



25th world gas conference  
"Gas: Sustaining Future Global Growth"

# Underground Natural Gas Storage in North America

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Patron



Host



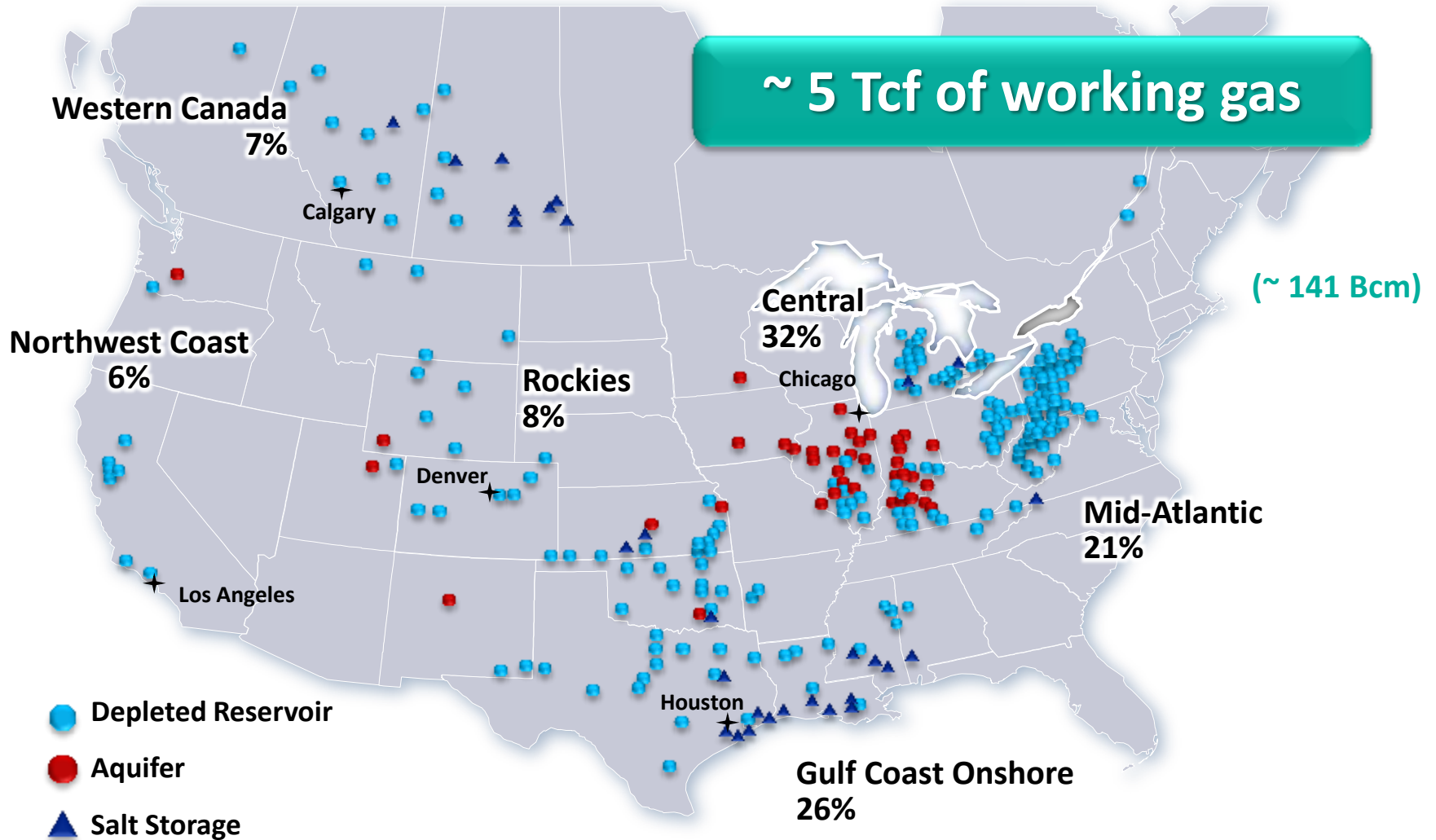
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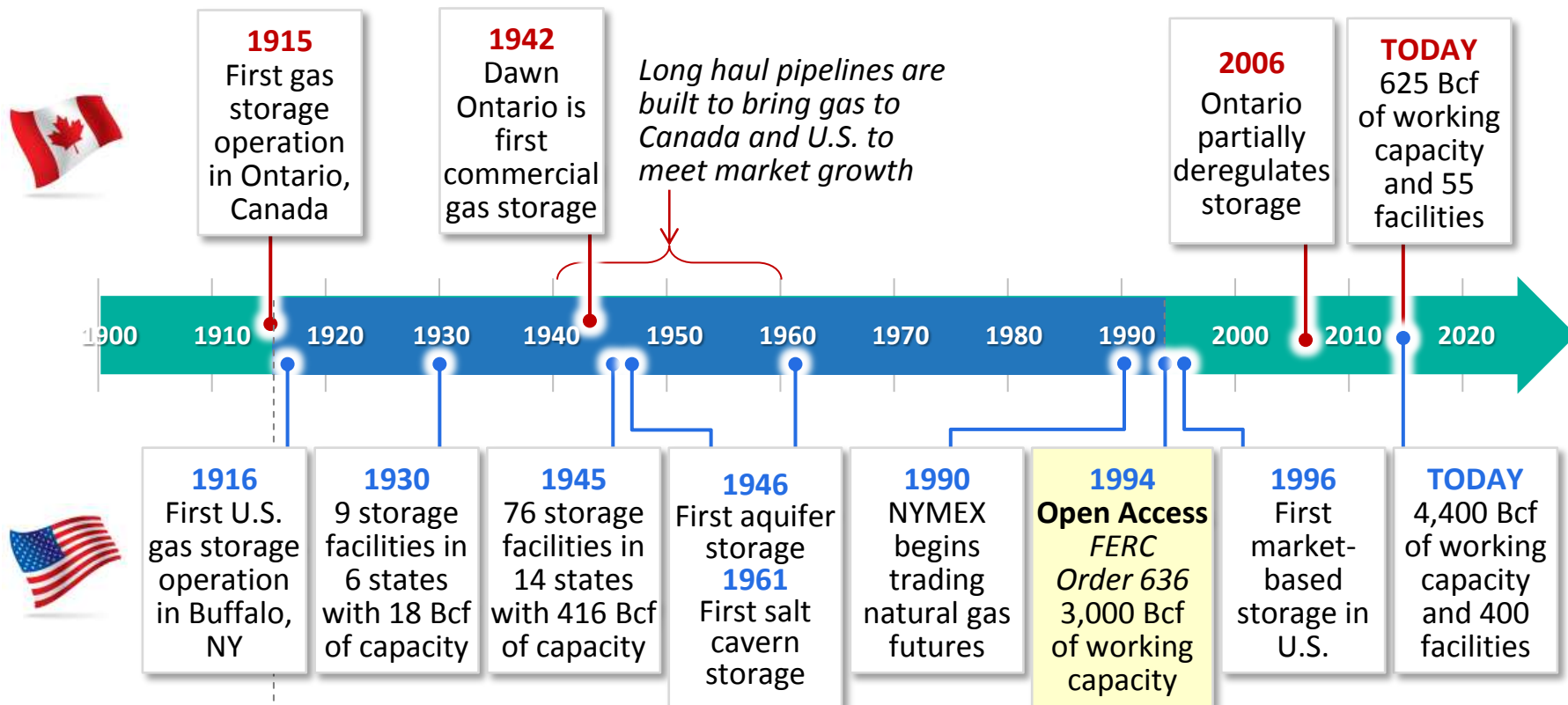
- What does storage look like in North America?
- How did we get here?
- What is the current environment for storage?
- As the natural gas market in North America continues to grow, how will storage play a role?



# North American Storage Facilities



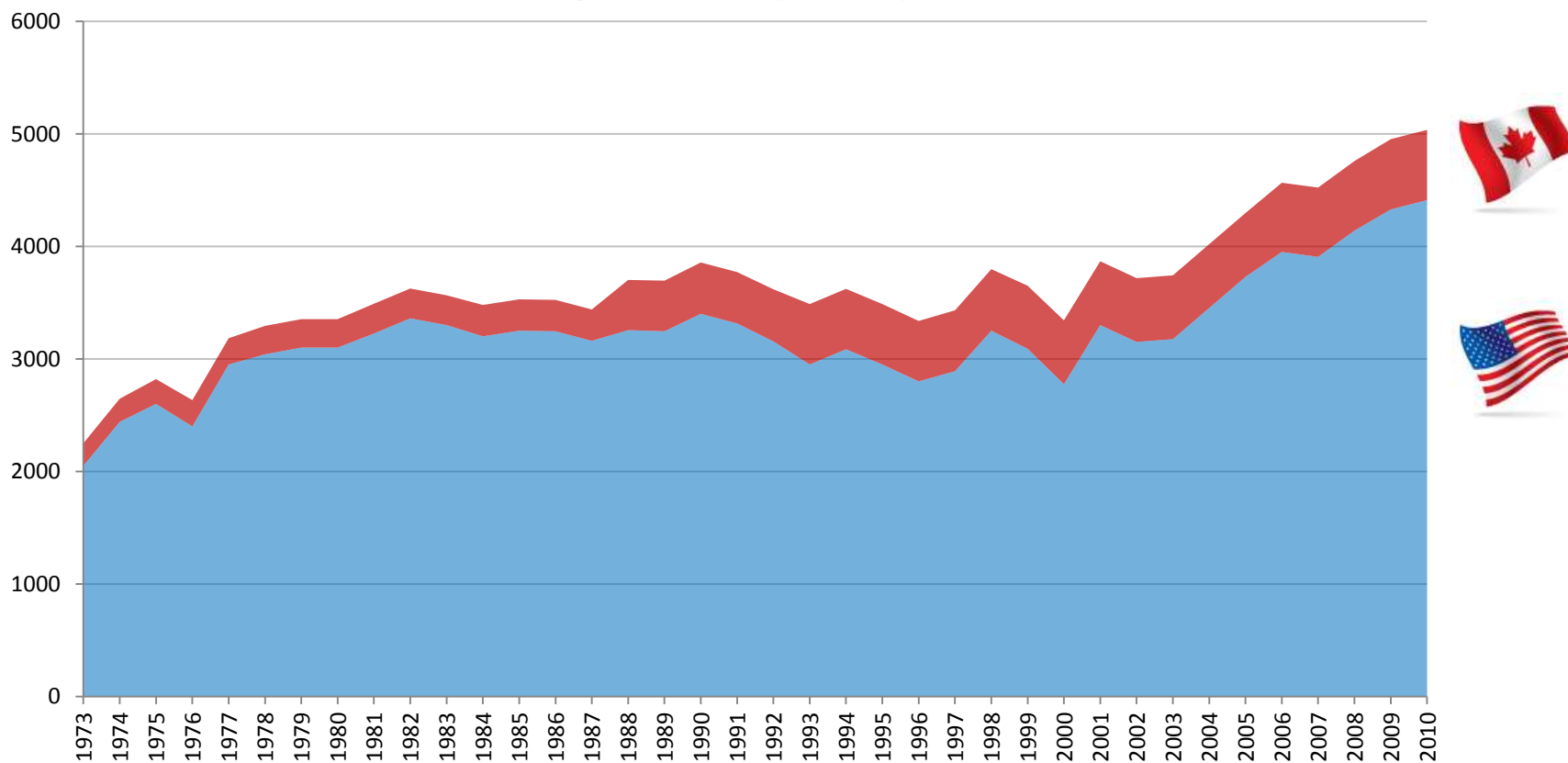
# How did we get here?



*During this period, interstate pipeline companies owned all the gas flowing through their systems including gas in storage*

# Historical North American Storage Capacity

## Cumulative Working Gas Capacity (Bcf)

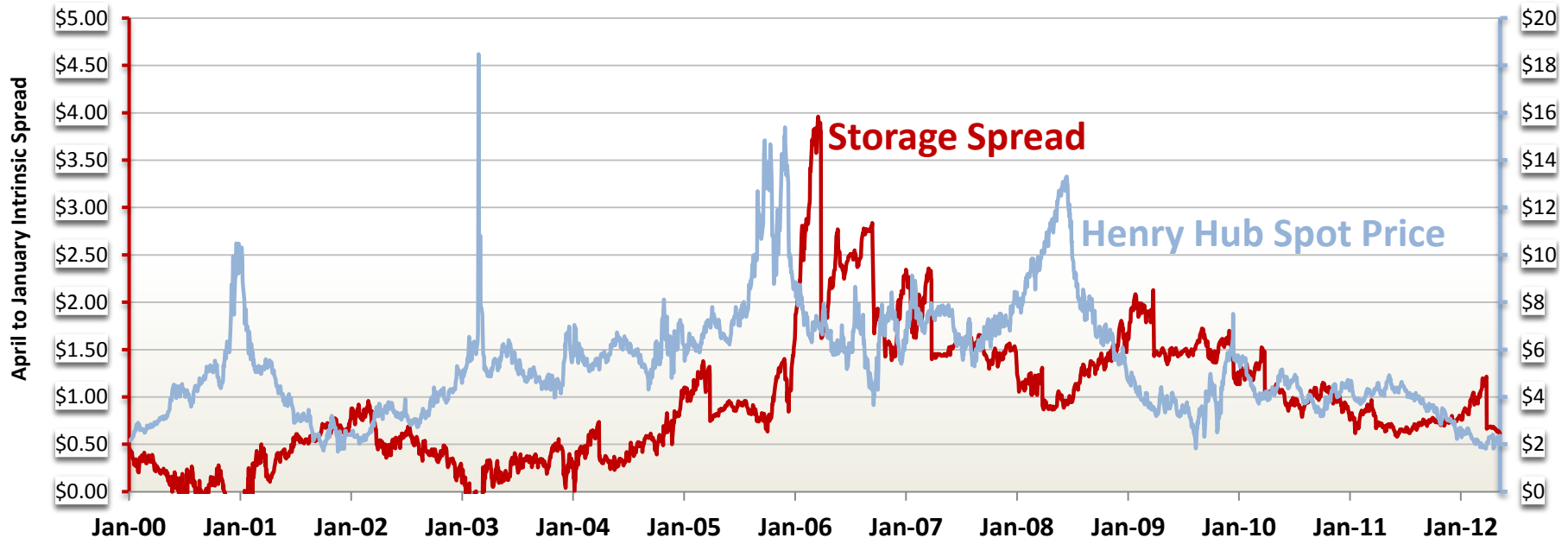


Sources: AGA, EIA, FERC

# How did we get here?

- Market based storage values reflect the spread between summer and winter prices
- Natural gas price volatility has been high but is now moderating due to the abundance of shale gas in North America

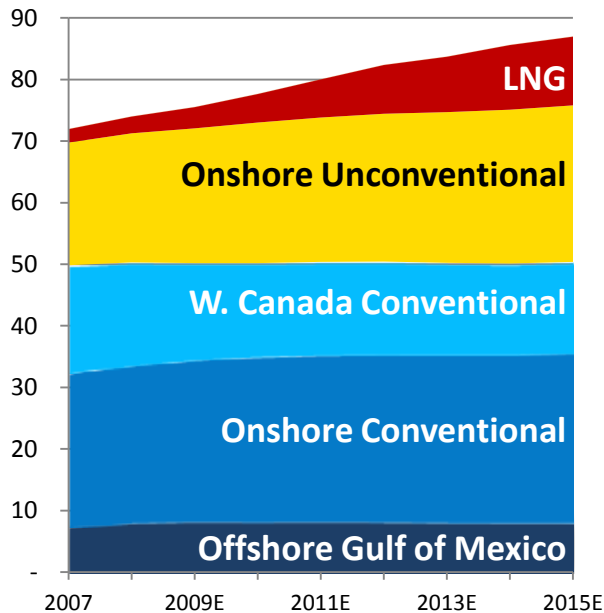
**Historical Storage Values (\$/Dth) vs Henry Hub Spot Prices (\$/MMBtu)**



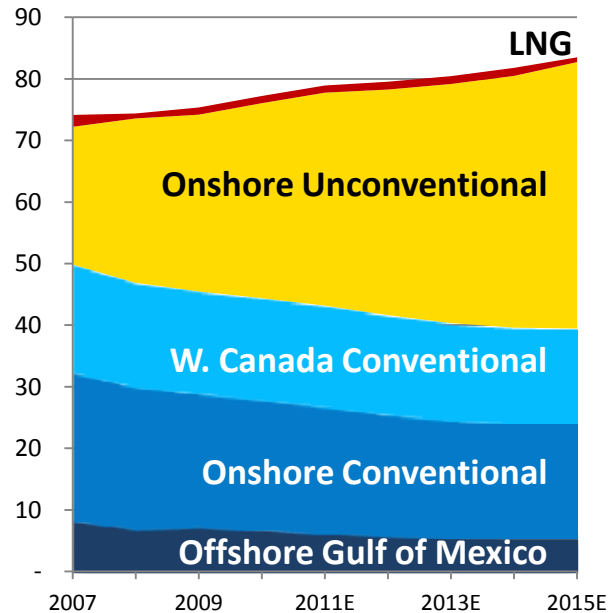
# Current Environment

## North American Natural Gas Supply (Bcf/d)

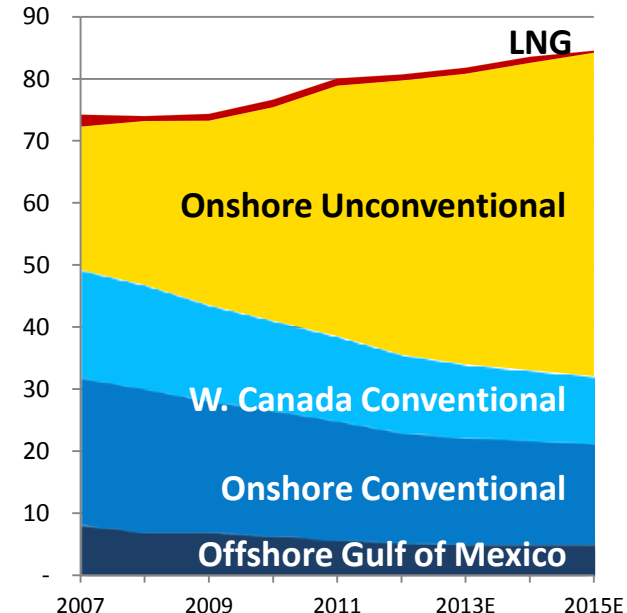
### 2007



### 2011



### 2012



Source: ICF International

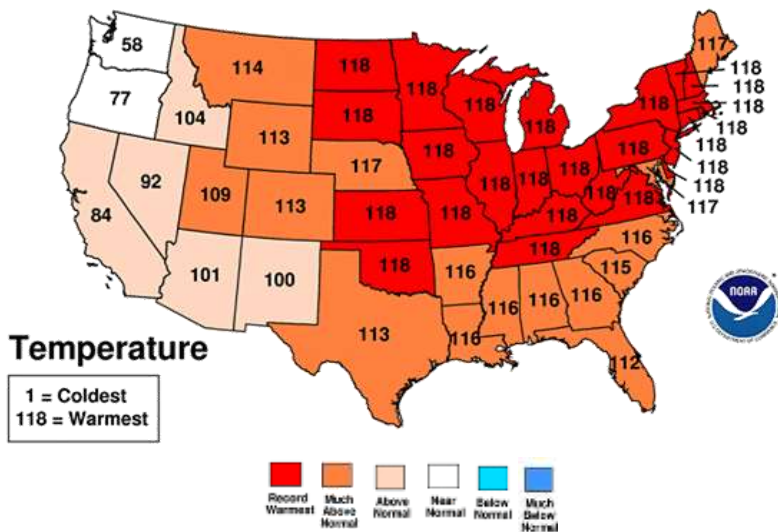
# Current Environment

## *Growing storage inventory levels*

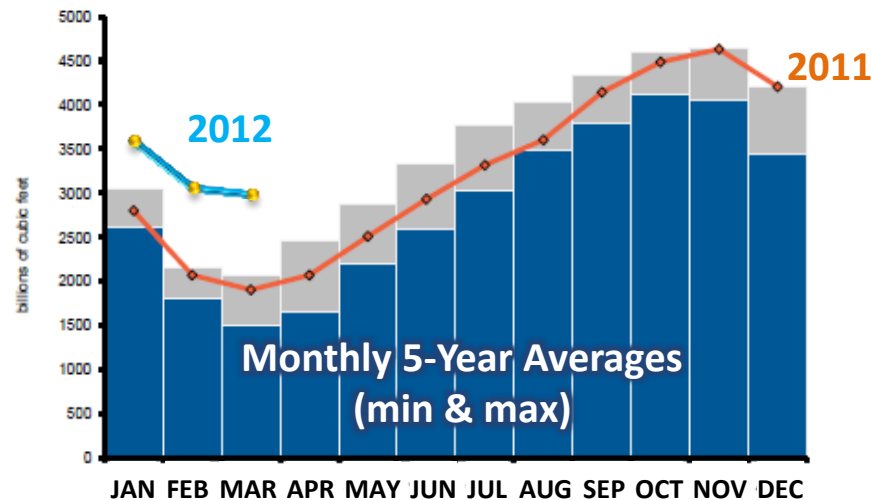
High gas production combined with a record warm winter...

... resulting in record gas storage inventories

**Record Temperatures**  
January – March 2012



**North American Natural Gas Storage Levels (Bcf)**



Source: CGA, EIA, First Energy Capital Ltd

5-Year Max 5-Year Min 2012 2011

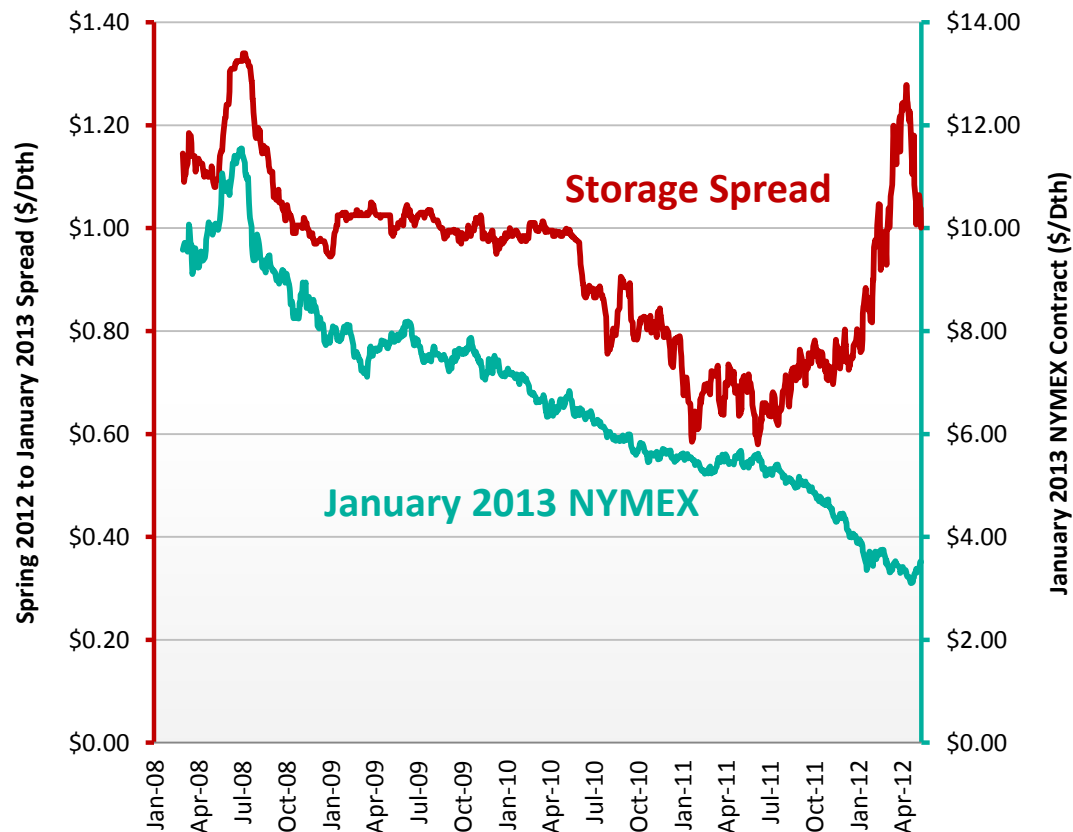


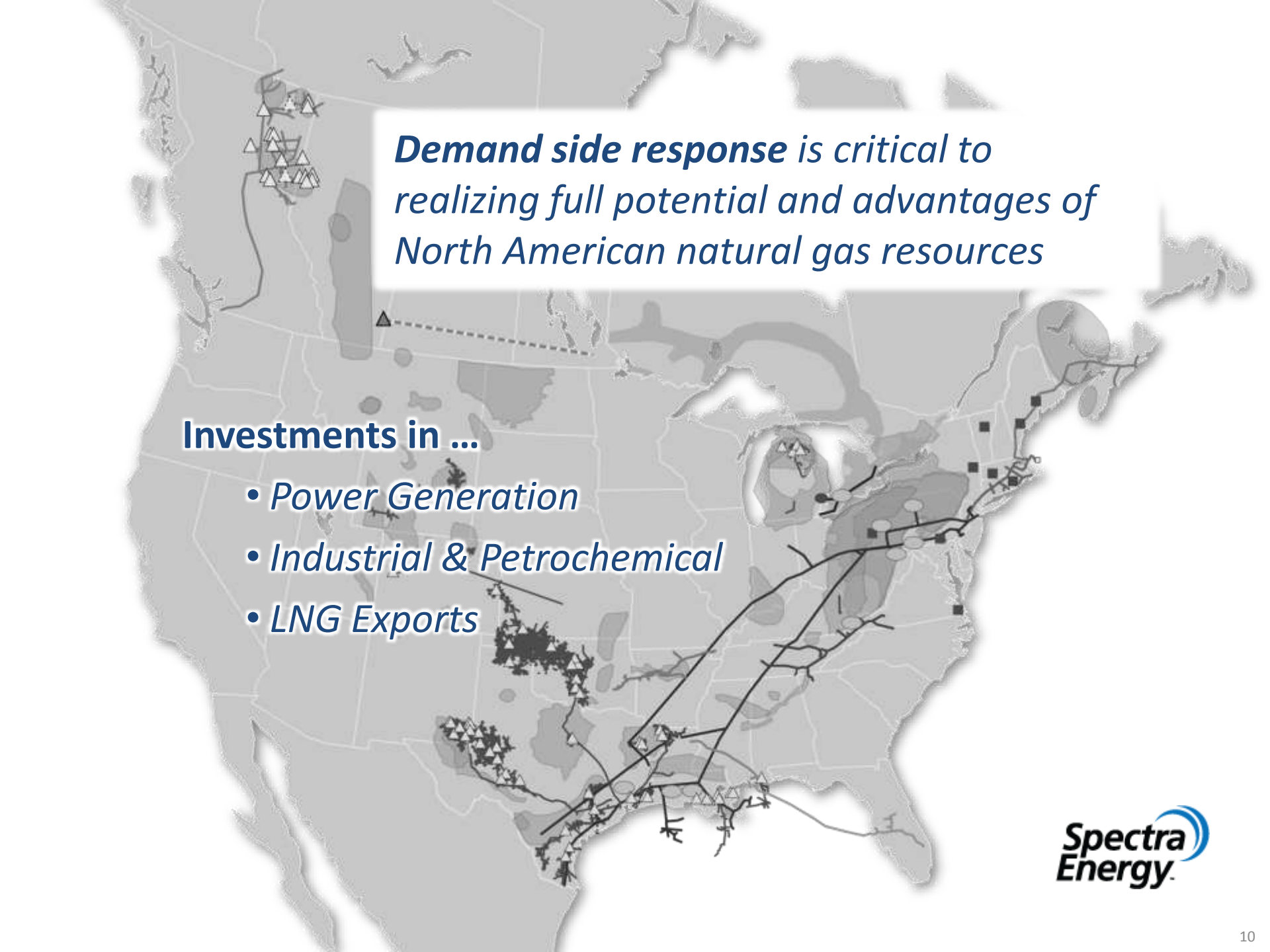
# Current Environment

## *How we manage storage*

- Cost of service rates for regulated storage
- Market based storage
  - Firm services
  - Interruptible services
- New demand growth in North America will provide opportunities for storage

### Current Storage Values (\$/Dth)



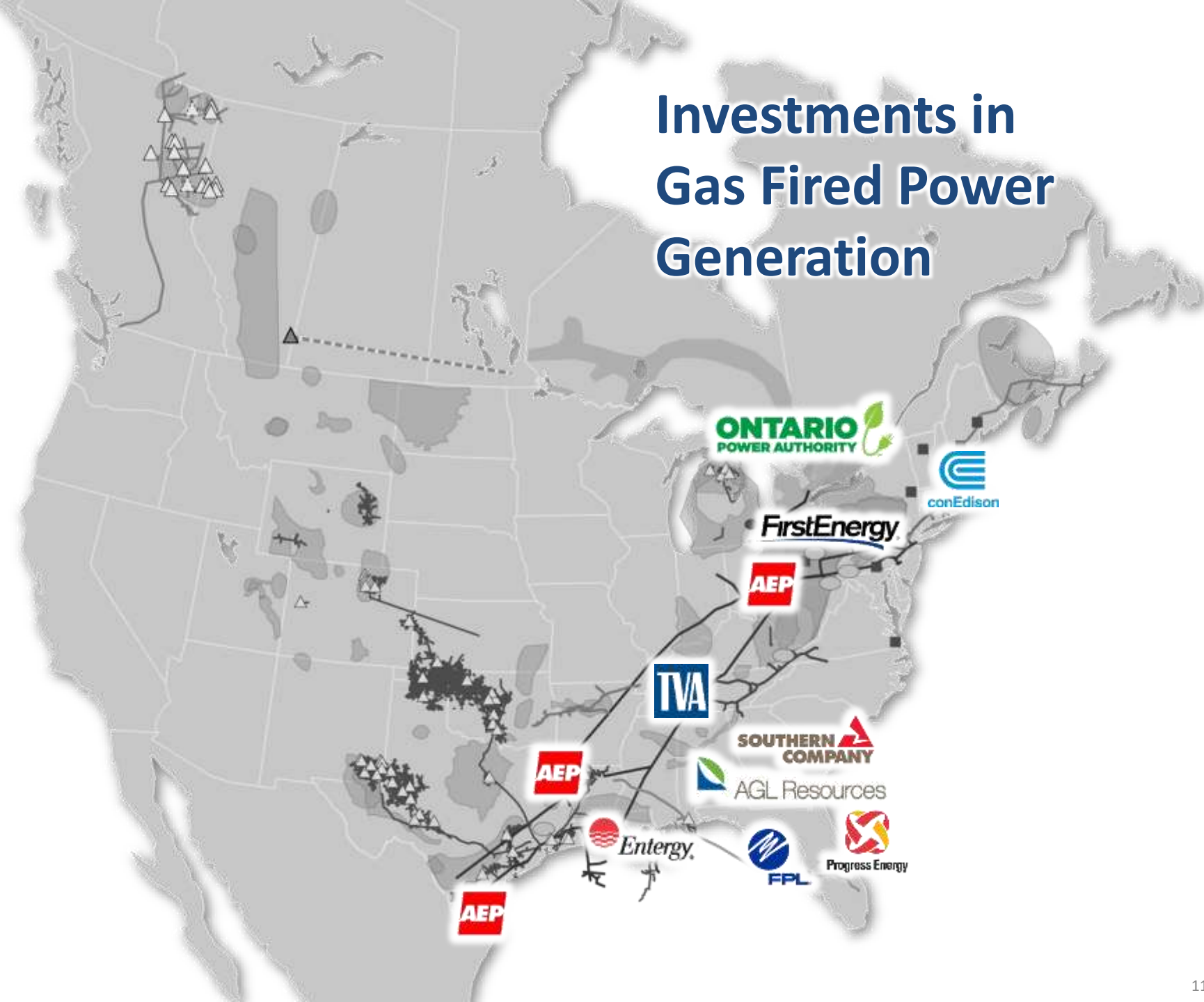
A grayscale map of North America showing the extensive natural gas pipeline network. The map includes major basins in the Rocky Mountain region, the Permian Basin in Texas, and the Marcellus/Utah basins in the Northeast. A white text box is overlaid on the upper central part of the map. A dashed line with a triangle at its end points from the text box to the Permian Basin. Various symbols like triangles and squares are scattered across the map, likely representing production or processing sites.

***Demand side response is critical to realizing full potential and advantages of North American natural gas resources***

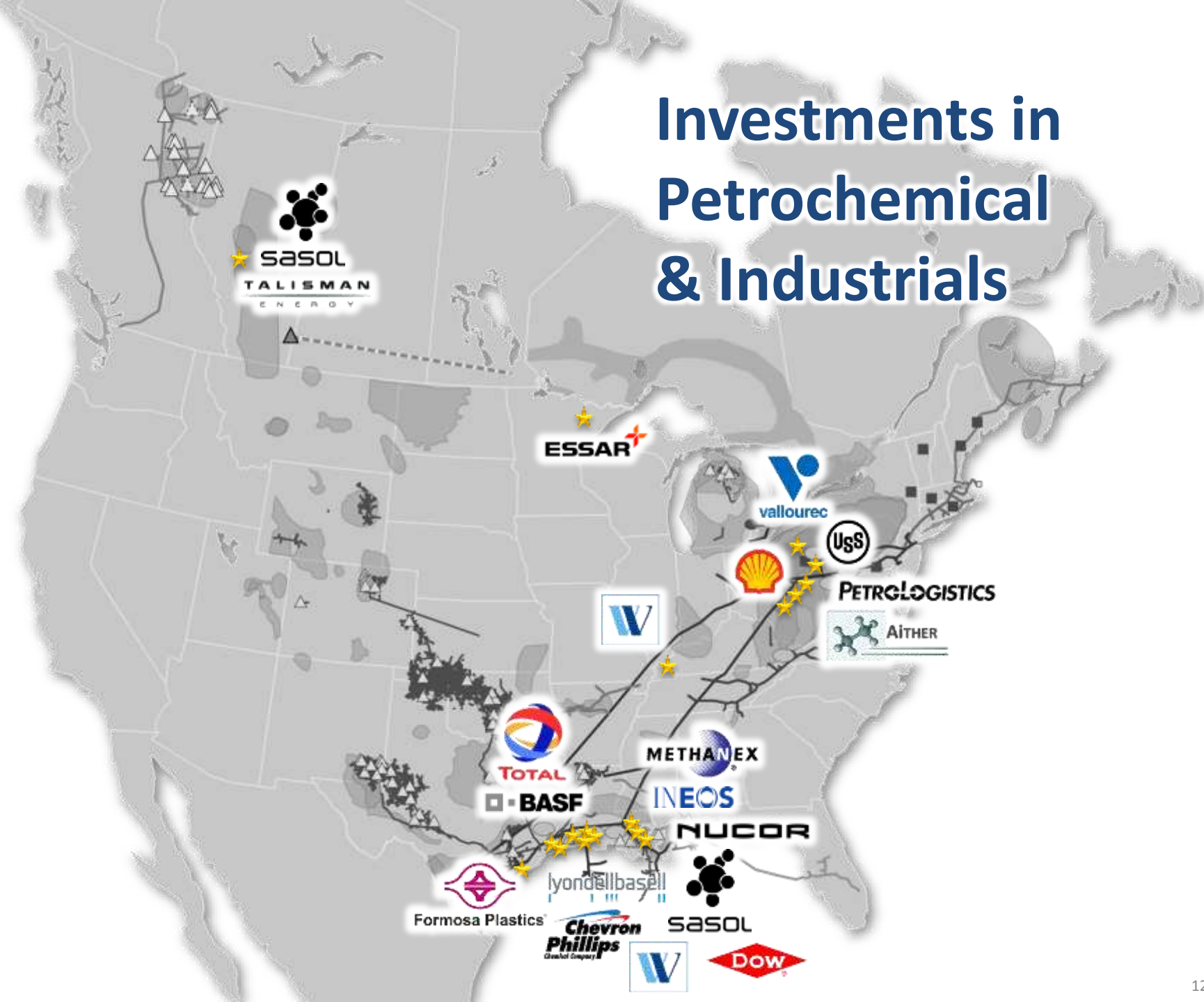
**Investments in ...**

- *Power Generation*
- *Industrial & Petrochemical*
- *LNG Exports*

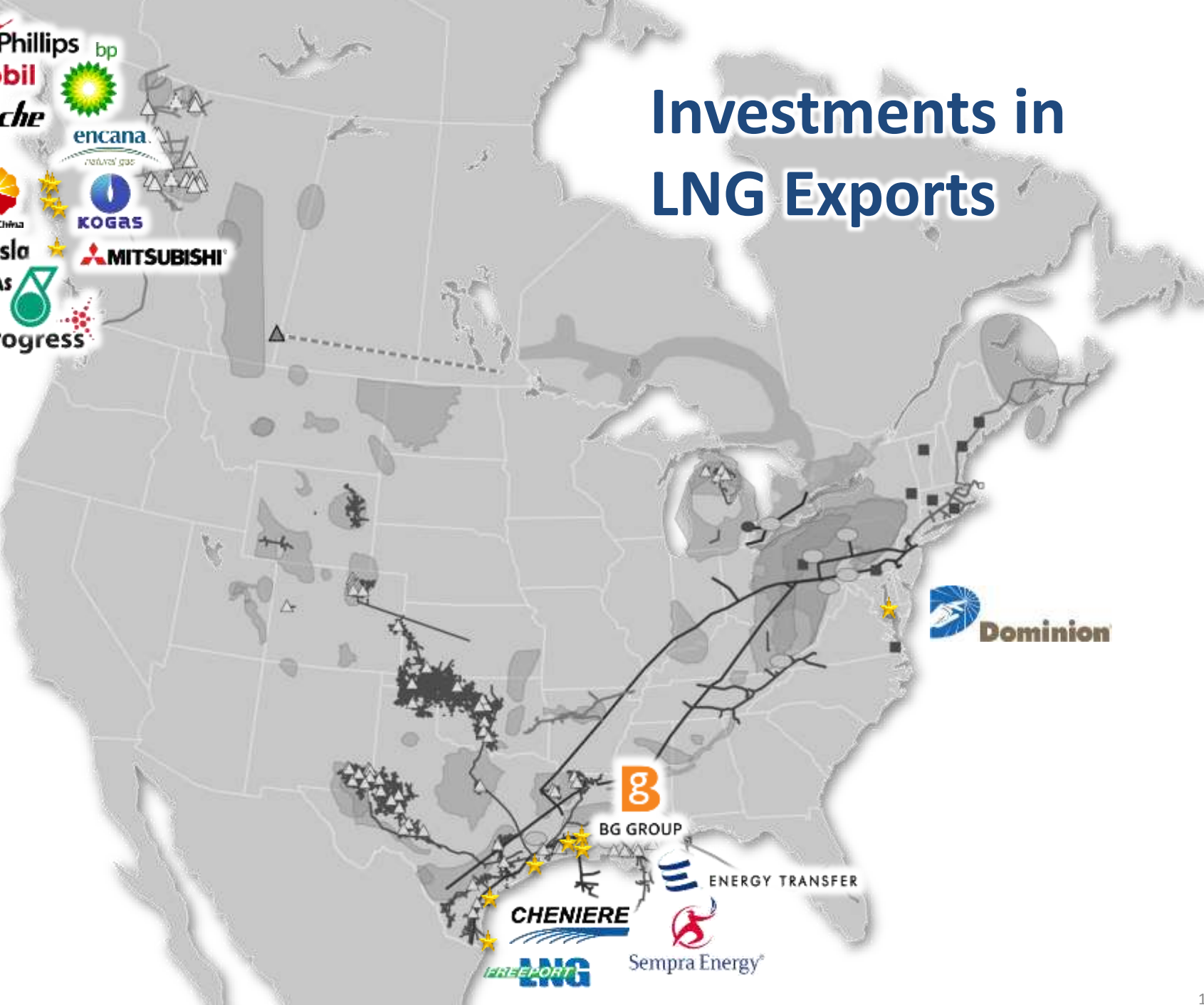
# Investments in Gas Fired Power Generation



# Investments in Petrochemical & Industrials



# Investments in LNG Exports



# Looking Ahead

## *Storage Plays a Key Role*

- Abundant supply and growing demand are changing the face of the natural gas industry in North America
- Storage continues to play an important role:
  - Growth in power generation will drive need for storage services to balance the grid on a hourly and daily basis
  - Reliability of storage will continue to be key for utilities
  - Emerging demand may provide additional opportunities for storage
- The nature of market based contracting will continue to evolve
- Storage will play a key role in maintaining a liquid, flexible, reliable North American market with a growing reliance on natural gas

