



Natural Gas

Smarter Power Today.



Why Natural Gas?



An aerial photograph of an oil production wellhead. The wellhead is a tall, white metal lattice structure with a red top section. It is situated on a blue-painted concrete pad. In the background, there is a dense forest of green trees and a large, rocky mountain. The word "PRODUCTION" is overlaid in large, white, bold, sans-serif capital letters across the center of the image.

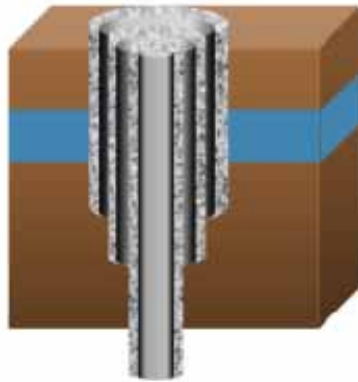
PRODUCTION

Risks vs. Benefits

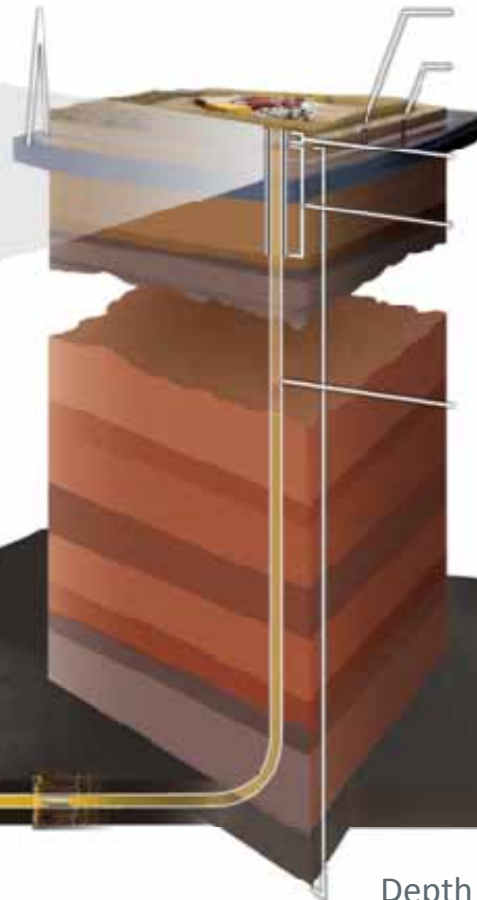
- All energy production comes with some risk.
 - Natural gas has a decades-long history of safety while producing more than one million wells.
 - No need to trade environmental protection for economic benefits; communities can and should have both.
 - ANGA members are committed to protecting our air, land and water while safely and responsibly developing this abundant domestic resource.

Hydraulic Fracturing

Multiple protective layers extend from surface to below aquifers.



Groundwater aquifers



Private well, about 500 feet deep

Public well, about 1,000 feet deep

Several layers of steel tubes encased in cement protect groundwater supplies

Protective steel casing encased in cement extends to shale depth

Shale Fractures



Depth from surface is typically more than a mile

Innovations In Production

Water Innovations

- Onsite Water Recycling
- Wastewater Treatment Facilities
- Hybrid Stimulation
- Abandoned Coal Mine Water
- Reuse of Municipal Wastewater
- Development of Electrocoagulation
- Greener Fluids
- Increased Efficiencies
- Water Pipelines Reducing Truck Traffic
- Involving Small Businesses in Water Reuse & Recycling
- “The Marcellus Effect” and Water Purification Developments



Non-Water Innovations

- Emissions Reductions
- Natural Gas STAR
- Horizontal Drilling
- Development of Natural Gas Turbines
- Improving Estimates for Technically Recoverable Gas

Voluntary Disclosure System

Chemical Disclosure & Operation Updates

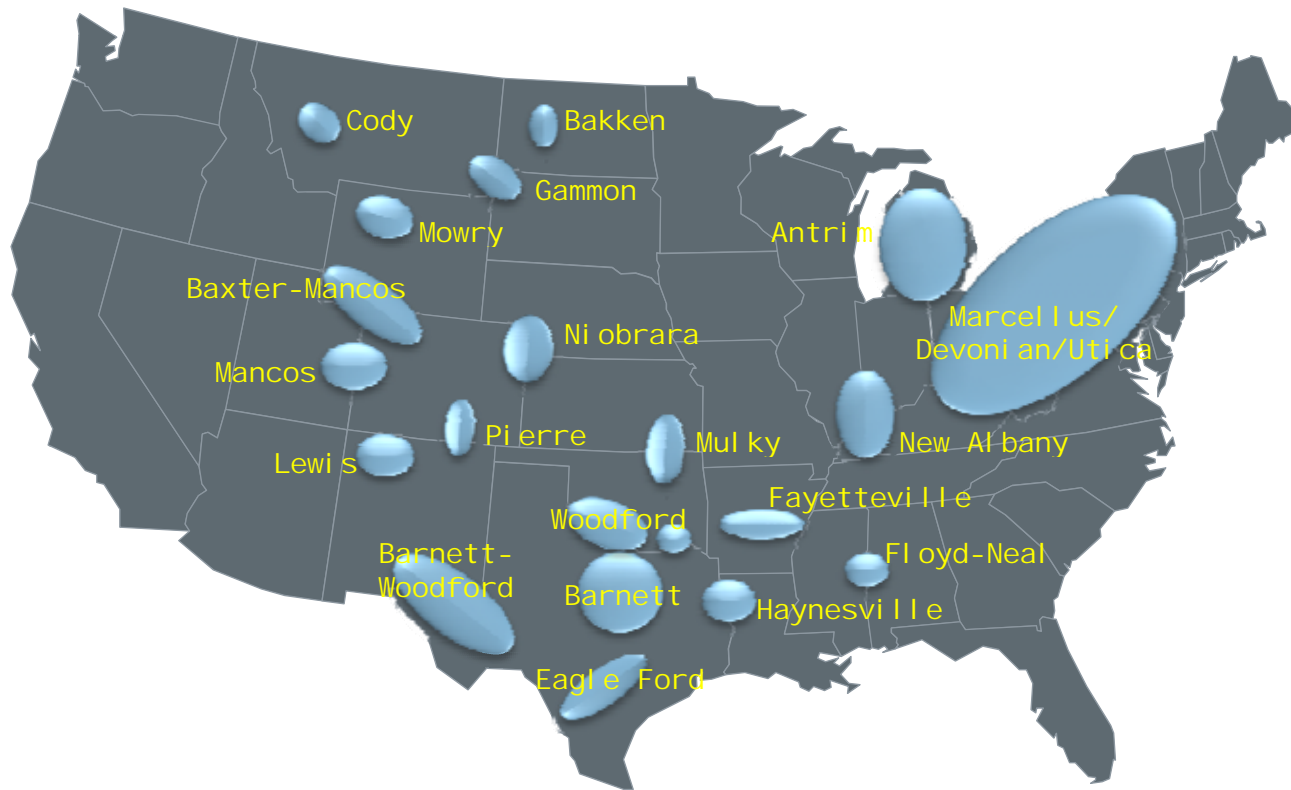
- **FracFocus.org** created by GWPC and IOGCC
 - 134 companies registered
 - Information is currently posted on 11,270 wells
 - 155,496 website visits
 - GWPC has funding proposal to enhance website including: improved data integration, electronic data exchange and batch submissions, state regulator compliance and search & filtering options. (Total cost ~ \$600M)





ABUNDANT

The Shale Gas Revolution



EIA AEO 2011

862 TCF shale

2,543 TCF total

45% INCREASE

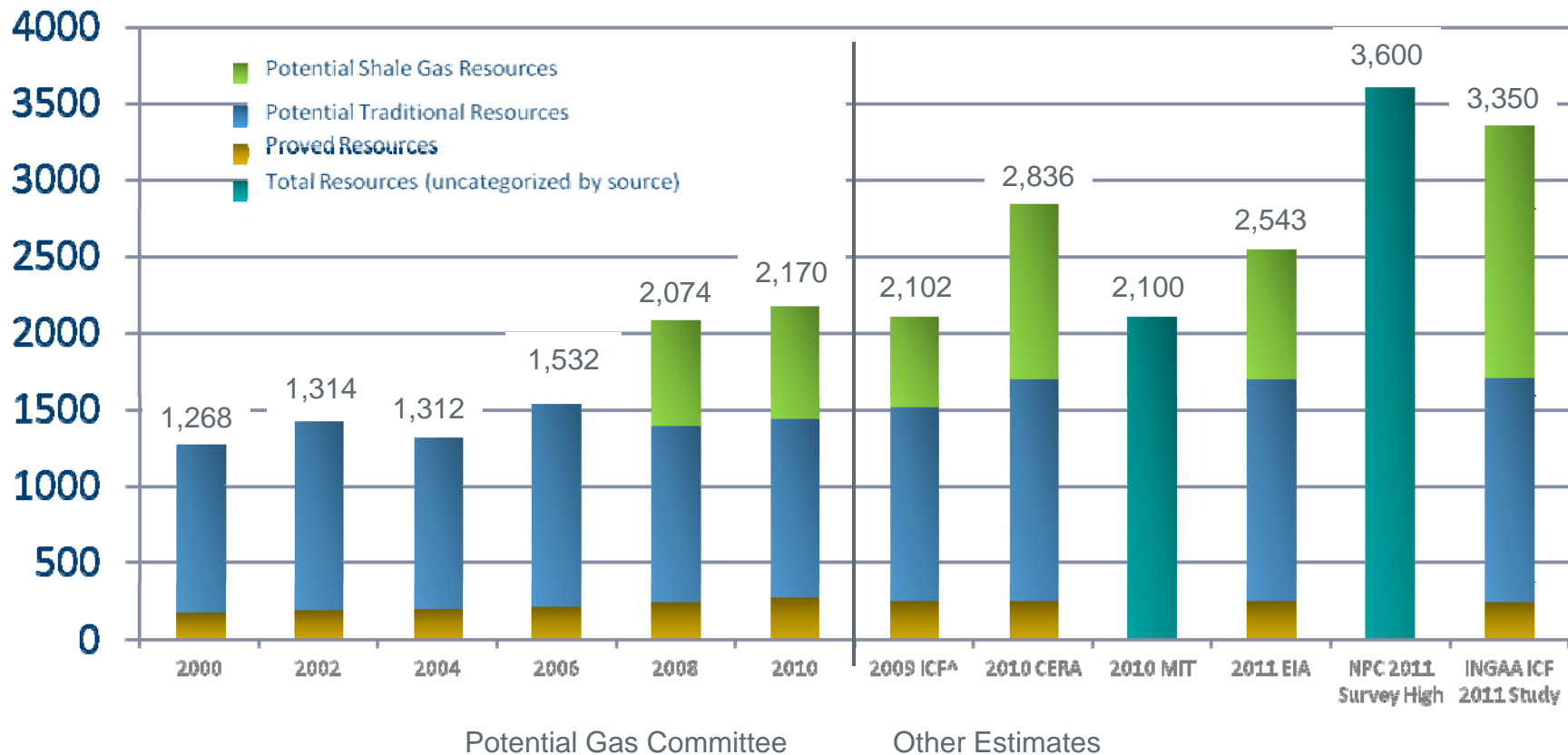
Over one year

Source: EIA Annual Energy Outlook, 2010; 2011



Abundant By Any Estimate

Estimates of U.S. Recoverable Natural Gas
(TCF – trillion cubic feet)



Sources:

ICF: As reported in MIT Energy Initiative, 2010, *The Future of Natural Gas*, interim report ; Table 2.1

EIA: See <http://www.eia.gov/analysis/studies/worldshalegas/>

PGC: Potential Gas Committee's *Advance Summary* and press release of its biennial assessment; see [g](#)

CERA: IHS CERA, 2010, *Fueling North America's Energy Future: The Unconventional Natural Gas Revolution and the Carbon Agenda*

MIT: MIT Energy Initiative, 2010, *The Future of Natural Gas*, interim report

NPC: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources Johns Hopkins University ; *Prudent Development Study 2011*



A glowing blue dollar sign is centered in the upper half of the image, appearing to float or emanate from a balance scale. The scale is positioned at the bottom, with its horizontal beam and a single weight on the right side. The background is dark, making the blue glow and the white text stand out.

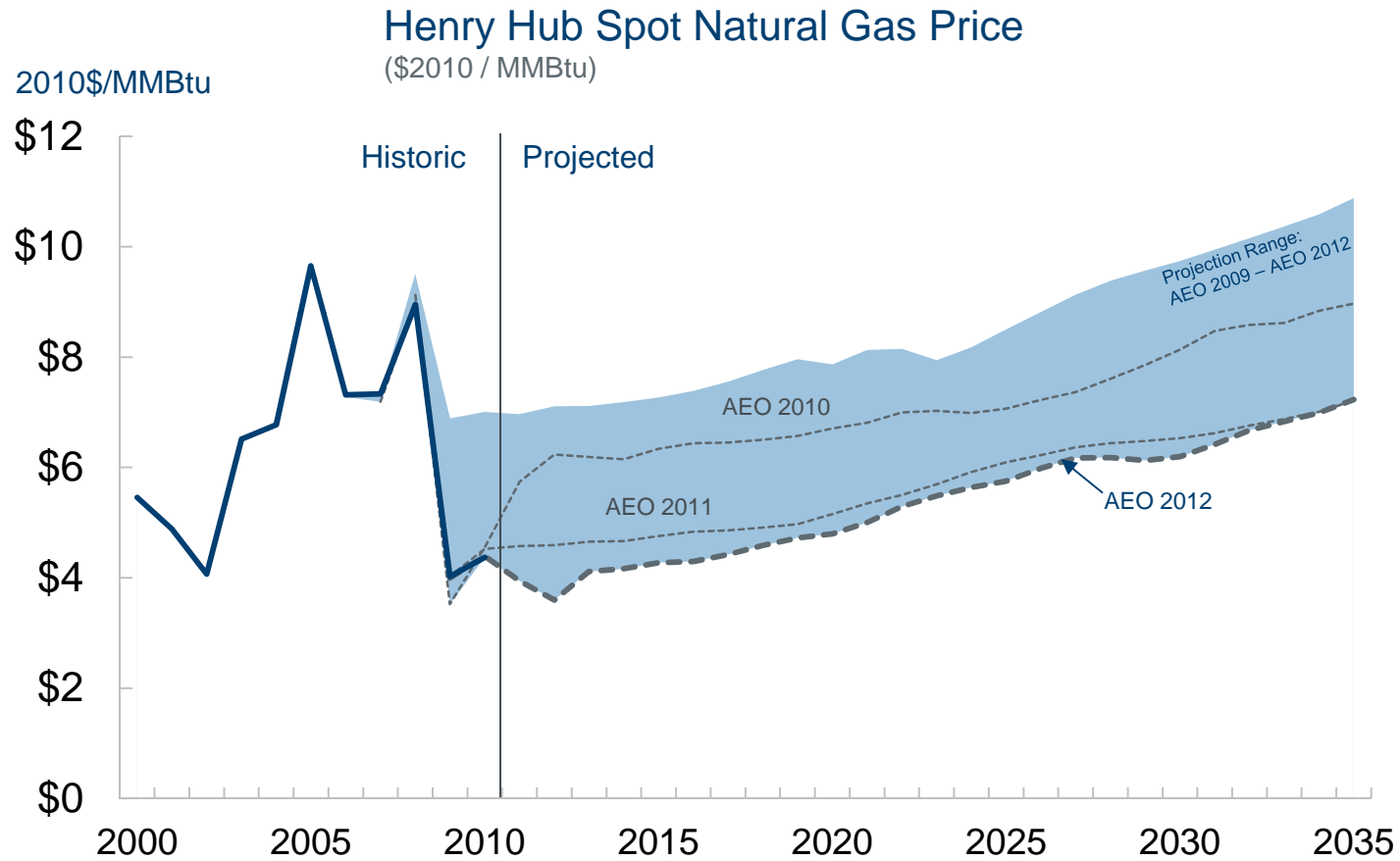
AFFORDABILITY & PRICING

Lower Energy Prices For Consumers

- Thanks to lower natural gas prices, U.S. households will save an average of **\$926** per year in disposable income between 2012 and 2015.
- Shale gas production has resulted in a **10 percent** reduction in electricity costs nationally.



Long-Term Price Stability



Source: EIA Annual Energy Outlook: 2012 (Early Release), 2011, 2010, and 2009
Henry Hub Spot prices (EIA reported actual prices included 2000 to 2010)



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