Regulation and Marcellus Shale

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If the right things happen, Shale could represent a lot of gas.

- A resource that would last over 100 years.
- A low-cost, low-carbon, clean fuel source to meet climate-change objectives.
- A trajectory of potential development that could add 50 percent to U.S. annual supplies by the mid-2020s.
- A global resource that could supply world gas requirements for over 150 years.
- But "the right things" that have to happen include three areas that all have a strong regulatory overlay: Facilities, water/land use, and the need for healthy demand growth.

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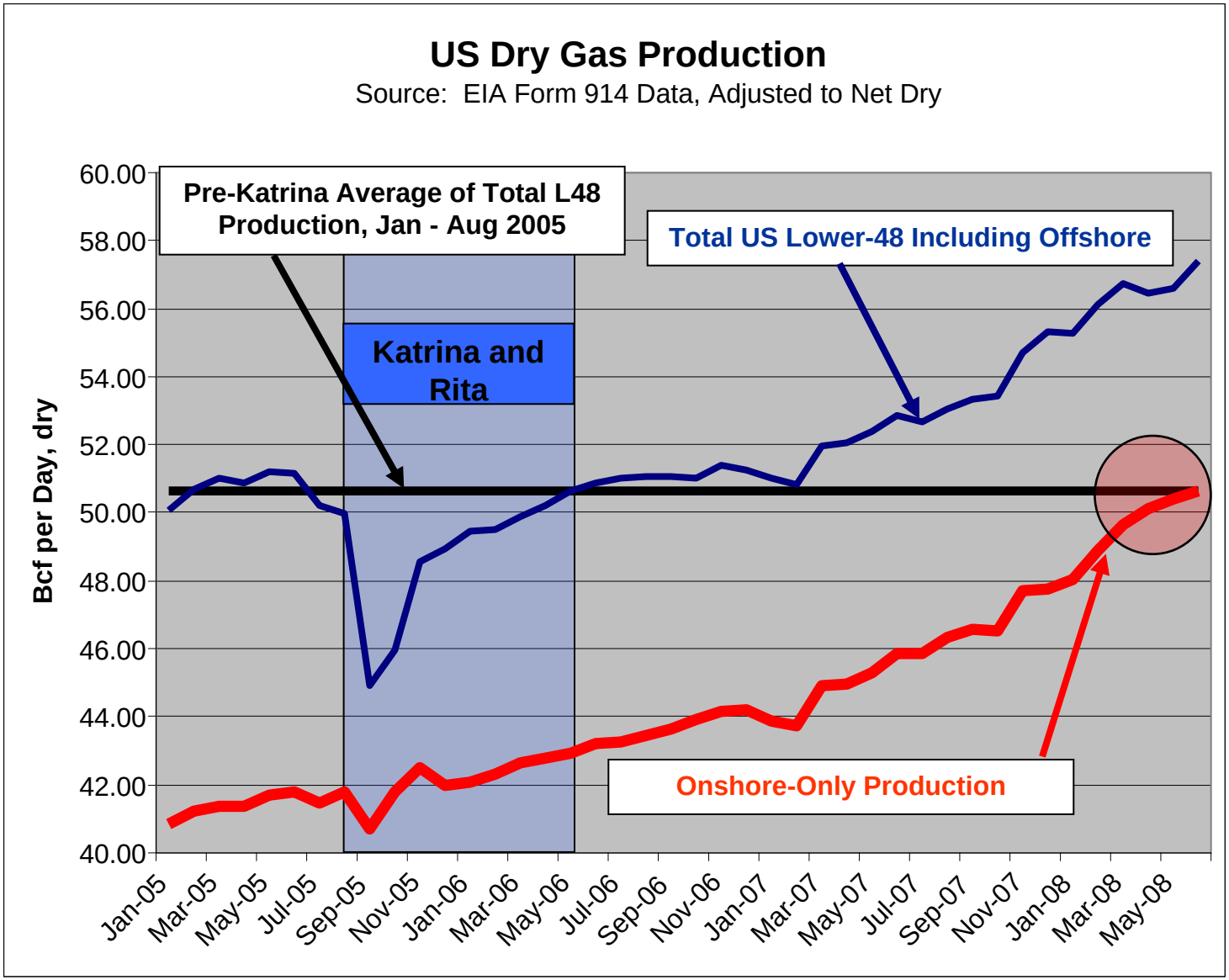
Through 2008,Production Increased Rapidly.-----As of June 2008, Onshore Production by itself Reached the Pre-Katrina Value for Total Lower 48 Production



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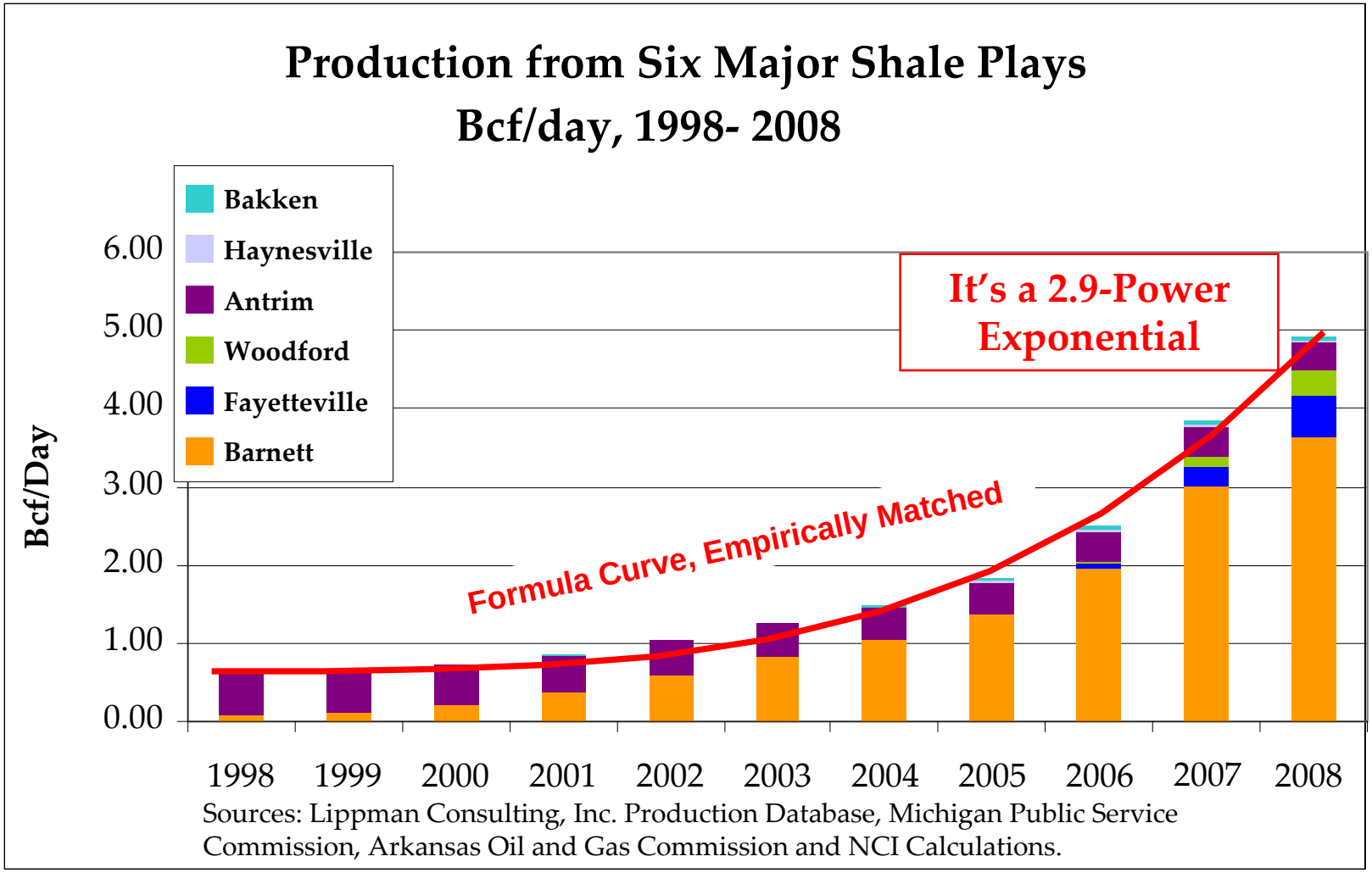
The Accelerating Run-Up in Shale Production—An Exponential Curve



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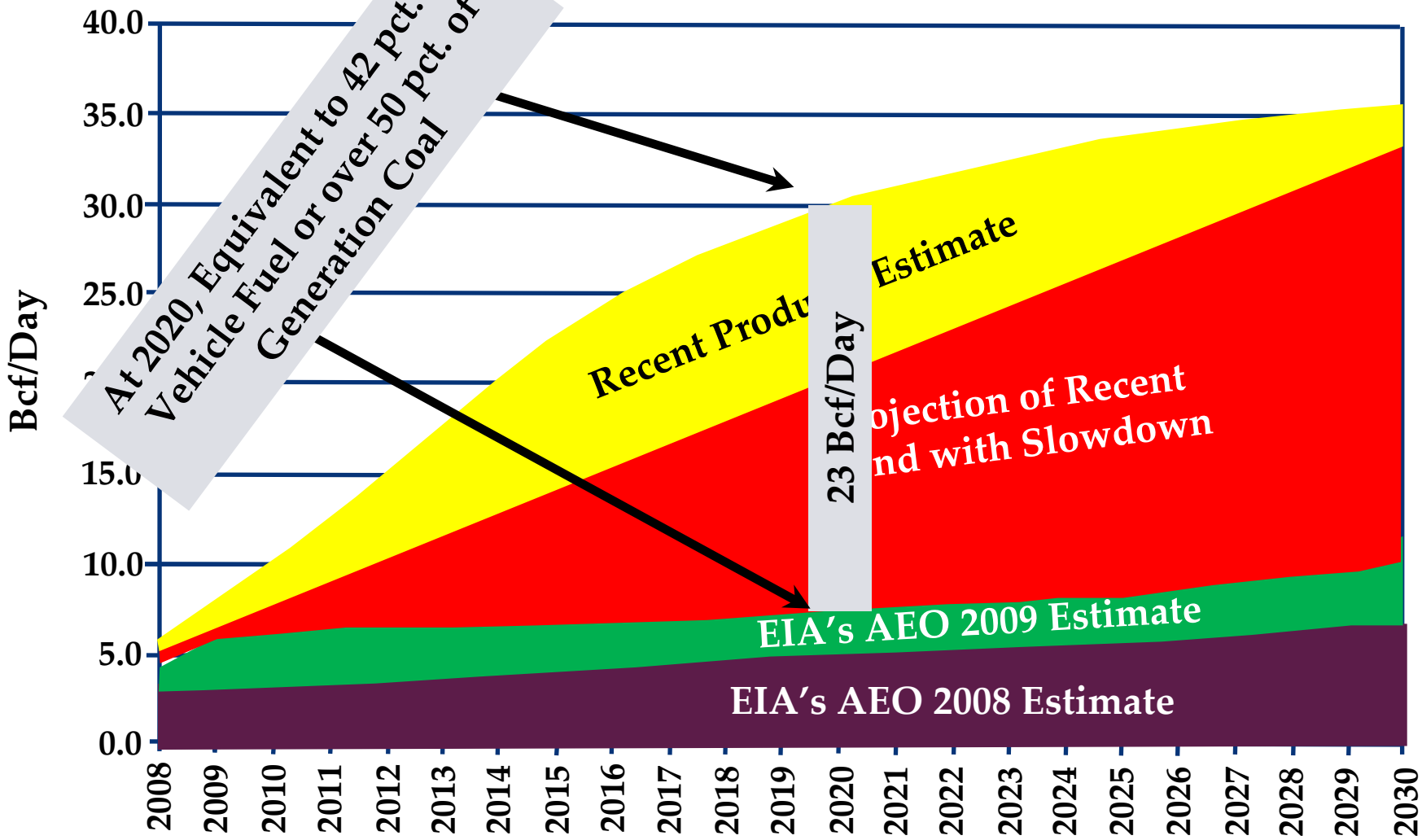
The Variation in Shale Production Estimates is Large

Projections of US S' Gas Production—From EIA to the Producers



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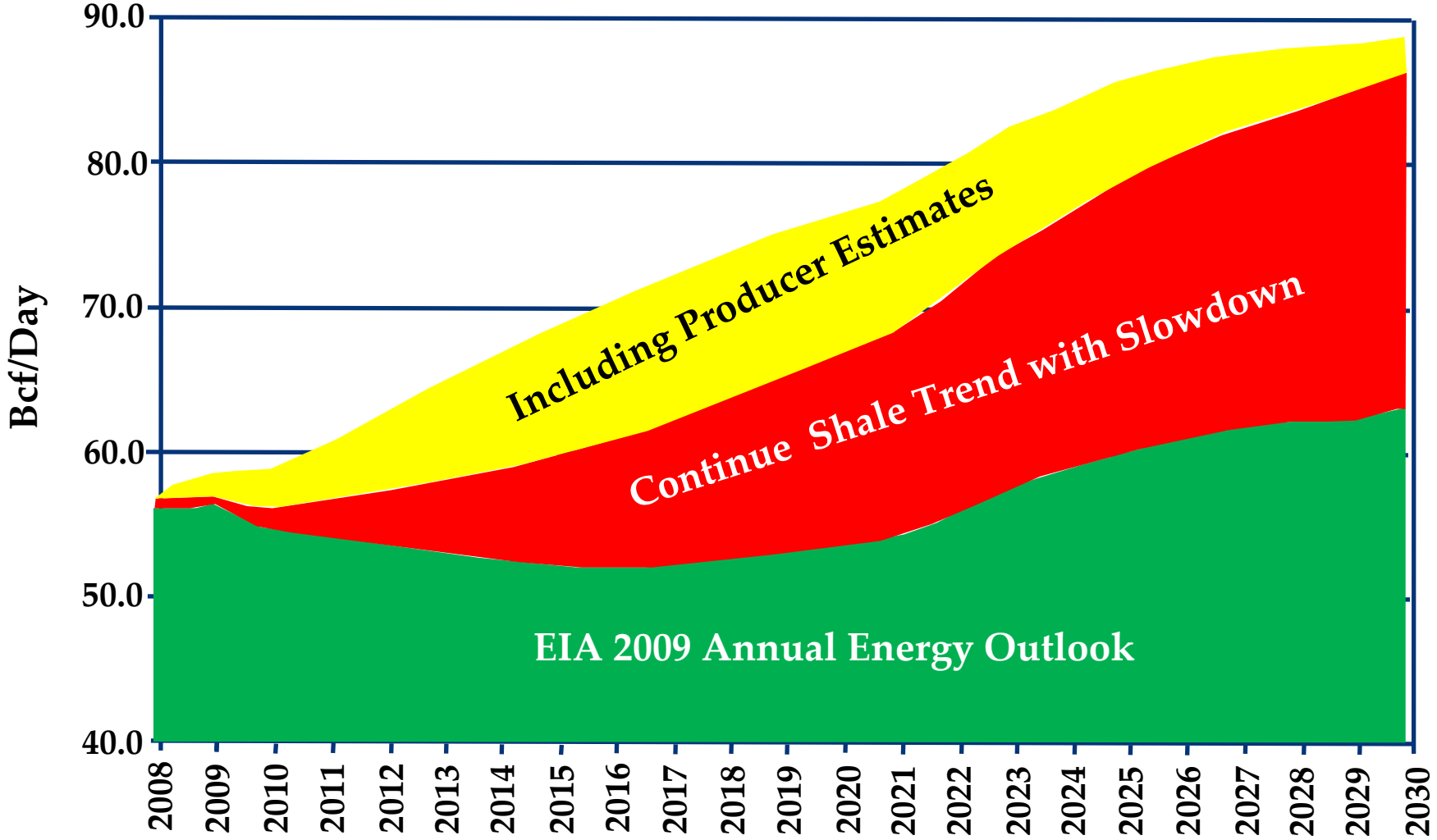
The Impact on Domestic U.S. Natural Gas Production

From the mid-50s to almost 90 Bcfd in just over 20 years



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Regulation affects every aspect of shale development

- **FERC and DOT** regulation, determining the adequacy, safety, and configuration of the facilities that get the gas to market.

- **State and water-authority** regulation determining the conditions for drilling, for land use, for hydraulic fracturing, and for fluid disposal.

- **PUC regulation** in every state, determining the rules affecting gas use, power-generation fuel, and thus the overall demand side of shale's economic equation.

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Relative state of development varies widely among regulatory areas

- FERC and DOT are the farthest along. Specifically, multiple reviews of the process for new-pipeline review and approval have indicated a near-perfect process, within the constraints of the statutes that must be observed.

- State and water-authority regulation, at least in Pennsylvania, are also extremely mature and sophisticated, as indicated in Professor Engelder's remarks. The issues surrounding water supply, fracturing dynamics, and disposal have been actively addressed for years, benefitting heavily from Pennsylvania's longstanding role as an active gas-exploration region.

- Regulatory treatment of gas, especially as a generation fuel, has the furthest to go. This will be a key area of continuing effort and scrutiny in the climate-change debate and the response of state regulators.

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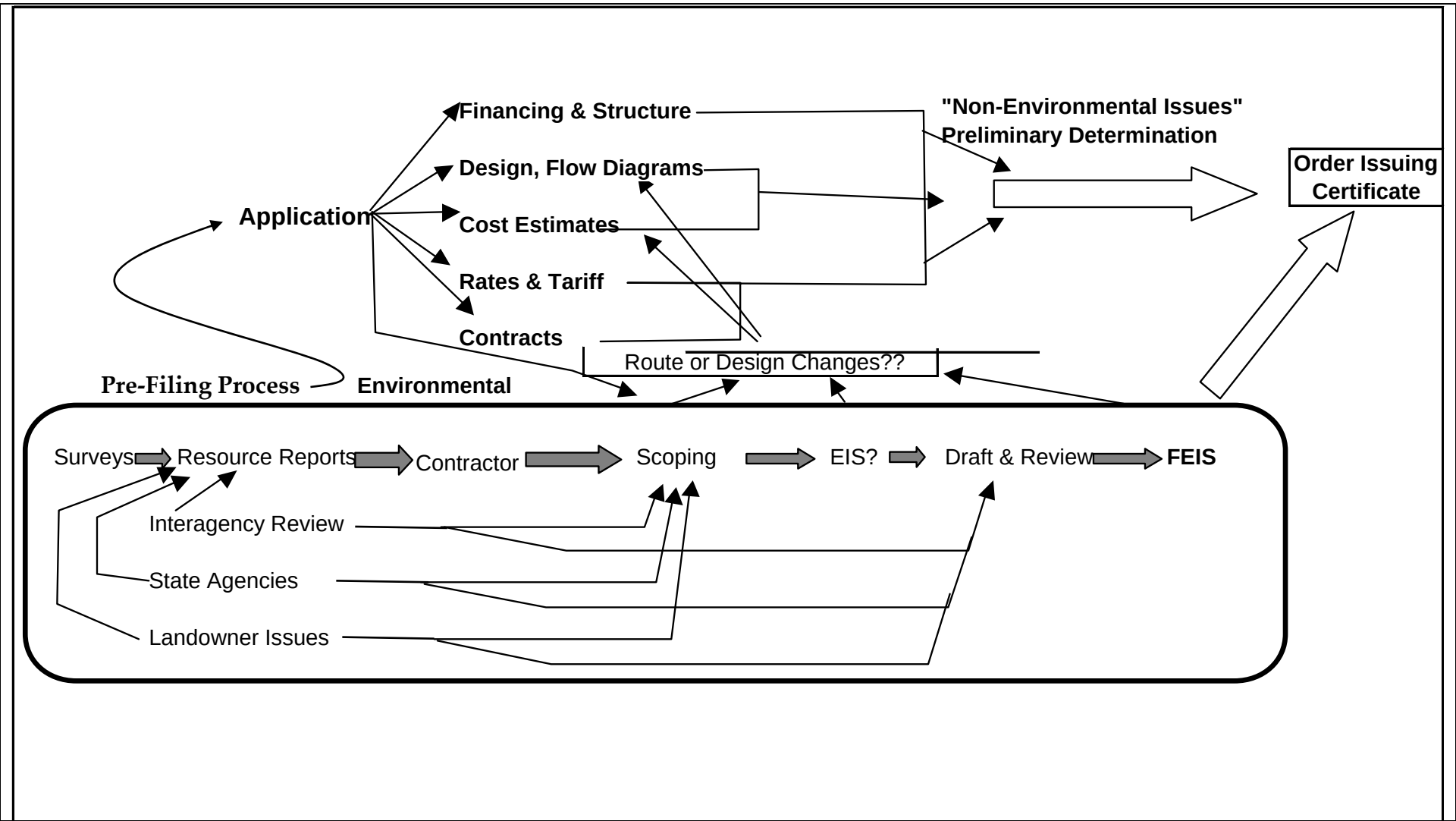
The Full FERC Certificate Process—Environmental Is the Critical Path



SO WHAT ABOUT DRILLING AND WATER?

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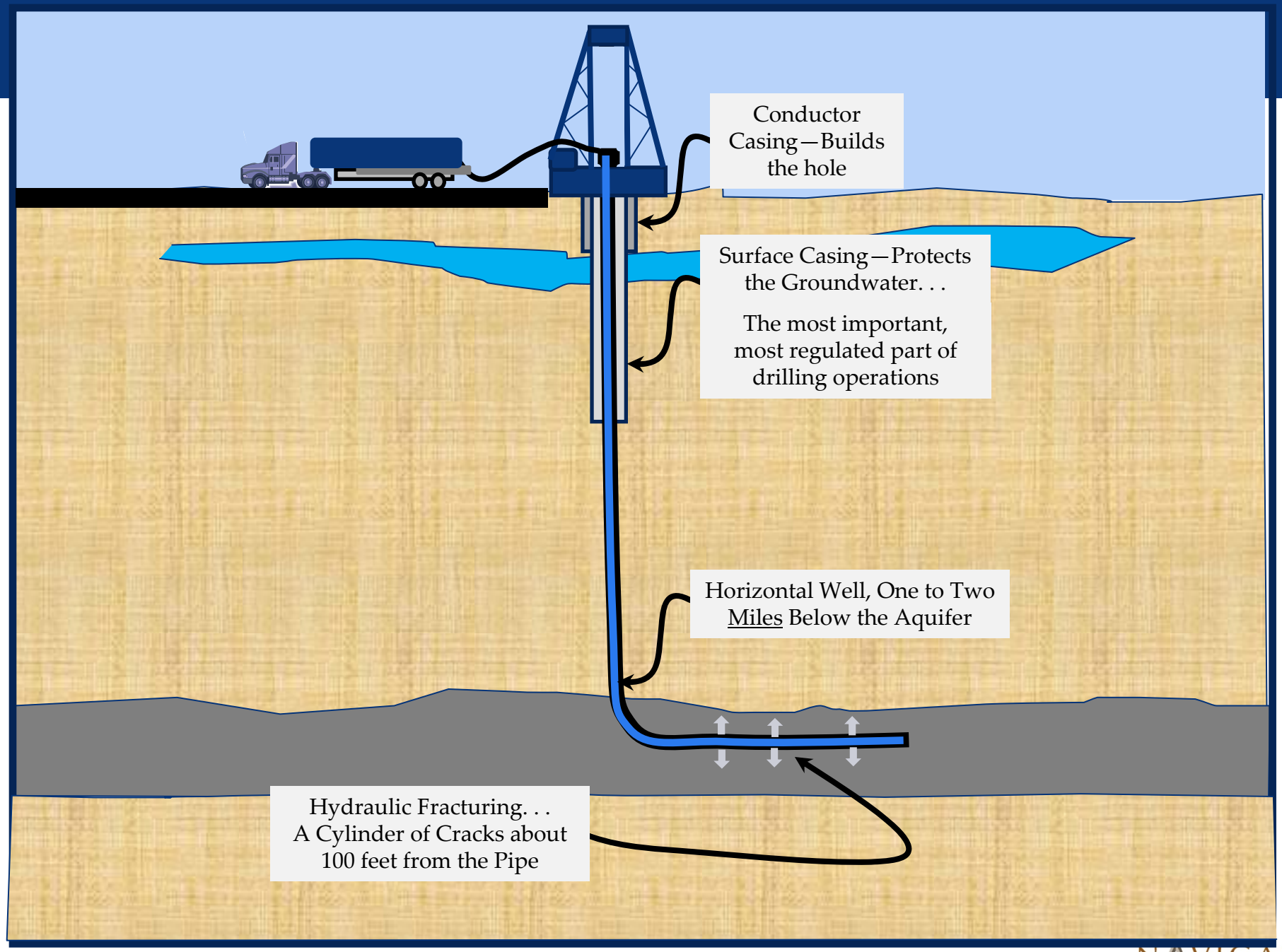

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It's all about Power Generation

- U.S. Gas-fired generation operates at a 26 percent capacity factor
- We actually have more gas-fired capacity than coal-fired—but coal runs at 70 percent
- Initiatives are underway to
  - (1) get rid of the dirtiest, lowest-efficiency coal plants and
  - (2) see whether the dispatch queue can be changed
- Both will take extensive PUC involvement, state by state
- Will internalizing the cost of carbon be enough?
- Can a similar tilt be accomplished worldwide, to balance the LNG market?

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