THE EFFECTS OF NORTH DAKOTA OIL PRODUCTION ON THE MINNESOTA ECONOMY

APRIL 2015
Overview and approach
Overview of situation

• Bakken shale formation is in western North Dakota and eastern Montana, 427 miles from St. Paul.

• Oil production in North Dakota rose rapidly from 123,600 barrels per day in 2007 to 1 million barrels per day by April 2014, making it the 2\textsuperscript{nd} largest oil-producing state.

• Increasing amounts of crude oil began to be shipped eastward across Minnesota by rail, which has increased the visibility of oil-production impacts in Minnesota.

• Study has 4 phases:
  • Energy Forecast
  • Transportation Forecast
  • Economic Impact
  • SCOPE Analysis (similar to SWOT)
• The study looked at three price scenarios: $50, $70, and $90/bbl.

• The overall breakeven cost of oil production in the Bakken is between $58 and $62/bbl.
Oil production and spending in the Bakken and Three Forks

- Low scenario results in lower expenditures.
- Base scenario relatively flat.
- High scenario allows for growth before eventual plateau.
Bakken and Three Forks Production Forecasts

• Even under the $50/barrel scenario, production is expected to plateau, not decline. In fact, it has increased slightly.

• Under the base scenario, there is modest growth, with robust growth under the $90/barrel scenario.

• In the real world, oil prices are likely to fluctuate and are likely to be a mixture of the three scenarios.
Minnesota’s frac sand in the Bakken

• Frac sand demand is not expected to increase unless oil prices move above $70/bbl. Even with higher oil prices, the demand increase will be only for a few years as the number of wells is expected to decline after 2019.

• Total annual production of industrial sand in Minnesota is estimated to be about 7 million tons, where about two-thirds are used for fracking and the majority is used in locations other than the Bakken.
• Truck and rail transported about 96% of all commodities, by weight.
• Reliance on truck shipping is expected to increase: truck and rail shares are forecasted to be 48% and 49%, respectively, by 2030.
Unit train forecasts

- North Dakota crude petroleum through rail shipments required approximately 3,300 unit trains in 2014.

- At $70/barrel WTI, IHS estimates that approximately 1,600 unit trains per year, or about five per day, will transit Minnesota in 2015.

- Assuming no new pipelines come online, at the $70/barrel WTI, by 2030, we expect nearly 4,000 unit trains per year, or 11 per day. At the $90/barrel WTI, by 2030, the annual number of unit trains could increase to approximately 6,000, or as many as 17 trains per day.

- Assuming new pipelines come online, the number of unit trains per day carrying Bakken-related production would drop to close to zero by 2020.

- Based on the revised Canadian crude-oil production estimates, the number of unit trains annually passing through Minnesota could fall slightly below 400, translating to about one train per day.
The economic impact were based on 3 direct effects:
- Expenditures for capital equipment and operations in ND for unconventional energy
- Construction of infrastructure in MN, such as the Sandpiper pipeline
- Losses in agriculture income from competition with crude oil for scarce rail capacity

Impacts were estimated for 4 years: 2014, 2016, 2019, and 2030 for all 3 price scenarios.
Minnesota’s employment impacts from energy, infrastructure, and agriculture

The effects of North Dakota oil production on the Minnesota economy / April 2015

Total employment impacts in Minnesota

<table>
<thead>
<tr>
<th>Year</th>
<th>High</th>
<th>Base</th>
<th>Low</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>10,000</td>
<td>5,000</td>
<td>-</td>
</tr>
<tr>
<td>2016</td>
<td>25,000</td>
<td>15,000</td>
<td>5,000</td>
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<tr>
<td>2019</td>
<td>20,000</td>
<td>10,000</td>
<td>5,000</td>
</tr>
<tr>
<td>2030</td>
<td>30,000</td>
<td>20,000</td>
<td>10,000</td>
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Source: IHS
Minnesota’s total economic impacts from spending in North Dakota, infrastructure, and agriculture

<table>
<thead>
<tr>
<th>Scenario and measure</th>
<th>2014</th>
<th>2016</th>
<th>2019</th>
<th>2030</th>
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<tbody>
<tr>
<td><strong>October high scenario</strong></td>
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<tr>
<td>Output</td>
<td>$1,813.8</td>
<td>$4,643.3</td>
<td>$2,400.3</td>
<td>$1,740.9</td>
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<td>Value Added</td>
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<td>$585.4</td>
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<td>$765.3</td>
<td>$547.6</td>
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<td><strong>December base scenario</strong></td>
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<tr>
<td>Output</td>
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<td>$3,789.1</td>
<td>$1,483.5</td>
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<td>Value Added</td>
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<td><strong>February low scenario</strong></td>
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<tr>
<td>Output</td>
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<td>$3,077.9</td>
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<td>Employment</td>
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<td>$174.7</td>
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</table>

Note: All dollar amounts are in millions, employment in total jobs.

Sources: Minnesota Implan Group, IMPAN input/output models for Minnesota and North Dakota, 2014. Analysis performed by IHS.
Situation, Core Competencies, and Obstacles

• Situation today and core competencies: these sections recap the discussion from earlier sections of the report.

• Obstacles:
  • Distance to the Bakken
  • Workforce issues
  • Increase in North Dakota’s oil and gas tax revenues
  • Local delays caused by unit trains
  • The “edge effect” and business costs
Prospects and expectations

• Educate Minnesota businesses about opportunities in North Dakota to: 1) support oil production, and 2) participate in spending for infrastructure and public services.

• Identify forward linkage opportunities in sectors that use crude oil as an input (e.g., fuel or feedstock), or provide storage & transportation services.

• Support transportation infrastructure improvements within Minnesota such as:
  • Roads, at-grade RR intersections, rail capacity, bypasses around towns.
  • Completion of crude oil pipelines diverts crude oil flows from rail to pipeline sooner.
Prospects and expectations

- Provide workforce training in core occupations used in oil production, mfg. sectors in supply chain & construction.
- Benefit from the North Dakota wealth effect
  - Offer goods and services not available in North Dakota.
- Form cross-border initiatives as necessary to:
  - Mitigate impacts of shipping oil and agricultural commodities.
  - Provide workforce training.
  - Implement bi-state efforts at business attraction.
Key takeaways

• Regardless of the price scenario, North Dakota will continue to be a major oil producer.

• The overall economic impacts of North Dakota oil on Minnesota’s economy are positive, but modest.

• New and expanded oil pipelines may lessen competition for rail capacity.

• Twin Cities are a major intermodal transportation center – rail, highway, air, and pipelines
  
  • Leverage location advantage to provide transportation services.

• Transportation improvements are essential to mitigate local effects.
Key takeaways

• Minnesota will continue to benefit from spending in the Bakken after capital expenditures drop off after 2019 under base price scenario.

• The state will benefit most from in-state infrastructure spending, which will have short-term impacts.

• The negative effects on agriculture from competition with crude for rail capacity disappears by 2019.

• Minnesota can potentially leverage its geographic advantage in the delivered price of crude oil to increase its refining capacity.

• Minnesota business could expand current efforts to capture shares of North Dakota’s rising income and wealth.

• Minnesota could use its competitive advantages to maximize economic benefit from North Dakota oil production, but not become too dependent on it.
Thank You!

Find a copy of the study at:

http://mn.gov/deed/images/NorthDakotaOilStudy.pdf
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