Changes in North America Natural Gas Market Outlook Between 2008 & 2011

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HB 142
House Finance
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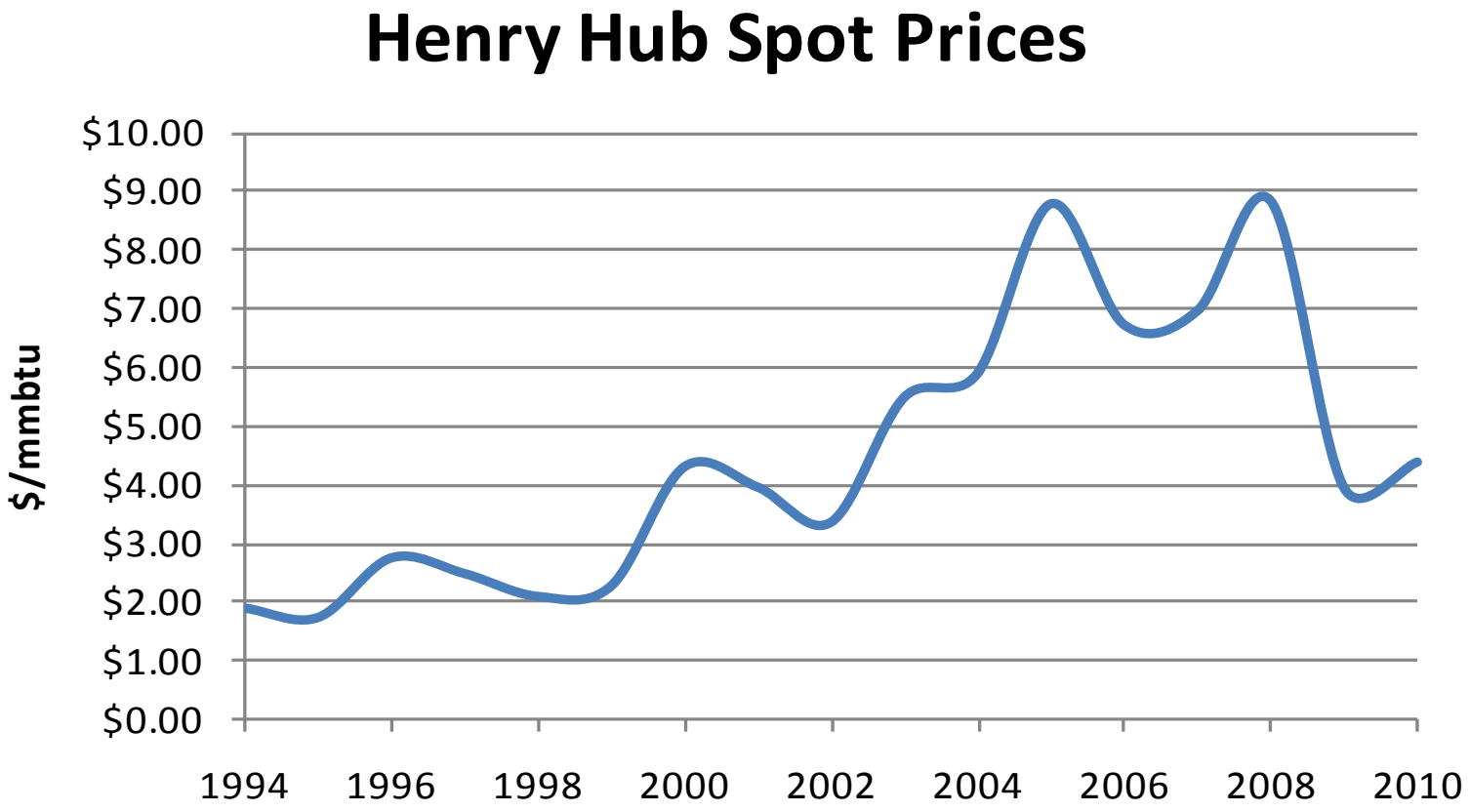
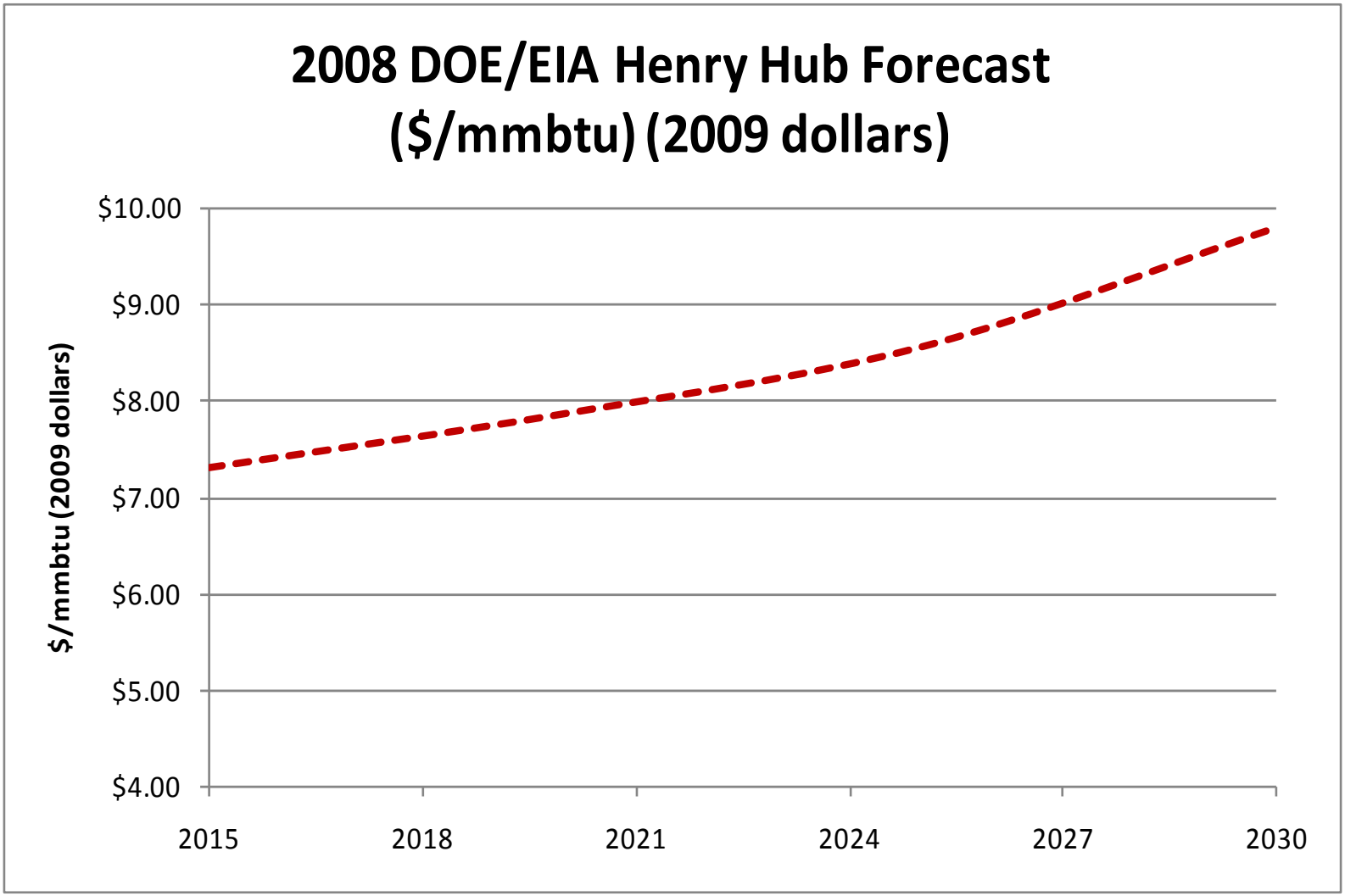
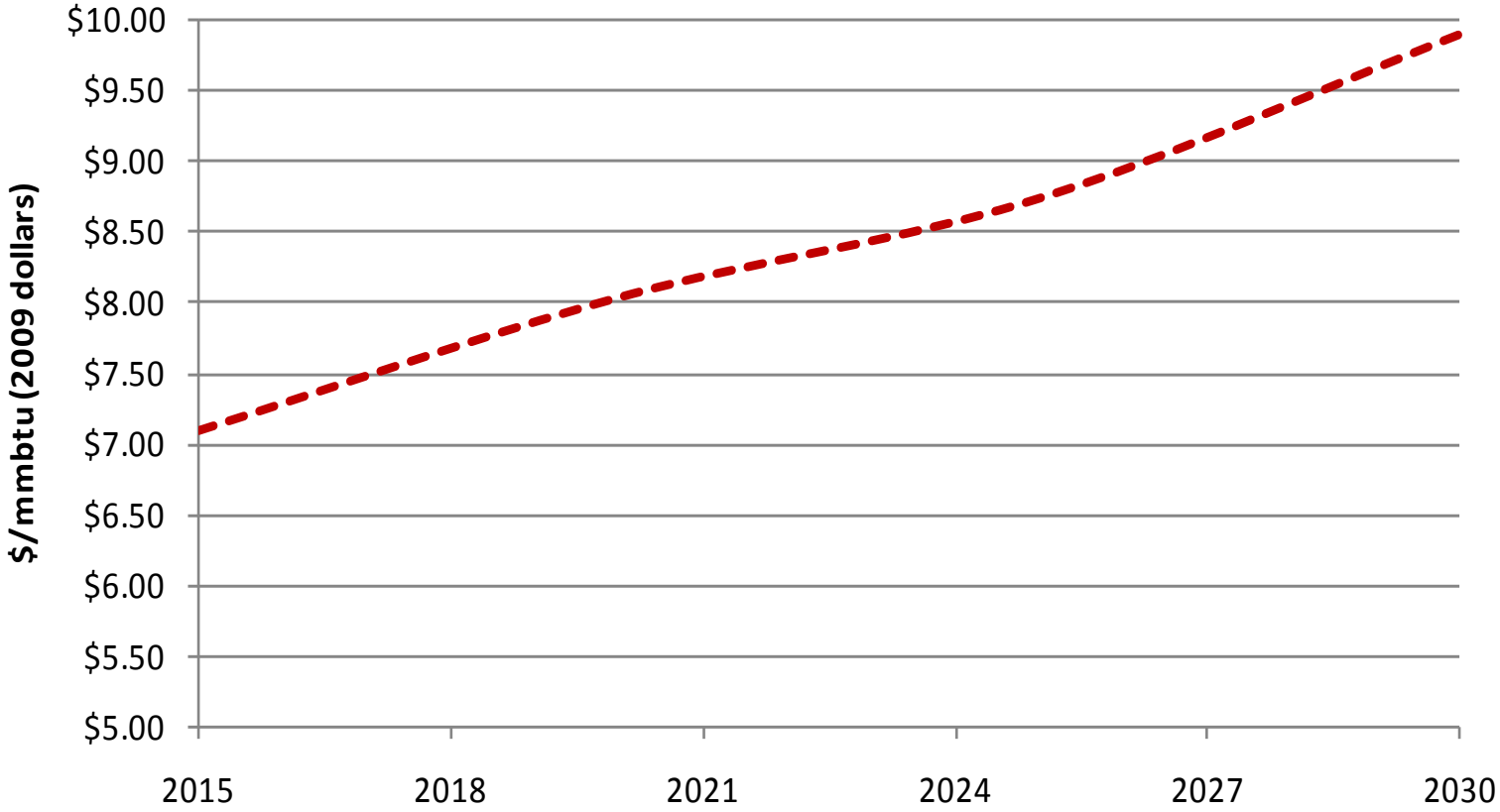
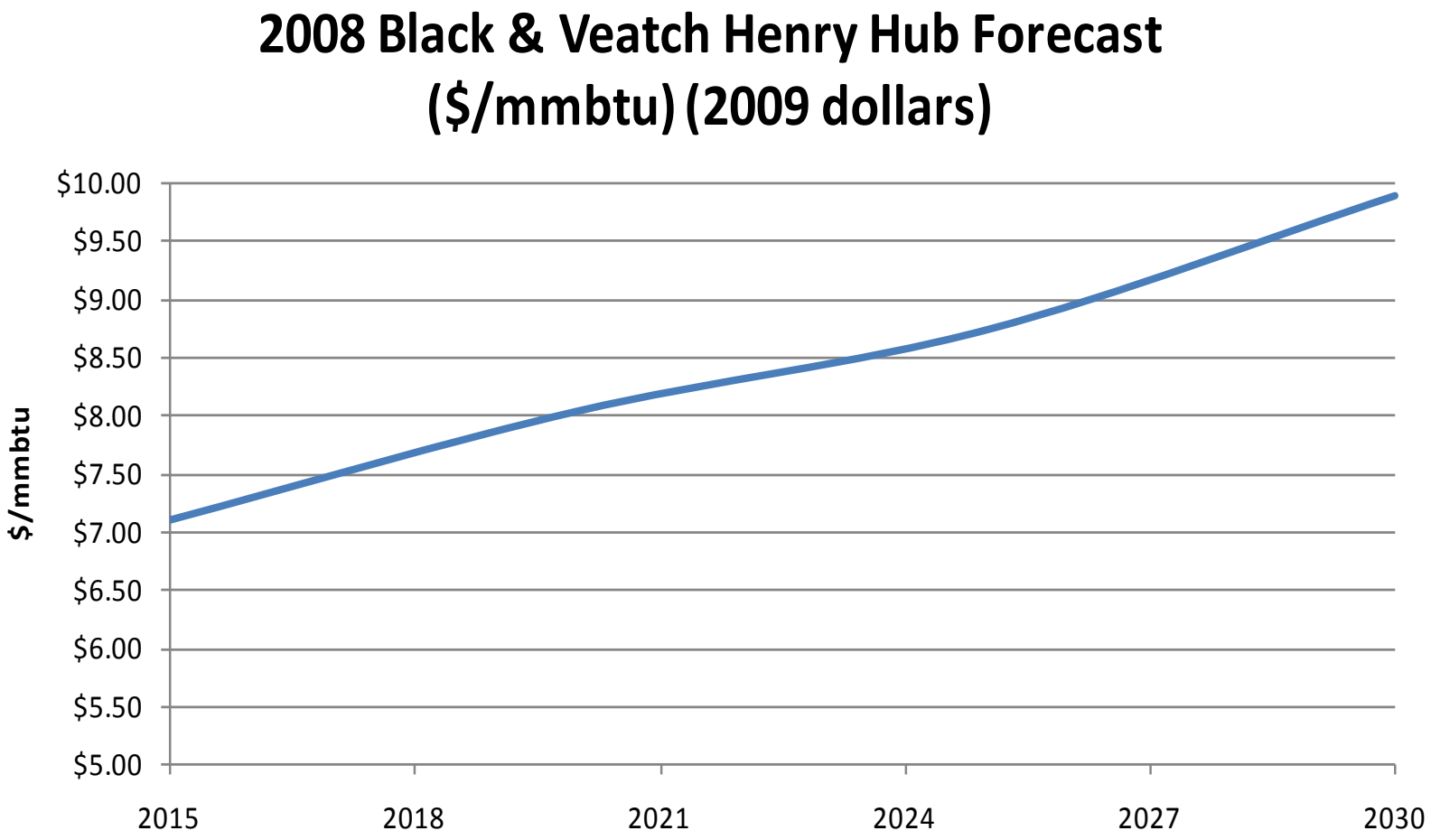

Henry Hub Spot Prices
$/mmbtu
$10.00
$9.00
$8.00
$7.00
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
1994
1996
1998
2000
2002
2004
2006
2008
2010



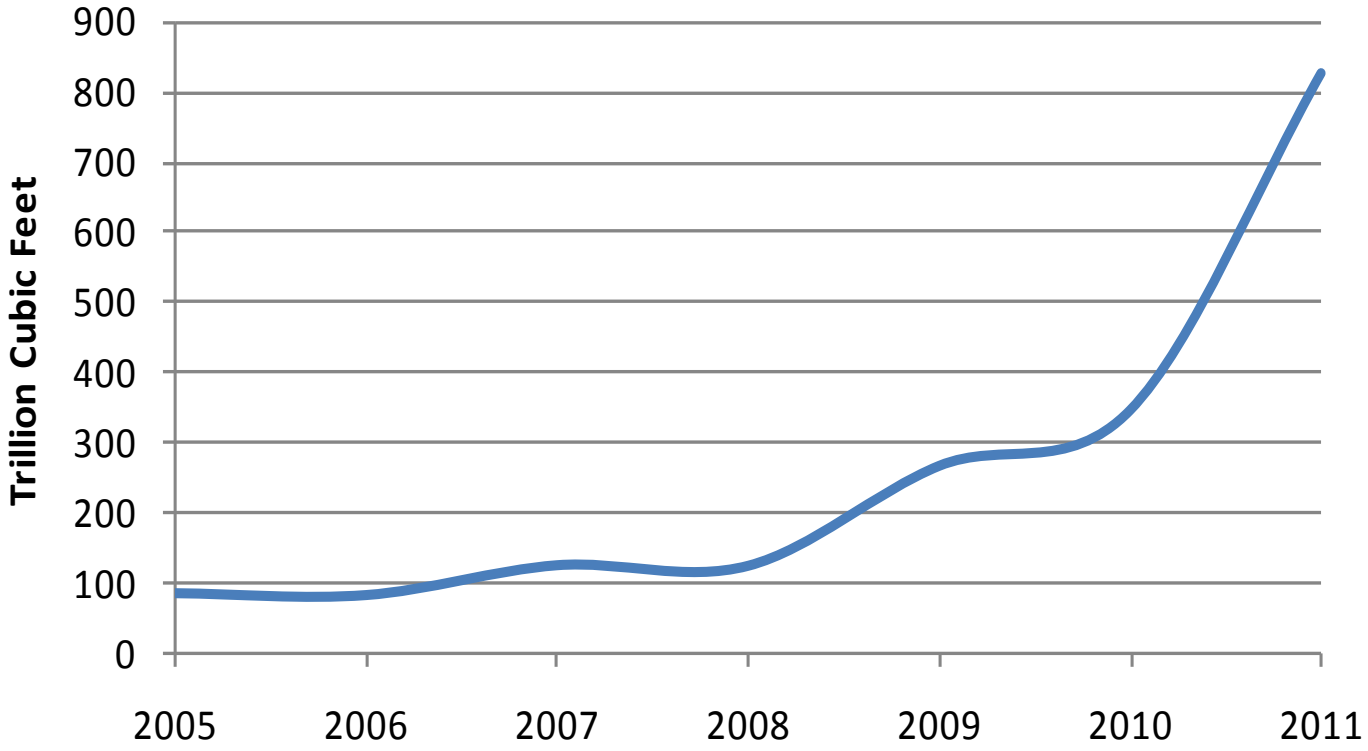
DOE/EIA is the Department of Energy / Energy Information Administration

2008 Wood Mackenzie Henry Hub Forecast ($/mmbtu) (2009 dollars)



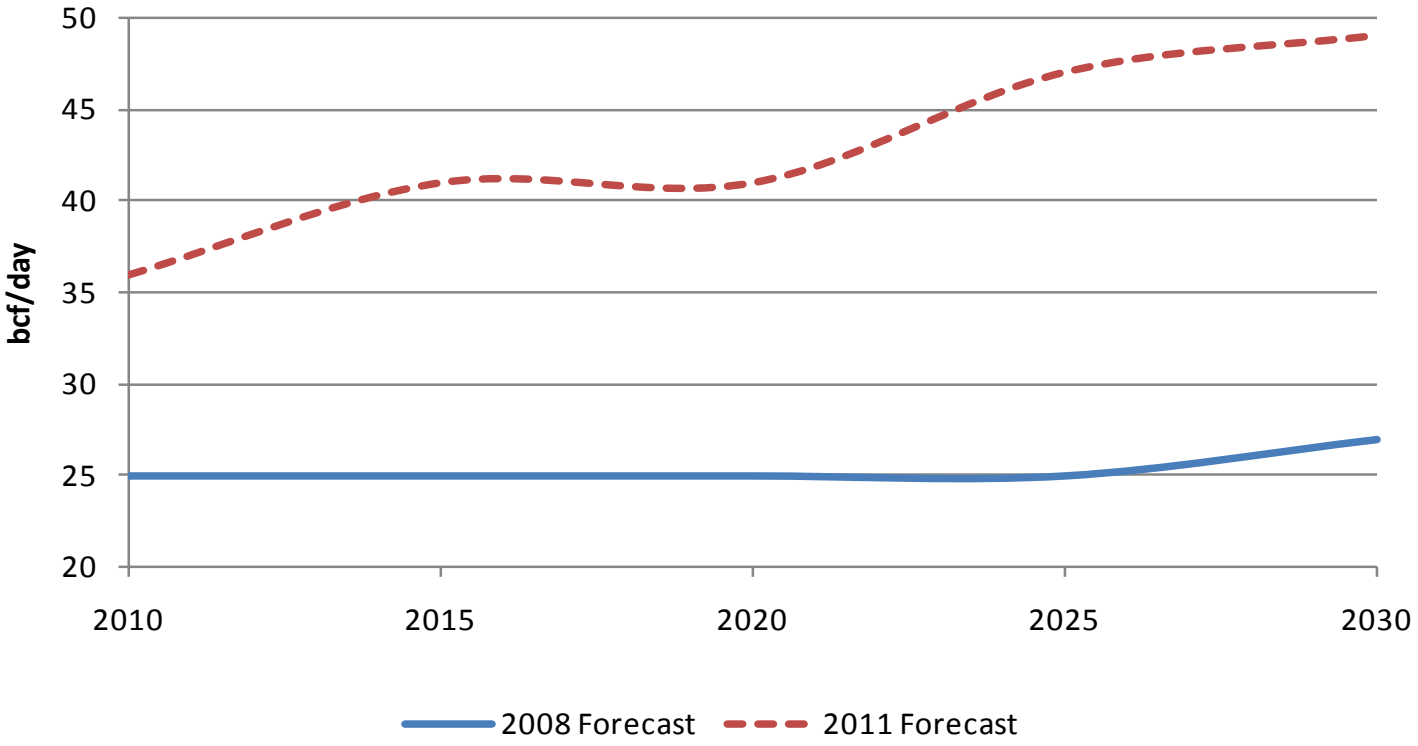

2008 Black & Veatch Henry Hub Forecast
($/mmbtu) (2009 dollars)
$/mmbtu
$10.00
$9.50
$9.00
$8.50
$8.00
$7.50
$7.00
$6.50
$6.00
$5.50
$5.00
2015
2018
2021
2024
2027
2030

U.S. Shale Gas Reserves

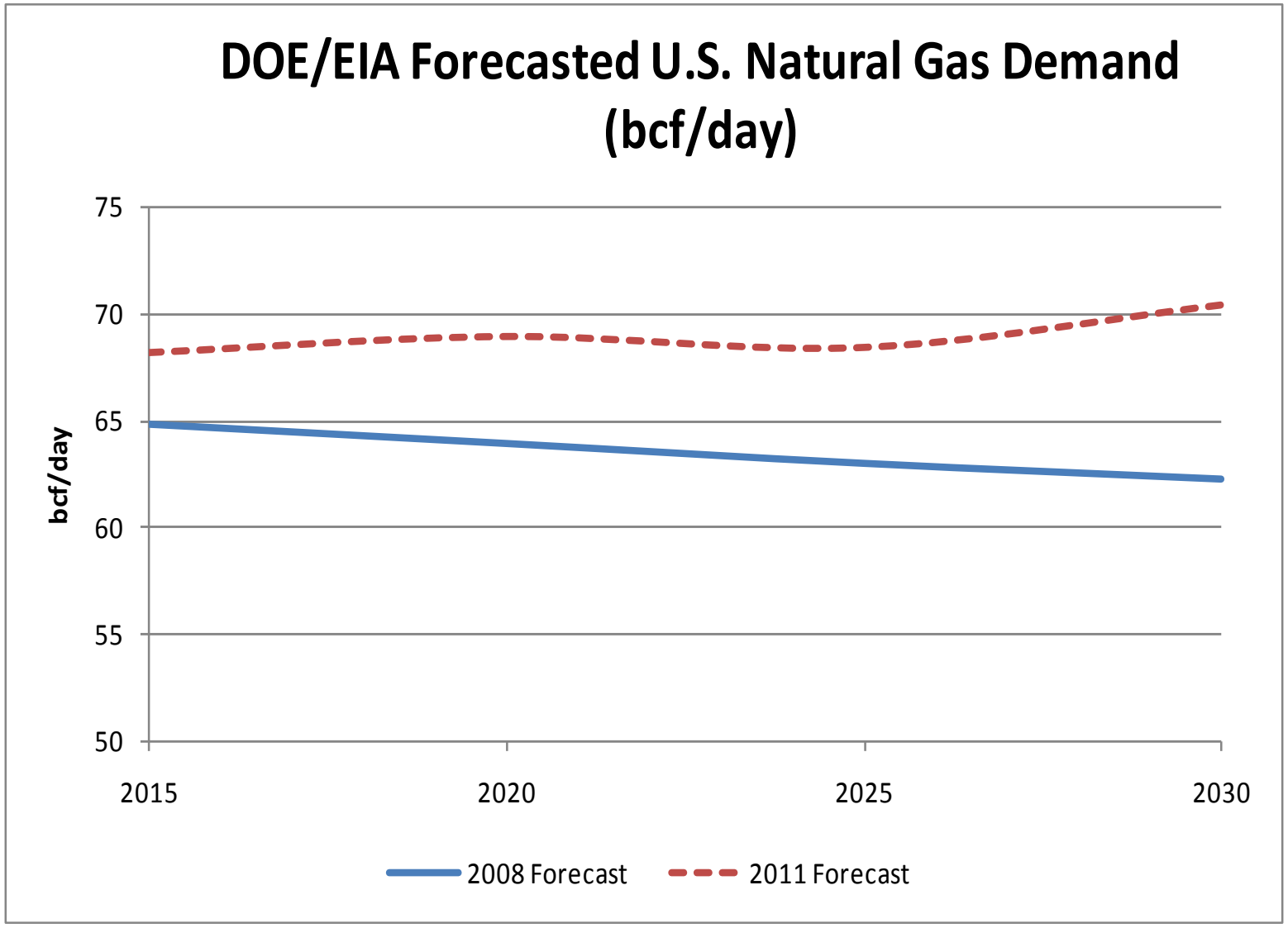


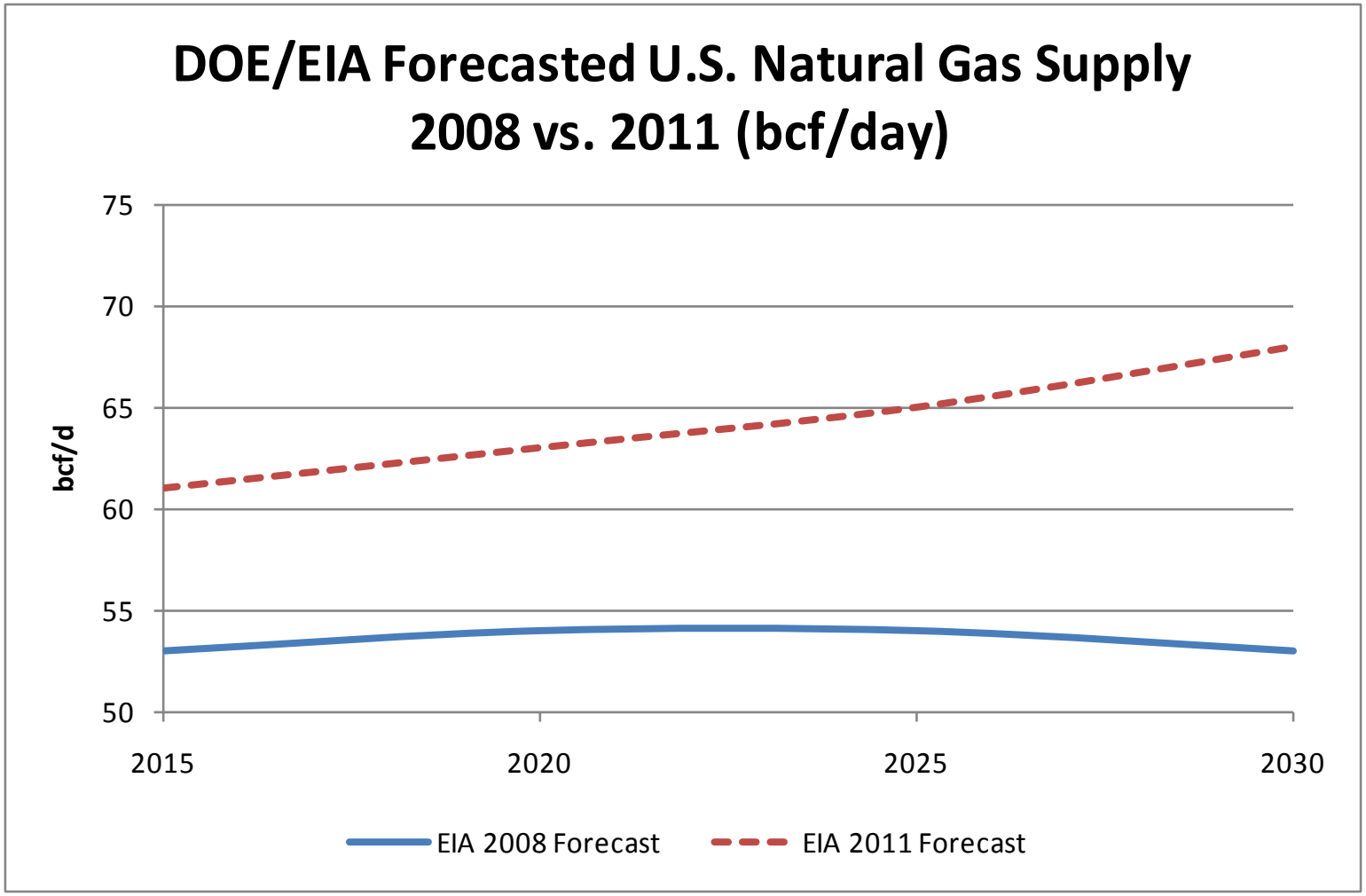
Source: DOE/EIA, 2011

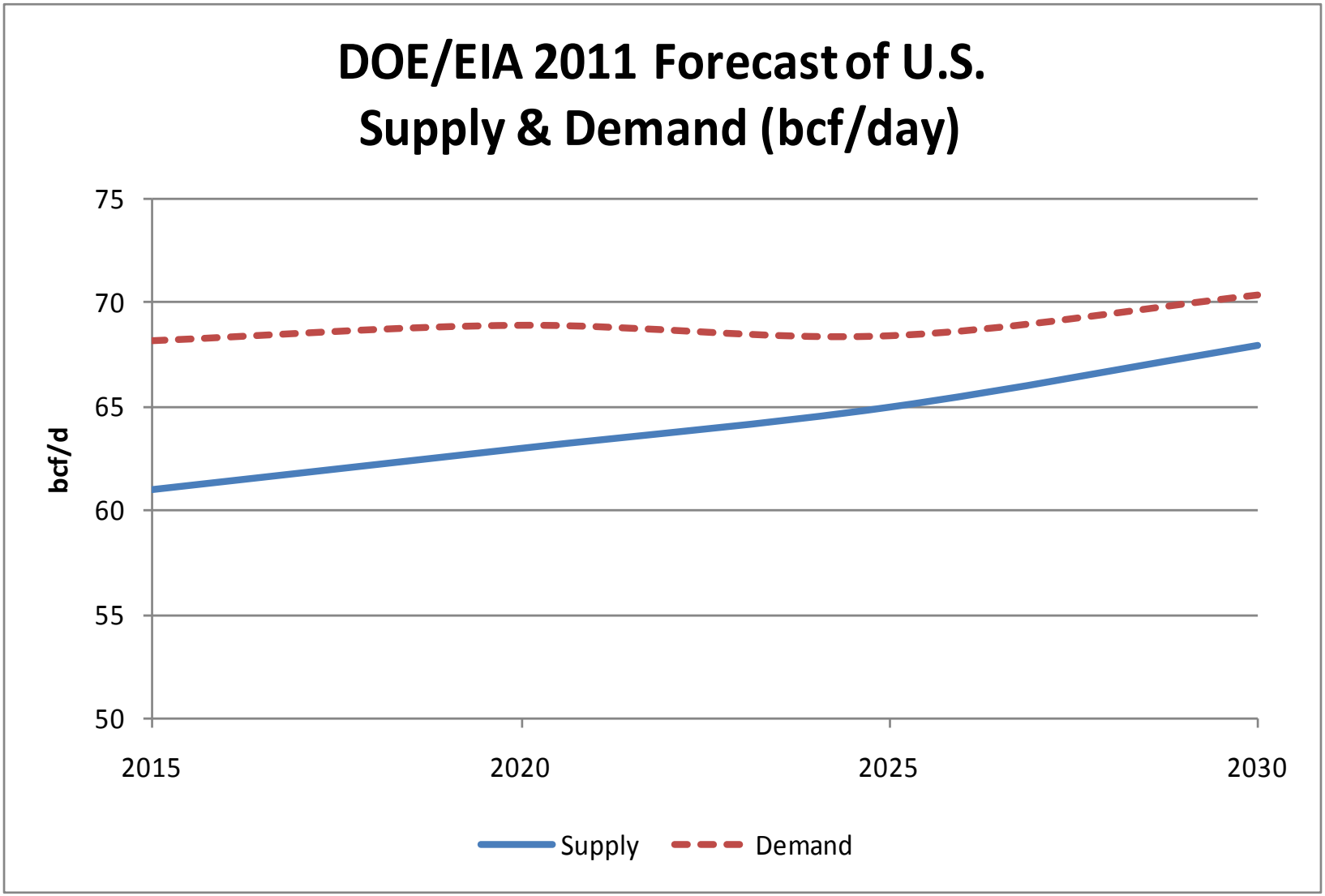
2008 vs. 2011 DOE/EIA Unconventional Gas* Production Outlook (bcf/day)

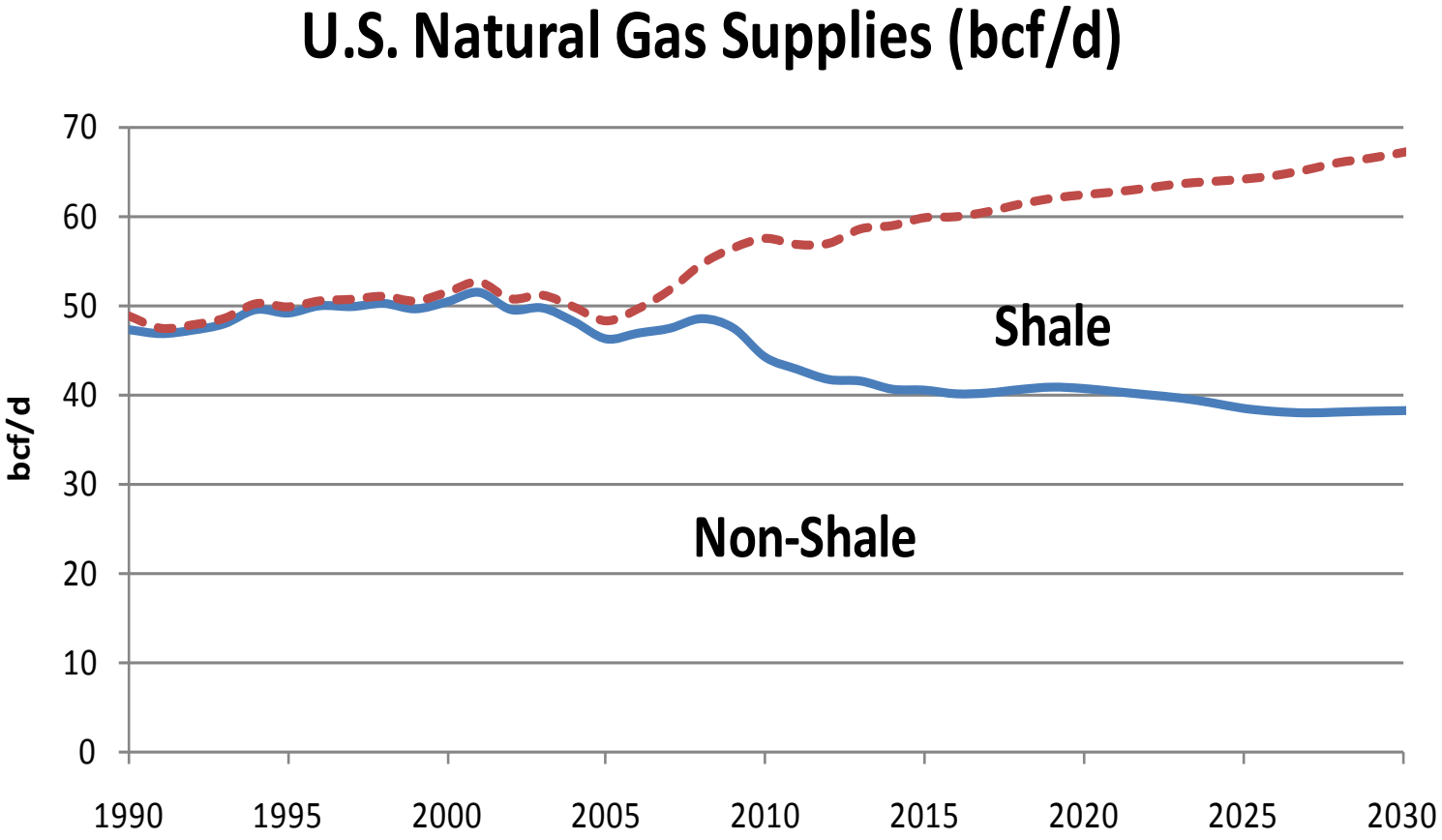


* Shale, tight gas, coal bed methane


DOE/EIA Forecasted U.S. Natural Gas Demand (bcf/day)
bcf/day
75
70
65
60
55
50
2015
2020
2025
2030
2008 Forecast
2011 Forecast

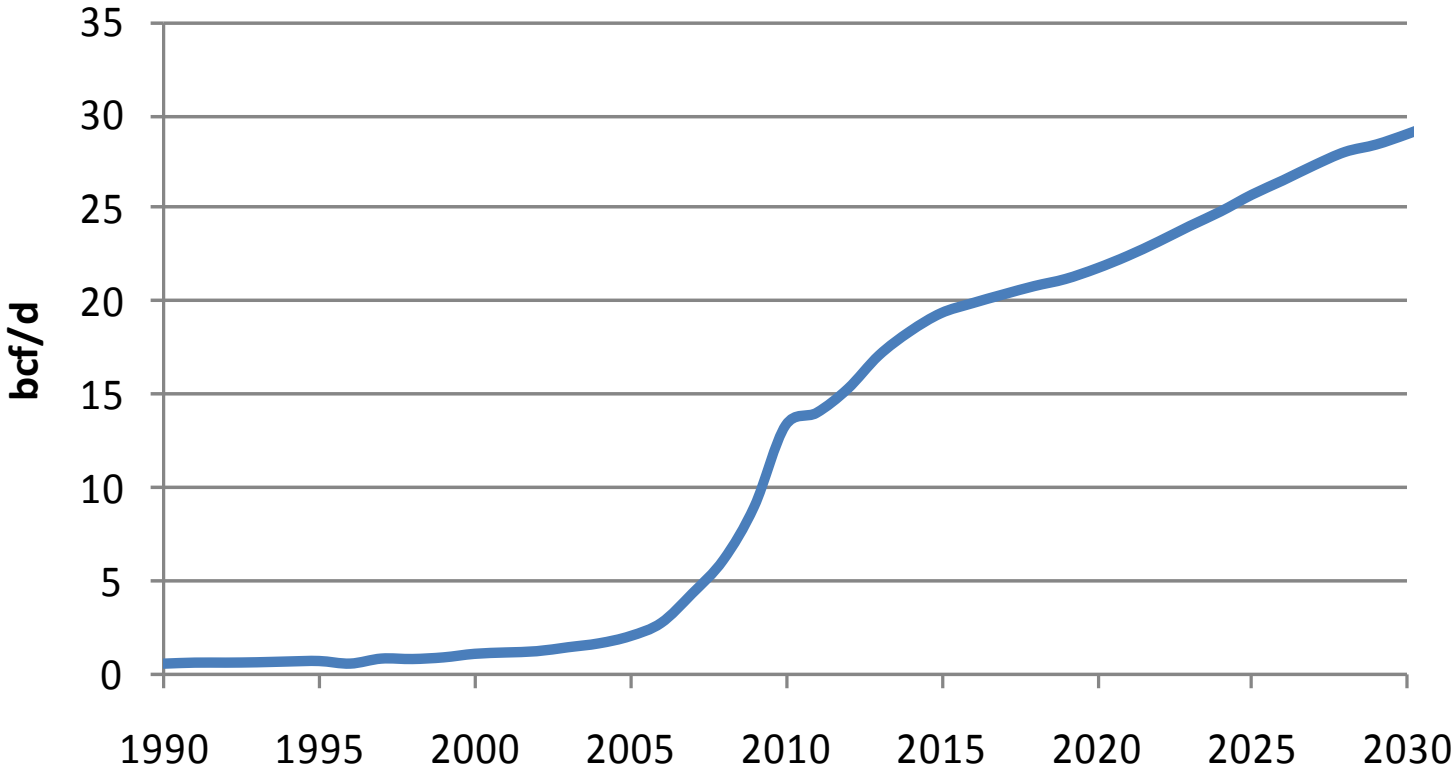

DOE/EIA Forecasted U.S. Natural Gas Supply
2008 vs. 2011 (bcf/day)
bcf/d
75
70
65
60
55
50
2015
2020
2025
2030
EIA 2008 Forecast
EIA 2011 Forecast


DOE/EIA 2011 Forecast of U.S.
Supply & Demand (bcf/day)
bcf/d
75
70
65
60
55
50
2015
2020
2025
2030
Supply
Demand

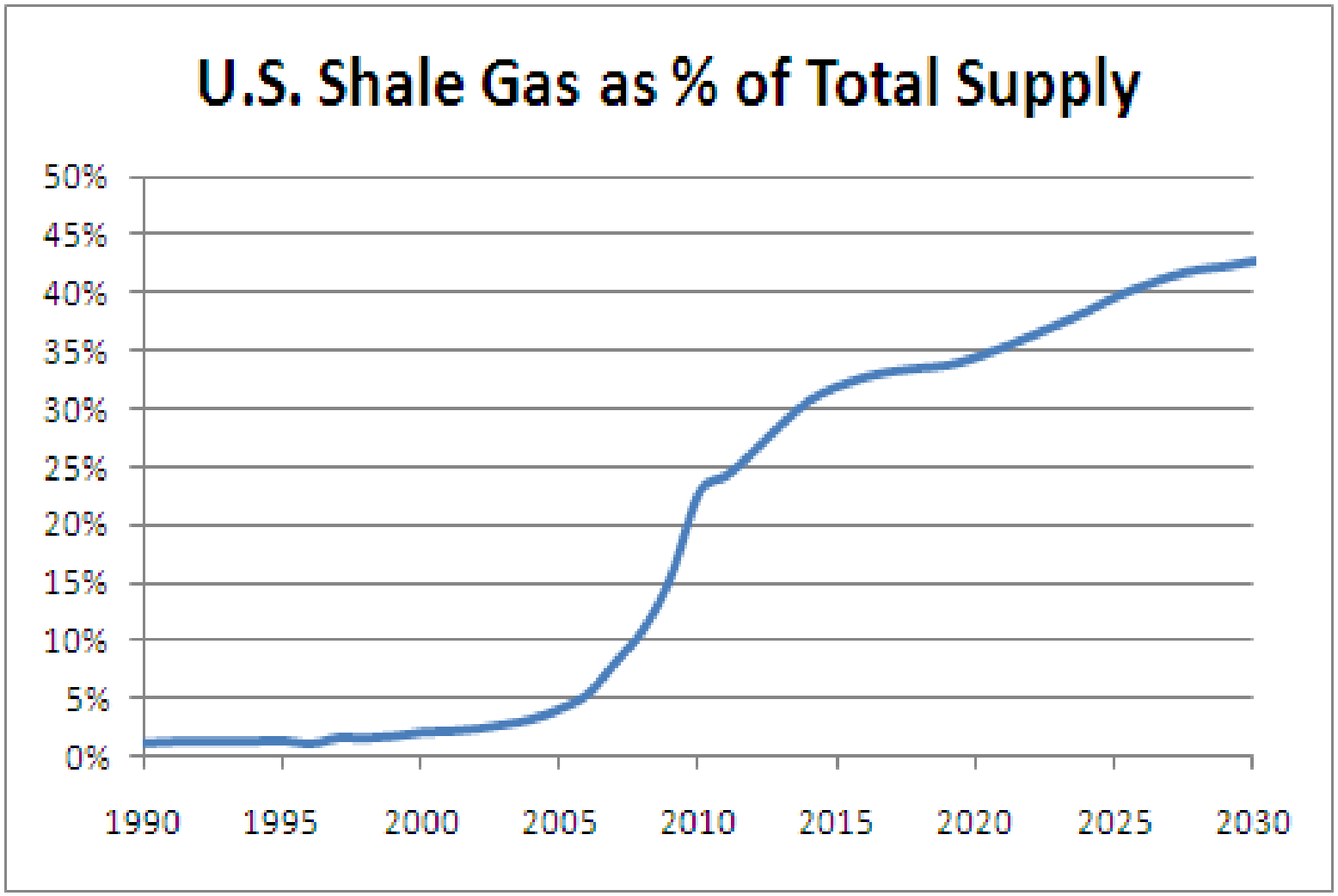


Source: DOE/EIA, 2011

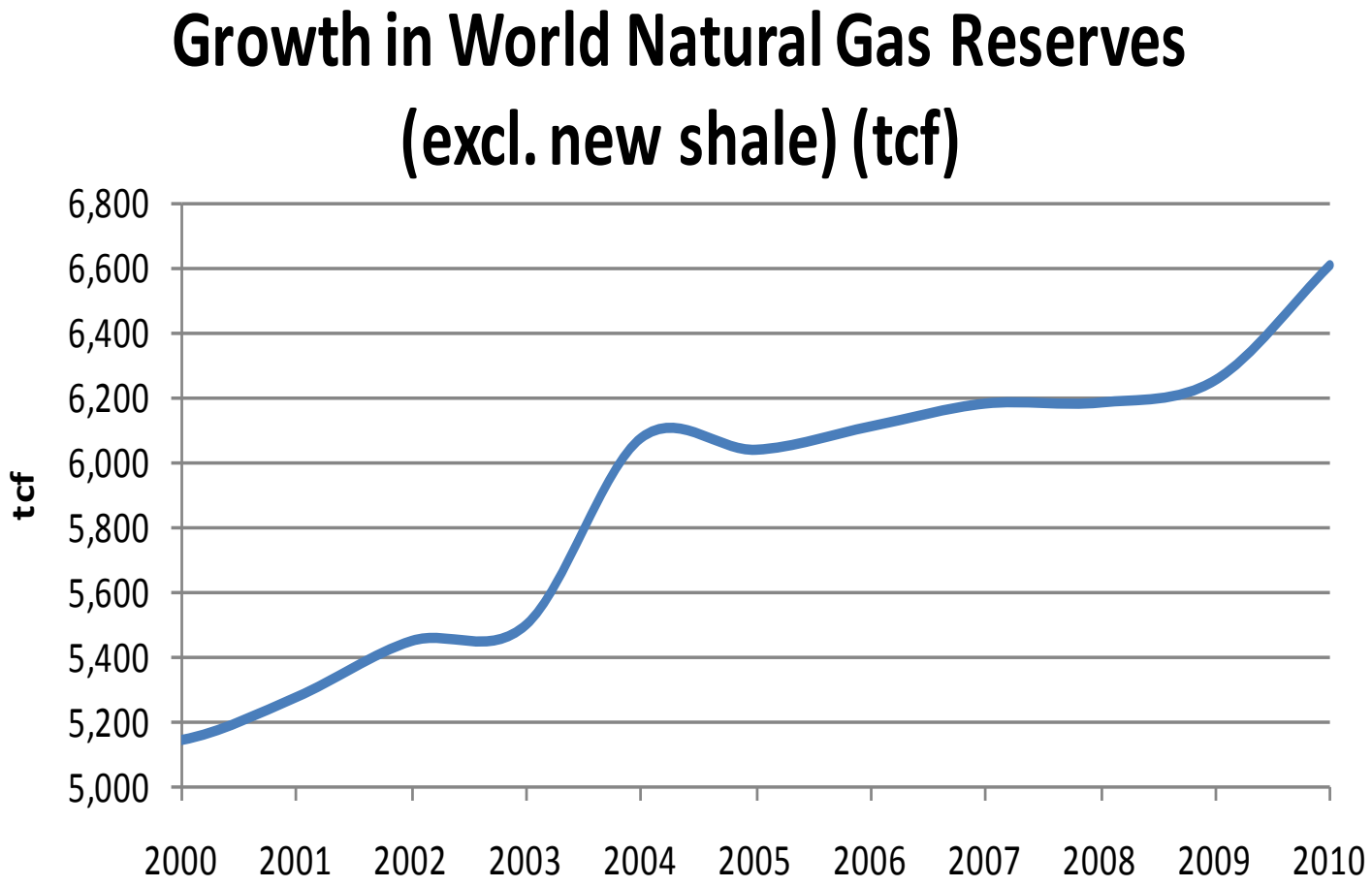
U.S. Shale Gas Supply (bcf/d)



Source: DOE/EIA, 2011



Source: DOE/EIA, 2011


Growth in World Natural Gas Reserves (excl. new shale) (tcf)
tcf
6,800
6,600
6,400
6,200
6,000
5,800
5,600
5,400
5,200
5,000
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

New/Sanctioned LNG Plants

- Sakhalin, Russia; opened 2009; Shell/Mitsui/Mitsubishi; 1.5 bcf/d
- Tangguh, Indonesia; 2009; BP/Mitsubishi/Nippon Oil/LNG Japan/CNOOC/Korea Gas; 1 bcf/d (short subsea pipes to shore)
- Yemen LNG, Yemen; 2009-2010; Total/Hunt Oil/Korea Gas/Hyundai/Yemen government; 900 mmcf/d (tidewater)
- Qatargas II, Qatar; 2009; Exxon/Total/Qatar Petroleum; 2 bcf/d (tidewater)
- Ras Laffan III, Qatar; 2009 and 2010; Exxon/Qatar Petroleum; 2 bcf/d (tidewater)
- Qatargas III, Qatar; 2010; ConocoPhillips/Mitsui/Qatar Petroleum; 1 bcf/d (tidewater)
- Melchorita LNG, Peru; 2010; Hunt Oil/Marubeni/Repsol; 600 mmcf/d (260 miles of overland pipe)
- Pluto LNG, Australia; under construction, 2011; Woodside/Tokyo Gas/Kansai Electric; 1.7 bcf/d by 2014 (includes planned expansions) (17 miles of subsea pipe)
- Soyo LNG, Angola; under construction, 2012; Chevron/Eni/Total/BP/national oil company; 700 mmcf/d
- Qatargas IV, Qatar; 2011; Shell/Qatar Petroleum; 1 bcf/d (tidewater)
- Gorgon LNG, Australia; under construction, 2014; Chevron/Shell/Exxon/ Tokyo Gas/Osaka Gas/Chubu Electric; 2 bcf/d (expansion contemplated) (subsea pipe, measured in the dozens of miles)
- Port Moresby, Papua New Guinea; under construction, 2014; Exxon/Nippon Oil/several other partners; 850 mmcf/d (450 miles of pipe, mostly subsea)
- Queensland Curtis, Australia; under construction, 2014; BG/Tokyo Gas/CNOOC (China); 1.1 bcf/d
- Gladstone, Australia; under construction, 2015; Santos/Petronas/Total; 1 bcf/d (260 miles of overland pipe)

Source: Office of Federal Coordinator Alaska Natural Gas Transportation Projects

Key Price Variables

- How much of shale reserves are economic
- Environmental fracking issues
- Controls on greenhouse gas and air emissions
  - Affects coal demand, which competes with natural gas

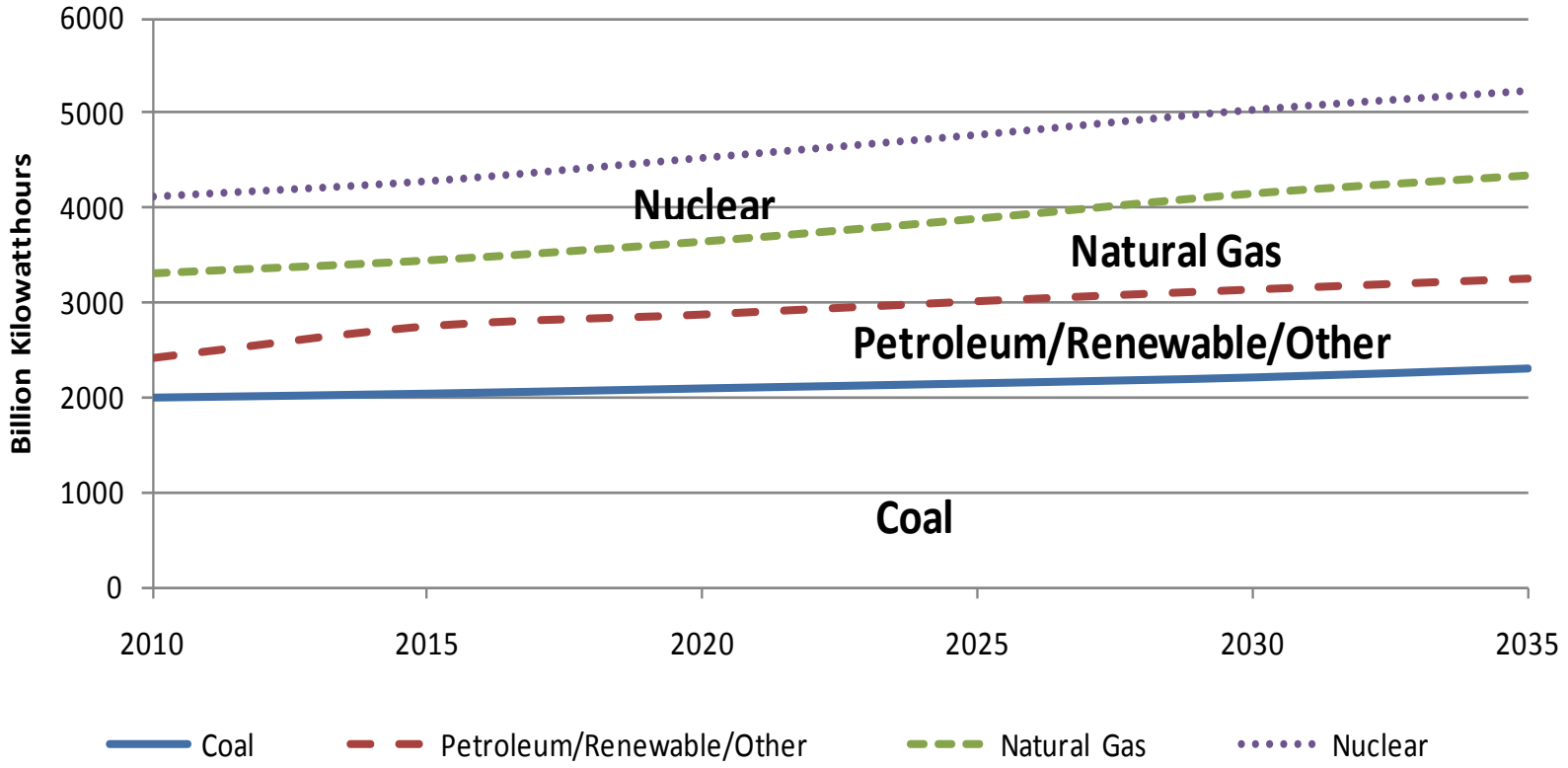
Cost to Produce Shale Reserves?

- Still too new to tell. Unknowns :
  - How do shale wells perform long term?
  - Ultimate recoveries and production potential for wells?
- Costs will go up?
  - Production tends to drop off quickly
  - More rigs will be needed: cost pressure
  - Land access
  - Water availability
- Costs will go down?
  - Exploration continues
  - Cost cutting technologies possible
  - Reserves and production of new energy resources tend to increase over time

Hydraulic Fracturing Issues

- Can fracking fluid migrate from deep underground to contaminate shallow aquifers?
- Sloppy drilling practices have occurred
- Currently under state oversight
  - Updated standards for well design, drilling, waste disposal
  - Federal possible
- Compliance and environmental costs will increase
  - Not overwhelming (5%-20% per well?)
- New technologies for water treatment are emerging

U.S. Electricity Generation by Fuel (billion kilowatthours)



Source: DOE/EIA

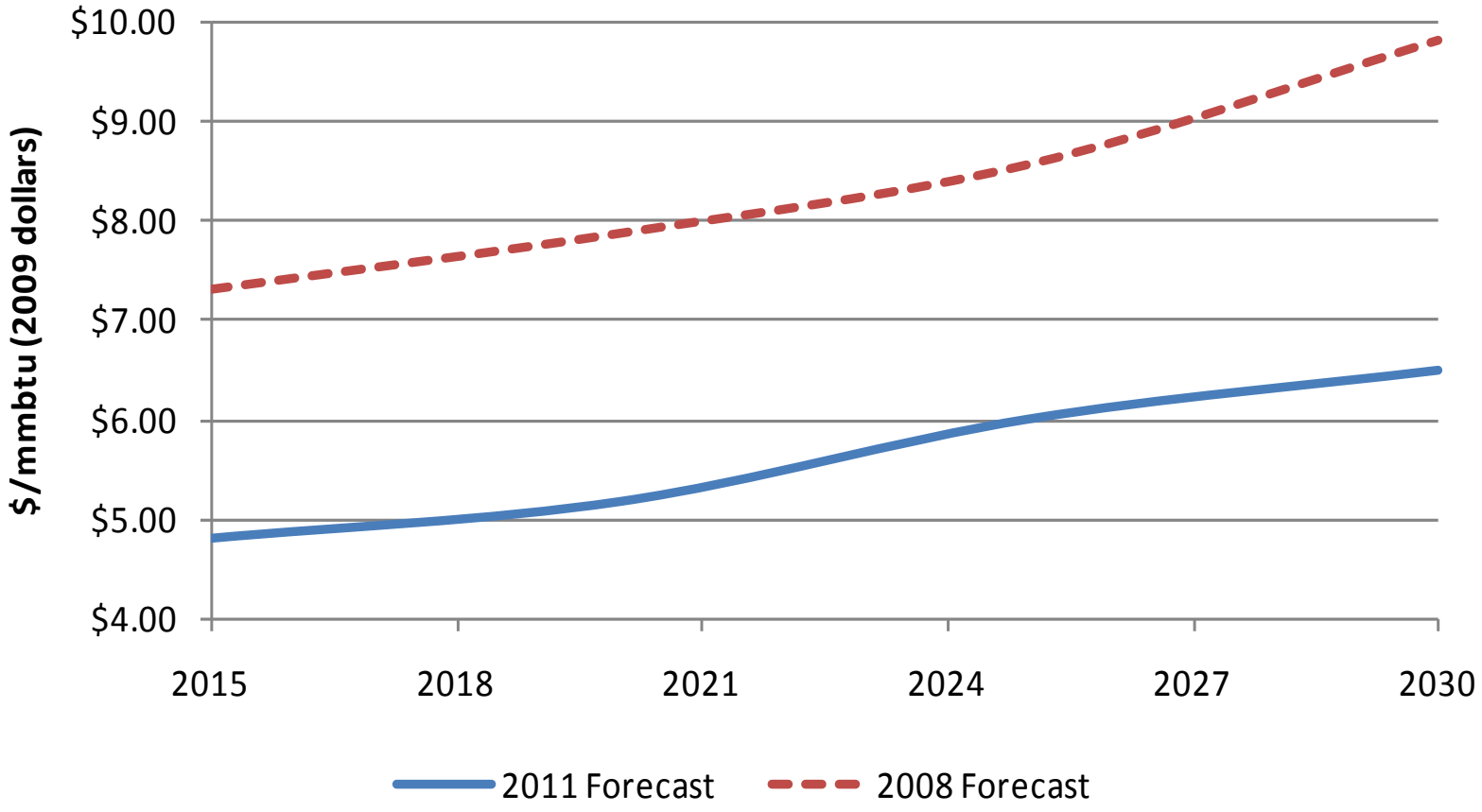
Regulation of Greenhouse Gas

- Near term – insufficient support for comprehensive climate change legislation coming out of Congress
- 2009 – EPA begins regulating GHG under the Clean Air Act
- Subject to judicial challenge
- Congress may try to limit regulatory action under CAA

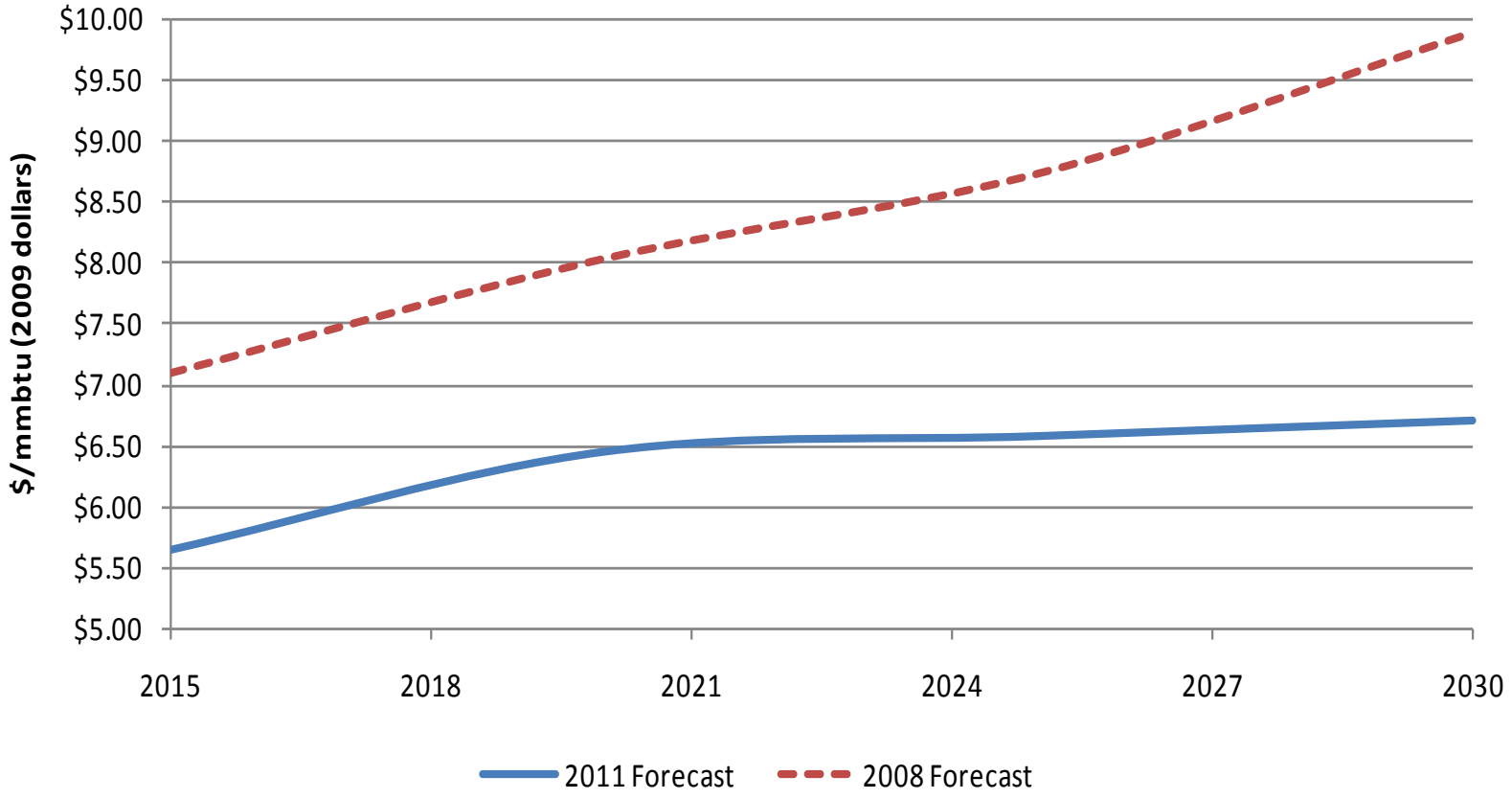
Regulation of Air Emissions

- EPA will soon issue tougher air emission standards for nitrogen dioxide, sulfur dioxide, mercury
- Large compliance costs for old coal plants:
  - Upgrading plant vs.
  - New natural gas plant
- Decision depends on severity of regs and coal/gas price spread
  - At low gas prices coal plants will be shut down
- Do not underestimate coal and railroad lobby

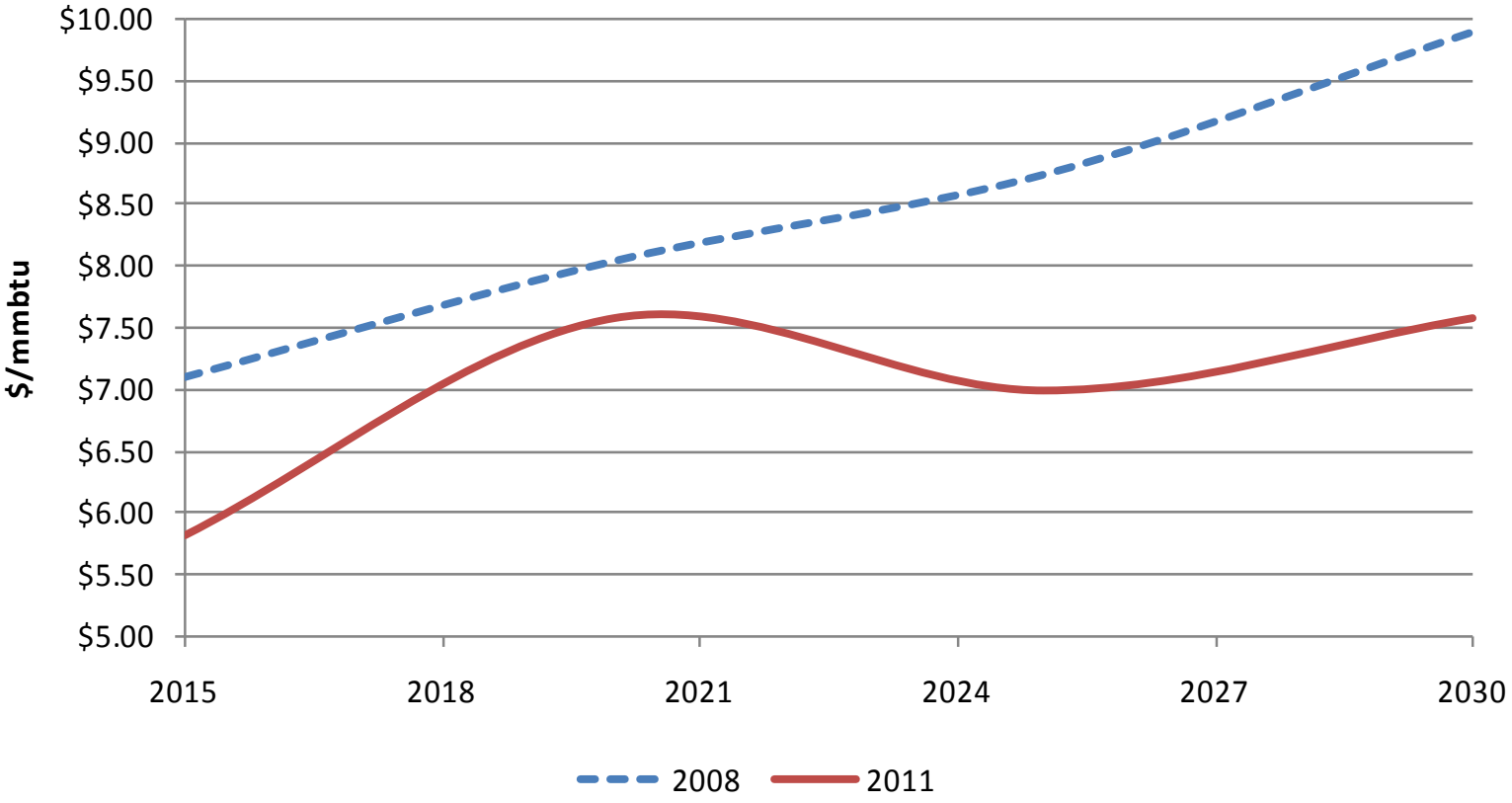
2008 vs. 2011 DOE/EIA Henry Hub Forecast ($/mmbtu) (2009 dollars)

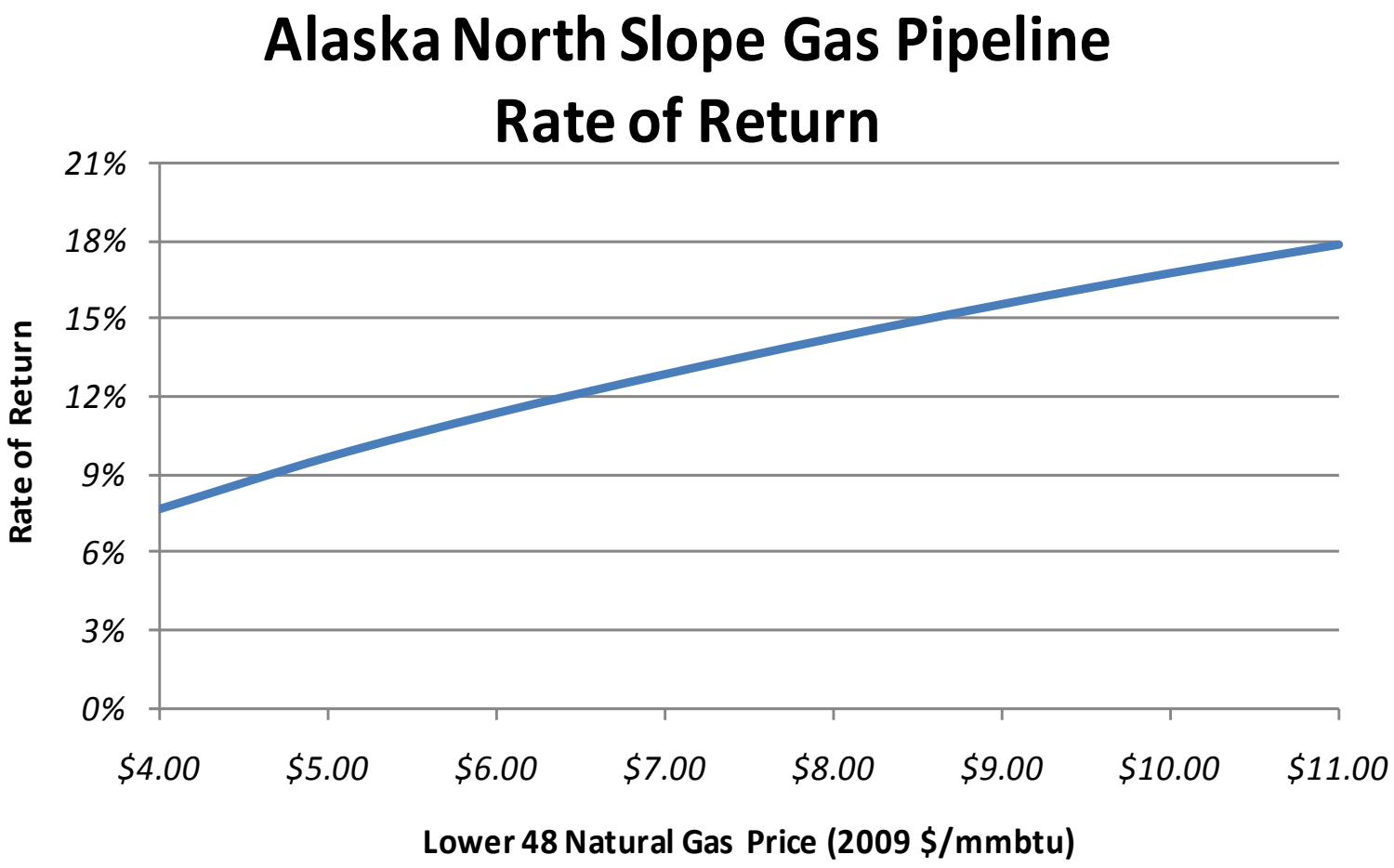


2008 vs. 2011 Wood Mackenzie Henry Hub Forecast ($/mmbtu) (2009 dollars)



2008 vs. 2011 Black & Veatch Henry Hub Forecast ($/mmbtu) (2009 dollars)




Alaska North Slope Gas Pipeline
Rate of Return
21%
18%
15%
12%
9%
6%
3%
0%
Rate of Return
$4.00
$5.00
$6.00
$7.00
$8.00
$9.00
$10.00
$11.00
Lower 48 Natural Gas Price (2009 $/mmbtu)

Conclusion: What has Changed between 2008 and Now?

- Short-medium term:
  - Grim market outlook
  - Imprudent for investors to proceed while uncertainties playing themselves out
  - Outlook for North Slope gas commercialization has been deferred
- Longer-term
  - Depending on how certainties play out
  - Possible alternative opportunities