Williston Basin
Greasing the Gears for Growth in North Dakota

NDPA/NDIC Study

Presented By:
BENTEK Energy
BENETEK Energy

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- Majors, Producers, Mktrs, Industrials
- Pipelines, Utilities, Midstream
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The Williston Basin Is Benefiting From the Significant Shift in Natural Gas Dynamics as a Result of:

- A Realignment of Producer Investment Criteria Toward Oil and NGL Plays.
- Reduction in Production From Neighboring, Less Economic Producing Basins.

While Still Early, Current Data Suggests the Basin Could Yield Higher Future Gas and NGL Volumes Due to a Rising Gas to Oil Ratio (GOR).

Strong Drilling Economics, a Rising GOR and Greater Efficiency Will Increase the Future Output From the Basin. Under BENTEK’s Base Case Scenario, Oil Production Will Climb to 2.2 MMB/d and Gross Gas Production Will Top 3.0 Bcf/d by the end of 2022.
Basin Conclusions (Continued)

- Oil Prices and Oil Infrastructure Takeaway Capacity Are Primary Drivers of the Strong Economics in the Region and Will Ultimately Drive Growth.
- Given Growth Expectations, Significant Midstream Investment Will Be Required To Capture Natural Gas and NGL Value in the Basin.
- Williston Basin Economics Enable Producers in the Region to Sufficiently Compete on Price with Upstream Natural Gas Supply In the Rockies and Canada for Space Out of the Region on Existing Infrastructure.
Natural Gas Supply Growth is Changing The US Energy Landscape

Source: EIA
Commodity Price Disparities Are Shifting Producer Behavior

- Higher Relative Oil and NGL Prices Incentivize Producers to Redirect Resources Toward Assets With a Higher BTU Content.

- Low Natural Gas Prices Are Forcing Producers to Revaluate Economics and Investment in Conventional and Even Unconventional Lean Gas Assets.

- Higher Relative Oil and NGL Prices Incentivize Producers to Redirect Resources Toward Assets With a Higher BTU Content.

- Driving Capital into the Williston Basin and Reducing Competition For Space on Existing Infrastructure Moving Gas Out of the Area.

Source: ICE, EIA
Bakken Earns Above Average Returns

Price Assumptions:  
Gas = 12 month forward average curve for each regional pricing point as of June, 2012 (price range $2.45-$2.86/Mcf)  
Oil = 6 month average WTI +/- differential as of June, 2012 (price range $84.40-$100.43/barrel)  
NGLs = weighted average $/barrel based on current Mt. Belvieu prices and the typical composition in each region (range $23.79-$45.22/barrel)
New Economic Realities Challenge Basin Returns

Canada

Conventional

Alberta  BC Other  Saskatchewan  Nova Scotia

Unconventional

Southeast

Haynesville  Fayetteville

Rockies

Midcon/TX

Woodford  E. Tx Haynesville

DJ  Other  Piceance  Powder River  GR-O  Uinta
Plays With High Returns Attract Drilling Rigs

Source: Rig Data, BENTEK, June 2012

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Active rig count: June 15, 2012 / Change in rig count from Jan. 1, 2010

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BENTEKENERGY.COM
Capital Moving to Oil - Williston Basin (MT and ND) Rigs

- Added 193 Rigs since May 2009
- Rigs Reach All Time High of 236

RigData: July 2012
Williston Basin Forecasts
Williston ND Horizontal Oil Type Curve Converges

30-day IP rate: 400 b/d
EUR: 459,000 bbls

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Well Life: 25 years
Older ND Wells Suggest a Flat Gas Type Curve

30-day IP rate: 340 Mcf/d
EUR: 669,000 Mcf

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ND Model EURs Inline with Producers Expectations

Model
Oil: 459,000 Bbls
Gas: 111,500 Boe
Total: 570,500 Boe

CLR: 603 Mboe

Whiting: 450-900 Mboe
(Sanish)

Oasis: 450-750 Mboe
(Middle Bakken)
Williston MT Horizontal Associated Gas Type Curves Reflect Adjusted ND Type Curve

30-day IP rate: 139 Mcf/d
EUR: 369,000 Mcf

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Stronger Gas Oil Ratio (GOR) Expected For ND Horizontal Oil Wells

![Chart showing Stronger Gas Oil Ratio (GOR) Expected For ND Horizontal Oil Wells](image-url)
PAD Drilling Leads to a Reduction in Drill Time of 11 Days

Source: RigData
Base Case - Level of Activity Remains At Current Levels For the Next 10 years

Reserve Requirement: 22 Billion Boe

CLR: 24 Billion Boe Technically Recoverable Oil and Gas

ND: 2,356 MT: 250

Fleet Gets More Efficient
Nine New Pipeline Expansions or New Build Slated in the Next Six Years; One Refinery Expansion

1,155 Mb/d of Additional Pipeline Capacity

*map does not include Banner and Sandpiper projects
High Case Scenario-Consistently Tests Oil Takeaway Capacity, Stressing Prices and Producers

Reserve Requirement: 28 Billion Boe

Rig-ND: 2,880
MT: 665
Drilling Economics Struggle @ $50 Oil

**IRR Sensitivities to Changes in Oil Prices**

- **Anad-Miss**
- **Bakken**
- **Eagle Ford Oil**
- **Granite Wash**
- **Montney**
- **Niobrara**
- **Permian**
- **Uinta**

Note: Assumes NGL: Oil price ratio 50%; IP(oil/gas/ngr): 700 B/d, 400 Mcf/d, 60 b/d; 1,300 BTU; D&C Costs $8.5 Mil
Williston Growth Can Be Maintained at Low Prices

Williston IRR Sensitivities: Oil IP Rates/Oil Prices

- Oil Price
  - $50/bbl
  - $60/bbl
  - $70/bbl
  - $80/bbl
  - $90/bbl
  - $100/bbl
  - $110/bbl

- IRR
  - 0%
  - 20%
  - 40%
  - 60%
  - 80%
  - 100%
  - 120%
  - 140%
  - 160%

- Oil IP Rate (B/d)
  - 400
  - 500
  - 600
  - 700
  - 800
  - 900
  - 1,000
Other counties with active rigs that see reduced activity include: Bowman, Roosevelt, Richland, Golden Valley, Burke
Low Case – Driven By Low Oil Prices

Reserve Requirement: 13 Billion Boe
Comparison of Oil Production Based on Various Scenarios

- **High Case:** Consistently Tests Oil Takeaway Capacity, Stressing Prices and Producers.

- **Base Case:** Provides Strong Consistent Growth For the Basin Without Straining Takeaway Capacity Until Around 2022.

- **Low Case:** Suggests a Significant Pullback in Activity Due to Falling Oil Prices.
North Dakota Gross Gas Production Set To Climb
Bring Gas Supply to Market
New Processing and Midstream Infrastructure Needed to Meet Growing Gas Production in the Williston

545 MMcf/d of Planned Processing Expansions Over Next Two Years
Open Capacity Leaving N. Dakota Is Tight

- Northern Border and Alliance Serve As the Primary Routes to Transport Gas From the Region.
- Each Have Limited Open Mainline Capacity to Carry Additional Williston Supply.
WBI Provides Local Demand Support

- Total Deliveries off of WBI Have Not Increased Substantially Over the Last Several Years
- Receipts Into the WBI System From MT, WY and SD Have Already Been Reduced.
Inlet Flows Currently Losing Market Share

- Declining PRB Production and Increased Competition For Space Has Resulted in Reduced Flows on Bison.
- Canadian Inflows Into Northern Border Have Remained Relatively Strong, But Have Experienced Displacement in the Past and Now.
Port of Morgan: The Rex Effect

- From 2008 – 2010, Rex Deliveries Into The Midwest Pushed out Existing Inflows From Canada. Once Rex Completed Zone Three Into the Northeast, Canada Resumed Stronger Flows Into the U.S. on Northern Border.

![Map of North America with pipelines labeled REX West, REX, and REX East, and a bar chart showing Port of Morgan Average Daily Flow from 2008 to 2012 with data points for each year.]
Contract Holders and Expirations Provide Latitude

Northern Border

Expirations

Alliance

Expirations

Type of Shipper

End User 6%

Producer 31%

LDC 24%

Pipeline 5%

Marketer 34%

Type of Shipper

Producer 11%

LDC 24%

Marketer 34%

Pipeline 6%
New Residue Volumes Move In on Canada

- Garden Creek Deliveries Into Northern Border Have Ramped Up Quickly, Effectively Displacing Other Receipts Into the System.

- Other New Facilities That Are Coming Online in the Williston Basin Have the Potential to Displace Canadian Supplied Gas.

- Williston Basin Supply Has A Competitive Advantage When Competing For Access to Pipeline Space.
Canada Continues to Lose U.S. Market Share

- In Addition to An IRR Economic Advantage, Williston Basin Producers Also Have Transport Advantage Versus Canadian Suppliers.
- In a Low Gas Price Environment, The Marginal Suppliers Gets Pinched at the Wellhead.

Variable Transport Cost To Chicago @ $4.00 per MMBtu

- SE/Gulf: $0.12
- Bakken: $0.16
- Midcon: $0.16
- Rockies: $0.22
- Canada: $0.24

Net Imports from Canada

- Northeast
- West
- Midwest
Canadian Spreads Narrow to Surrounding Markets

Market Price Forecasts

Basis Price

Henry Hub Price


CIG Basis Ventura Basis AECO Basis Chicago Basis Henry Hub Spot
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BENETEK is an energy market analytics company, focused on the natural gas market and related energy sectors.

Justin Carlson
jcarlson@bentekenergy.com

Jodi Quinnell
jquinnell@bentekenergy.com

Jennifer Van Dinter
jvandinter@bentekenergy.com

Contact Any Analyst Direct at
(303) 988-1320

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