MONTANA’S NEW ENERGY FRONTIER
What are the prospects?
About 45,000 Wells Drilled
4400 Producing Oil Wells, 6500 Gas Wells

Montana Producing Areas and Exploration Activities
HISTORICAL PRODUCTION
Statewide Oil Production History, 1916 through 2010
Monthly Oil Production, Vertical vs. Horizontal Wells
January 1986 through August 2011

EIA Montana Monthly Wellhead Price

Barrels per Month

Millions

Drilling Incentives
Horizontal Re-drill

Horizontal

Vertical
North American shale plays
(as of May 2011)

Source: U.S. Energy Information Administration based on data from various published studies. Canada and Mexico plays from ARI.
Updated: May 9, 2011
Technology’s Role

Why the revolution?

Fracture stimulation 5,000’ – 15,000’ below the surface

- Migrating hydrocarbons
- Porous and permeable reservoir layer
- Frack
- Shale organic rich source layer
- Impermeable sealing layer
- Hydrocarbon Trap

Why the revolution?

Technology’s Role
Horizontal Oil Shale Activity
Vertical Casing Exit

Horizontal Well Vertical Exit
Typical Bakken Wellbore Diagram

- Potable water—3 layers of protection
  - 9-5/8” surface casing
  - 7” production casing
  - 3-1/2” tubing

- Hydraulic fracturing
  - stage frac btn csg pkrs
  - pump wtr @ high press
  - pump proppant into frac
Groundwater Protection through proper well construction
Middle Bakken / Three Forks Pay Variation

- Middle Bakken pay not a shale lithology
  - Complex, laterally varying lithology & play types
  - Stratigraphic / diagenetic trap drivers
- Underlying Three Forks ‘non-shale’ play potential established 2008
  - Also sourced by Bakken shale
  - Dual zone development underway

Modified from CRI web, 2010

from ConocoPhillips
Montana Drilling Permits Issued, 1990 through 2011
Montana Oil Production by County

Monthly Oil Production, Barrels

Montana Oil Production by County

- Big Horn
- Blaine
- Carbon
- Carter
- Chouteau
- Custer
- Daniels
- Dawson
- Fallon
- Fergus
- Garfield
- Glacier
- Golden Valley
- Hill
- Liberty
- McCon
- Musselshell
- Park
- Petroleum
- Phillips
- Pondera
- Powder River
- Prairie
- Richland
- Roosevelt
- Rosebud
- Sheridan
- Stillwater
- Sweetgrass
- Teton
- Toole
- Valley
- Wibaux
- Yellowstone
Oil and Natural Gas Production Tax Revenue Collections

Total State Share: $958,629,814
Total Local Share: $949,382,548
TOTAL $1,908,012,362
Oil and Gas State Land Lease Sales

Number of Tracts Leased Each Year

Million Dollars


AMOUNT RECEIVED TRACTS LEASED

$0 $5 $10 $15 $20
Petroleum Industry Facts

$9+ BILLION Total economic impact – including E&P and Refining

4,600 Employees in Exploration, Production, or Refining

Economic impact from producing an additional 1 million barrels of oil
  • 86 Full time positions
  • $18.5 million in labor income

Each 10% increase in drilling activity leads to about 315 additional jobs.

Drilling Rig Count Increased from 9 last year to 13 in January 2012

Industry likes MT’s business climate and tax structure
  • Brigham Energy: “They (Montana) have a good operating environment.”
    (Billings Gazette, May, 2011)
Montana Oil and Gas Taxes

Montana’s tax rate on oil is 20% lower than North Dakota’s

→ 9.25% vs. 11.5%  (Former North Dakota Governor Ed Schafer, FixTheTax.com)

<table>
<thead>
<tr>
<th>Taxes</th>
<th>Montana</th>
<th>North Dakota</th>
<th>Advantage</th>
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</thead>
<tbody>
<tr>
<td>Tax Rate</td>
<td>9.25%</td>
<td>11.5%</td>
<td>Montana</td>
</tr>
<tr>
<td>Tax Holiday</td>
<td>18 mo. (0.5%)</td>
<td>Only if oil &lt;$50.07</td>
<td>Montana</td>
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<tr>
<td>Avg. Tax/Bbl (05-08)</td>
<td>$4.89</td>
<td>$5.87</td>
<td>Montana</td>
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(Montana Department of Revenue Study)
### O&G Impact Funds to Counties, 2007-2001

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>All O&amp;G Producing Counties (33)</td>
<td>$555 million</td>
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<tr>
<td>Top 12 Counties</td>
<td>$515 million</td>
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<tr>
<td>Big Horn, Blaine, Fallon, Glacier, Hill, Phillips, Powder River, Richland, Roosevelt, Sheridan, Toole, Wibaux</td>
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</tr>
<tr>
<td>Richland County</td>
<td>$244 million</td>
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<td></td>
<td>Over $26,000/resident</td>
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