

Traditional Energy – Still Our Energy Future*

C. Michael Ming¹

Search and Discovery Article #70111 (2011)

Posted November 30, 2011

*Adapted from keynote address, AAPG Mid-Continent Section Meeting, Oklahoma City, Oklahoma, October 2, 2011

¹Oklahoma Secretary of Energy, Oklahoma City, OK (michael.ming@doe.ok.gov)

Summary

Fossil fuels (petroleum, natural gas, and coal) provide almost 85% of the energy supplies. The main demand sectors are electric power, transportation, industrial, and residential and commercial. Our nation's energy supply currently includes 8% renewable sources (biomass, hydroelectric, wind, geothermal and solar, in decreasing percentages). Active resource plays (especially gas) are in the process of changing the nation's dependence on foreign sources for energy supplies, as the estimates of the remaining natural gas, from shale in particular, continue to increase.

Natural gas is the logical bridge for future electric generation and an alternate source for surface transportation. The main challenge is possible environmental regulations, which are largely unnecessary. However, industry must be transparent in its use of advanced technology to recover our needed supplies, and we must be diligent and convincing in presenting the facts to the general public.

Selected References

Flavin, C., and S. Kitasei, 2010, The role of Natural Gas in a Low-Carbon Energy Economy: Worldwatch Institute's Natural Gas and Sustainable Energy Initiative Briefing Paper, 23 p.

Walsh, Bryan, 2011, This rock could power the world: Why shale can solve the energy crisis: cover photograph by Jeff Riedel, Time Magazine, April 2011, cover page.

Websites

Colorado Oil and Gas Association (COGA): Web accessed 22 November 2011, <http://coga.org>

Energy Information Agency (EIA), 2010, Renewable energy consumption and electricity preliminary statistics: Web accessed 22 November 2011,

<http://ceileadership.org/index.php/energy-efficiency-and-renewable-energy/4470-renewable-energy-consumption-and-electricity-preliminary-statistics-2010>

Energy Information Agency (EIA), 2009, Annual Energy Review: Web accessed 22 November 2011,

<ftp://ftp.eia.doe.gov/multifuel/038409.pdf>

MIT, 2011, U.S. Gas Production, Use and Trade: Potential Futures: Web accessed 22 November 2011,

http://web.mit.edu/mitei/research/studies/documents/natural-gas-2011/NaturalGas_Chapter3_EPPA.pdf

MIT Energy Initiative, 2009, Future of Natural Gas 2010: Smead and Navigant Consulting: Web accessed 22 November 2011,

<http://web.mit.edu/mitei/research/studies/natural-gas-2011.shtml>

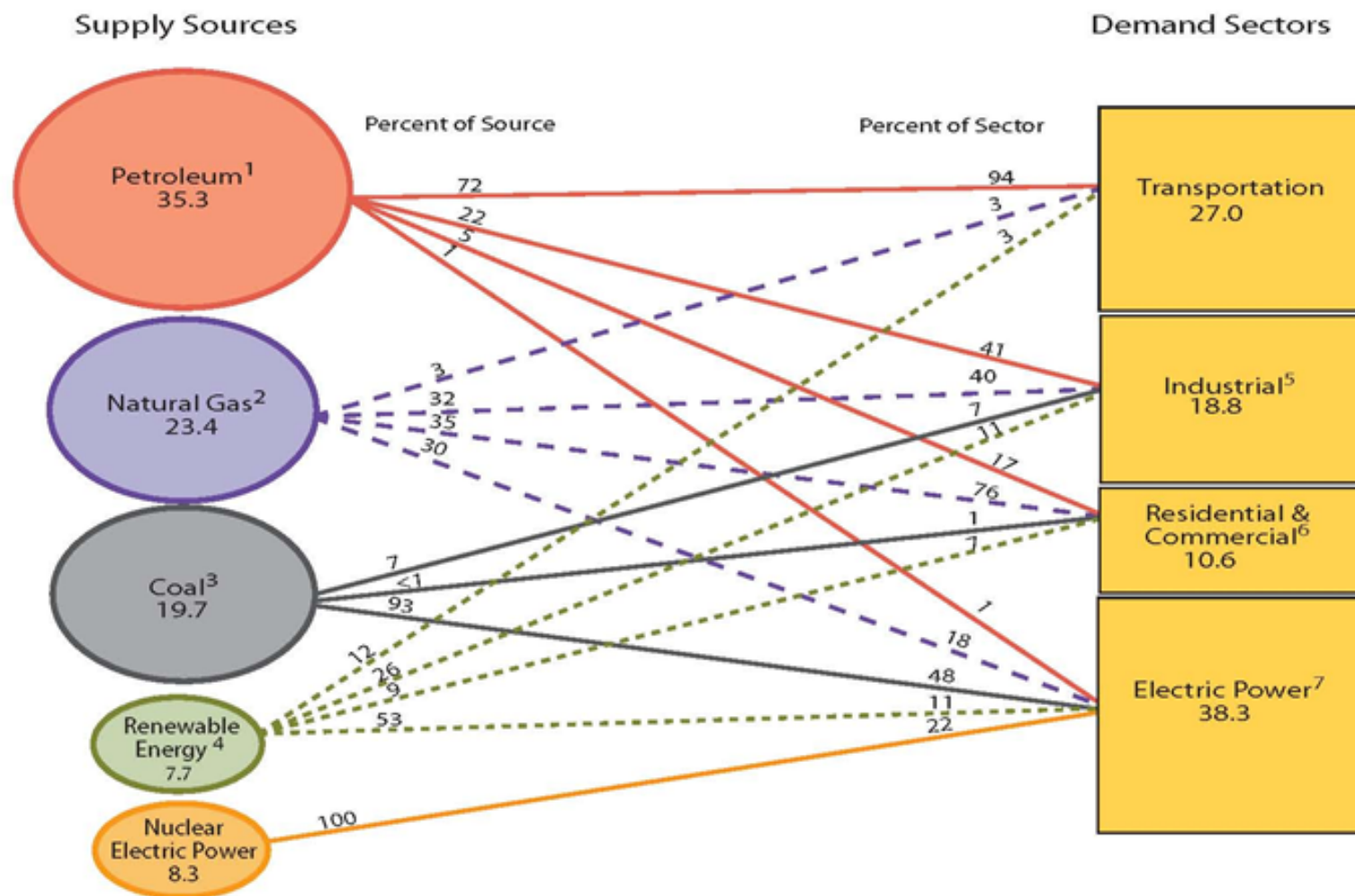
Traditional Energy – Still Our Energy Future



C. Michael Ming
AAPG
Oklahoma City, Oklahoma
October 2, 2011

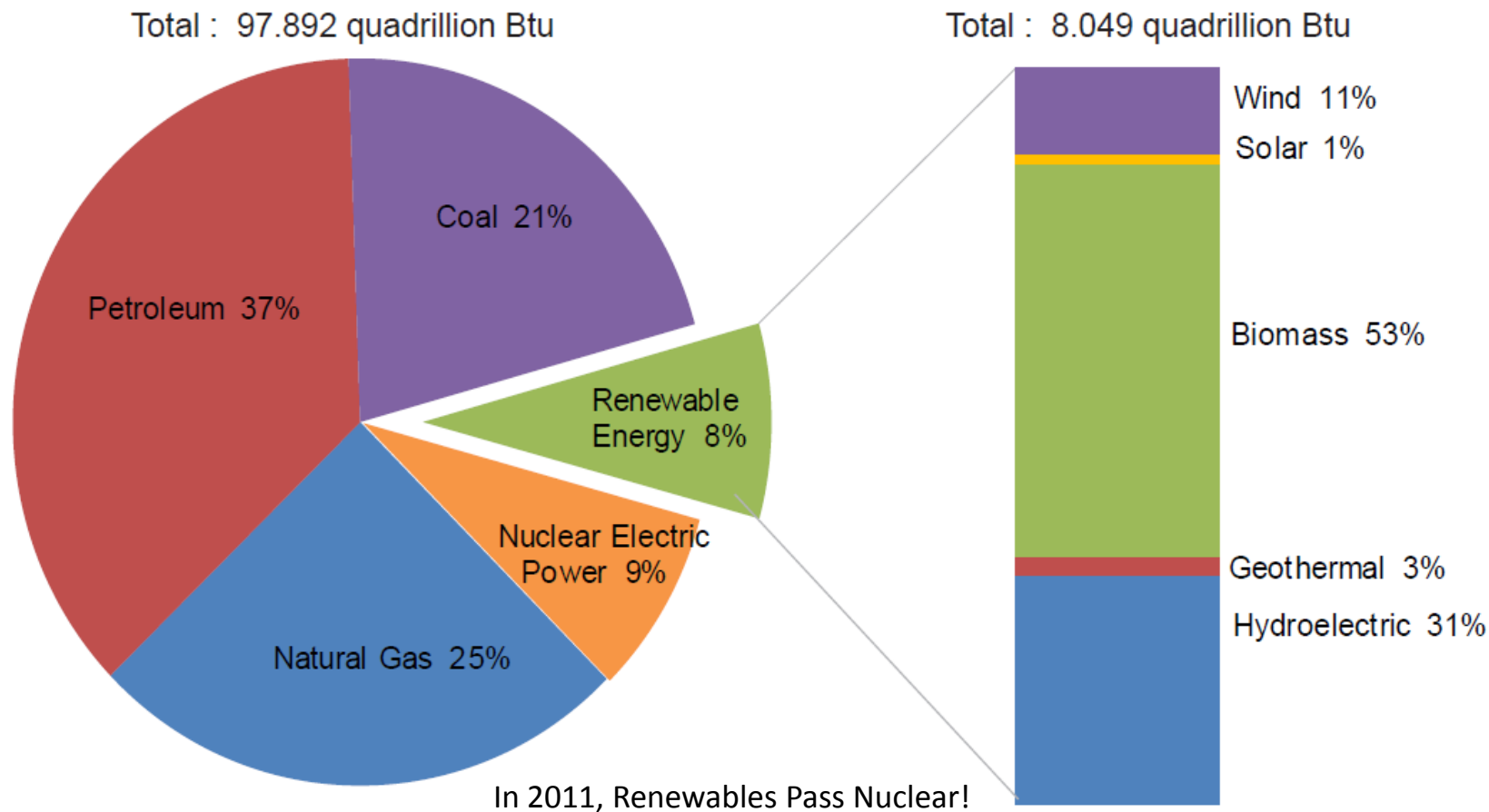
Primary Energy Flow by Source and Sector, 2009

(Quadrillion Btu)



The Issue of Scale

Renewable Energy Consumption in the Nation's Energy Supply, 2010



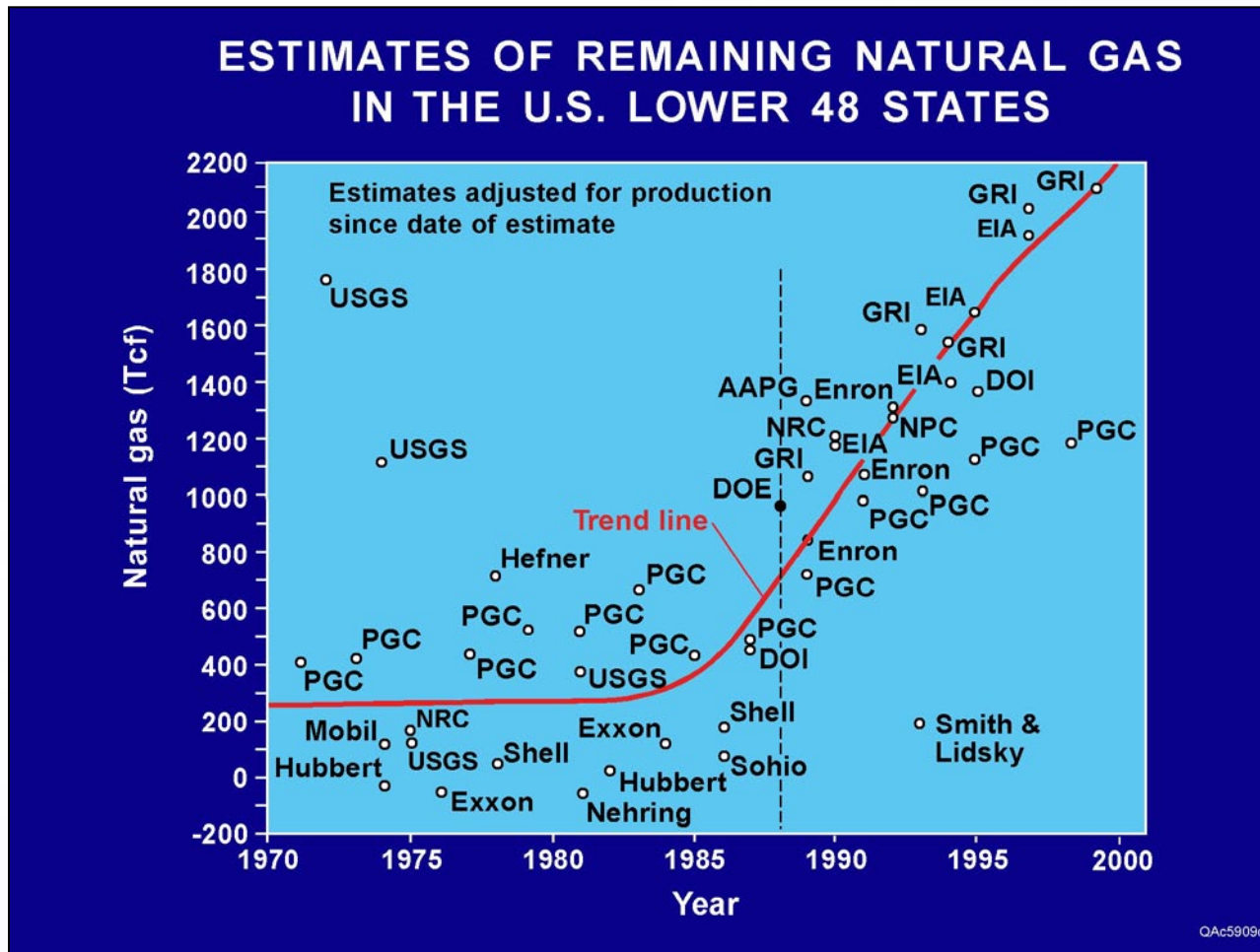
Shale Gas



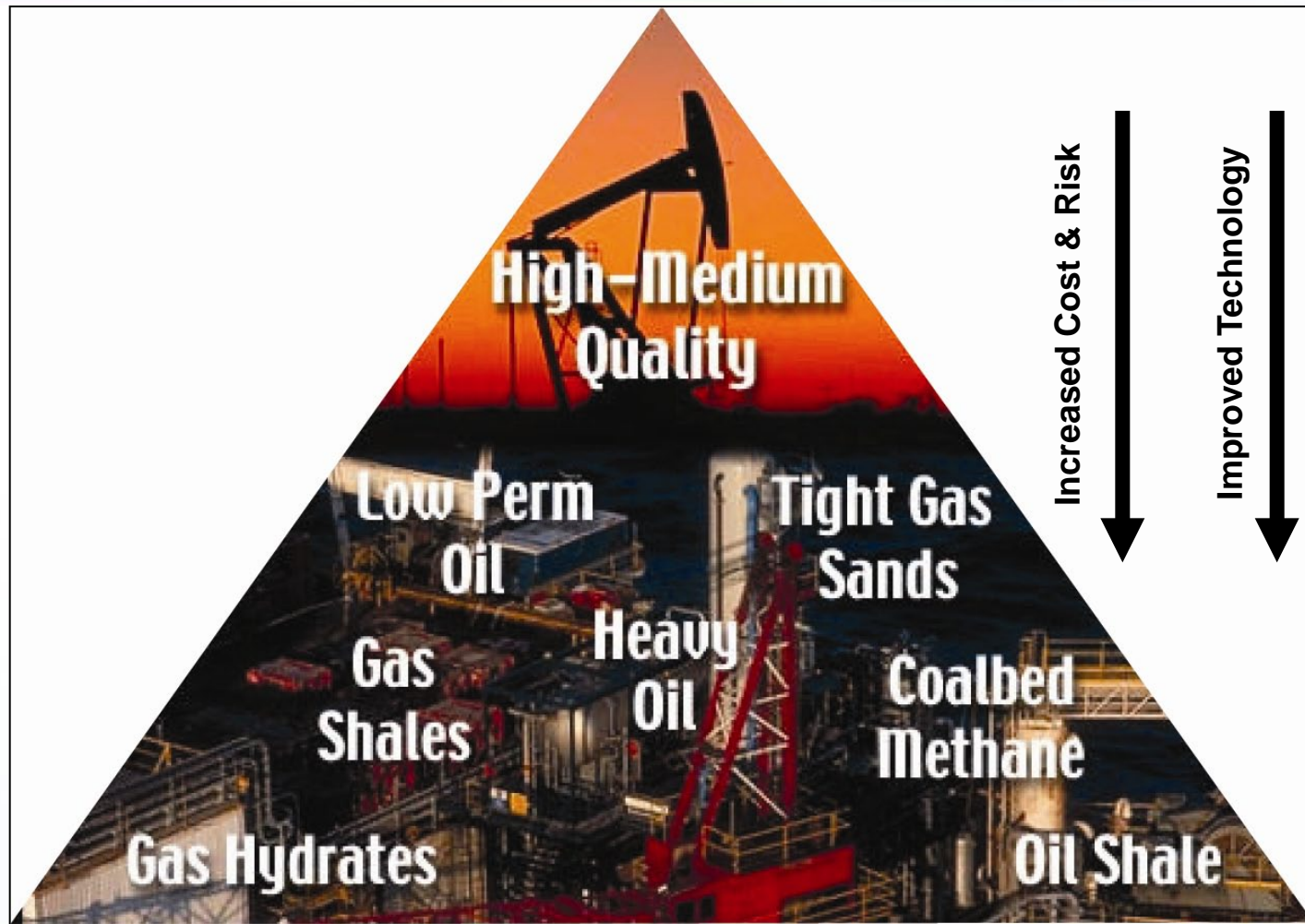
Source: Time Magazine, April 2011; Photograph by Jeff Riedel



U.S. Gas Resource Estimates Continue To Increase



Technology has Driven the Growth

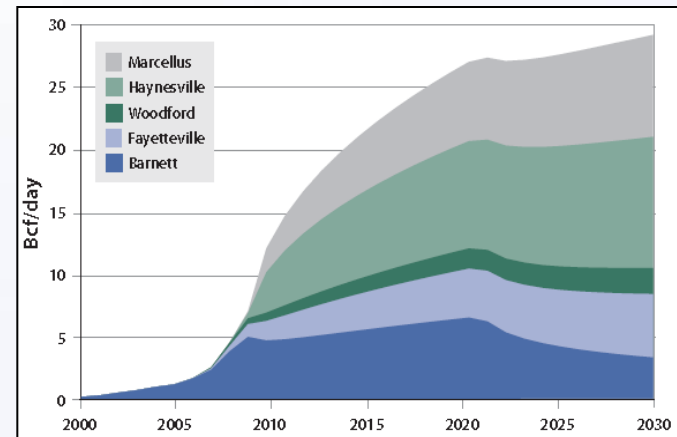
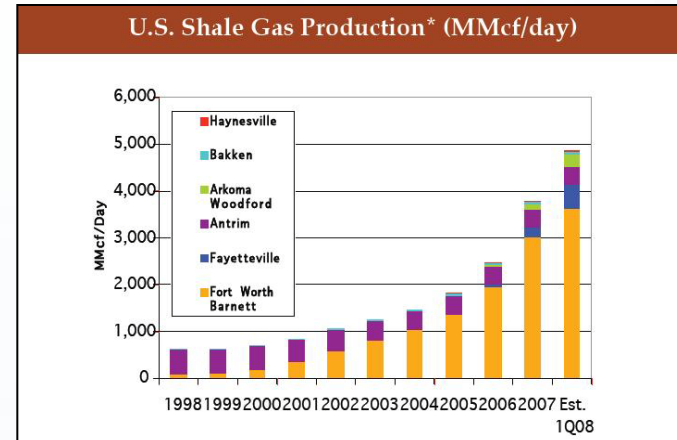


Source: Steve Holditch



The U.S. Gas Shale Ramp

- The Barnett grew 3000% from 1998 to 2007
- The Eagle Ford, Fayetteville, Haynesville, Marcellus, and Woodford will dwarf this
- Technology improvements in horizontal drilling and fracturing have economically enabled vast new unconventional and conventional resources.



Natural Gas Demand

Resilience in gas use across sectors

Potential major growth areas:

Electricity

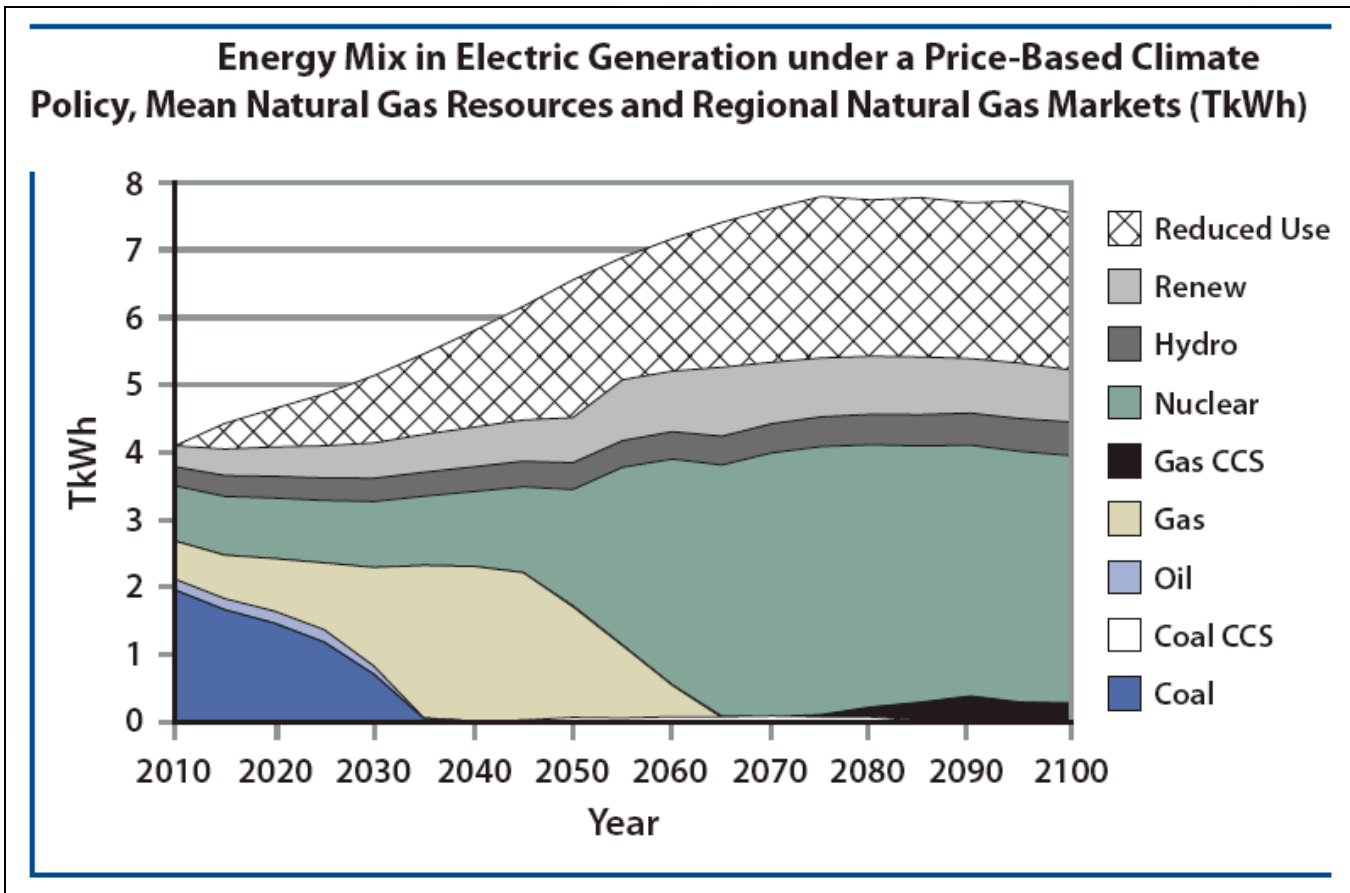
- Natural gas substitution for coal
- Intermittent sources/variability & uncertainty

Transportation

- Long term potential for CNG
- LNG not currently attractive



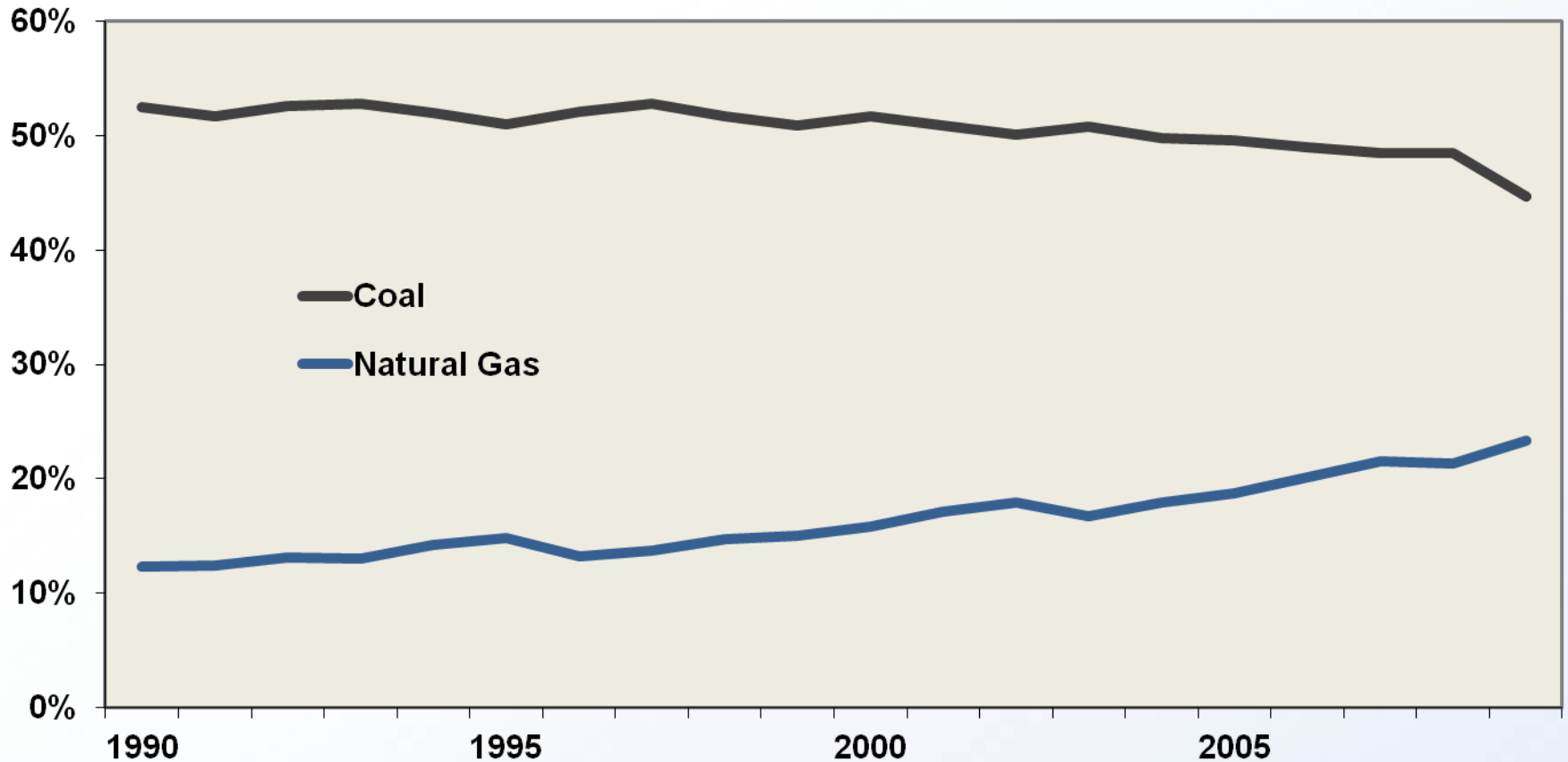
Natural Gas, a 60-year Bridge



Source: MIT, *The Future of Natural Gas* 2010



Share of U.S. Electric Generation from Coal and Gas, 1990-2009

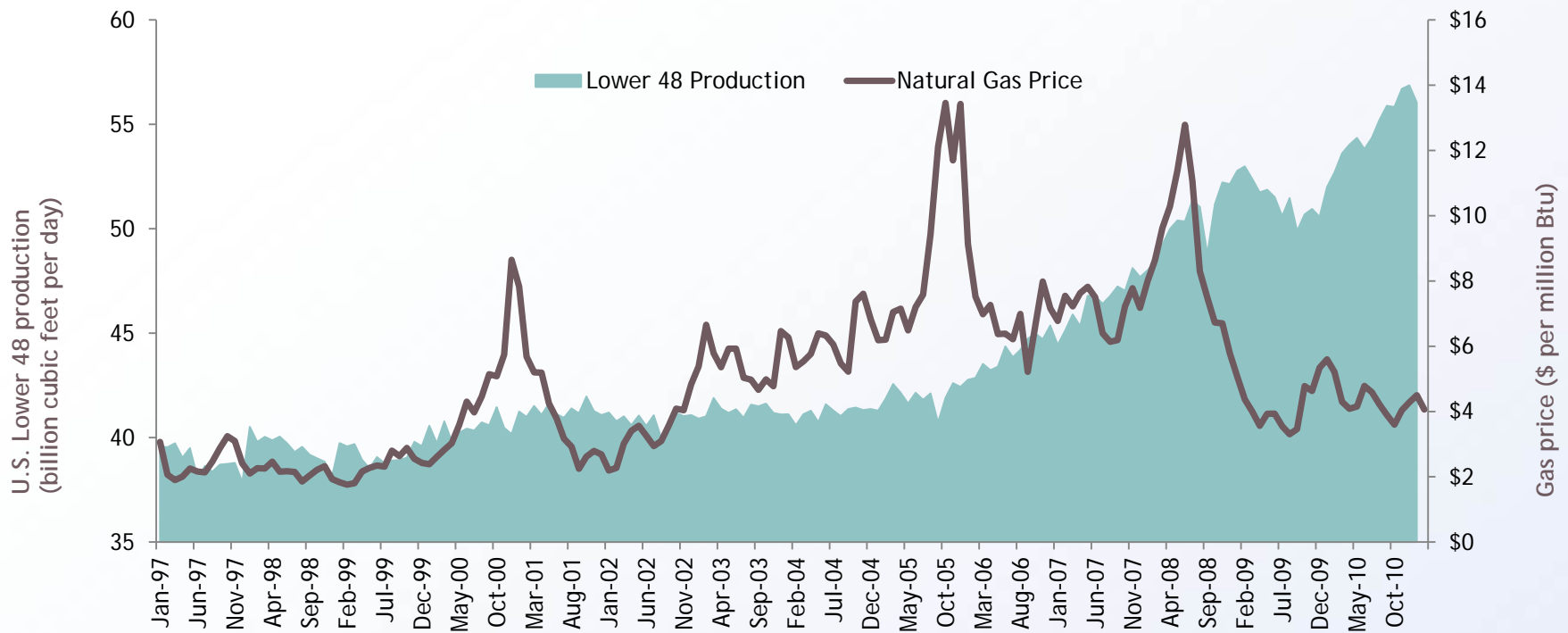


Source: Worldwatch Institute, EIA



As Supply Grows, Price Remains Low & Stable

- Lower 48 supply has grown by 13.5 billion cubic feet per day since 2004, up 33%
 - Driven by horizontal shale and infrastructure development
 - Impact has been more stable pricing



Note: Natural gas price and range are for Henry Hub trading point
Source: Devon Energy Corporation



Challenges



FracFocus

Creating Transparency

The screenshot shows the FracFocus Chemical Disclosure Registry website. At the top, there is a navigation bar with links: Home / Welcome / Publications / News & Updates / Links. Below this is a secondary navigation bar with categories: HYDRAULIC FRACTURING (HOW IT WORKS), GROUNDWATER PROTECTION, CHEMICAL USE, REGULATIONS BY STATE, FIND A WELL BY STATE, and FREQUENT QUESTIONS. The main content area features a large 'WELCOME' banner with a blue and white water splash background. Below the banner, a paragraph welcomes visitors and explains the site's purpose as a joint project of the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. A 'LEARN MORE' button is positioned to the right. To the right of the banner is a section titled 'Looking for information about a well site near you?' featuring a map of the United States with a 'FIND A WELL' button. Below the map, a search prompt asks users to find nearby well sites. At the bottom right, there is an 'FAQs' section with a '1 / 3' indicator. The first question asks 'Where does the water used in hydraulic fracturing come from?' and the answer explains that water comes from various sources including surface water bodies, groundwater wells, and recycled water. A 'Read more...' link is provided. At the bottom left, a partial section titled 'Is groundwater' is visible, with the text 'Groundwater Protection: Priority Number One' next to it.

Home / Welcome / Publications / News & Updates / Links

Frac Focus
Chemical Disclosure Registry

HYDRAULIC FRACTURING
HOW IT WORKS

GROUNDWATER
PROTECTION

CHEMICAL
USE

REGULATIONS
BY STATE

FIND A WELL
BY STATE

FREQUENT
QUESTIONS

WELCOME

Welcome to FracFocus, the hydraulic fracturing chemical registry website. This website is a joint project of the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission.

On this site you can search for information about the chemicals used in the hydraulic fracturing of oil and gas wells. You will also find educational materials designed to help you put this information in perspective.

[LEARN MORE >](#)

Looking for information about a well site near you?

[FIND A WELL](#)

Search for nearby well sites that have been hydraulically fractured to see what chemicals were used in the process.

FAQs

1 / 3

Q. Where does the water used in hydraulic fracturing come from?

A. It comes from many sources including surface water bodies such as ponds, lakes, and streams, municipal authorities, groundwater wells, "produced water" (water that comes to the surface during oil and gas production), and re-cycled water from other hydraulic fracturing jobs. [Read more...](#)

[Welcome](#) [Hydraulic Fracturing](#) [Casing & Cement](#) [State Regulations](#) [Chemical Use](#)

Is groundwater Groundwater Protection: Priority Number One

<http://fracfocus.org>



“Do or do not, there is no try.”

Yoda

