

# Emerging Oil & Gas Supplies: Future Prospects for Oil & Gas Production



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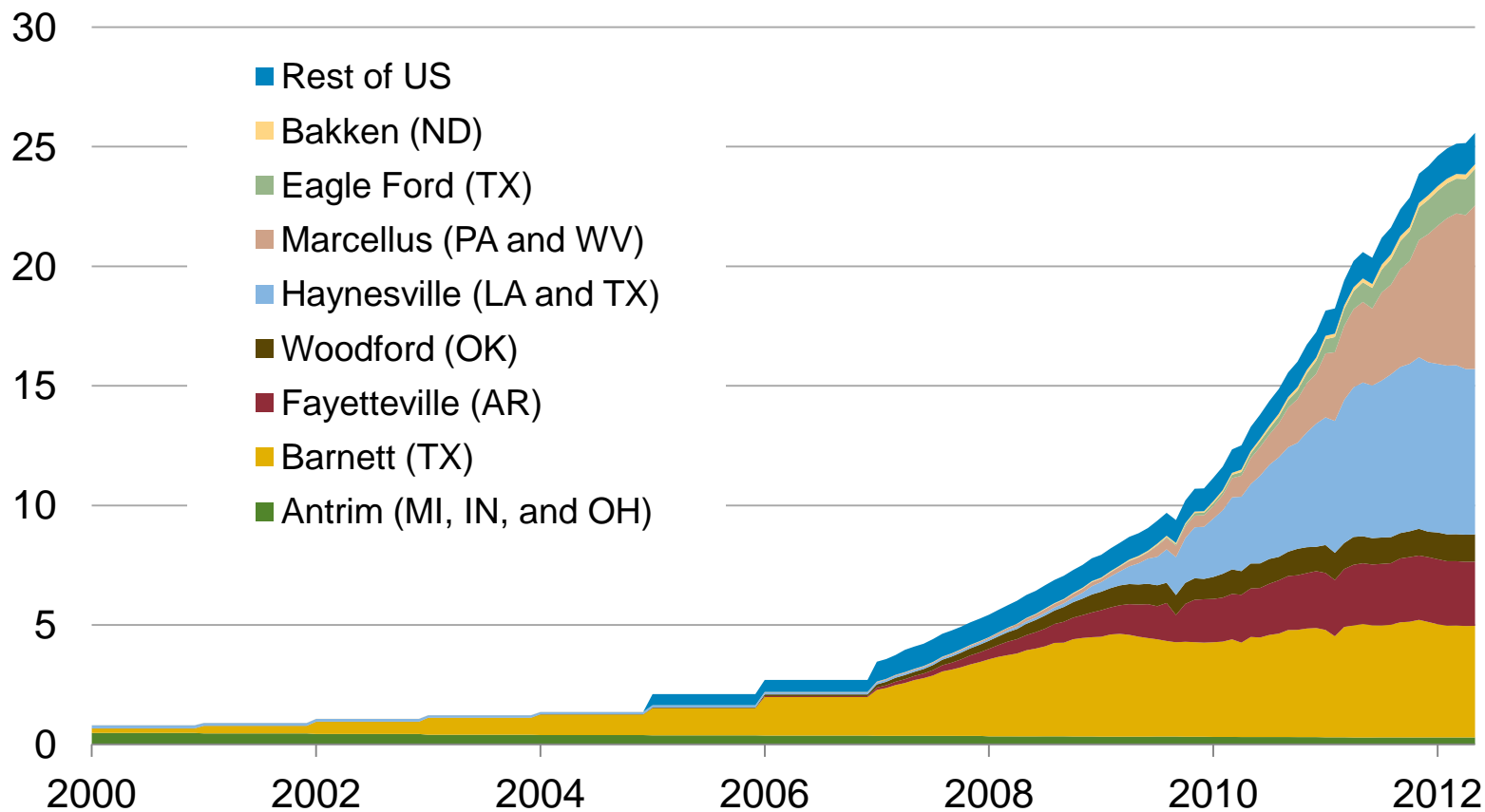
*for*

*Bipartisan Policy Center: Understanding the New Energy Landscape  
June 27, 2012/ Washington, DC*

*John Staub, Team Leader for Exploration and Production Analysis*

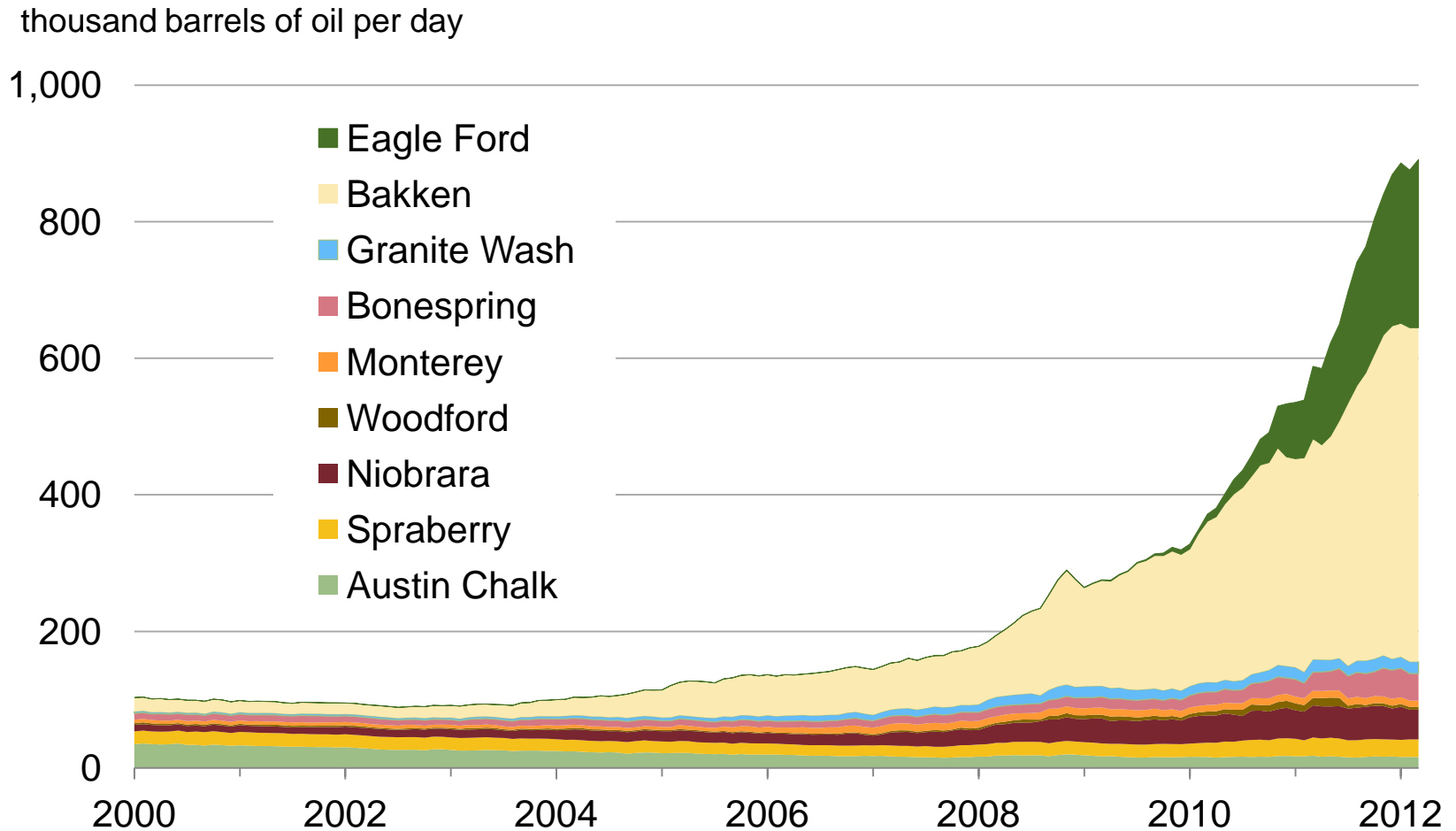
# U.S. shale gas production comprised over 30 percent of total U.S. dry production, in 2011

shale gas production (dry)  
billion cubic feet per day



Sources: Lippman Consulting, Inc. gross withdrawal estimates as of May 2012 and converted to dry production estimates with EIA-calculated average gross-to-dry shrinkage factors by state and/or shale play.

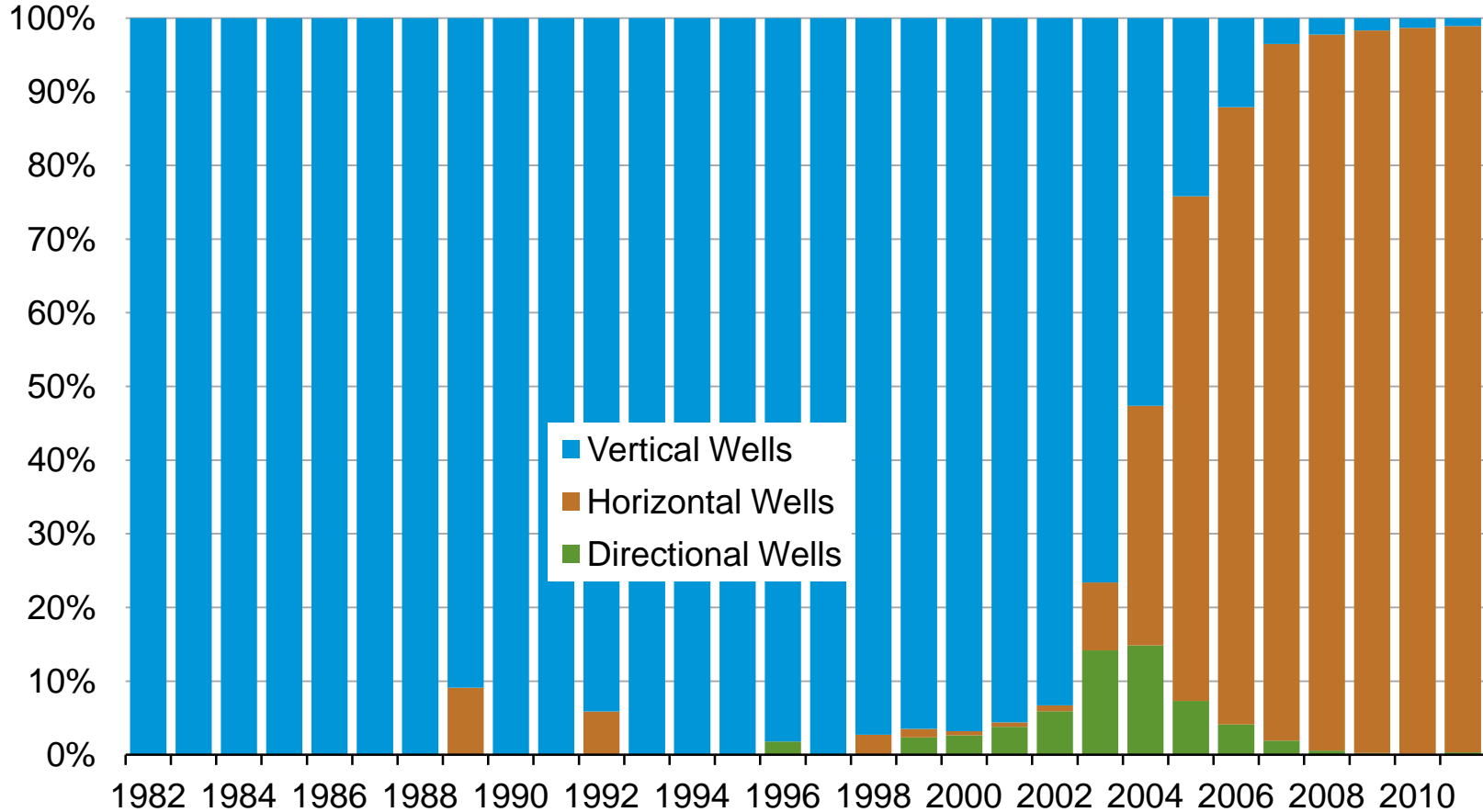
# Tight oil production for selected plays in March 2012 approaches 900,000 barrels per day



Source: HPDI, Texas RRC, North Dakota department of mineral resources, and EIA, through March, 2012.

# Technology and its application can change rapidly: horizontal drilling replaced vertical drilling in the Barnett shale between 2003 and 2007

percentage of new wells drilled



Source: EIA analysis of Barnett shale play

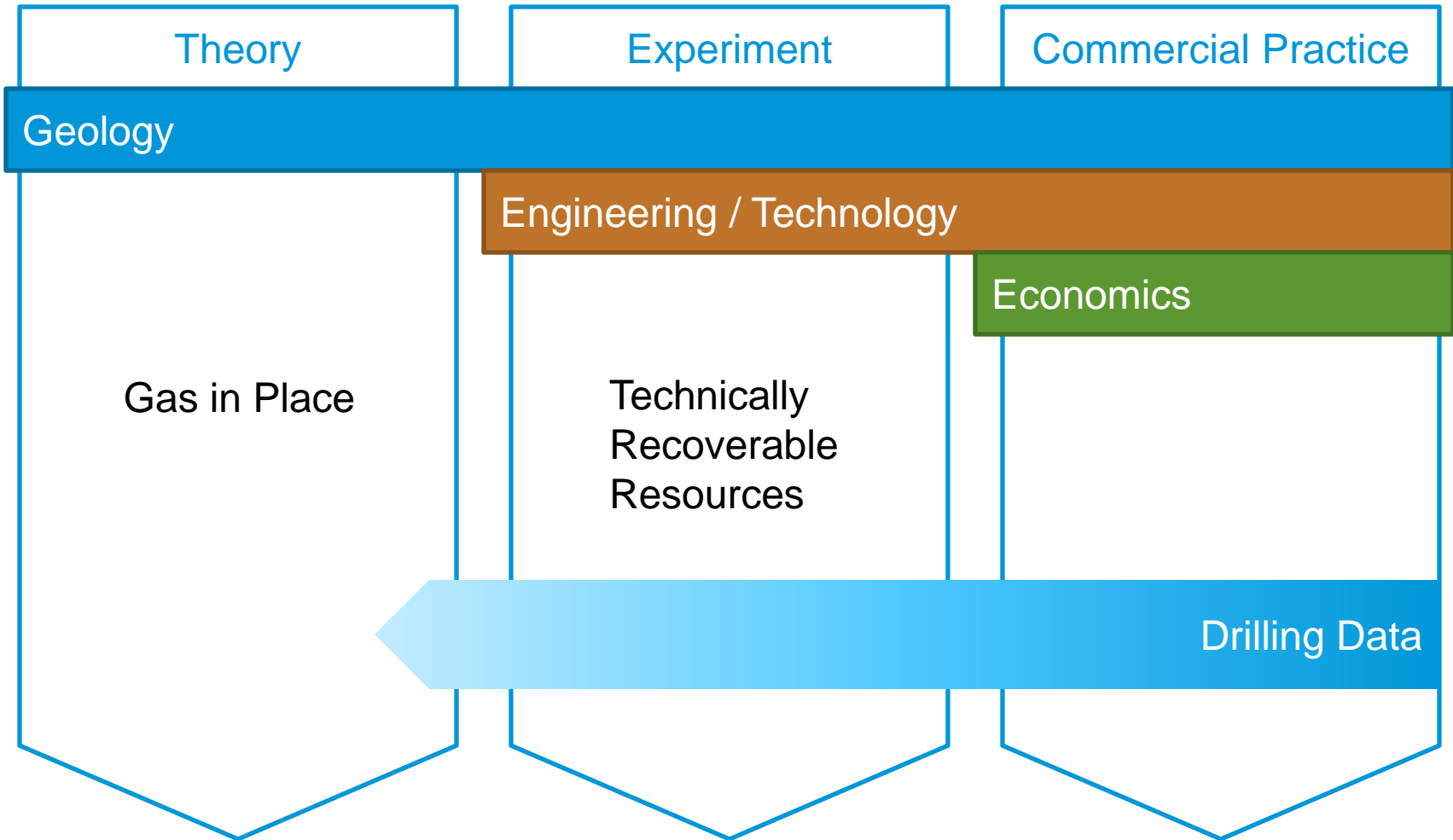
# The shale gas & tight oil technology story is only beginning, with much yet to be written

- Technology is creating new resources out of rocks
- Production data provides a rearview mirror perspective
  - see the changes, but with a delay
  - EIA does not anticipate step changes in technology applications
  - EIA does recognize and incorporate long-term technological change
- Annual re-estimating of U.S. plays is necessary
  - new data is providing significant new detail of what production is possible
- Broad implications exist for world wide oil and gas production

# The shale gas & tight oil uncertainty

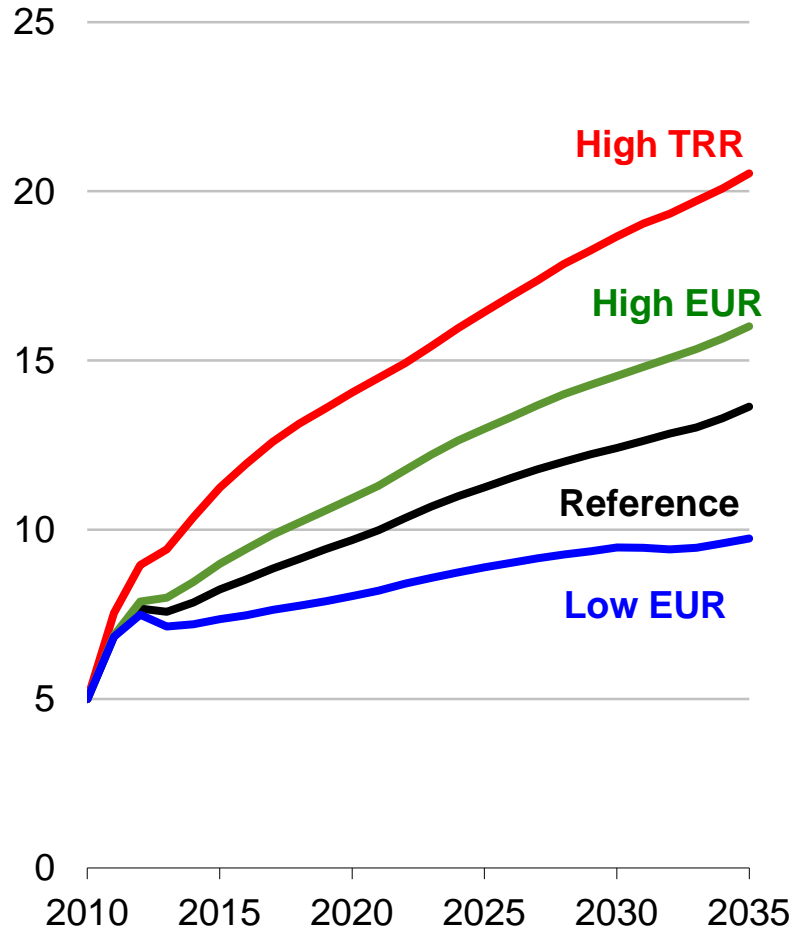
- Uncertainty is illustrated through scenario analysis of key variables
  - resource volume, how well we understand geology characteristics, productivity of wells across a play and over time, and how many wells can be drilled
  - Technically Recoverable Resources is only one measure of production potential
  - others considerations include: depth, access, labor and infrastructure availability, which all play a role in the cost of production

Technically recoverable resources are dynamic and reflect changing understanding of geology, technology and economics



# Shale gas resource potential and related costs remain highly uncertain

Shale gas production  
trillion cubic feet



Source: EIA, Annual Energy Outlook 2012

## Three alternate cases

**High Technically Recoverable Resource (TRR) case** assumes High EUR case with wells closer together (80 acres per well), and it could represent finding more plays.

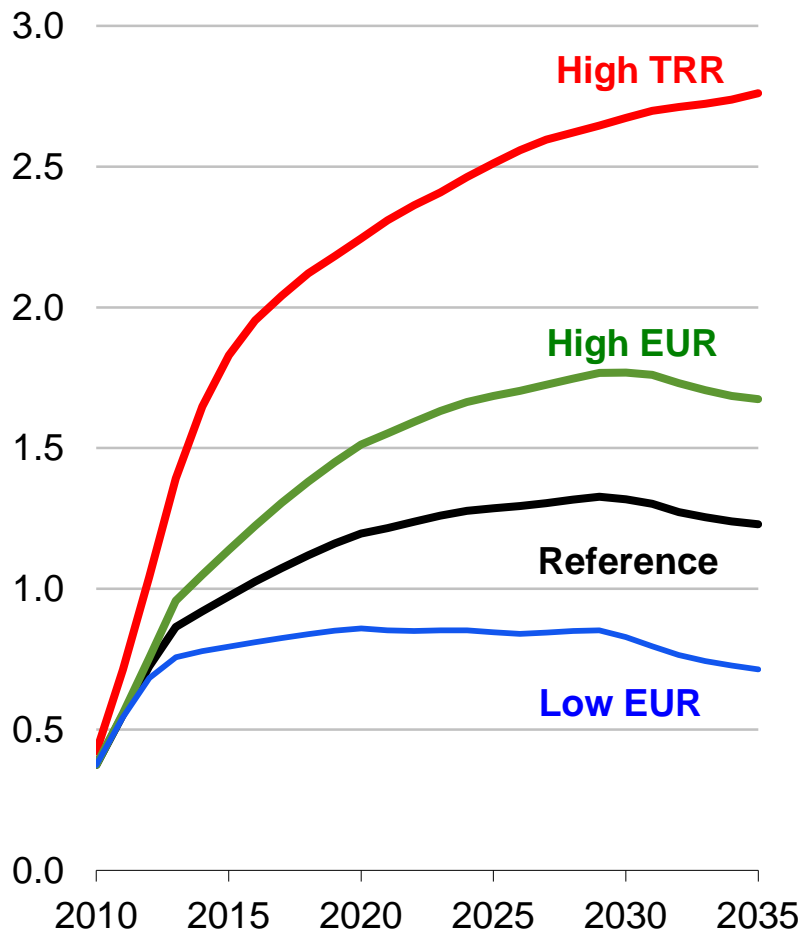
**High Estimate Ultimate Recovery (EUR) case** assumes an EUR per shale gas well set 50% higher than in the Reference case. Results in lower per Mcf costs.

**Low EUR** case is like High EUR but lower.



# Tight oil resource potential and production remain highly uncertain

Tight oil production  
million barrels per day



Source: EIA, Annual Energy Outlook 2012

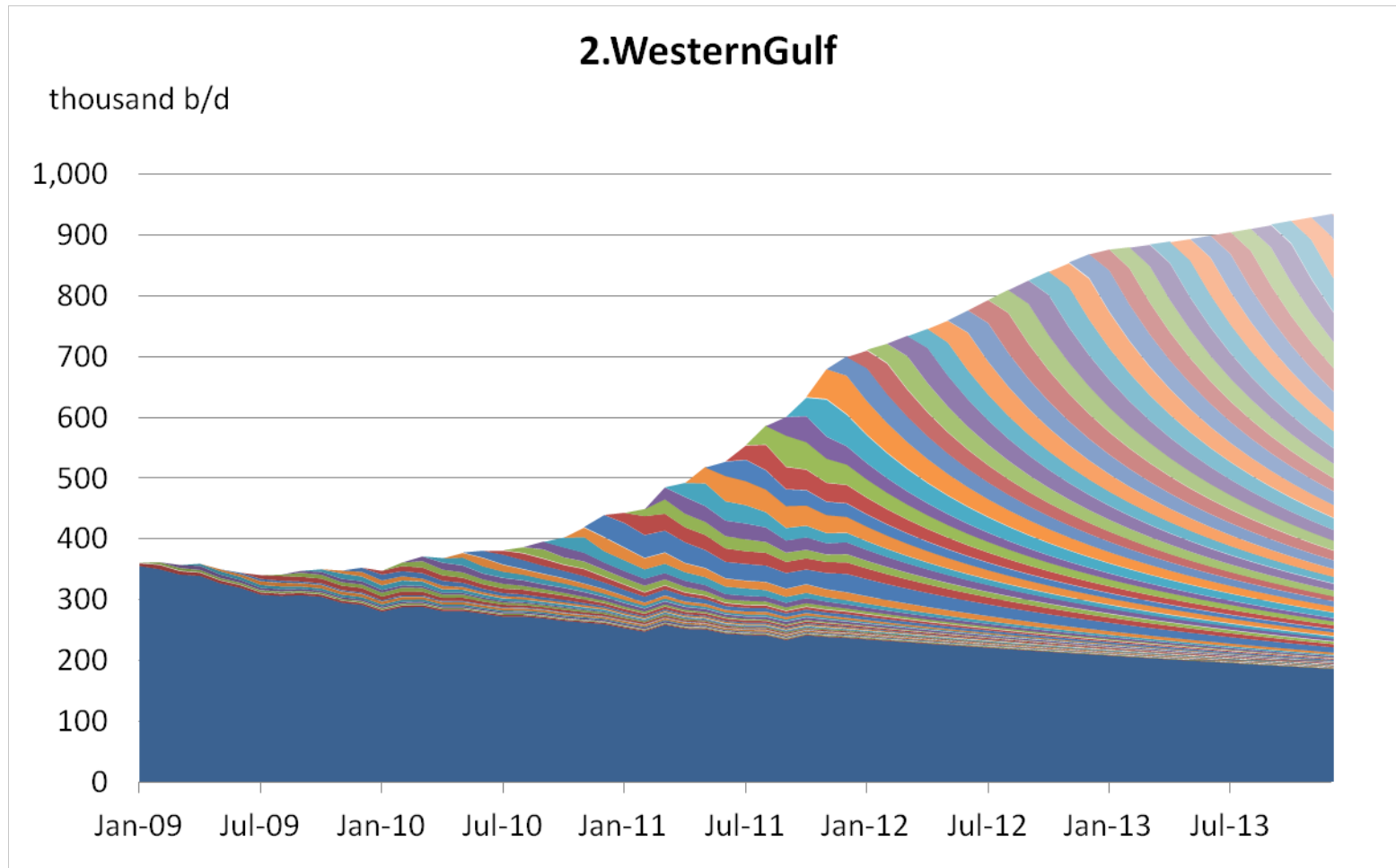
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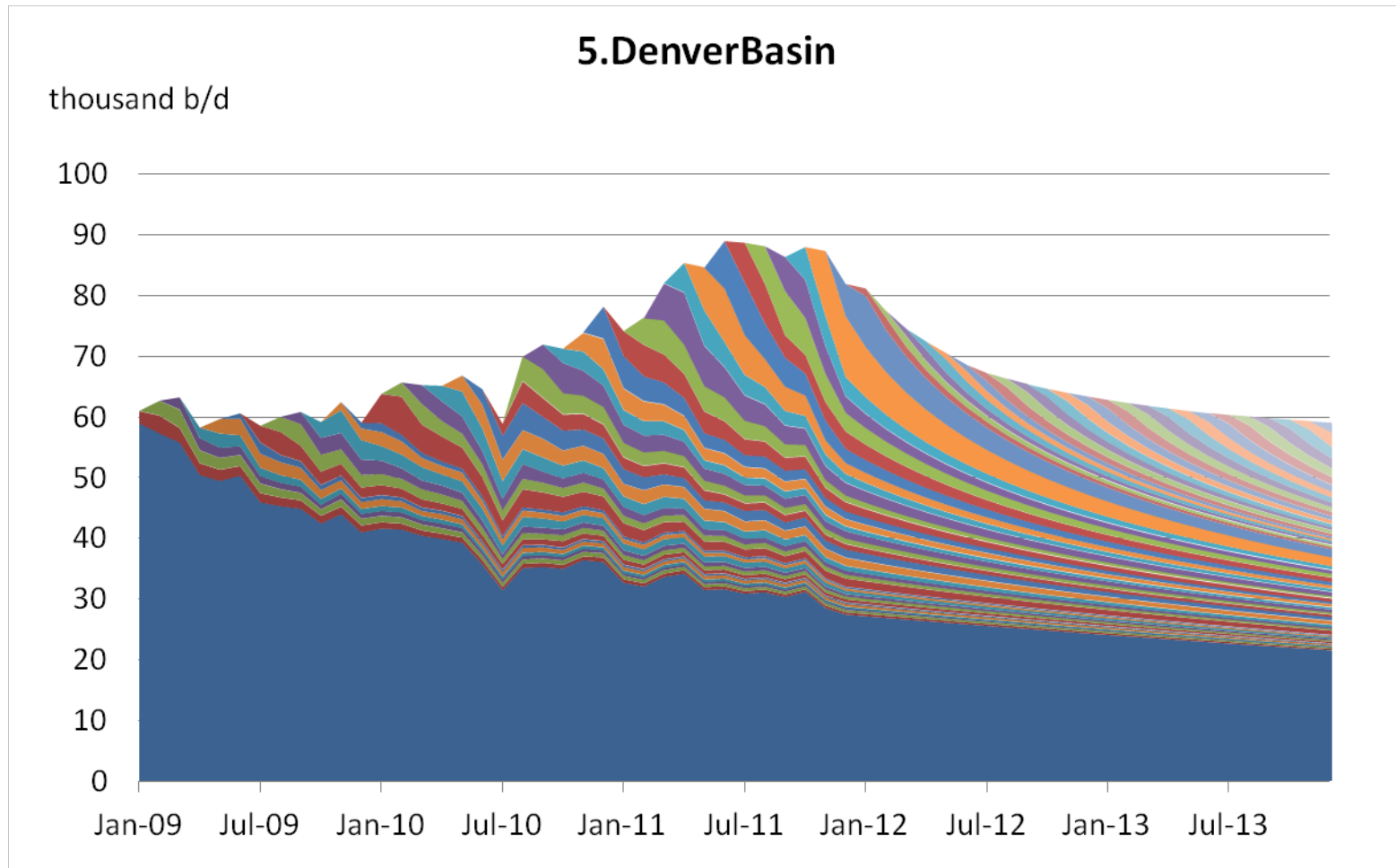
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# Increased drilling in the Western Gulf Basin (Eagle Ford play) is driving up oil production



Source: EIA, HPDI

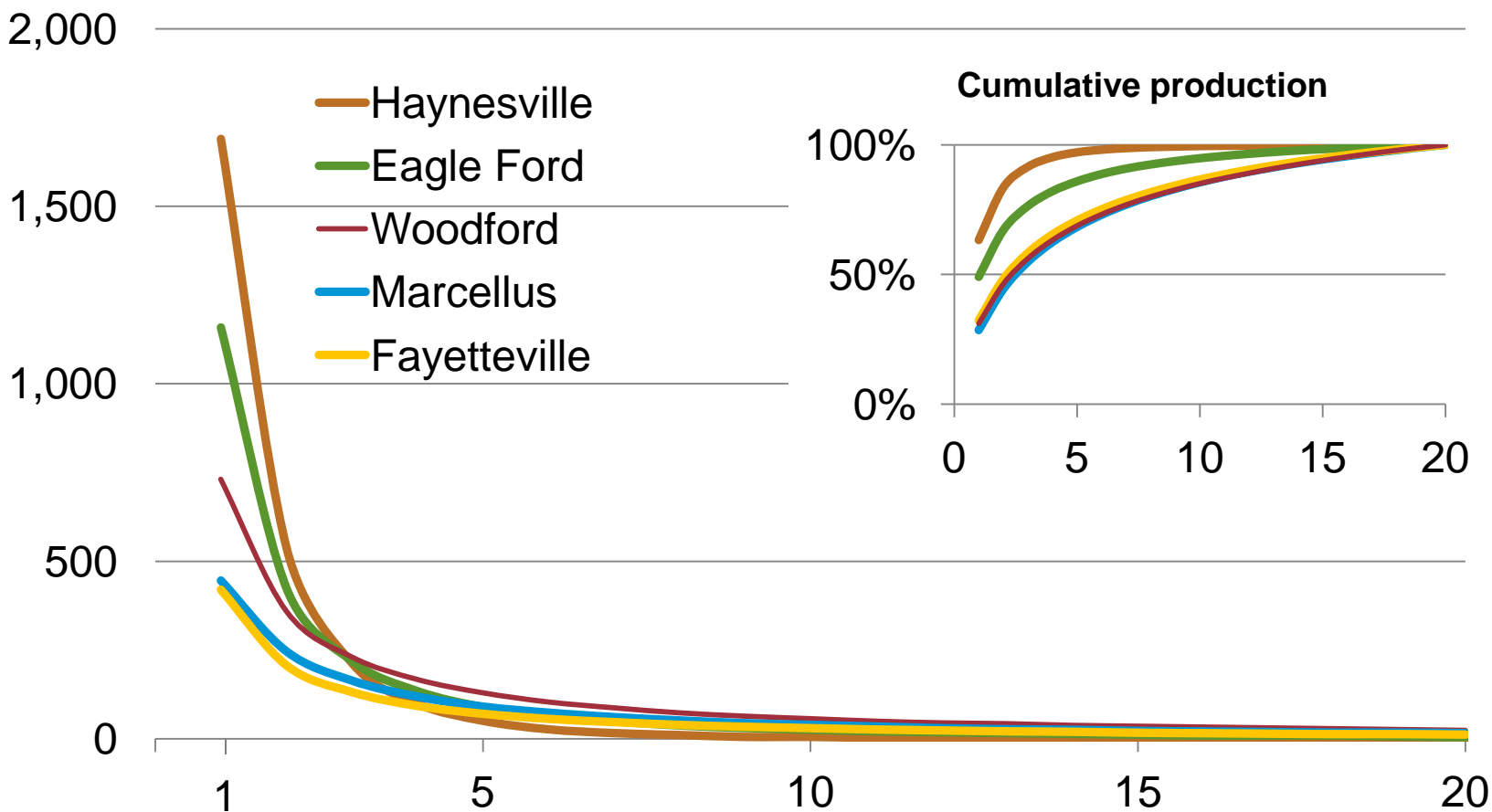
# Denver Basin (Niobrara play) production is expected to fall due to better productivity in other plays



Source: EIA, HPDI

# Steep decline curves for shale gas plays make the market more responsive to price

million cubic feet per year



Source: EIA, Annual Energy Outlook 2012

# Some questions to consider:

What is possible?

What are the risks?

- What do we know, and don't know, about the resources?
- What is the possible rate and magnitude of production?
  - What is the breakeven cost, or profitability that is driving the industry?
  - What is the possibility that we aim to low or have overlooked some better prospects?
  - What are the technology factors that either could be improved upon, or have already been improved upon, to achieve that growth?
- What, if anything, is standing in the way of achieving the full potential of tight oil?
  - Labor, access to resources, pipeline or rail capacity, refinery capacity and type

# For more information

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

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

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

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

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