EIA’s Coal Outlook Through 2030

Diane Kearney
Energy Information Administration
U.S. Department of Energy

Surface Transportation Board

September 17, 2008
Washington, DC
Energy Information Administration

- Independent statistical agency within the Department of Energy
  - [www.eia.doe.gov](http://www.eia.doe.gov)
- Produce monthly short-term and annual long-term forecasts of U.S. and world energy markets
- Short Term Energy Outlook
  - [http://www.eia.doe.gov/emeu/steo/pub/contents.html](http://www.eia.doe.gov/emeu/steo/pub/contents.html)
- Annual Energy Outlook, 2008
  - [http://www.eia.doe.gov/oiaf/aeo/index.html](http://www.eia.doe.gov/oiaf/aeo/index.html)
- International Energy Outlook, 2008
  - [http://www.eia.doe.gov/oiaf/ieo/index.html](http://www.eia.doe.gov/oiaf/ieo/index.html)
- Produce special analyses of emerging issues and the impacts of regulatory/legislative changes
  - [http://www.eia.doe.gov/oiaf/service_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm)
  - [http://www.eia.doe.gov/oiaf/analysis.htm](http://www.eia.doe.gov/oiaf/analysis.htm)
- EIA’s analyses and projections should not be seen as advocating or reflecting any position of the Department of Energy, the Administration, or any other organization.
Topics

• AEO2008 Overview
• Coal distribution and transportation prices
AEO2008 Overview
Energy Consumption by Fuel, 1980-2030
(quadrillion Btu)

Source: Annual Energy Outlook 2008, Reference Case (June 2008)
Coal Consumption by Sector, 1970-2030
(million short tons)

Source: Annual Energy Outlook 2008, Reference Case (June 2008)
### AEO2008 Reference Case
**Top 4 Growth Demand Regions, Growth in Select Years Compared to 2006**
(million short tons)

<table>
<thead>
<tr>
<th>Region</th>
<th>2015</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain</td>
<td>+12</td>
<td>+88</td>
</tr>
<tr>
<td>AZ,NM,CO,UT,NV,MT, WY,ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West South Central</td>
<td>+14</td>
<td>+66</td>
</tr>
<tr>
<td>TX,LA,OK,AR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West North Central</td>
<td>+5</td>
<td>+53</td>
</tr>
<tr>
<td>MN,IA,ND,SD,NE,MO,KS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East South Central</td>
<td>+12</td>
<td>+45</td>
</tr>
<tr>
<td>AL,MS,KY,TN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
* Wyoming PRB data for 1970 through 1976 are based on data reported by the U.S. Bureau of Mines and the U.S. Mine Safety and Health Administration.

Source: Annual Energy Outlook 2008, Reference Case (June 2008); and Annual Energy Outlook 2007 (February 2007)
Average Minemouth Price of Coal by Region, 1980-2030
(2006 dollars per short ton)


Source: Annual Energy Outlook 2008, Reference Case (June 2008)
Source: Annual Energy Outlook 2008 (June 2008); and
# Key Differences between Alternative Cases

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>2.4%</td>
<td>$70</td>
<td>$6.63</td>
<td>1%</td>
<td>2%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>High Oil/Gas Price</td>
<td></td>
<td>$119</td>
<td>$7.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal High Cost</td>
<td></td>
<td></td>
<td></td>
<td>8%</td>
<td>8%</td>
<td>-3%</td>
<td></td>
</tr>
<tr>
<td>S. 2191 Lieberman-Warner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>39% below 2006 levels in 2030</td>
<td></td>
</tr>
</tbody>
</table>

All cases include representation of the Clean Air Interstate Rule and Clean Air Mercury Rule.

*Constant dollars.
Average Delivered Coal Prices, 1990-2030
(2006 dollars per million Btu)

Coal Distribution and Transportation Prices
General Assumptions

- Base transportation rates are derived from the difference between delivered prices and minemouth prices.
- Transportation rates are modeled for origin region to destination region pairs.
- Base year transportation rates are modified over time with an econometrically derived escalator (in 2030, 1% higher for East and 2% higher for West compared to 2006).
- Representation of fuel surcharge program.
- The model satisfies coal demand by choosing the least cost solution.
Distribution of coal to the Mountain Census Division, 2006* and 2030 (million short tons, percentage)

*Volumes with unknown destinations or origins are excluded. Source: EIA-6 “Coal Distribution Data”. For 2006, 12 million tons is estimated to be sourced from Western Wyoming. Waste coal is excluded.
Distribution of coal to the West South Central Census Division, 2006* and 2030
(million short tons, percentage)

<table>
<thead>
<tr>
<th>2006*</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Interior</td>
<td>WY PRB</td>
</tr>
<tr>
<td>107, 65%</td>
<td>139, 61%</td>
</tr>
<tr>
<td>4, 2%</td>
<td>84, 37%</td>
</tr>
<tr>
<td>49, 30%</td>
<td>101, 34%</td>
</tr>
</tbody>
</table>

*Volumes with unknown destinations or origins are excluded. Source: EIA-6 “Coal Distribution Data”. Waste coal is excluded.
Distribution of coal to the West North Central Census Division, 2006* and 2030 (million short tons, percentage)

2006*

- Rocky Mountain: 30, 19%
- Western Interior: 1, 1%
- WY PRB: 1, 1%
- Eastern Interior: 10, 6%
- Central Appalachia: 1, 1%
- Western Montana: 3, 2%
- Dakota Lignite: 111, 70%

AEO2008 Reference

- Rocky Mountain: 88, 39%
- Western Interior: 2, 1%
- WY PRB: 24, 11%

2030

- Rocky Mountain: 142, 49%
- Western Interior: 2, 1%
- WY PRB: 24, 11%
- Eastern Interior: 122, 42%
- Central Appalachia: 24, 8%
- Western Montana: 142, 49%

*Volumes with unknown destinations or origins are excluded. Source: EIA-6 “Coal Distribution Data”. Waste coal is excluded.
Distribution of coal to the East South Central Census Division, 2006* and 2030 (million short tons, percentage)

2006*

- Central Appalachia: 5, 4%
- Southern Appalachia: 9, 7%
- Northern Appalachia: 12, 9%
- Eastern Interior: 26, 19%
- WY PRB: 37, 26%
- Rocky Mountain: 0, 0%
- Western Montana: 0, 0%
- Western Interior: 12, 9%
- Imports: 33, 23%

AEO2008 Reference

- Central Appalachia: 42, 22%
- Southern Appalachia: 27, 14%
- Northern Appalachia: 0, 0%
- Eastern Interior: 8, 4%
- WY PRB: 26, 13%
- Rocky Mountain: 4, 2%
- Western Montana: 4, 2%
- Western Interior: 24, 12%

High Oil and Gas Price

- Central Appalachia: 31, 16%
- Southern Appalachia: 18, 9%
- Northern Appalachia: 31, 16%
- Eastern Interior: 85, 43%
- WY PRB: 24, 12%
- Rocky Mountain: 5, 3%
- Western Montana: 3, 2%

*Volumes with unknown destinations or origins are excluded. Source: EIA-6 “Coal Distribution Data”. Waste coal is excluded.
Distribution of coal to the South Atlantic Census Division, 2006* and 2030 (million short tons, percentage)

*Volumes with unknown destinations or origins are excluded. Source: EIA-6 “Coal Distribution Data”. Waste coal is excluded.

2006*

- Southern Appalachia: 1, 1%
- Central Appalachia: 130, 65%
- Eastern Interior: 32, 16%
- Wyoming PRB: 7, 4%
- Rocky Mountain: 19, 10%
- Northern Appalachia: 6, 3%
- Imports: 1, 1%

AEO2008 Reference

- Central Appalachia: 75, 31%
- Eastern Interior: 54, 22%
- Wyoming PRB: 28, 11%
- Rockies: 23, 9%
- Northern Appalachia: 9, 4%
- Imports: 0%

2030

- Southern Appalachia: 76, 34%
- Central Appalachia: 38, 17%
- Eastern Interior: 20, 9%
- Wyoming PRB: 10, 4%
- Rockies: 0%
- Imports: 73, 32%

High Oil and Gas Price
Demand located East of the Mississippi

Transportation Rates and Volumes by Supply Region

- Appalachia: 2006 - $14.97, 2030 - $347 million short tons
- Interior: 2006 - $7.63, 2030 - $100 million short tons
- West: 2006 - $16.16, 2030 - $197 million short tons
- Imports: 2006 - $6.21, 2030 - $33 million short tons
- Total: 2006 - $14.34, 2030 - $677 million short tons

Demand located West of the Mississippi

Transportation Rates and Volumes by Supply Region

Distribution of coal from Central Appalachia, 2006 and 2030 (million short tons)

- East South Central: AL, MS, KY, TN
- East North Central: OH, IN, IL, MI, WI
- South Atlantic: WV, MD, DC, DE, VA, NC, SC, GA, FL
- Middle Atlantic: NY, PA, NJ

*Volumes with unknown origin, or unknown destination are not shown. Source: EIA-6 “Coal Distribution Data”. Projected volumes of less than 1 million tons are not included.
Distribution of coal from Northern Appalachia, 2006* and 2030
(million short tons)

- **East South Central:** AL, MS, KY, TN
- **South Atlantic:** WV, MD, DC, DE, VA, NC, SC, GA, FL
- **East North Central:** OH, IN, IL, MI, WI
- **Middle Atlantic:** NY, PA, NJ

*Volumes with unknown origin, or unknown destination are not shown. Source: EIA-6 “Coal Distribution Data”. Projected volumes of less than 1 million tons are not included.
Distribution of coal from Eastern Interior, 2006* and 2030 (million short tons)

- **East South Central**: AL, MS, KY, TN
- **East North Central**: OH, IN, IL, MI, WI
- **South Atlantic**: WV, MD, DC, DE, VA, NC, SC, GA, FL
- **West North Central**: MN, IA, ND, SD, NE, MO, KS

- **2006***
- AEO2008 Ref
- High Oil and Gas Price
- High Coal Cost
- Lieberman-Warner

• Volumes with unknown origin or unknown destination are not shown. Source: EIA-6 “Coal Distribution Data”. Projected volumes of less than 1 million tons are not included.
Distribution of coal from WY PRB, 2006* and 2030 (million short tons)

*Volumes with unknown origin, or unknown destination are not shown. Source: EIA-6 “Coal Distribution Data”. Projected volumes of less than 1 million tons are not included.
Contact Information

• Energy Information Administration
  • www.eia.doe.gov

• Diane.Kearney@eia.doe.gov