

The Future Role of Natural Gas in the U.S.

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President & CEO

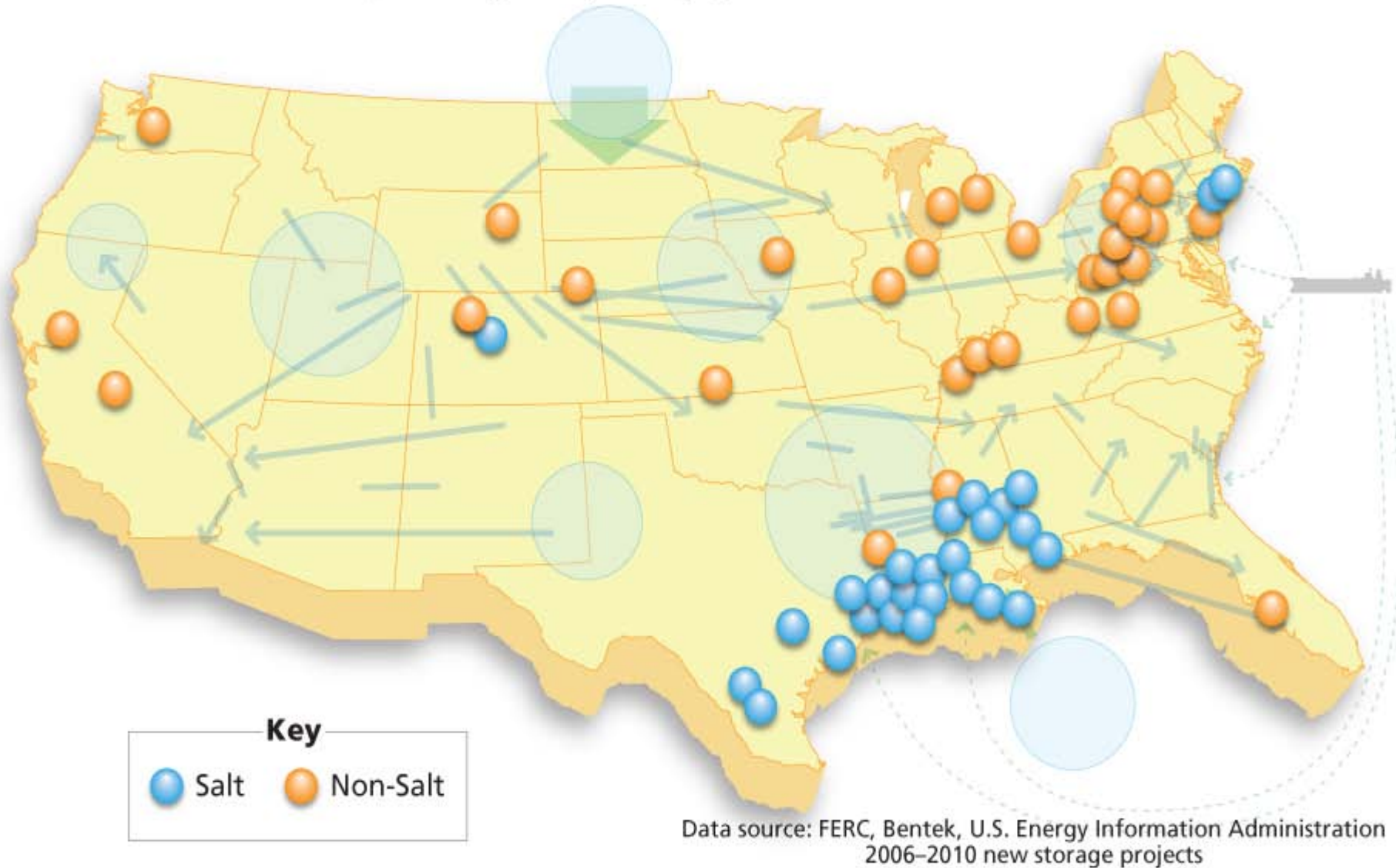
Harvard Electricity Policy Group

June 2, 2011

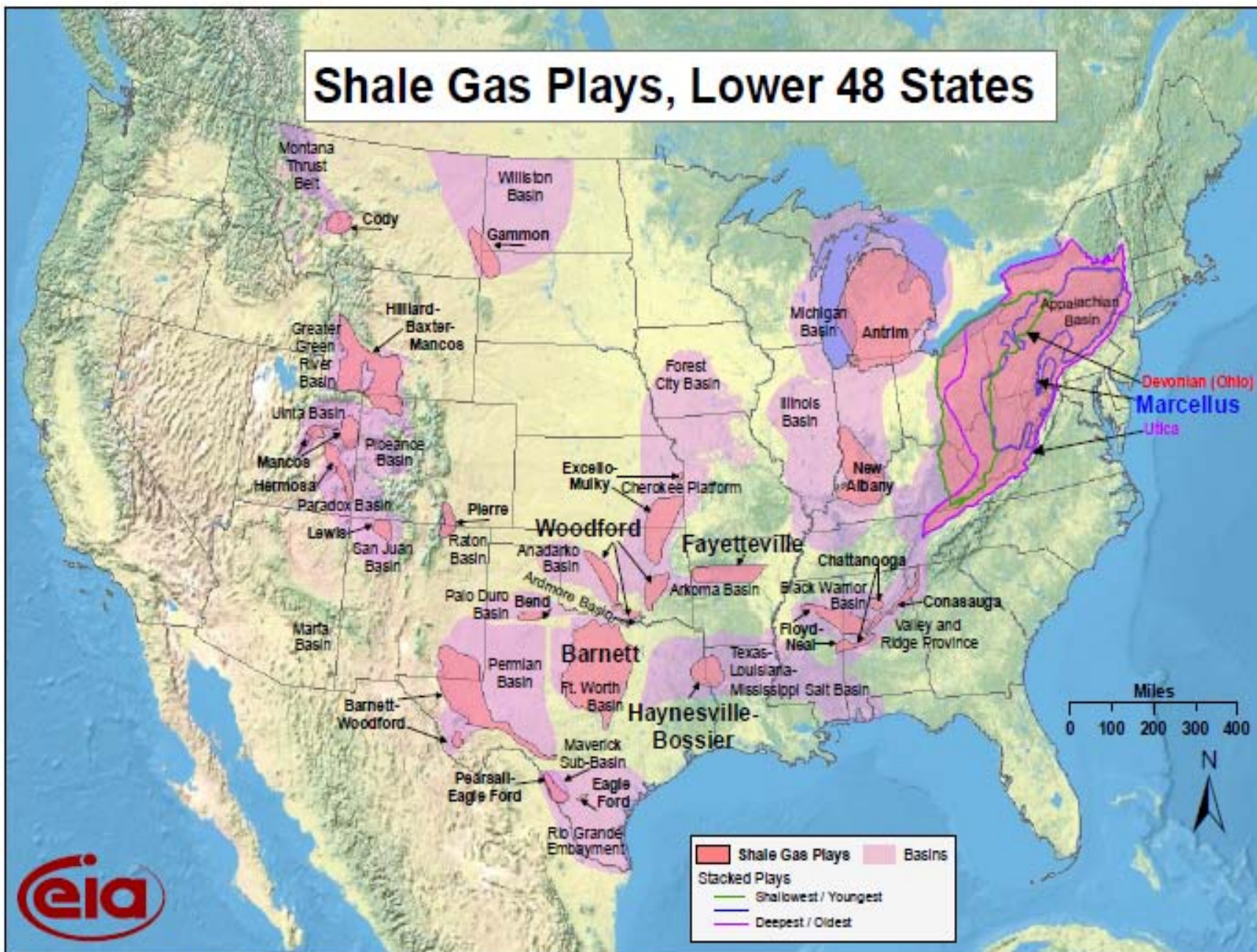
Washington, DC

Decade of Growing Natural Gas Infrastructure

Working storage capacity grew 22% 2006–2010

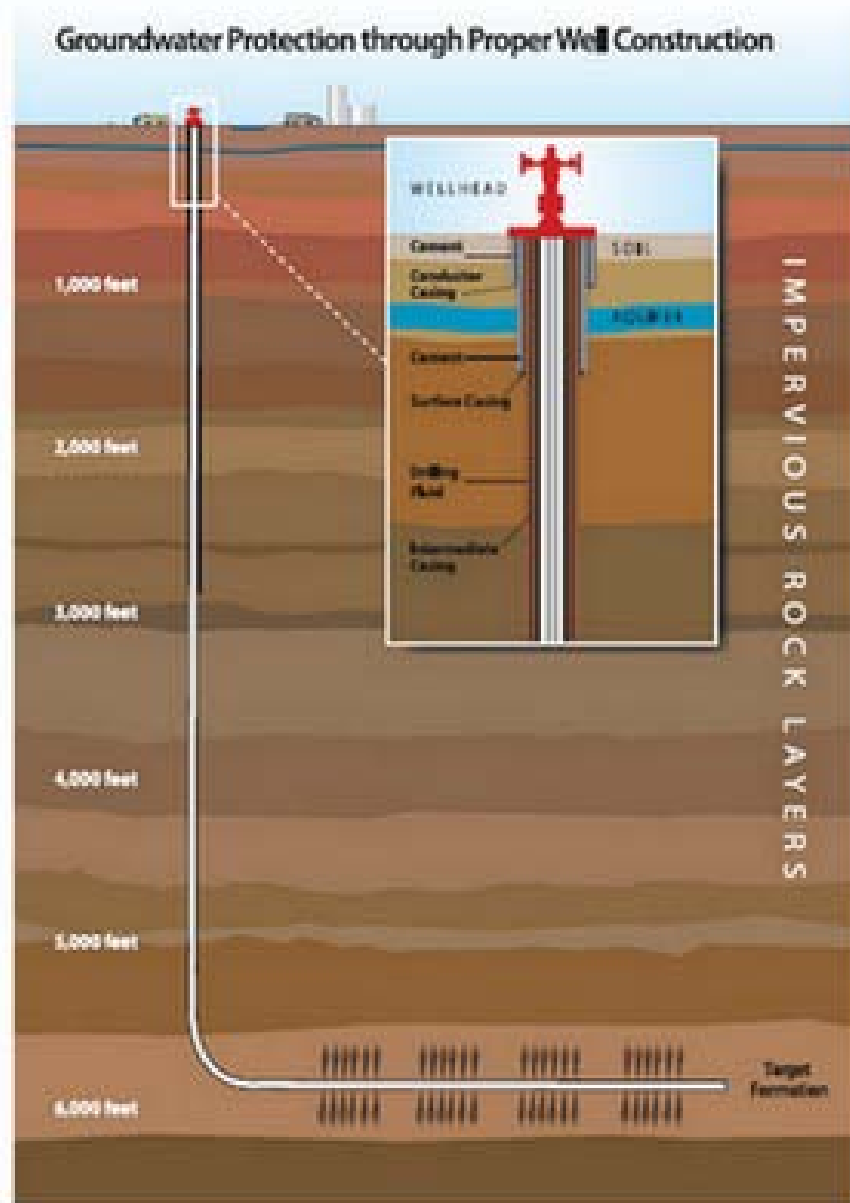


Shale Gas Plays, Lower 48 States



Source: Energy Information Administration based on data from various published studies.
 Updated: March 10, 2010

How Shale Produces Natural Gas

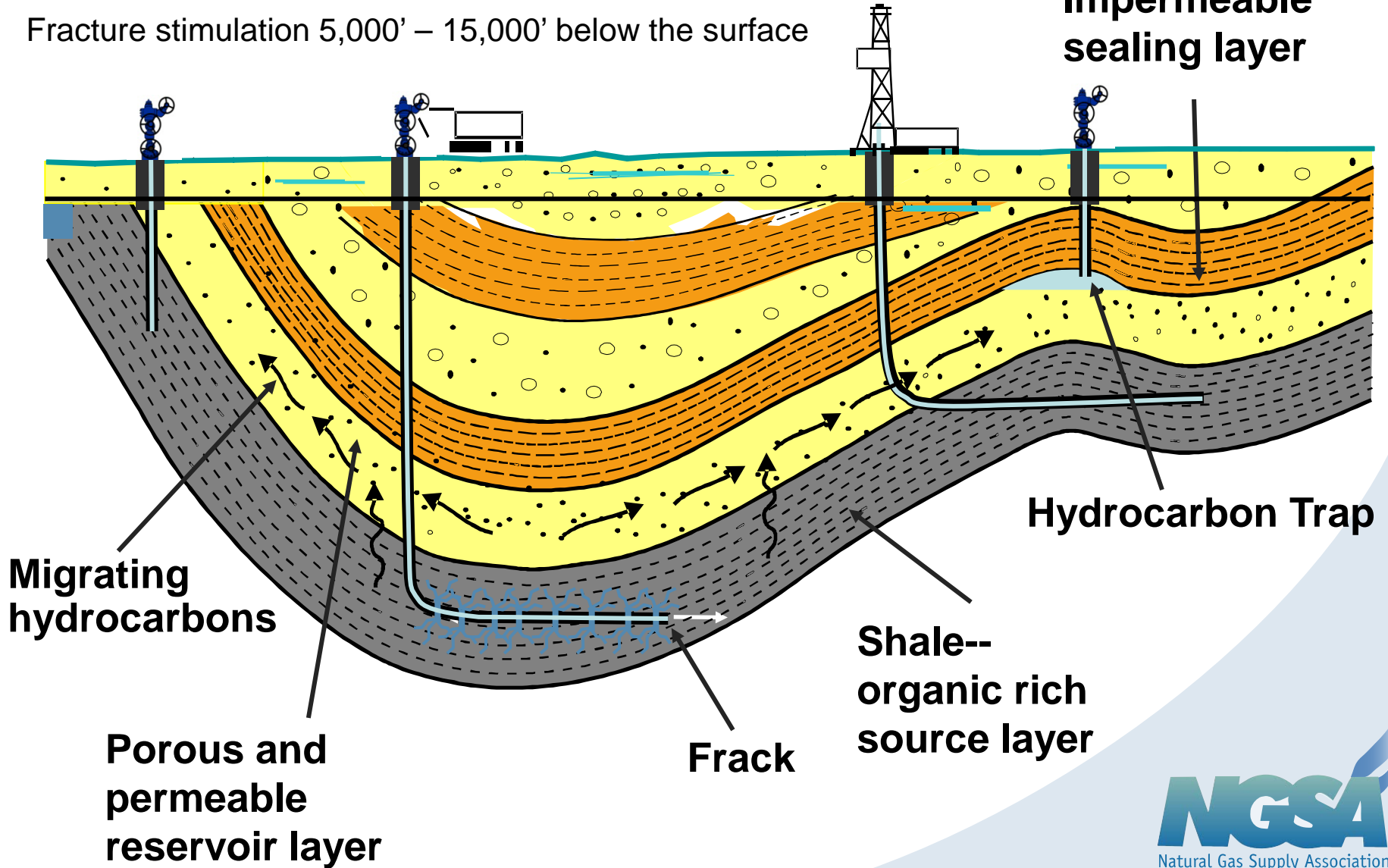


Source: Energy Tomorrow

Technology's role: Finding the Source Rock

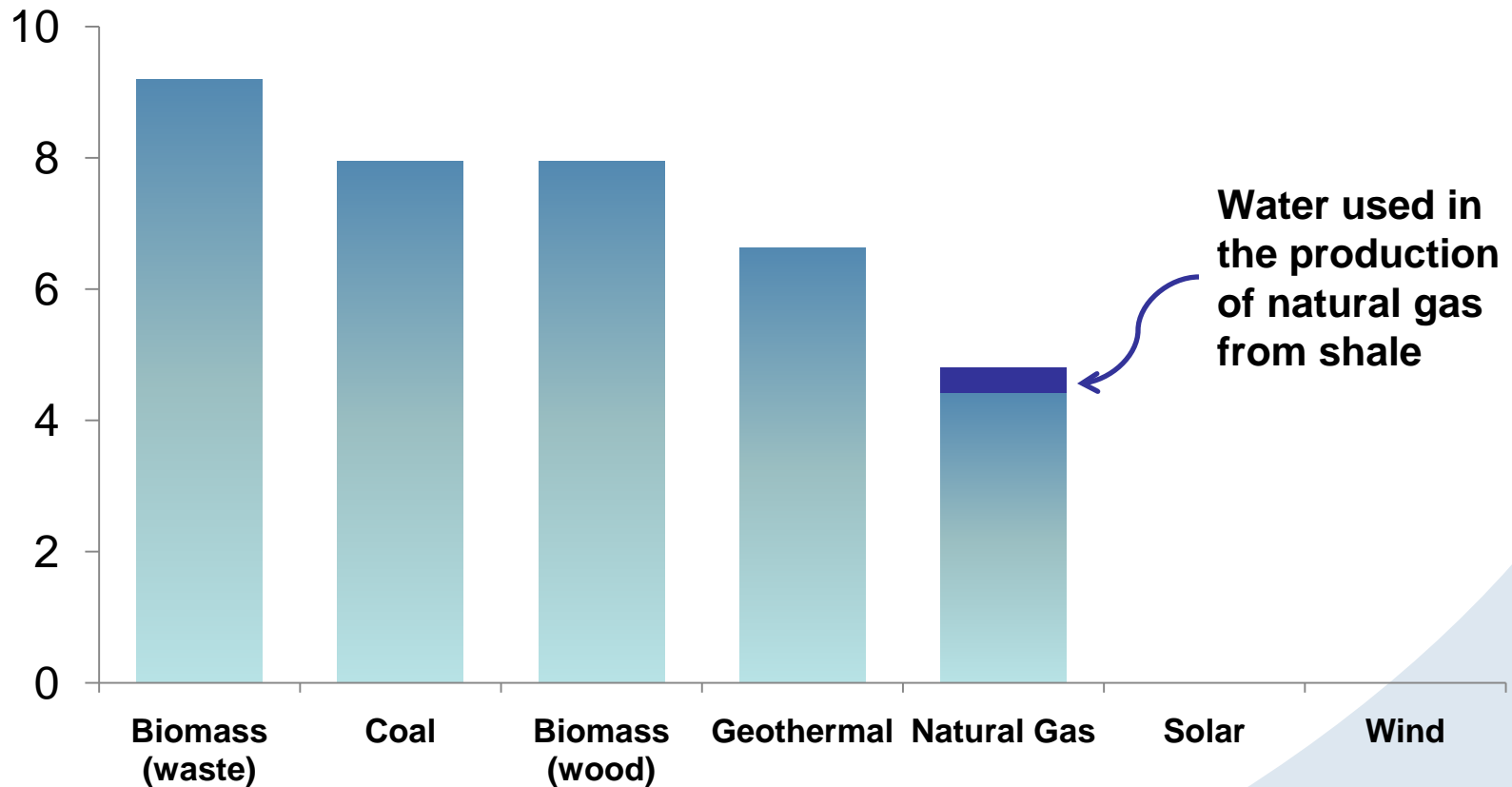
Fracture stimulation 5,000' – 15,000' below the surface

Impermeable
sealing layer



Natural Gas Water Use Lowest among Combustion Fuels

MM Gal/1000 Households

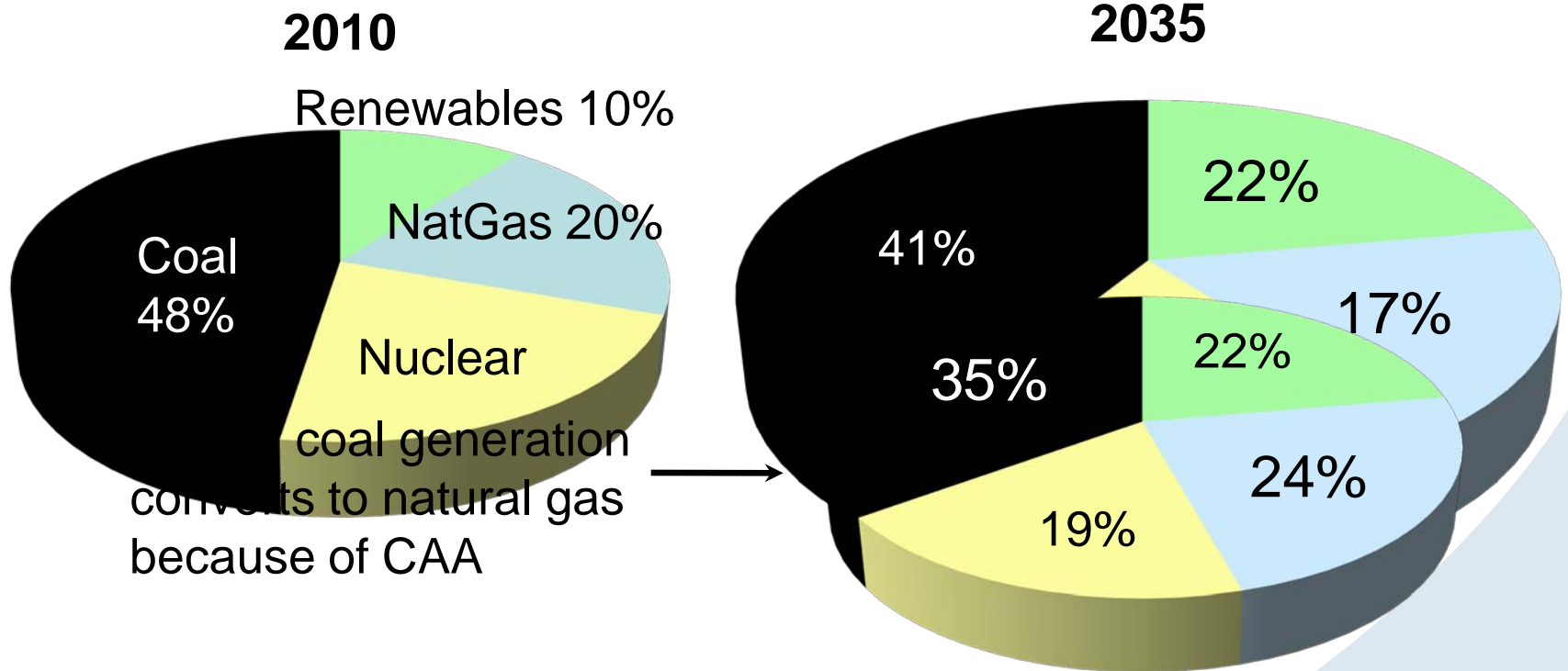


Water used in the production of natural gas from shale

Future U.S. Fuel Mix (Electricity) Thought Experiment

- Start with today's fuel mix, then incorporate demographic trends
- U.S. Census Bureau: Population grows 16% by 2035 (to 360 MM people)
- Per capita use in 2035 after 1% efficiency gains factored in: 10,920 kwh/person (EIA)
- Needed by 2035: Fuel to generate electricity for 50 million people (= 546 billion kwh)

Power Generation Fuel Mix If All New U.S. Population Uses Only Renewables



Resource Decisions

- We need all our fuels
- Most Confident: Let competitive market determine supply mix—guided by appropriate regulations
- Of Concern: As renewables grow market share, grid operators challenged to maintain reliability
 - Ancillary service markets not competitive
 - Generators not motivated to invest
- Nat Gas Challenge: Address public perception of environmental concerns with hydraulic fracturing