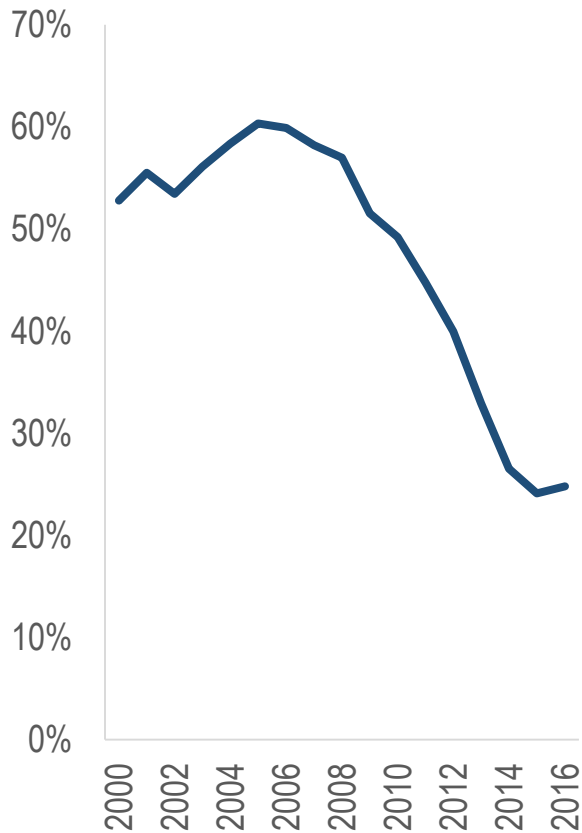


Source: EIA AEO 2017 Reference Case Projections

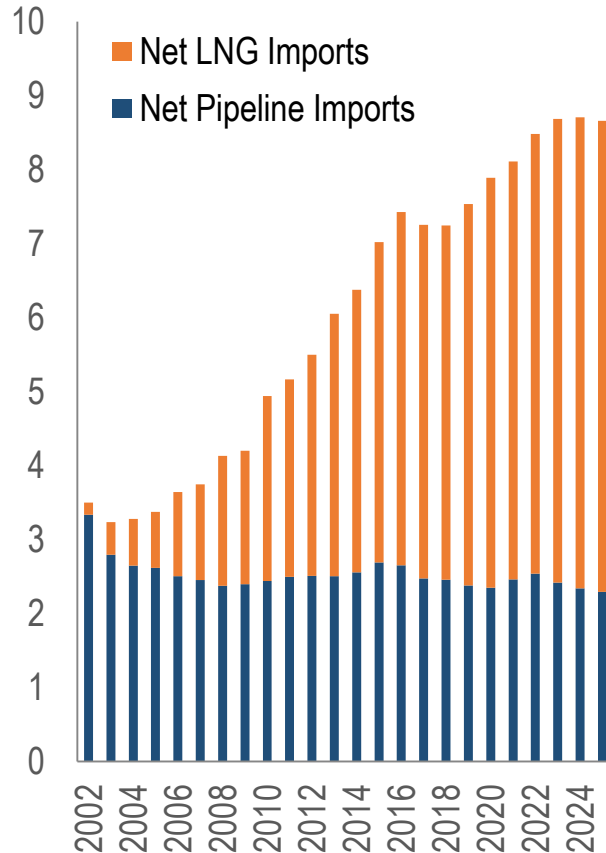


Turnaround in US Oil and Natural Gas Outlook

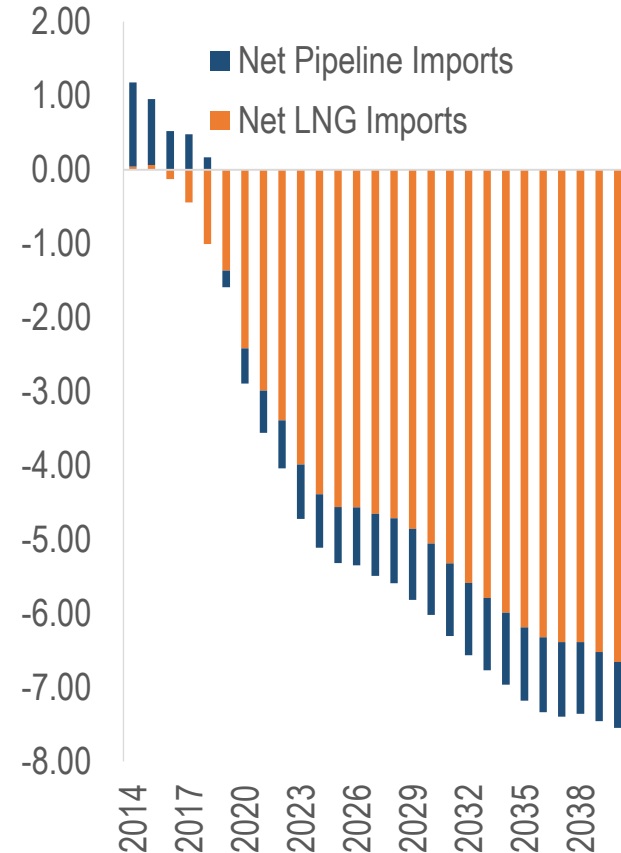
US Net Oil Import Dependence
% share of net imports in total consumption



AEO 2005 US Net Natural Gas Imports
Trillion cubic feet



AEO 2016 US Net Natural Gas Imports
Trillion cubic feet



Source: EIA Annual Energy Outlook 2005 and 2016



The Implications of the US Shale Revolution

Economic:

- Faster GDP growth*
- Job growth
- Lower energy prices

Geopolitical:

- Undermining OPEC
- Transformed global gas market—more competition, liquidity, supply diversity, and more flexible, efficient, secure gas markets
- Fiscal strains in oil-exporting countries

Environmental:

- Primary driver of US CO₂ decline (though market forces alone don't achieve goals)
- Also challenging economics of zero-carbon energy
- Local environmental concerns that require strong regulation and responsible development



* Economists Michael Greenstone and Chris Knittel found large net benefits for shale-producing communities, even after negative health effects and social impacts were considered. In a paper for Brookings, meanwhile, the economists Ryan Kellogg and Catherine Hausman similarly found that because of the shale revolution, natural gas prices were about half what they otherwise would have been, saving an average of \$74 billion annually for commercial, industrial, and household energy consumers between 2007 and 2013

American “Energy Dominance”

“An energy-dominant America means a self-reliant and secure nation, free from the geopolitical turmoil of other nations that seek to use energy as an economic weapon....An energy-dominant America will export to markets around the world, increasing our global leadership and influence.” –Perry, Zinke, Pruitt



Extensive regulatory reform proposed:

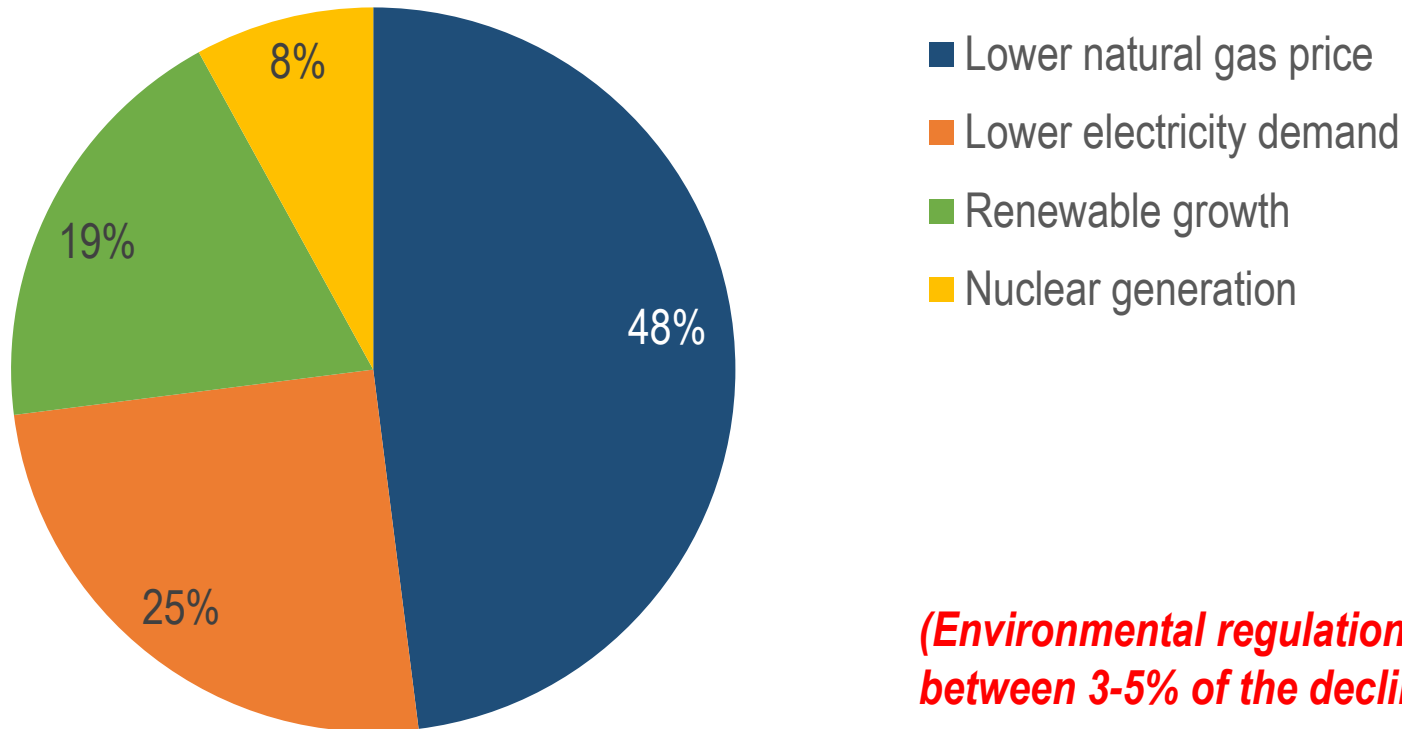
- Pull out of Paris Agreement (distinct from domestic policy changes)
- Roll back Clean Power Plan
- Reverse regulations on methane emissions
- Revisit social cost of carbon
- Lift moratorium on coal leasing on federal lands
- Expedited energy infrastructure and lease permitting
- End consideration of climate change in environmental reviews
- Expand offshore drilling leasing (Alaskan Arctic)
- Ease fuel economy standards
- Reverse stream protection rule
- And more...



Coal Use Declined Primarily Due to Cheap Gas, Not Regulation

Factors Contributing to the Decline in US Coal Consumption in 2006-2016

2016 actual vs. projected levels in AEO 2006

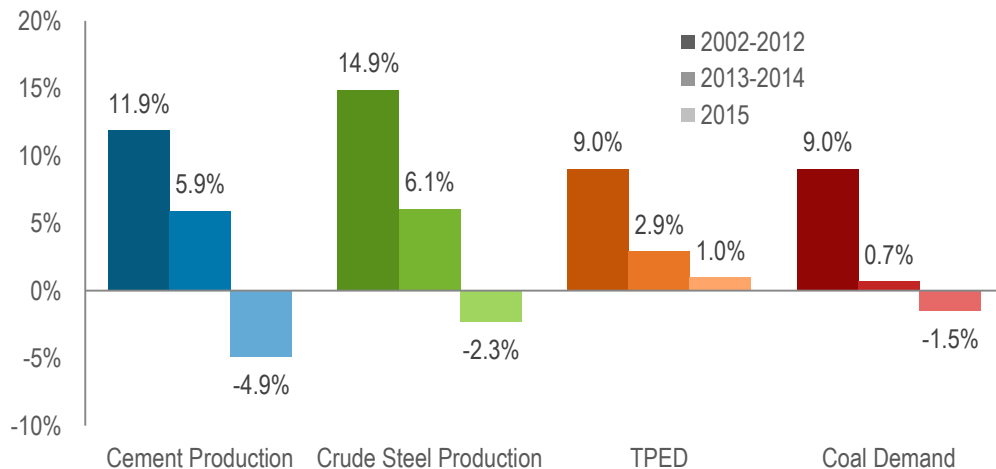


(Environmental regulations explain between 3-5% of the decline)

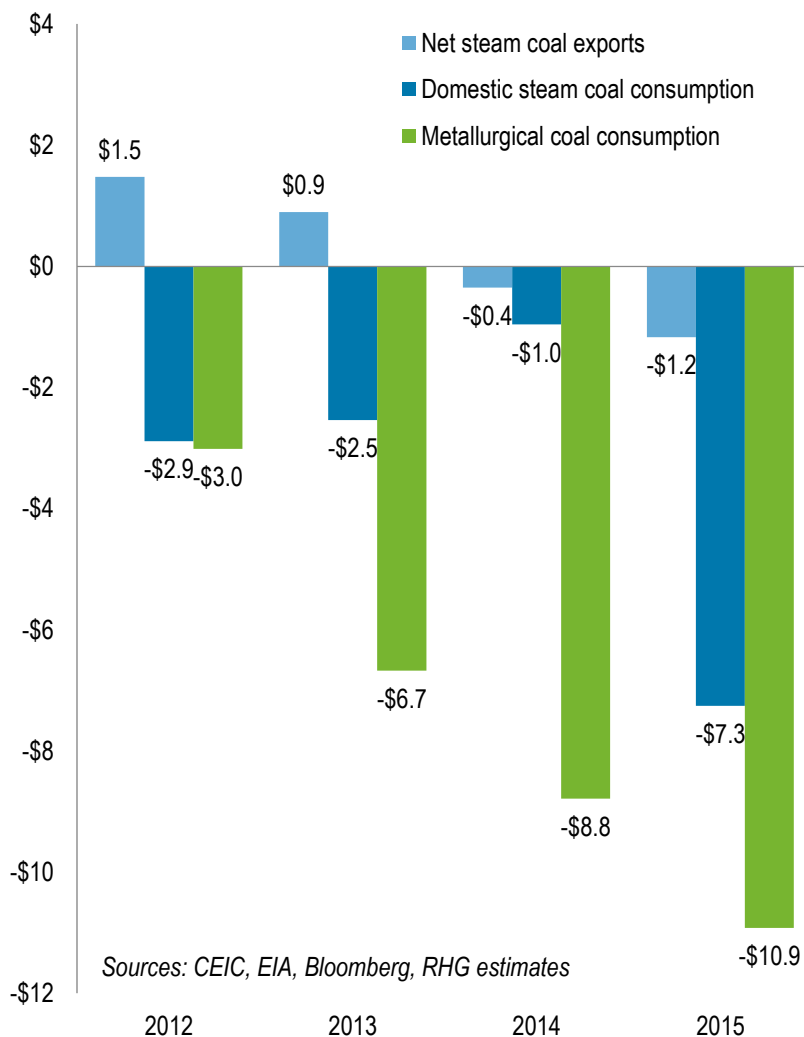
Source: Houser, Bordoff, Marsters (2017), "Can Coal Make a Comeback?," Center on Global Energy Policy, April 2017

US Coal Producers Hit by Chinese Rebalancing

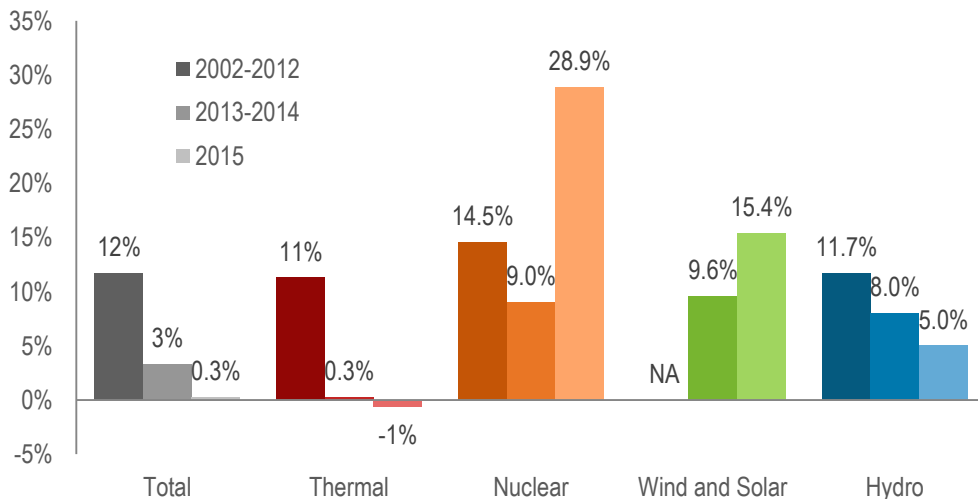
The Energy Implications of Chinese Rebalancing (% change y-o-y)



Change in Revenue for US Coal Producers vs. 2011 (\$ billion)



Chinese Electricity Generation Growth (% change y-o-y)



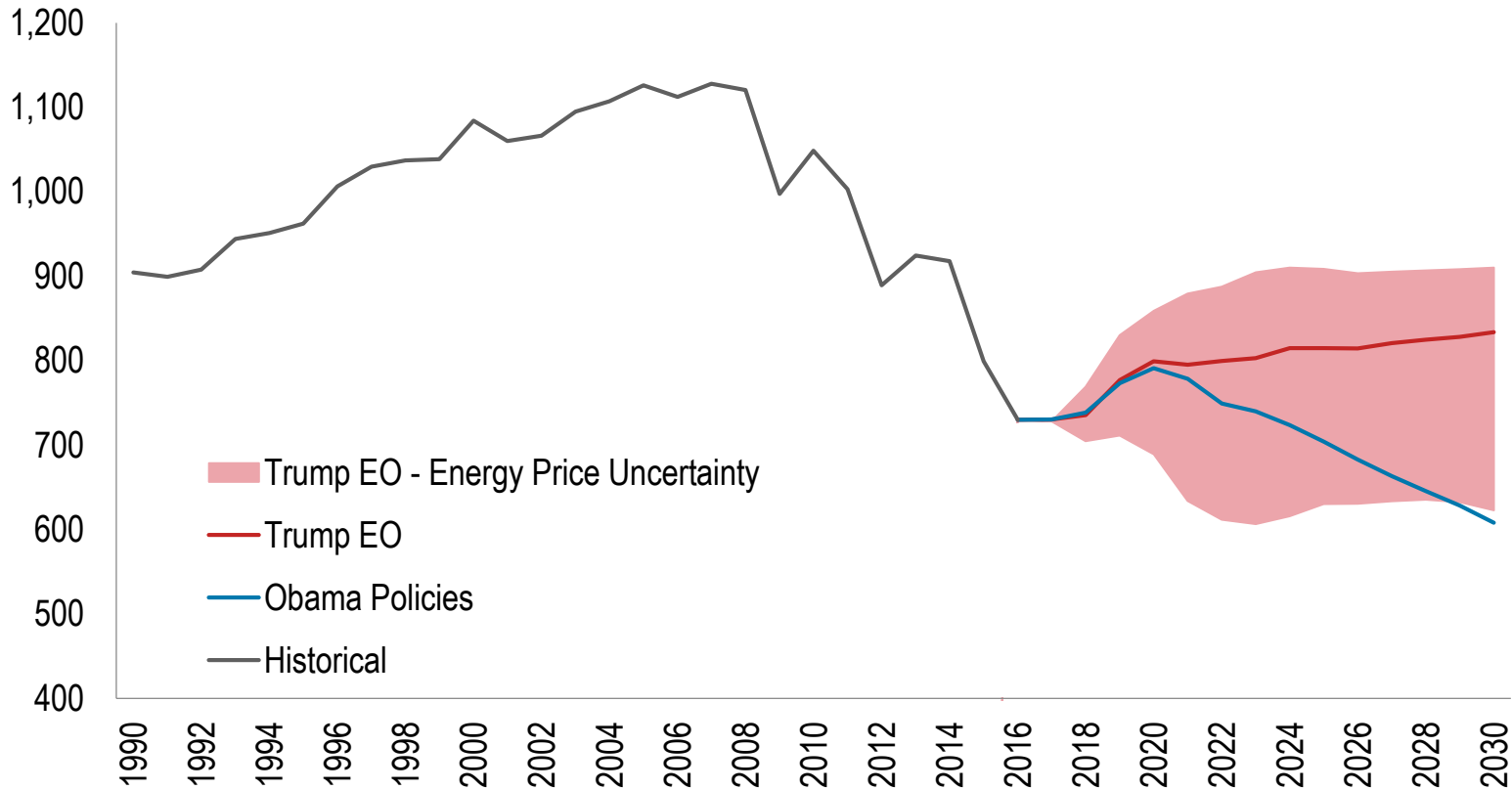
Sources: CEIC, EIA, Bloomberg, RHG estimates



Trump EO Stems Decline of Coal, But Doesn't Bring It Back

US Coal Consumption under Obama Policies and Trump Proposals

Million short tons

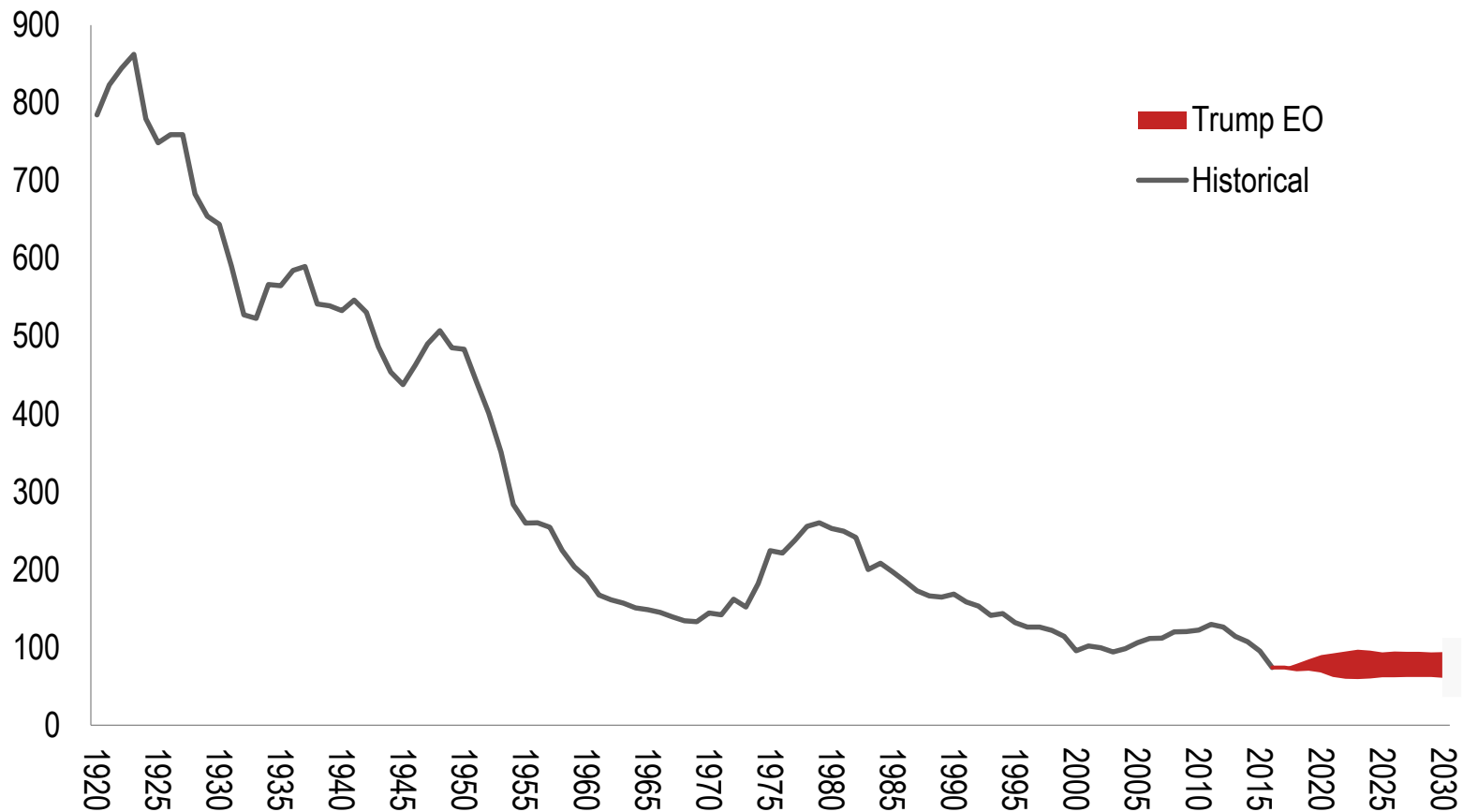


Source: Bordoff et al. (2017), "Can Coal Make a Comeback?," Center on Global Energy Policy, April 2017

US Coal Jobs Are Not Coming Back

US Coal Mining Employment

Thousand workers, including contractors



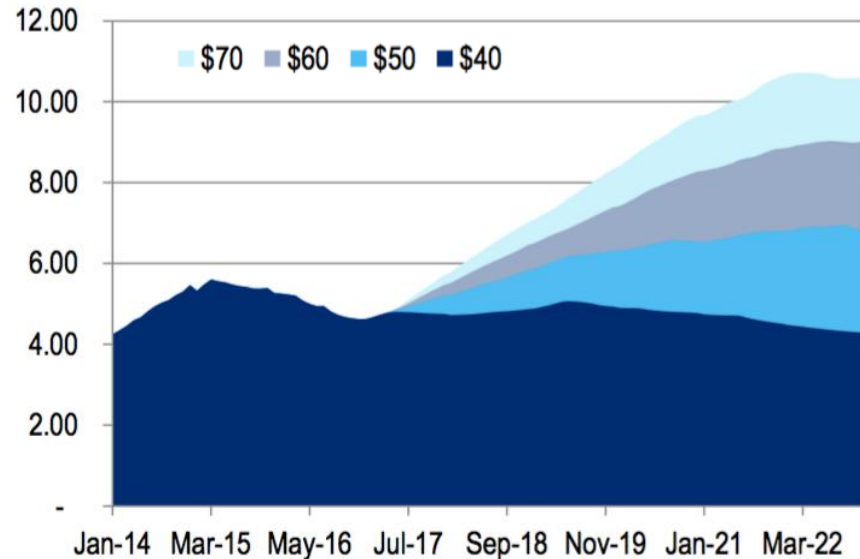
Source: Bordoff et al. (2017), "Can Coal Make a Comeback?," Center on Global Energy Policy, April 2017



Markets Trump Policy in Outlook for US Oil and Gas

US Shale Liquids Production under Various WTI Price Scenarios

Million barrels per day



Source: EIA, Baker Hughes, Citi Research

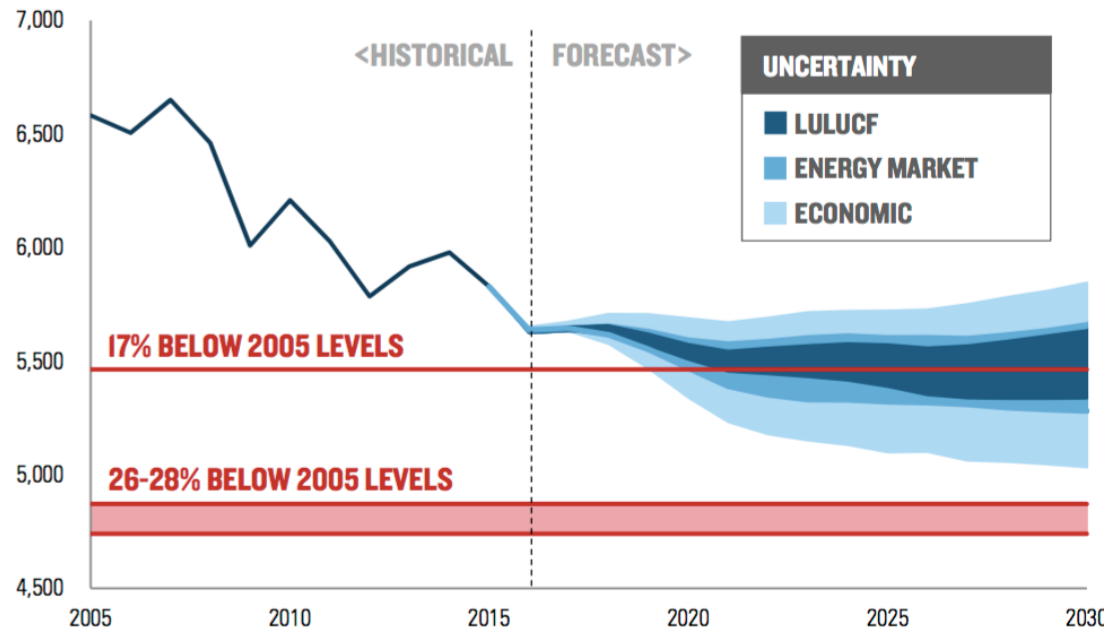
- Scrapping Clean Power Plan and other rules does not bring coal back
- Redoing Five Year Leasing Plan does not bring oil companies back to Alaskan Arctic in this price environment
- Lift coal moratorium, but companies not expected to need new reserves with current leases sufficient for 20 years.
- Easing O&G production rules may help on margin, but start to end-2017 already expected at ~1mmbd thanks to productivity & technology gains
- Promote LNG Exports, but DOE already giving permits & new projects already challenged in this LNG market



GHG Emissions With and Without Trump Policy Changes

- Emission reduction under the Obama Climate Action Plan: 21% by 2025 vs. 26-28% Paris target
- Under current policies by the Trump Administration: 15-18% reduction vs. 26-28% target by 2025
- Key uncertainties beyond policy actions include gas and renewable costs, LULUCF, economic growth
- Uncertainty range around current GHG trajectory: 13-23% reduction in 2025 vs. 2005

Figure 3: US net GHG emissions under current policy with energy and economic uncertainty
MMt CO₂e

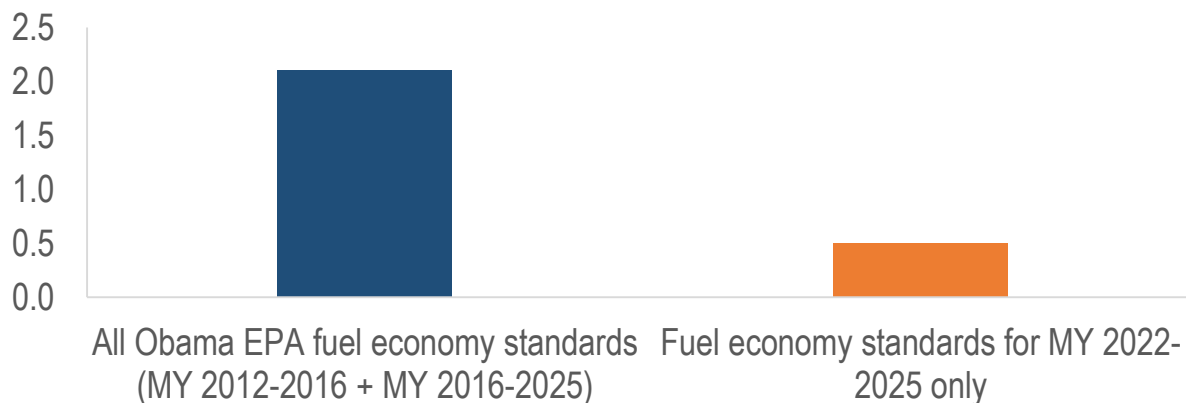


Source: EPA, Rhodium Group analysis

Regulations Still Matter

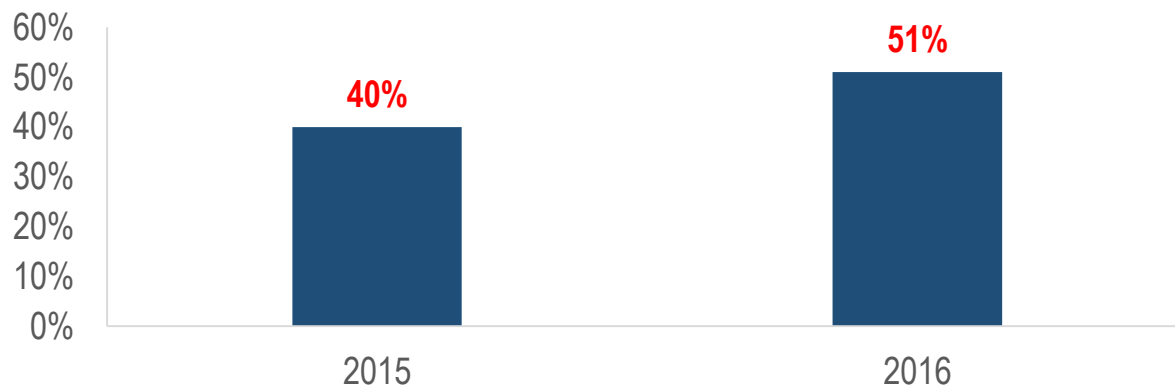
- Oil and gas production—
e.g., pipeline
debottlenecking, faster
federal permitting (shale
is largely on private land)
- Easing fuel economy =
~0.5 mbd higher
demand in 2025
- Protect air, water, health
- Social license to
operate: build public
trust and confidence at
time of weakening
support for shale

Oil Demand Impact of Obama-Era Fuel Economy Standards in 2025 (Million b/d)



Source: EPA Regulatory Impact Analysis, EIA

Opposition to “Fracking” in the US



Source: Gallup





Thank you!

For more information contact

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