

North American Natural Gas Trends

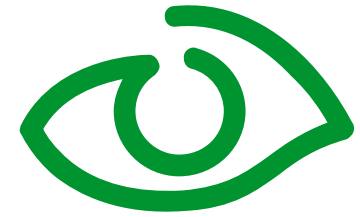
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GasTech
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Special acknowledgement to Mr. Tom Miesner
Pipeline Knowledge & Development



Let's share a vision



A world where we can all
**achieve more while
using less**
of our common planet

Trends impacting the industry

- Energy

- as a key challenge

- Emergence of new economies

- as a major opportunity for our generation

- Connectivity

- for everything, everywhere at any time

- Globalization

- allowing anybody to get the best of the world

- Simpler solutions

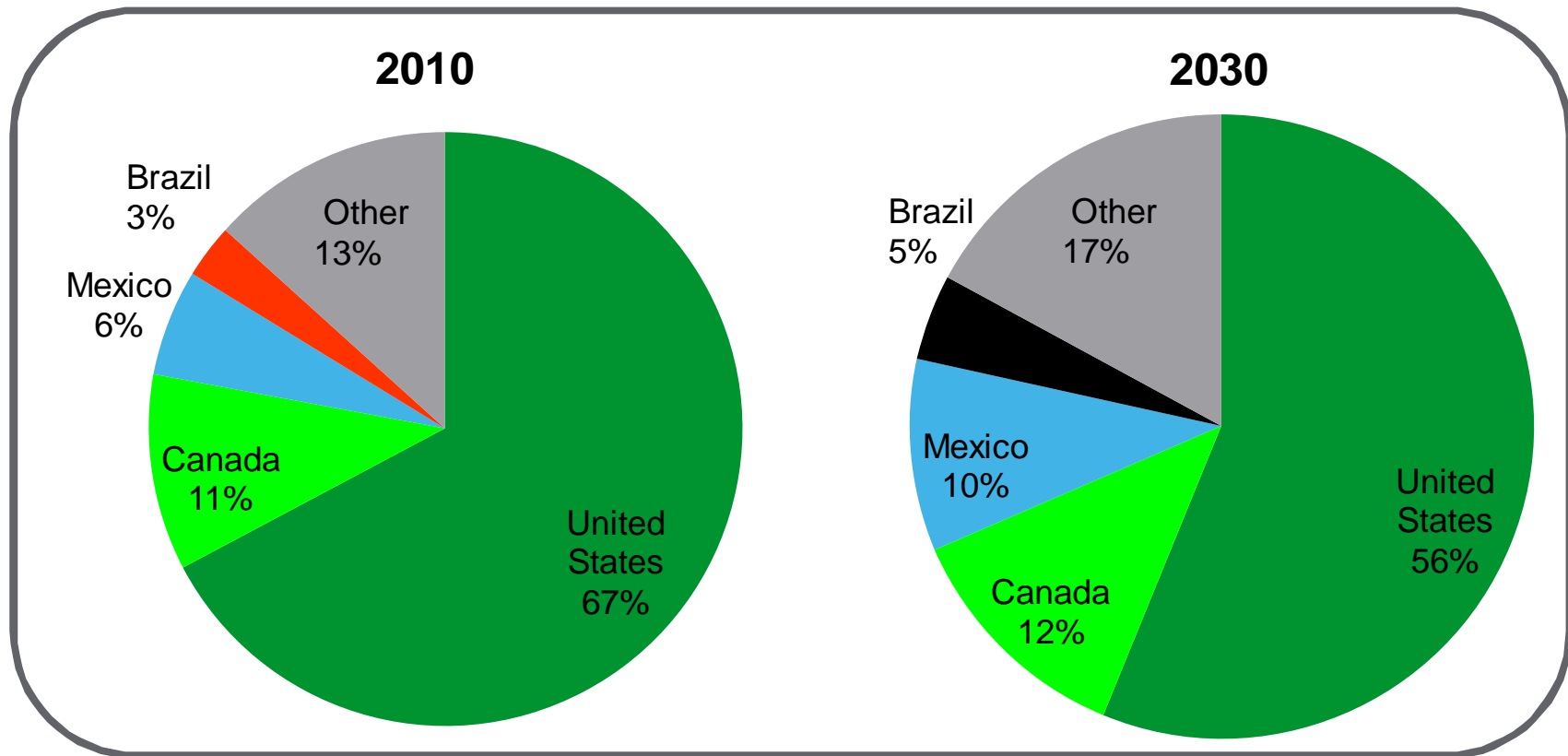
- for the increasing complexity of our life and work

- Security

- as a growing & global concern

Americas Demand

• North America **3x** than South America



Economy, Technology, and Policy

Drivers of Natural Gas Key Markets

- **Economic growth rates**

- US
- Global

- **Technology development**

- Unconventional gas exploration and extraction
- “Clean” Coal
- Conservation

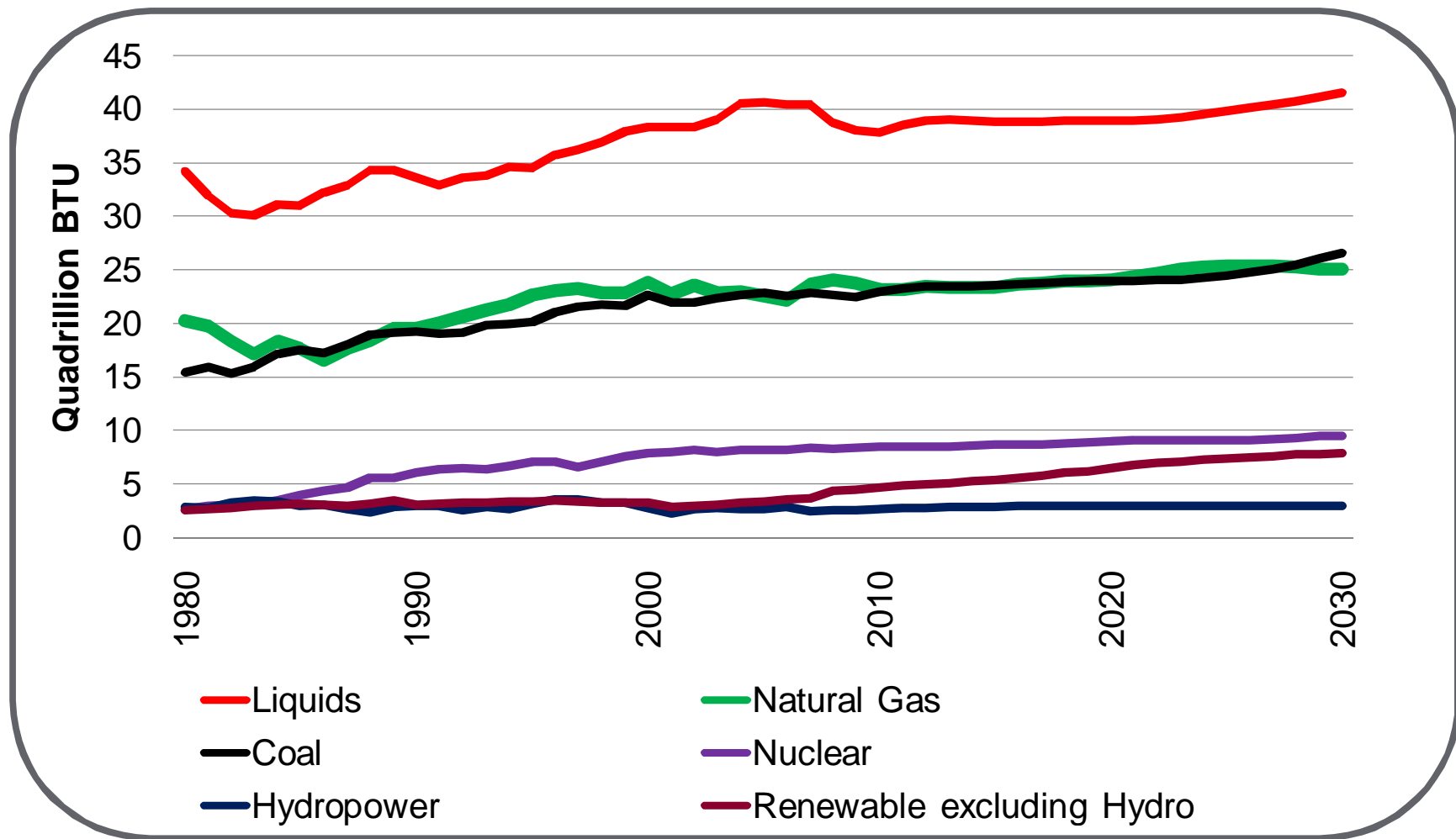
- **Policy evolution**

- Carbon
- Renewable energy
- Nuclear
- Conservation



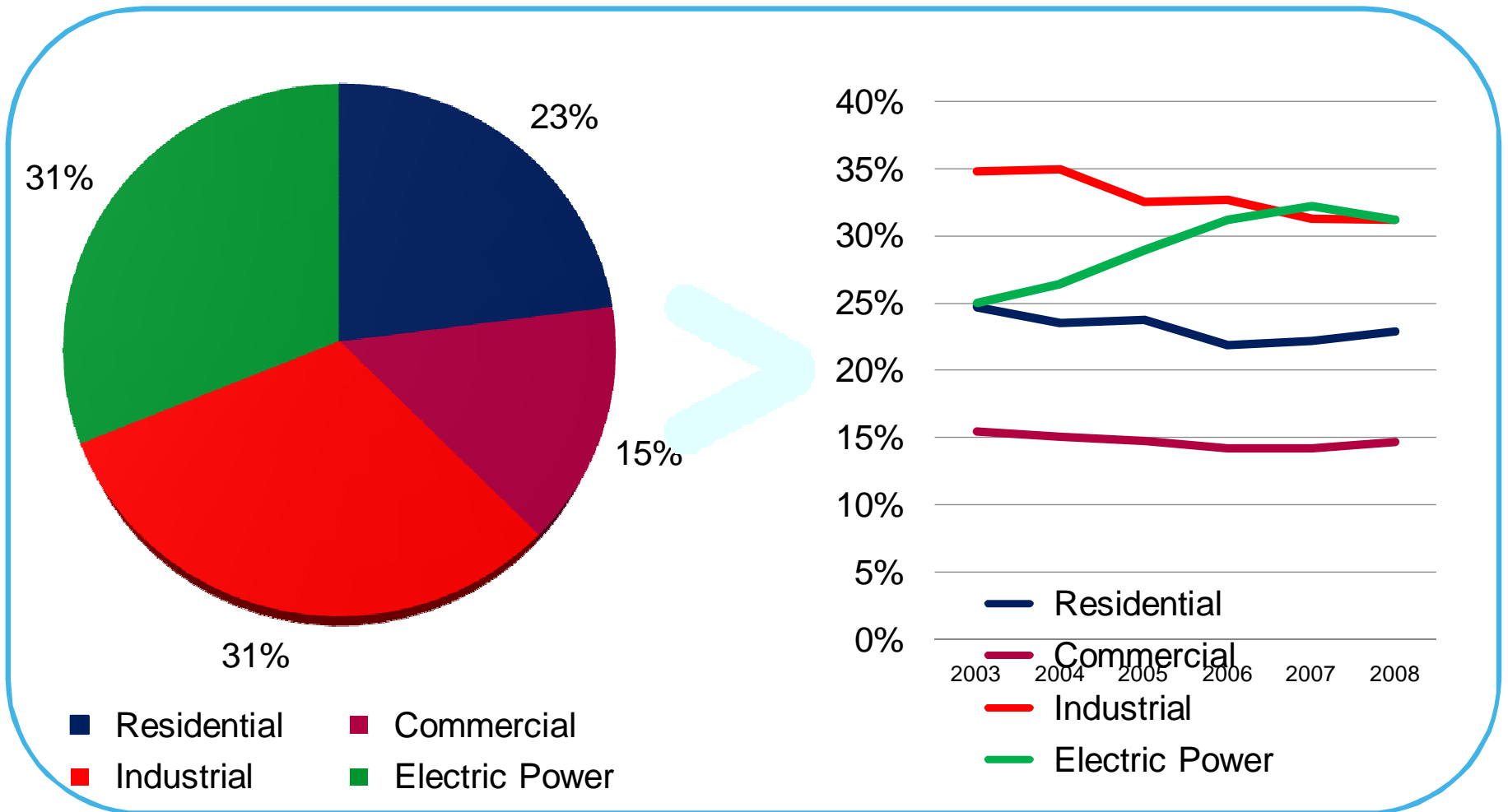
U. S. Gas Demand Rises Modestly

US 30 TCF forecast challenged



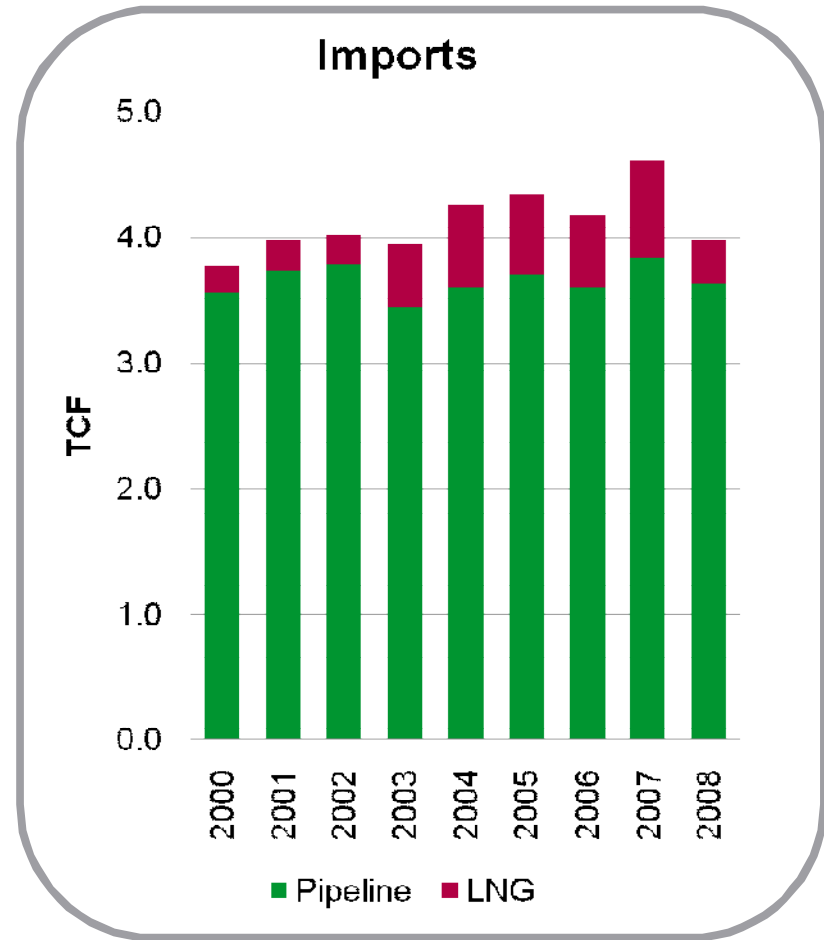
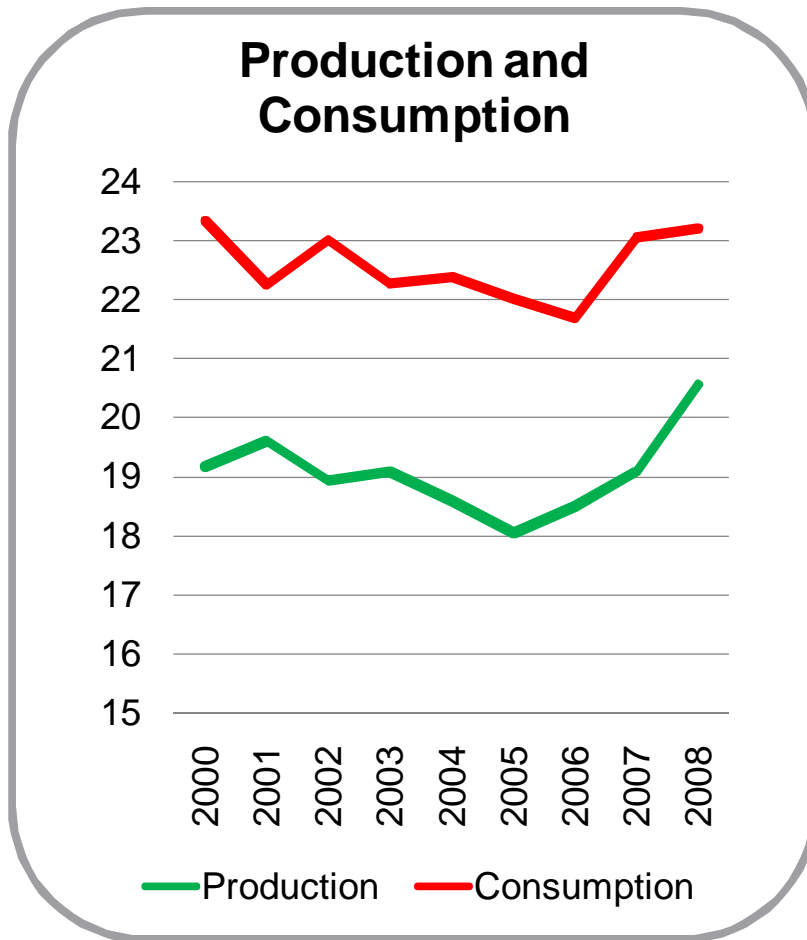
Electrical Generation

Key Growth Area



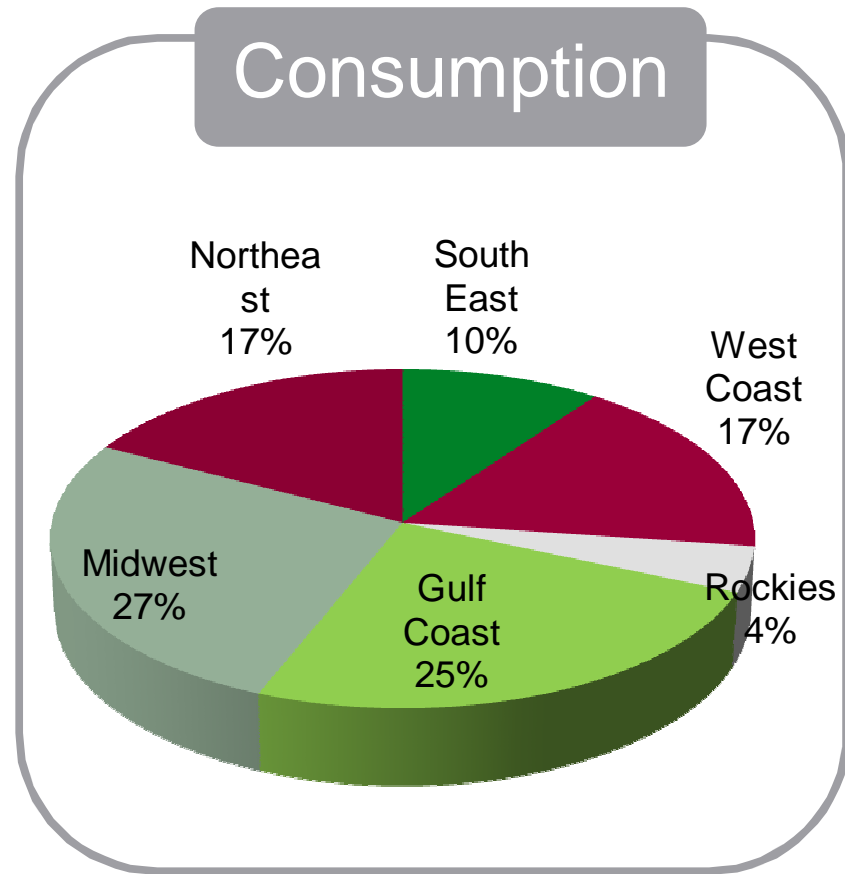
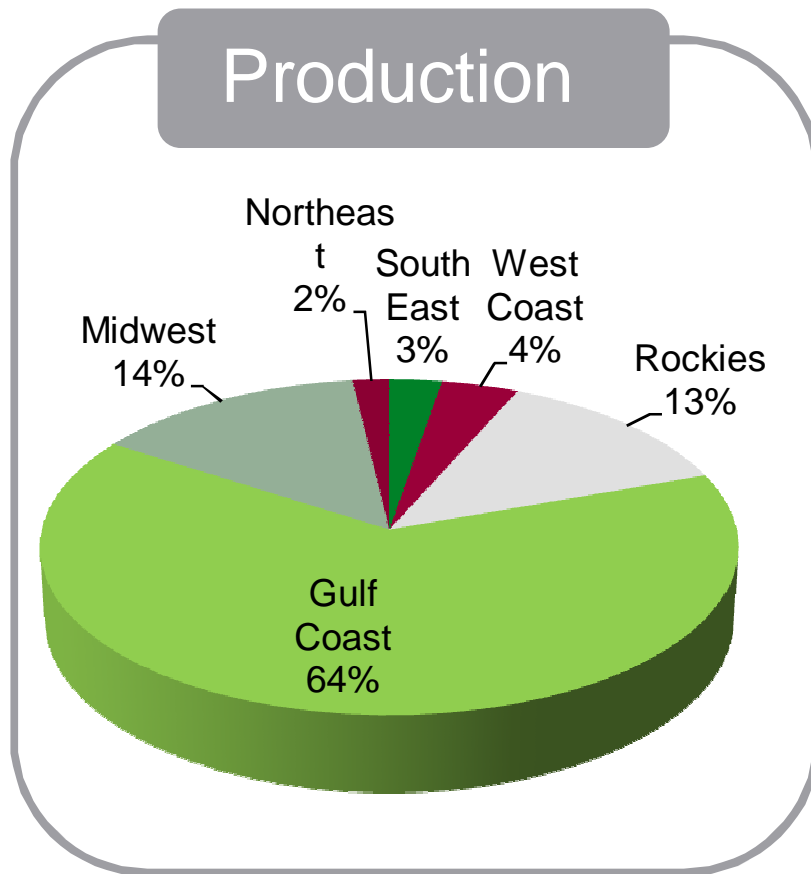
Higher Prices Increased Supply

Depressed demand and reduced imports



Regional Production/Consumption

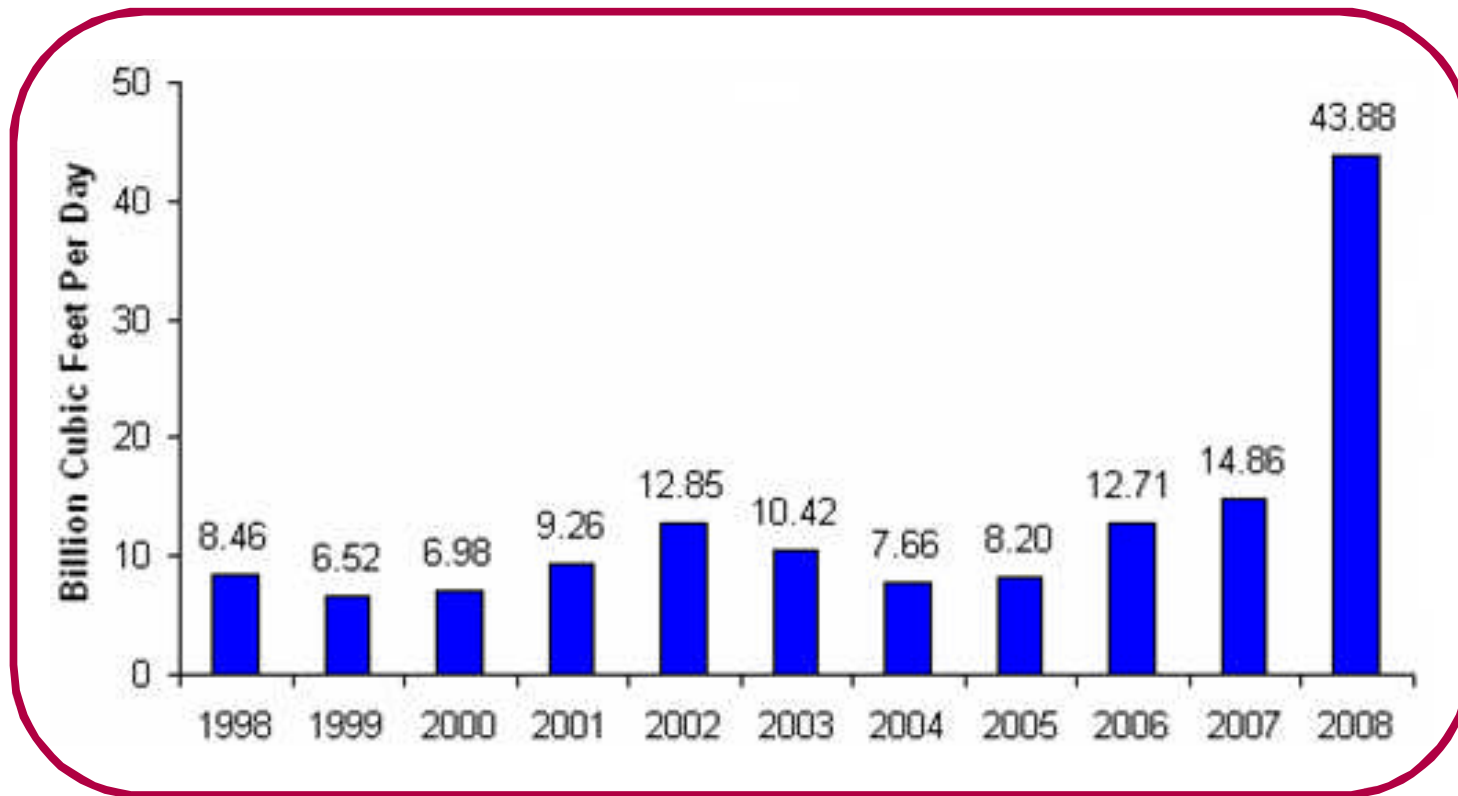
- imbalances provide pipeline opportunities



Source: Practical Guide to US Natural Gas Transmission Pipeline Economics, Pennwell 2009

Unconventional Gas and Interconnects

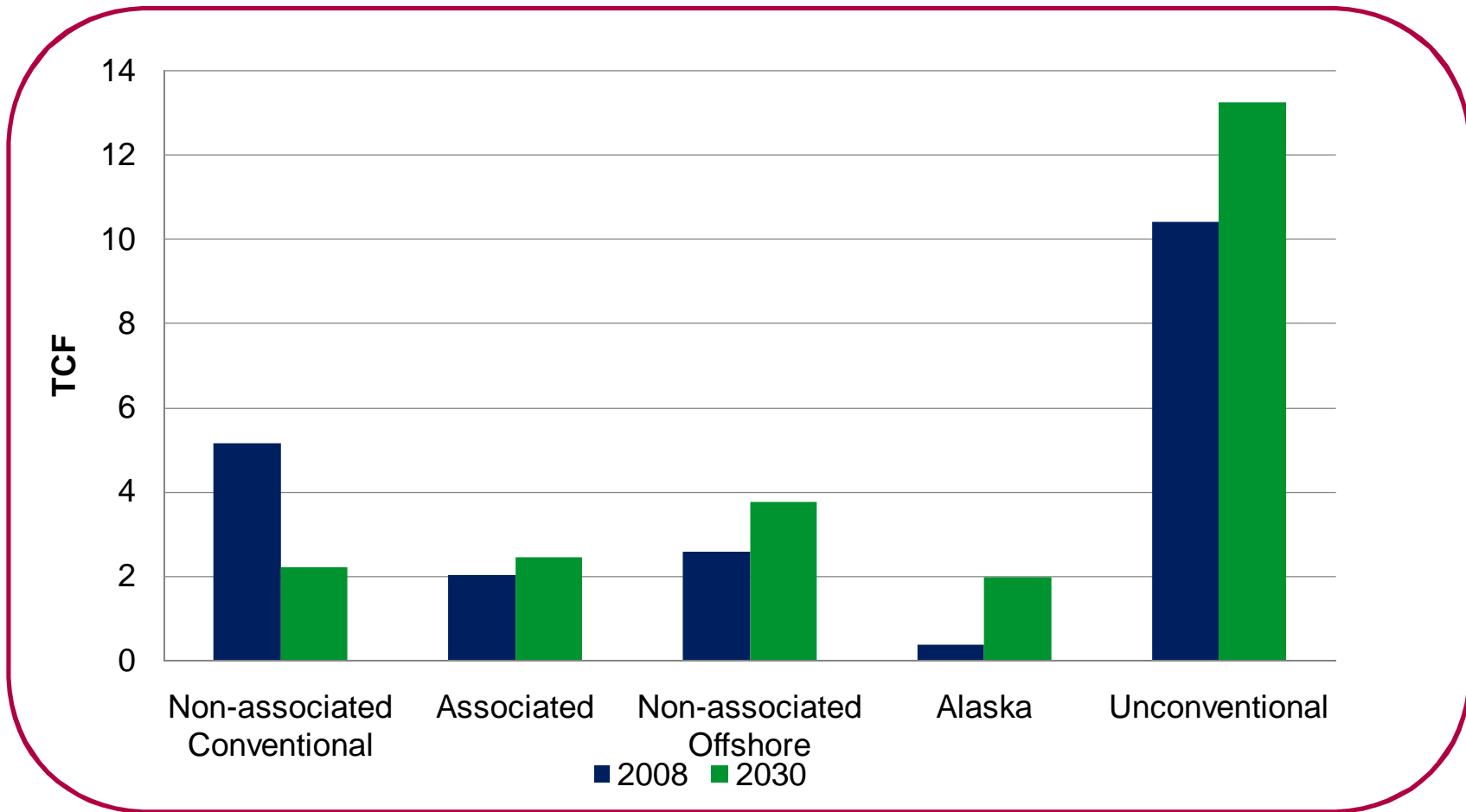
- Drove pipeline projects



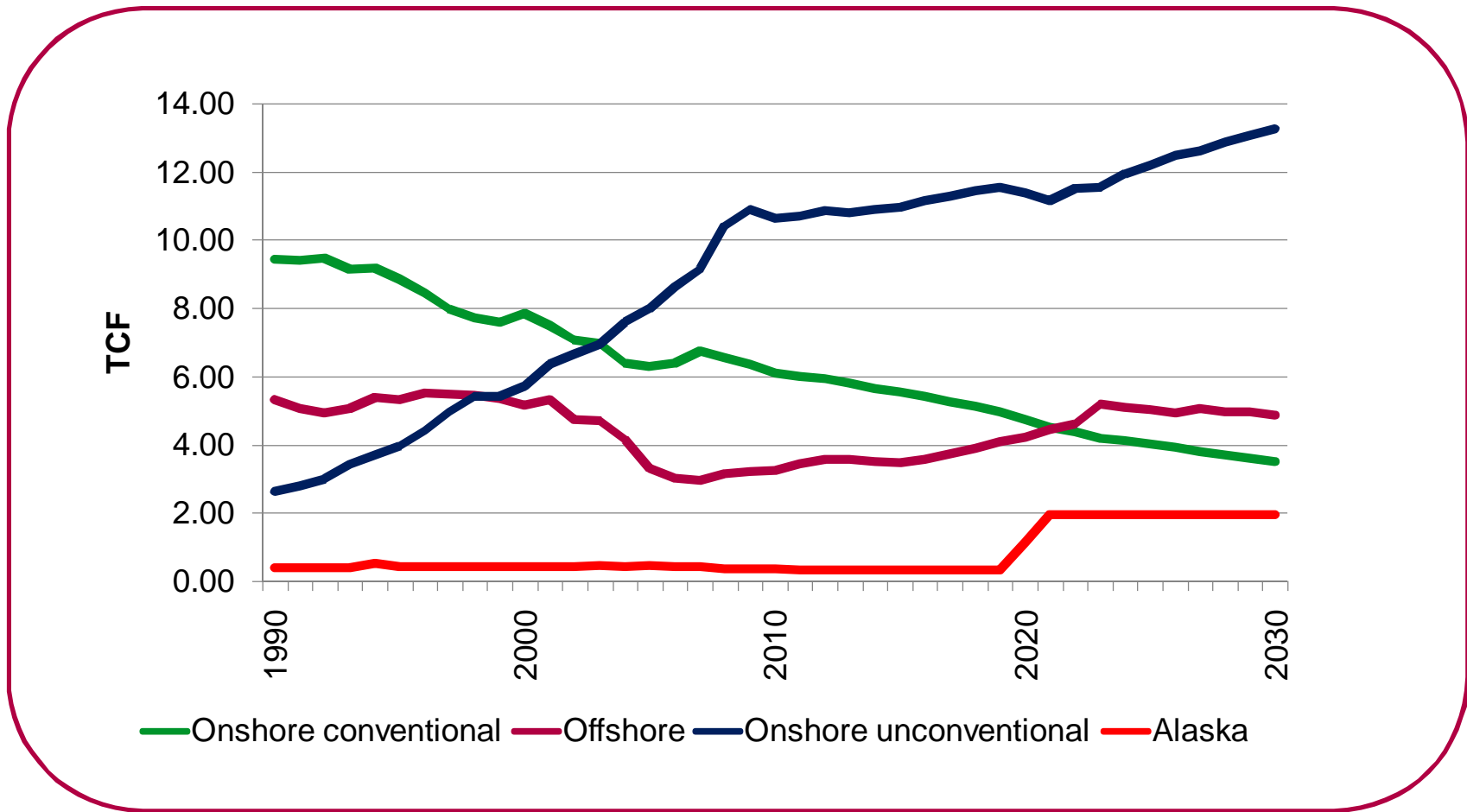
Source: Energy Information Administration (EIA)
GasTran Natural Gas Transportation Information System
Natural Gas Pipeline Projects Database, as of January 2009

Unconventional Gas

Displacing Conventional Gas



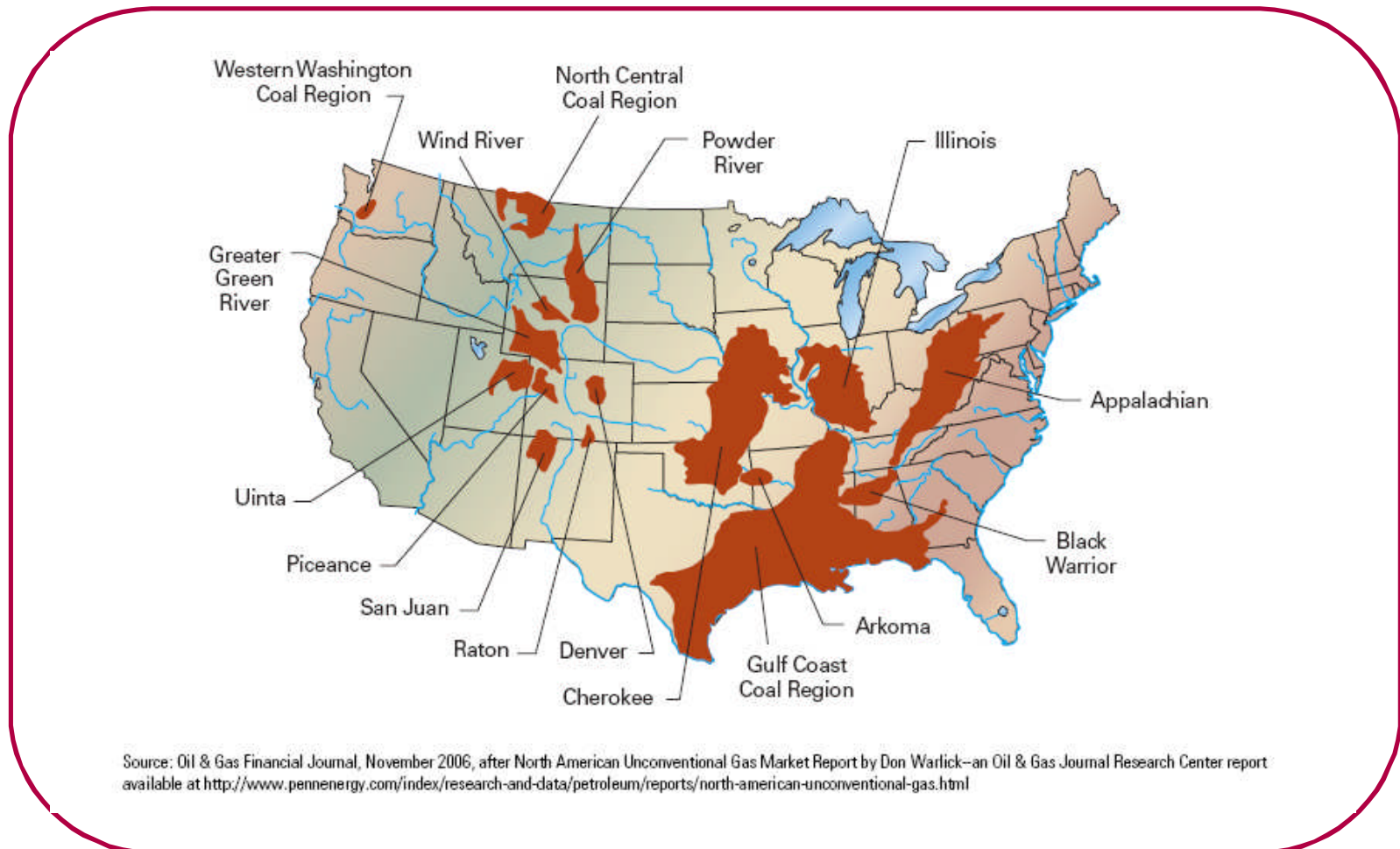
Changing Supply Sources Create Disruptions



Major Coal Bed Methane

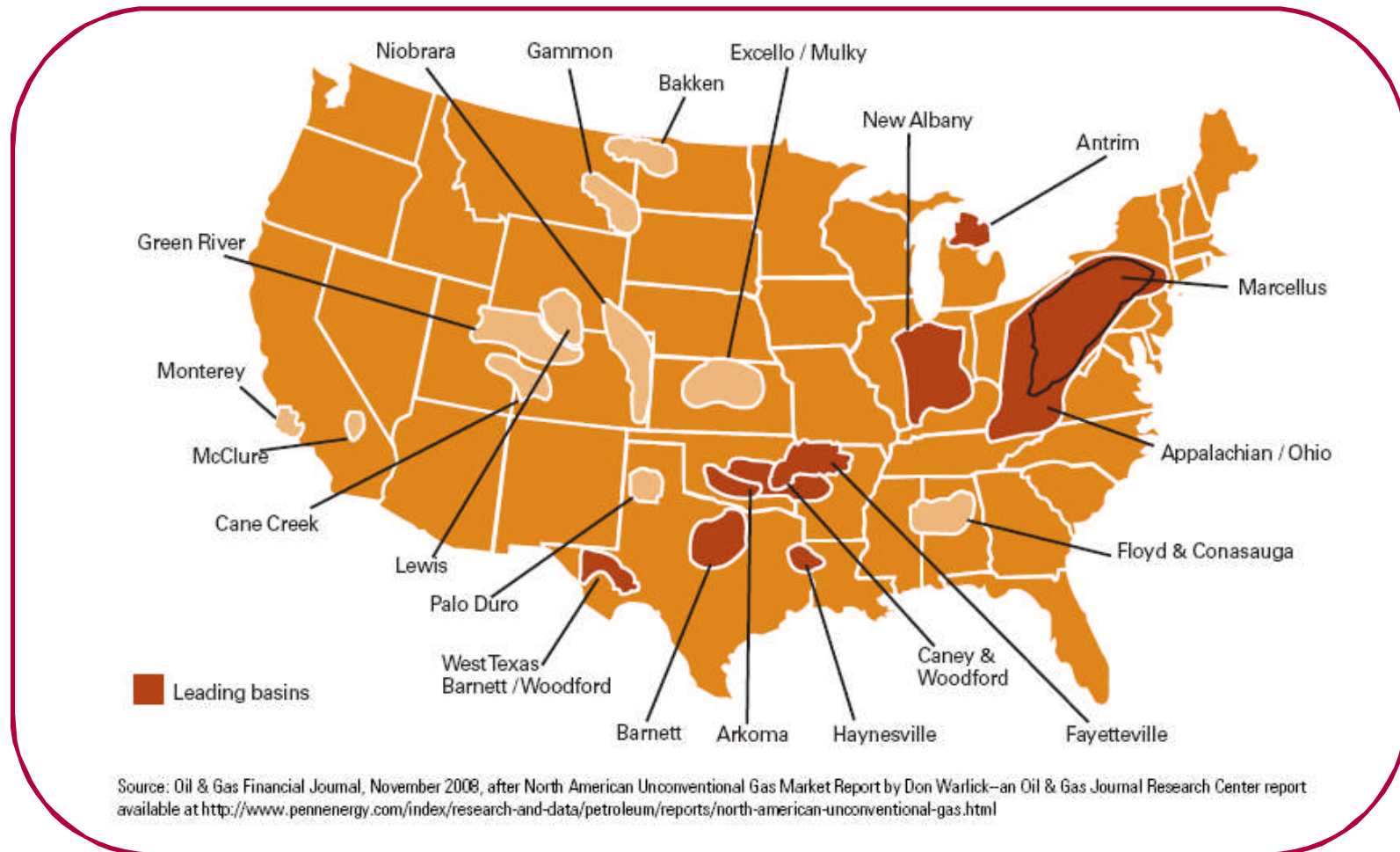
Created new pipelines economic

- Rocky Mountain Area

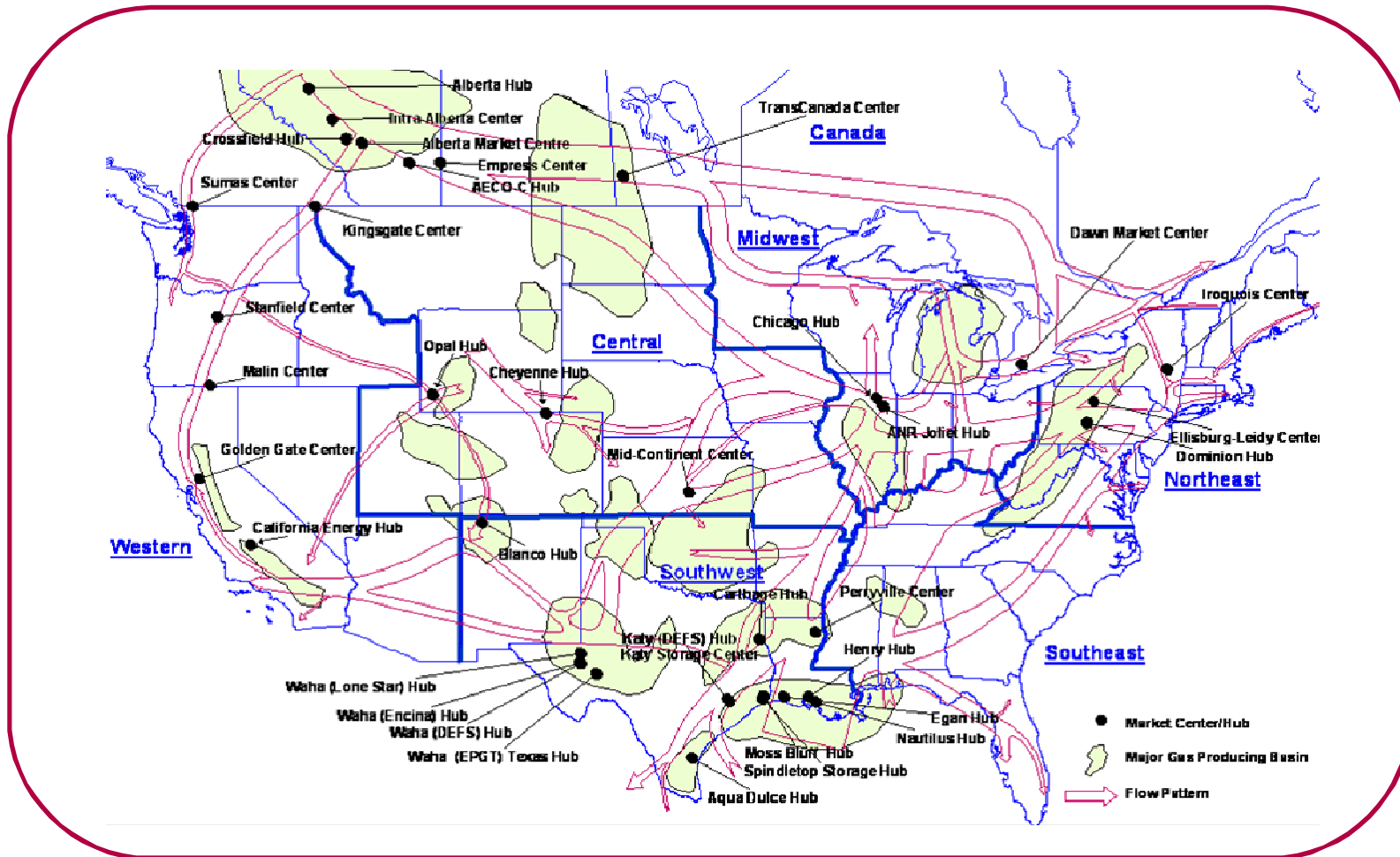


Shale Gas Production Economic

- Viability through technology improvements



Pipeline Interconnects and Hubs Facilitate Commerce



US Natural Gas Trends – Demand

● On the Demand Side

- Moderate demand increases driven primarily by power generation.
- Demand is highly dependent on economic growth rates
- Prices are highly dependent on demand



● Challenges

- Sustained low or negative economic growth
- Disruptive technologies (such as clean coal technology)
- Changes in the public view of nuclear energy

US Natural Gas Trends – Supply

● Supply Side

- Production continues to rise through the forecast period.
- Supply is moving from conventional to unconventional natural gas
 - particularly coal bed methane, shale and tight gas
- LNG is the swing supply source
- Alaska gas timing is still in question

● Challenges

- Low prices
- Access to investment capital
- Aging work force
- Tighter drilling restrictions
- Public resistance to drilling



US Natural Gas Trends – Logistics

● Logistics

- Pipeline interconnects are being added to facilitate gas movements
- Continued pipeline projects to balance supply/demand logistics
- Growth of high deliverability storage to meet peak daily demands

● CO₂ capture and sequestration may provide opportunities for natural gas transporters.

● Challenges

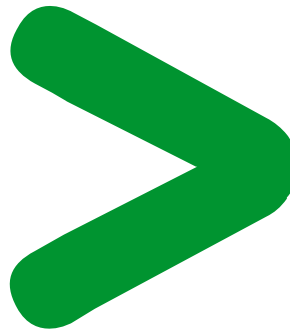
- Permitting delays
- Not in my back yard syndrome
- Public perception around safety
- Changing political landscape



Implications

**Increasing cost of
new natural gas
sources**

**Infrastructure
required to bring
new supplies to
market**



**Extraction
technologies &
processing
efficiency**

**Secure and
reliable transport
and storage**

The best way to secure energy availability is through efficiency



Achieve more while using less