

# The Challenges of Transport — Unconventional Oil & Gas

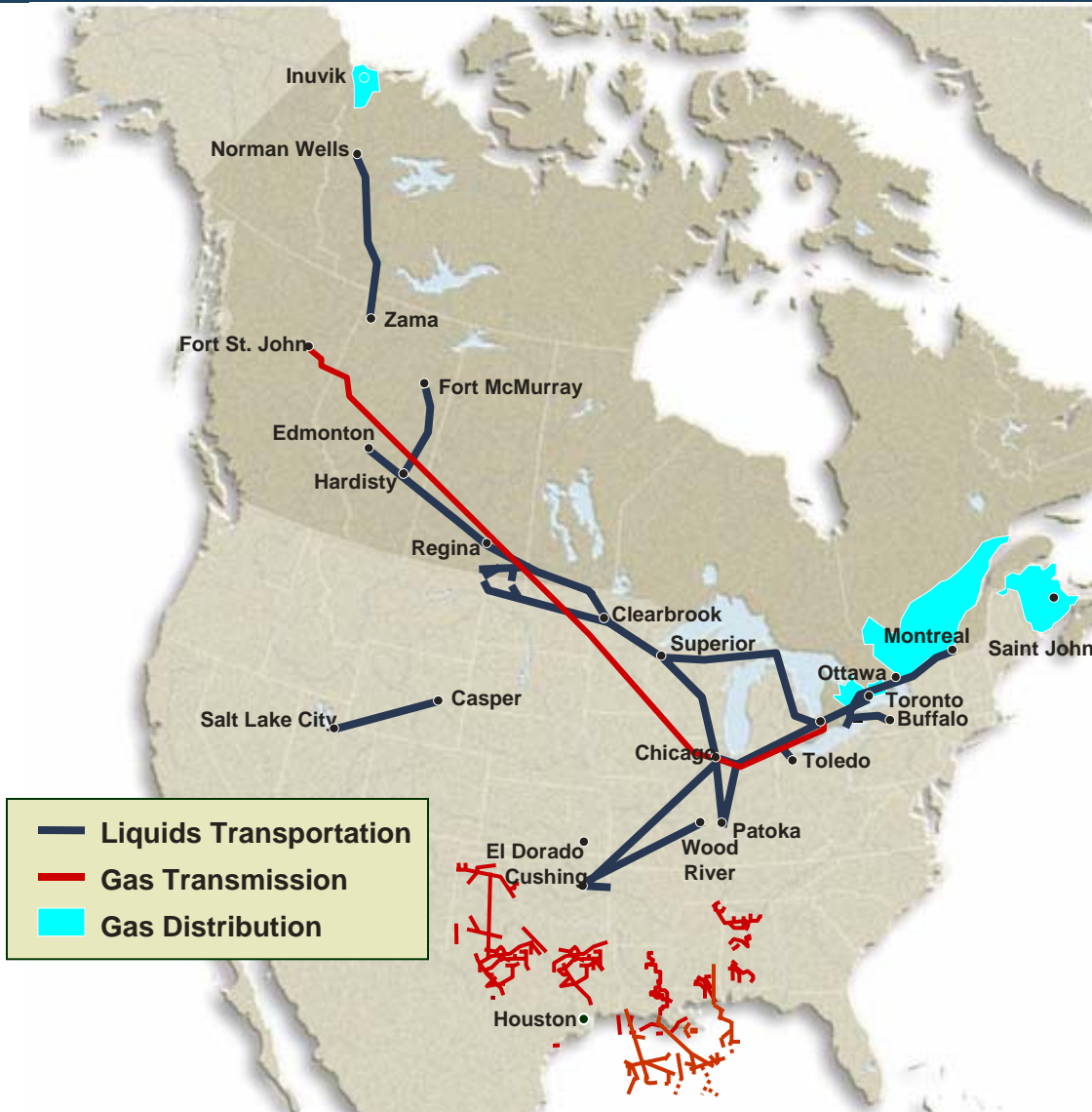


## *Expanding North America's Pipeline Infrastructure*

*Denise Hamsher*

*November 2008*

# About Enbridge



- Operates world's longest liquids pipeline and Canada's largest natural gas distribution company
- Interest in 50,000 miles of pipelines
- Delivers 2 million bpd of liquids
  - >10% of U.S. crude imports
- Handles 5 bcf/d of natural gas
- Employs 5,000 people
- Wind development capacity of 270 megawatts

# Expansion Projects Recently Initiated or Completed



**Over \$12 billion in North American expansions underway with more on drawing board:**

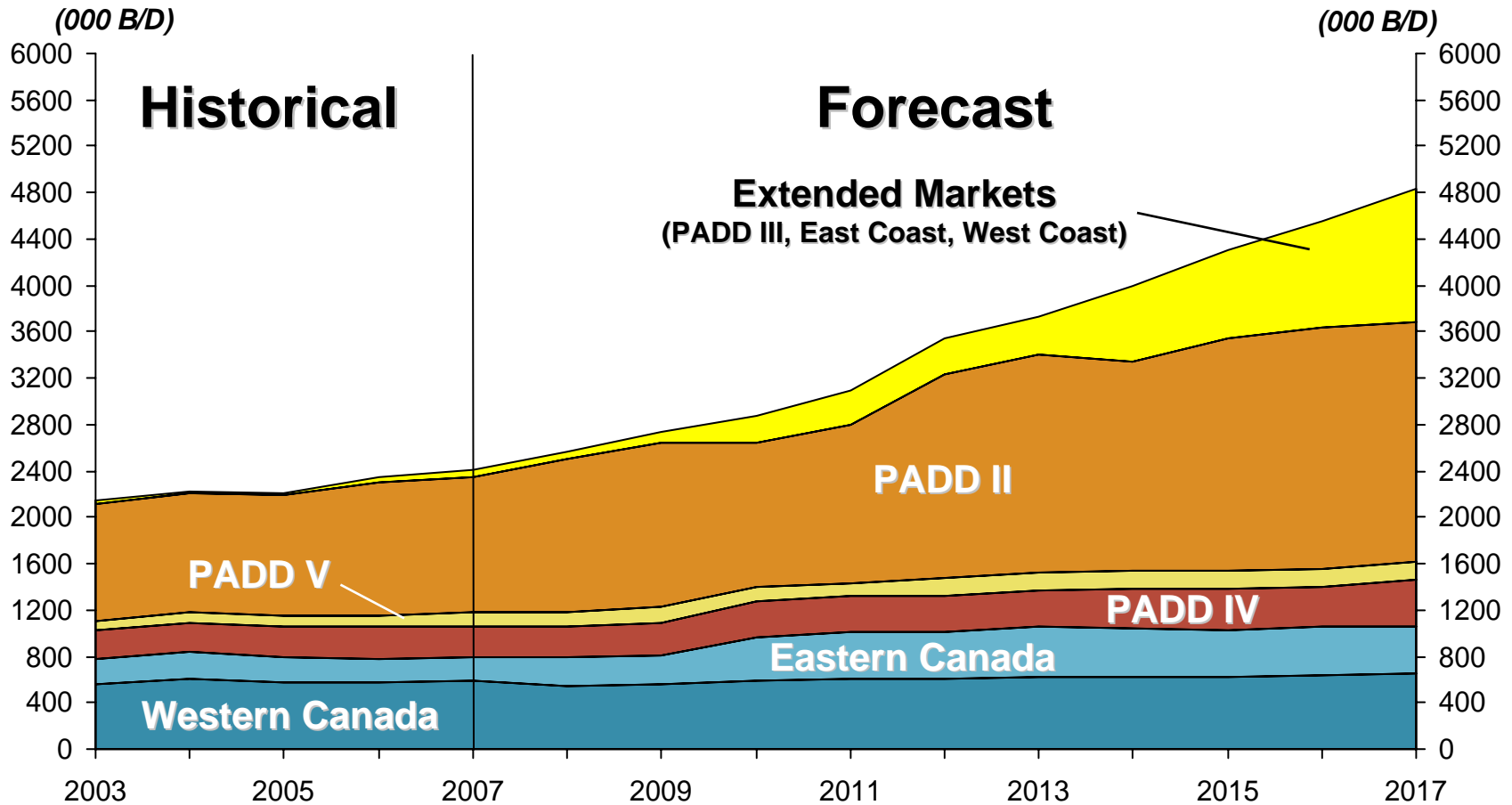
- **Three major growth areas:**

- Alberta Oil Sands to market
- Williston Basin production to pipeline network
- Barnett Shale to regional hubs

- **Nearly 2,500 miles of new pipeline:**

- Approximately 2,300 miles of new liquid transmission pipeline proceeding with more on drawing board...
- 163 miles of new gas transmission pipelines

# Expected Disposition of Western Canadian Crude



# Access to Key Refinery Markets



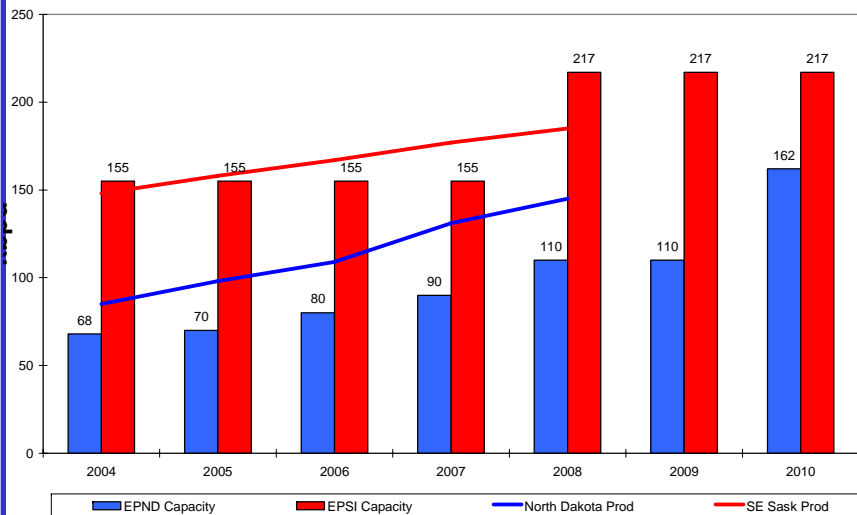
- **Enbridge's Lakehead System delivered more than 11% of total U.S. crude oil imports in 2007**
  - This amount was 70% of total Canadian crude oil exported to U.S.
  - New projects will add 450,000 bpd capacity on Lakehead System (expandable up to an additional 1.2 million bpd)
- **Expanded capacity will deliver Williston Basin production to market**
  - Enbridge's North Dakota System will grow from:
    - 80,000 bpd capacity in 2006
    - 162,000 bpd capacity by 2009
  - Enbridge's Saskatchewan System expanding to 217,000 bpd from today's 155,000 bpd
- **Systems connect to major U.S. Refinery Hubs**
  - US PADD II (Midwest) and PADD III (Gulf Coast) includes approximately 70% of US refining capacity.

# Expanding Transport Options as Production Grows



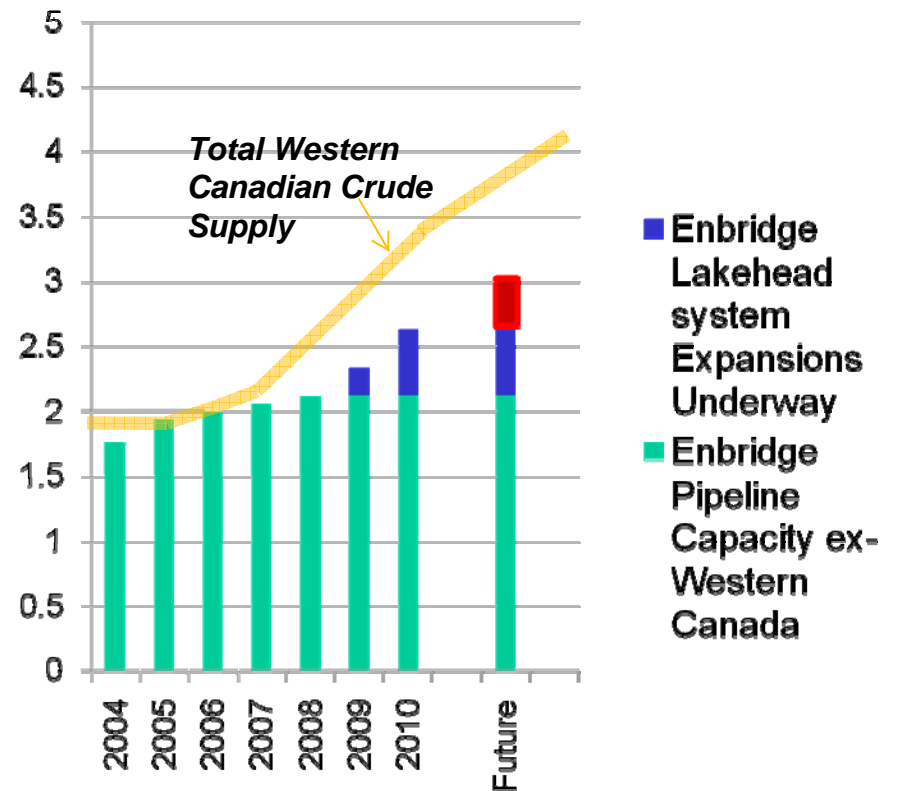
## Enbridge Feeder Systems in Williston Basin

(thousands bbl per day)

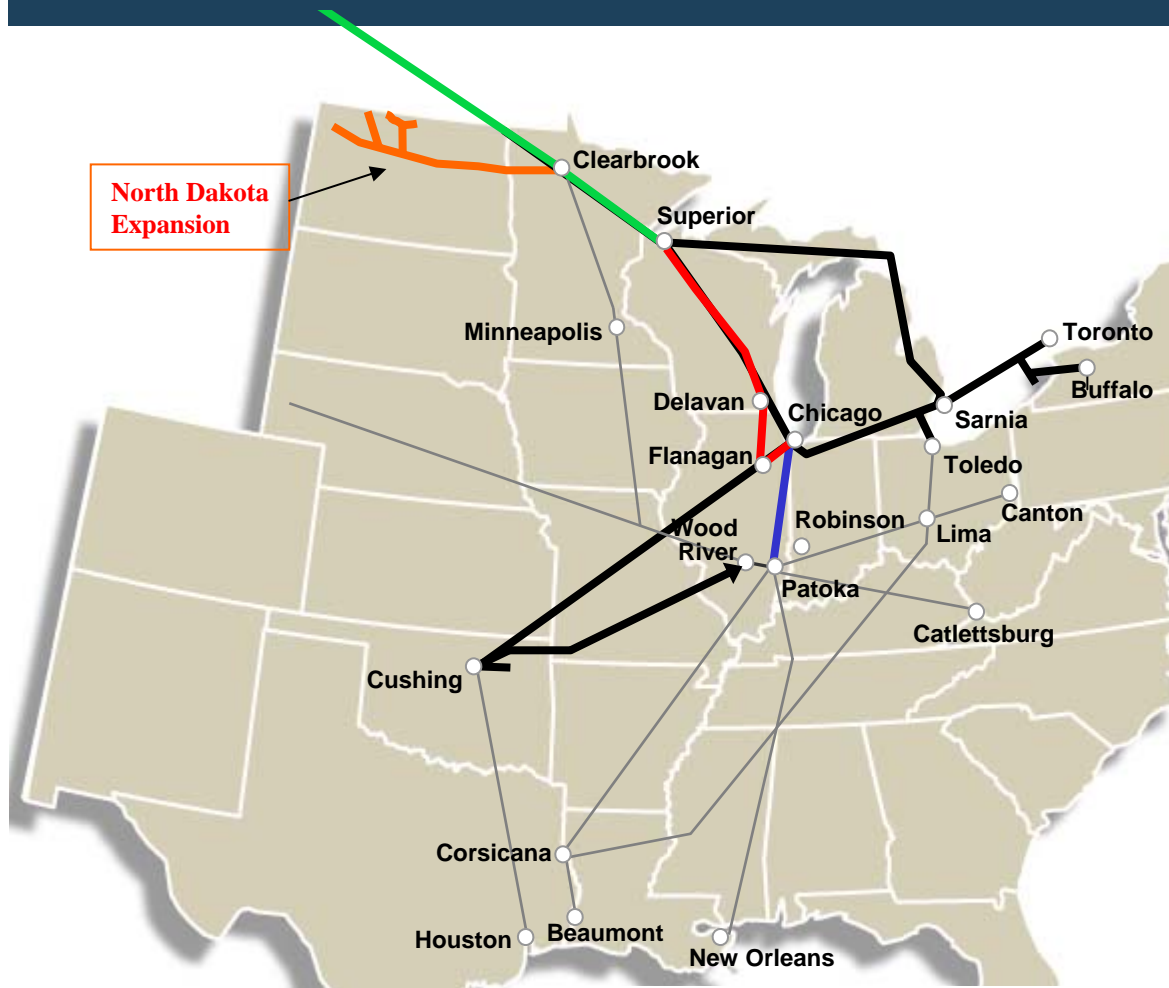


## Enbridge Lakehead System Added Capacity

(millions bbl per day)

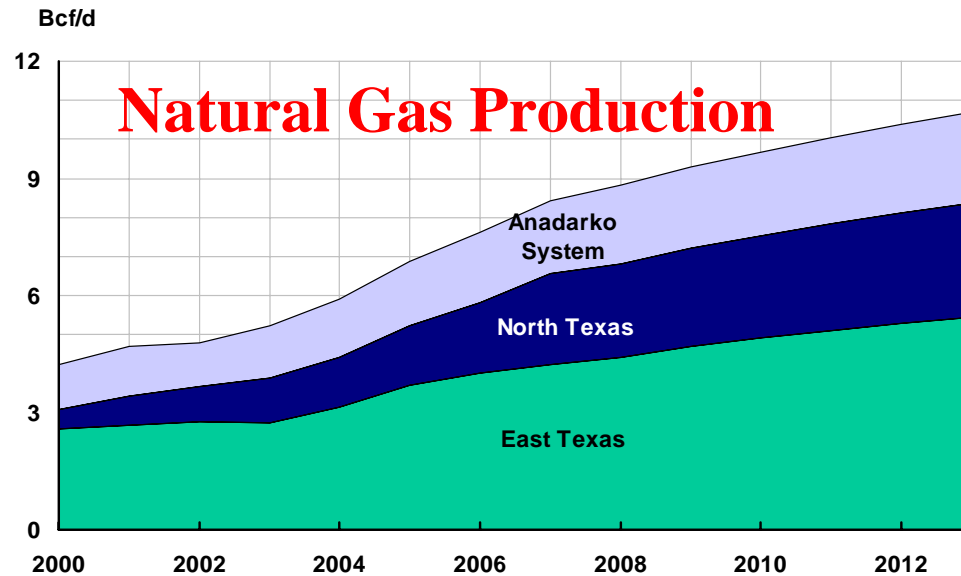


# Williston Basin Connects to Major Pipeline Network



- **Southern Access Stage 1** added 190,000 bpd capacity in April 2008.
- **Southern Access Stage 2** to add 210,000 bpd capacity in early 2009.
- **Alberta Clipper** to add 450,000 bpd capacity by mid-2010 (expandable to add another 400,000 as required)

# Keeping Up with New Barnett Shale Gas Production

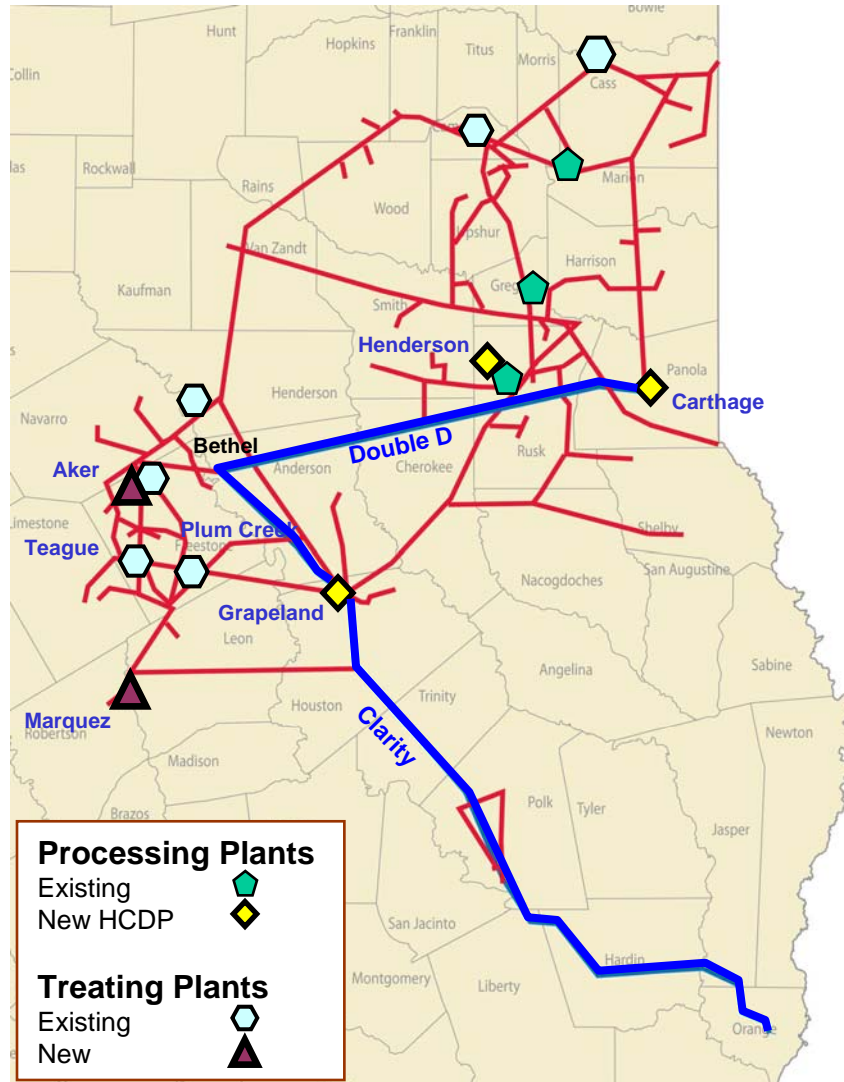


Source: Cawley Gillespie (May 2008)

- Average throughput on Enbridge midstream systems increased from:
  - 2.1 MMBtu/d in 2007
  - 4.7 MMBtu/d in 2008
- Processing plant capacity increased from:
  - 105,000 MMcf/d
  - 195,000 MMcf/d
- Enbridge “Clarity” pipeline completed in February 2008 adding 700 MMcf/d transmission capacity



# East Texas System Expansions



- **Enbridge's Clarity Project** increased market access for producers in East and North Texas to large industrial base in SE Texas and several interstate pipelines
  - 700 MMcfd intrastate transmission
  - Q2 throughput exceeded 350 MMcfd
  - 500 MMcfd projected by end of 2008
- **New treating and HCDP plants** provide competitive advantage, and volumes are increasing.

# Major Challenges



- **Commercial**

- Expectation to have pipeline infrastructure in place to transport new production to market
- However, early and long term commitments difficult to obtain
- Agreement of shipping terms among producers, shippers and marketing interests takes time
- Major projects now require longer lead times to acquire land and permits
- Capital and labor costs escalating and require long lead times

- **Routing**

- Populated areas
  - Into Chicago hub and Barnett Shale near Ft. Worth
- Increased resistance to use of eminent domain leads to governmental action, including legislation, ballot initiatives and legal action
- Adds to timeline and pipeline construction costs

# Major Challenges (con't)



- **Permitting**
  - Liquid pipelines and intrastate gas subject to á-la-carte federal/state
    - Varies significantly from state to state or by project
    - Bottlenecks can develop when one state has protracted approvals
  - Expectations by public in regulatory proceedings
    - Consultation to resolve issues is beneficial but takes time
    - Strong views on environmental and route issues often difficult to balance with market need, energy security and project costs
- **Federal agencies' proposed rulemakings very costly**
  - Legislation:
    - Energy Infrastructure Security Act of 2007 - Section 526
    - Anticipated green house gas emission cap-and-trade
  - Regulatory:
    - FERC – attempting to regulate intrastate natural gas pipelines
    - U.S DOT/PHMSA – control room management
  - Executive Order – U.S. Department of State lead federal agency for cross-border projects

# Major Challenges (con't)



- **Legal Challenges: Environmental non-government groups opposed to projects and/or unconventional production**
  - Interveners turning attention to pipeline and downstream projects
  - Increasingly intervention goes beyond concerns about specific project
  - Tactic is “lifecycle, greenhouse gas emissions” – e.g. seek expanded scope of environmental permits
  - Organized and supported financially

■ Wisconsin Wetlands Association



Minnesota Center for  
Environmental Advocacy



# Recommendations



- 1. Develop uniform framework or models for regulatory permitting and site-selection for liquid pipelines across multi-state boundaries.**
  - Consider establishing 12-month window for state Certificate/Route permit
  - Urge adjoining states to cooperate in respective processes
  - Develop best practices in federal and state collaboration
  - Model effective ways to seek public input & improve transparency
  - Develop best practices in corridor and routing approvals with enough flexibility to accommodate environment, construction and landowner solutions
- 2. Continue to support development of all new supplies of energy within North America in order to meet future energy demand.**
  - But meanwhile, oil and gas projects need to proceed and be judged on their own environmental merits
- 3. Establish policies that balance environmental AND energy needs.**

# Recommendations (con't)



- 5. Strengthen cooperation between FERC and state agencies, rather than expanding FERC commercial jurisdiction on intrastate facilities.**
- 6. Encourage IOGCC to work with federal environmental agencies to develop energy infrastructure permitting practices that make sense.**
- 7. Continue to have IOGCC and other policy makers educate non-producing states and other stakeholders on need for predictable, reasonable energy infrastructure site-selection criteria.**