Natural Resources & Energy Outlook:
Coal, Oil Natural Gas (Fossil Fuels), Renewables, Minerals, Alternative
By Terry Johnson
Presentation Outline

• Fossil Fuel Focus
  – Coal
  – Oil
  – Natural Gas

• Renewables, Minerals, Alternatives

• What Changed? 2008 to 2011

• Energy Outlook

• What Does This All Mean?
Montana’s Fossil Fuel Sources

Coal, Oil, Natural Gas
Value of Production Change - 2008 versus 2011

<table>
<thead>
<tr>
<th>Millions</th>
<th>Coal</th>
<th>Oil</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td>$3,000</td>
<td></td>
</tr>
</tbody>
</table>
Coal Production Value Increase: What Happened?

Montana Average Coal Price By Quarter

<table>
<thead>
<tr>
<th>Year</th>
<th>Price (FOB)</th>
<th>Tons (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$11.85</td>
<td>37.4</td>
</tr>
<tr>
<td>2011</td>
<td>$15.89</td>
<td>36.3</td>
</tr>
</tbody>
</table>
Gas Production Value Decline: What Happened?

Montana Natural Gas Production By Quarter

<table>
<thead>
<tr>
<th>Year</th>
<th>Price</th>
<th>MCF's</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$6.90</td>
<td>116.2</td>
</tr>
<tr>
<td>2011</td>
<td>$3.47</td>
<td>76.6</td>
</tr>
</tbody>
</table>

Million MCF
Reasons for Production Value Change – 2008 to 2011

- **Coal**
  - Price increases due to world demand
  - International energy policies

- **Oil**
  - Stable prices (on average)
  - Slow implementation of new technology

- **Natural Gas**
  - Weak demand, over supply
  - Transportation
Montana’s Energy Outlook
Coal ---

- Why?
  - International Demand
  - International Natural Gas Price vs. Coal Price

- What to monitor
  - Federal Environmental Rules
  - Construction of Port Facilities
International Coal Consumption, 2010

- China, 46.2%
- Other, 31.7%
- United States, 13.1%
- India, 9.0%
Montana’s Energy Outlook

Oil --- ★

• Why?
  – Rig Count Improvement
  – Economic Recovery
  – U.S. Energy Independence

• What to monitor
  – Environmental Issues With “Fracking”
  – Transportation Issues
  – Federal & State Taxation Policies
Montana Oil Rig Counts By Month

Number of Rigs

- Yearly oil rig counts in Montana, showing fluctuations from 1990 to 2012.
Montana’s Energy Outlook
Natural Gas

• Why?
  – Electricity Generation
  – Environmental Issues with Coal

• What to monitor
  – Environmental Issues With “Fracking”
  – Federal & State Taxation Policies
U.S. Electricity Generation by Fuel Type

![Graph showing electricity generation by fuel type from 1990 to 2040. The graph includes historical data (1993) and projections (2011 and 2040) for Natural gas, Renewables, Nuclear, Coal, and Oil and other liquids. Natural gas is projected to increase from 25% in 2011 to 30% in 2040, Renewables from 13% to 16%, Nuclear from 19% to 17%, Coal from 53% to 35%, and Oil and other liquids from 4% to 1%.]

- Natural gas: 30% (2040), 25% (2011)
- Renewables: 16% (2040), 13% (2011)
- Nuclear: 17% (2040), 19% (2011)
- Coal: 35% (2040), 53% (2011)
- Oil and other liquids: 1% (2040), 4% (2011)
What Does This All Mean?

• Economic Growth
  – Eastern Montana
  – Other Areas (Billings for example)

• Enhanced Governmental Revenue
  – Natural Resource Taxes
  – Income Taxes
  – Consumption Taxes

• Governmental Service Pressures
  – Education
  – Public Safety
  – Infrastructure (State and Local)
Oil Production Comparison
Montana vs. North Dakota

Annual Oil Production

Million Barrels

0 50 100 150 200 250 300

2006 2007 2008 2009 2010 2011 2012

MT ND
Some Interesting Energy Facts

- Montana has the highest estimated recoverable coal reserves in U.S.
- Wyoming produced the most coal in U.S. (2011) – over 40%
- U.S. was 3rd largest oil producer in 2011 – Saudi Arabia and Russia were 1st and 2nd, respectively
- North Dakota was second largest oil producer in U.S. (2012)
- U.S. natural gas production was highest level ever in 2011
- U.S. natural gas use for electricity generation increased 188% from 1988 to 2011