EIA’s Outlook Through 2035
From the Annual Energy Outlook 2010

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

Surface Transportation Board

March 23, 2010
Washington, DC
Energy Information Administration

- Statistical and analytical agency within the Department of Energy
  - [www.eia.doe.gov](http://www.eia.doe.gov)
- Produces 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, 2010
    - [http://www.eia.doe.gov/oiaf/aeo/index.html](http://www.eia.doe.gov/oiaf/aeo/index.html)
  - International Energy Outlook, 2009
    - [http://www.eia.doe.gov/oiaf/ieo/index.html](http://www.eia.doe.gov/oiaf/ieo/index.html)
- Produces 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 are independent, by law, and should not be seen as representing the views of the Department of Energy, the Administration, or any other organization.
AEO2010: Key Issues

- **Renewable energy**: Continued representation of States’ Renewable Portfolio Standards (RPS), extension of production tax credits (PTC), investment tax credits (ITC), and loan guarantees

- **Environmental rules**:
  - SO2 and NOx: Clean Air Interstate Rule (CAIR) modeled as cap and trade
  - Mercury: modeled as a 90 percent Maximum Achievable Control Technology (MACT) for several coal demand regions based on State-level initiatives
  - CO2: Regional Greenhouse Gas Initiative (RGGI)

- **Expectation of greenhouse gas regulations**
  - 3% higher cost of capital for greenhouse gas intensive projects
  - Financial community adoption of “Carbon Principles”

- 2 gigawatts of coal w/ carbon capture and sequestration (CCS) assumed by 2017 (investment tax credits in the Energy Improvement and Extension Act of 2008 and funding from the American Recovery and Revitalization Act)
AEO2010: Key Issues Compared to AEO2009 (continued)

- Extend forecast horizon to 2035
- Electric Generating Capacity: Slightly higher capital cost estimates for new coal (+6%) and nuclear (+13%) power plants
- Fuel Prices: Slightly lower fossil fuel prices in 2030 (Oil: -8%, Natural Gas: -11%; Coal, -4%)*

* Price changes for fuels are calculated on physical units basis (i.e., per barrel, per thousand cubic feet, and per short ton).
Energy Prices, 1980-2035
(2008 dollars per million Btu)

- Crude Oil*
- Electricity: Average Delivered
- Wellhead Natural Gas
- Minemouth Coal

* Low sulfur light
Source: Annual Energy Outlook 2010, Early Release (December 2009)
Energy Consumption by Fuel, 1980-2035 (quadrillion Btu)

Source: Annual Energy Outlook 2010, Early Release (December 2009)
Coal Consumption by Sector, 1970-2035
(million short tons)

Source: Annual Energy Outlook 2010, Early Release (December 2009)
Electricity Generation by Fuel, 1980-2035 (billion kilowatthours)

Source: Annual Energy Outlook 2010, Early Release (December 2009)
Cumulative Electric Generating Capacity Additions by Fuel: All Sectors, 2009-2035 (gigawatts)

- **Updated AEO2009 With ARRA**
  - Coal: 32 gigaWatts
  - Natural Gas/Oil: 119 gigaWatts
  - Nuclear: 11 gigaWatts
  - Renewables/Other: 75 gigaWatts
  - Total: 236 gigaWatts

- **AEO2010**
  - Coal: 24 gigaWatts
  - Natural Gas/Oil: 82 gigaWatts
  - Nuclear: 6 gigaWatts
  - Renewables/Other: 194 gigaWatts
  - Total: 250 gigaWatts

- **AEO2010**
  - Coal: 31 gigaWatts
  - Natural Gas/Oil: 116 gigaWatts
  - Nuclear: 8 gigaWatts
  - Renewables/Other: 95 gigaWatts
  - Total: 250 gigaWatts

Changes in Energy Use for Electricity
By Fuel Source and Census Division, 2008-2035
(quadrillion Btu)

Total change: +7.9 quadrillion Btu

Source: Annual Energy Outlook 2010, Early Release (December 2009)
Coal Production, 2035 (and 2008)
(million short tons)

3 (1)**

551 (452)*

16 (16)

60 (56)

40 (34)

83 (44) 47 (30) 2 (2) 138 (102)

165 (136)

99 (234)

13 (21)

68 (43)

U.S. Total:
1,285 (1,172) million short tons

* Includes production from all mines in Wyoming’s Powder River Basin.
** Includes production from mines in both Alaska and Washington.
Source: Annual Energy Outlook 2010, Early Release, Reference Case (December 2009)
Coal Production by Region, 1970-2035
(million short tons)

Average Minemouth Price of Coal by Region, 1980-2035
(2008 dollars per short ton)

Source: Annual Energy Outlook 2010, Early Release (December 2009)
Contact Info:

Diane Kearney
Office of Integrated Analysis and Forecasting
Energy Information Administration

Diane.Kearney@eia.doe.gov
(202) 586-2415
## U.S. Census Divisions

<table>
<thead>
<tr>
<th>Census Division</th>
<th>States Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New England CT, MA, ME, NH, RI, VT</td>
<td></td>
</tr>
<tr>
<td>2. Middle Atlantic NY, PA, NJ</td>
<td></td>
</tr>
<tr>
<td>3. East North Central OH, IN, IL, MI, WI</td>
<td></td>
</tr>
<tr>
<td>4. West North Central MN, IA, ND, SD, NE, MO, KS</td>
<td></td>
</tr>
<tr>
<td>5. South Atlantic WV, MD, DC, DE, VA, NC, SC, GA, FL</td>
<td></td>
</tr>
<tr>
<td>6. East South Central KY, TN, AL, MS</td>
<td></td>
</tr>
<tr>
<td>7. West South Central TX, LA, OK, AR</td>
<td></td>
</tr>
<tr>
<td>8. Mountain MT, WY, ID, CO, UT, NV, AZ, NM</td>
<td></td>
</tr>
<tr>
<td>9. Pacific AK, HI, WA, OR, CA</td>
<td></td>
</tr>
</tbody>
</table>