Tracking New Coal-Fired Power Plants
(data update 1/13/2012)

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Office of Strategic Energy Analysis & Planning
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Tracking New Coal-Fired Power Plants

This report is intended to provide an overview of proposed new coal-fired power plants that are under development. This report may not represent all possible plants under consideration but is intended to illustrate the potential that exists for installation of new coal-fired power plants. Additional perspective has been added for non-coal-fired generation additions in the U.S. and coal-fired power plant activity in China.

Experience has shown that public announcements of power plant developments do not provide an accurate representation of eventually commissioned power plants. Actual plant capacity commissioned has historically been significantly less than new capacity announced.

The report focuses on those coal-fired power plant projects that have achieved significant progress toward completion, to provide a more accurate assessment of the ability of this segment of the power generation industry to support demand for new electricity capacity in various regions of the United States.

The Department of Energy does not warrant the accuracy or suitability of this information.
Tracking New Coal-Fired Power Plants

• This report provides a perspective of coal-fired power plants that are currently under development, with a focus on those having made significant progress toward achieving commercial operation.

• The status of projects identified varies from project announcements to those under construction.

• Announced projects are not necessarily strong indicators of commitment of capital and human resources to actual development and follow-through to actual capacity additions is highly dependent on the market environment.

• Plants that are permitted or under construction (“Progressing Projects”) reflect a more significant financial and human resource commitment to completion and offer a better perspective of the new generation capacity that may be forthcoming.
Past Capacity Announcements vs. Actual

**Figure 1**

Actual capacity completed has been shown to be significantly less than proposed capacity; the 2002 report listed 11,455 MW of proposed capacity for the year 2005 when only 329 MW were constructed.

2002 – 2005 data – Previous NETL Tracking New Coal-Fired Power Plants Reports
Latest Capacity Announcements vs. Actual

Figure 1a

Total Identified Capacity Declines Due to Commissioning, Cancelations, and Fewer Postponements

- Actual
- 2012
- 2010
- 2009
- 2008

Totals → 16 GW, 28 GW, 32 GW, 49 GW, 64 GW

Source: Ventyx – Velocity Suite
2012 data – 1/13/2012
# Current Coal-Fired Capacity Projects (Annual Change)

## Table 1

<table>
<thead>
<tr>
<th>General Status</th>
<th>Number of Plants</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under Construction</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Near Construction</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Permitted</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td><strong>SUB TOTAL</strong></td>
<td><strong>21</strong></td>
<td><strong>24</strong></td>
</tr>
<tr>
<td>Announced (early stages of development)</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>57</strong></td>
<td><strong>48</strong></td>
</tr>
<tr>
<td>Commissioned this Period</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL December 2011 Progressing and Commissioned</strong></td>
<td><strong>53</strong></td>
<td><strong>-4</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status Listing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under Construction</td>
<td>Project is under construction.</td>
</tr>
<tr>
<td>Near Construction</td>
<td>Project has been approved; majority or all permits are obtained. Sponsor is contracting vendors and Engineering, Procurement and Construction (EPC) contractors. Site preparation has begun.</td>
</tr>
<tr>
<td>Permitted</td>
<td>In the permitting phase. Two or more permits approved or fuel or power contracts have been negotiated.</td>
</tr>
<tr>
<td>Announced</td>
<td>Early stages of development to filing for permits. May include a feasibility study.</td>
</tr>
</tbody>
</table>

Source: Ventyx – Velocity Suite  
Data reflects change between 12/13/2010 and 1/13/2012
Current Capacity Additions by Years

Refer to Table 1

- Table 1 reflects the current status of coal-fired plant development activity as of January 13, 2012 and shows the nominal annual change (*December 13, 2010 through January 13, 2012*)

- “Progressing” plants represent projects with status indicating permitted, near construction, or under construction

- “Progressing” plants have attained a higher likelihood of advancing toward commercial operation; however, regulatory uncertainty, market perception and industry cost increases continue to impact development decisions for all projects

- 2,343 MW (6 units at 5 plants) have become operational during 2011 & Jan 2012

- There has been a net increase of 1,388 MW (+10%) of total *Progressing and/or Commissioned* projects through 2011 over *Progressing* projects in January
Current Coal Capacity Additions by Years

**Figure 2**

**Operational Dates**

- **Announced**
- **Permitted**
- **Near Construction**
- **Under Construction**
- **Actual**

**Commissioned in 2011 & Jan 2012**
- Dry Fork (390 MW)
- Oak Creek (615 MW)
- Point Comfort (310 MW)
- Whelan (220 MW)
- Longview (808 MW)

Source: Ventyx – Velocity Suite (1/13/2012)
Currently Proposed and Forecasted Coal-Fired Capacity

Figure 3

Virtually No New Coal in Reference case Following Several CCS Demos

Source: Ventyx – Velocity Suite (1/13/2012)
EIA – AEO 2011, Reference Case
Last 50 Years of New Coal Capacity

Figure 4

Source: Ventyx–Velocity Suite (1/13/2012)
Net Capacity Changes (Removed and Added Opportunities)

**Figure 5**

32% of MWs removed represent “Announced” projects
48% of MWs removed due to Commissioned plants

- **Commissioned** in Dec 2010 - Jan 2012
  - Dry Fork (390 MW)
  - Oak Creek (615 MW)
  - Point Comfort (310 MW)
  - Whelan (220 MW)
  - Longview (808 MW)

- **Proposed Online Year**

- **Capacity Change Breakdown**
  - 2,343 MW operational now removed from the list
  - 2,890 MW canceled
  - 1,325 MW permitted canceled
  - 1,565 MW announcements canceled

- **Total Net Reductions (less operating)** -2,272 MW

Source: Ventyx–Velocity Suite (12/13/2010 and 12/13/2012)
Proposed Technologies of New Plants
(with Annual change)

Figure 6

Table 2

<table>
<thead>
<tr>
<th>Technology Listings</th>
<th>Operational (Since 2000)</th>
<th>Progressing (Permitted, Near-, and Under Construction)</th>
<th>Announced</th>
<th>Total Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>December 2010</td>
<td>Jan 2012 (Change)</td>
<td>December 2010</td>
</tr>
<tr>
<td>PC Subcritical</td>
<td>31</td>
<td>5</td>
<td>4 (-1)</td>
<td>10</td>
</tr>
<tr>
<td>CFB</td>
<td>12</td>
<td>4</td>
<td>6 (-2)</td>
<td>9</td>
</tr>
<tr>
<td>PC Supercritical</td>
<td>7</td>
<td>7</td>
<td>7 (0)</td>
<td>4</td>
</tr>
<tr>
<td>IGCC</td>
<td>1</td>
<td>5</td>
<td>7 (2)</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Ventyx – Velocity Suite
Data collected (12/13/2010); Current Report data collected (1/13/2012)
Geographical location by State: Coal-Fired Plants (Permitted, Near Construction, and Under Construction)

Figure 7

Source: Ventyx – Velocity Suite (1/13/2012)
Location by NERC Regions: Coal-Fired Plants
(Permitted, Near Construction, and Under Construction)

Figure 8

Source: Ventyx – Velocity Suite (1/13/2012)
Specified Coal Ranks
All Proposed Plants

Figure 9

Proposed Plant Capacities (MW)

16,790 MW “Generic Coal” not shown on chart

Source: Ventyx – Velocity Suite (1/13/2012)
Coal-Fired Build Rate
China and United States

Figure 10

Results are Stacked

China: Operational
U.S.: Operational

Online Year

Capacity (GW)

273 GW of Undetermined Dates of Chinese Plants

China data – Platts - UDI WEPPDB December 2011

Source: USA data - Ventyx – Velocity Suite (1/13/2012)

Planned no date (evenly distributed over 4 years)
Coal-Fired Power Plants Retirements

Recently announced retirements of currently operating coal-fired power plants with retirement date from 2012 - 2020
Current Coal Capacity Additions/Retirements by Years

Figure 2a

24.7 GW of specific announced plant retirements (does not include general company announced retirements that do not include a specific unit)

Source: Ventyx – Velocity Suite (1/13/2012)
Announced Coal-Fired Retirements (2012 – 2020)

Total retirement capacity at the plant level

24.7 GW of specific announced plant retirements

Announced Retirements
Size By Nameplate_Capacity_MW
- 558 to 1485
- 239 to 558
- 9 to 238
Announced Coal-Fired Retirements

24.7 GW

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Trend Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Capacity Factor</td>
<td>45.6%</td>
<td>Lower capacity factors</td>
</tr>
<tr>
<td>Average size (MW)</td>
<td>191 MW</td>
<td>Units under 200 MW in size</td>
</tr>
<tr>
<td>Average Age of Units</td>
<td>54 Yeas</td>
<td>Older units being retired</td>
</tr>
<tr>
<td>% of units with No SO2 Control</td>
<td>84%</td>
<td>Units with out SO2 controls</td>
</tr>
<tr>
<td>% of units with Planned SO2 Control</td>
<td>6%</td>
<td>Units that did not have plans to install SO2 controls</td>
</tr>
</tbody>
</table>
Operating Coal-Fired Fleet
Announced Retirements & Remaining Units

Capacity Factor vs. Size

Capacity Factor vs. Age

Announced Retirements: 24.7 GW
Remaining Plants: ~300 GW
Other Generation Development Activity
Proposed U.S. New Capacity
Coal, Natural Gas, Wind, and Nuclear

Figure 12

Source: Ventyx – Velocity Suite 1/13/2012
Status of Proposed New U.S. Capacity

Coal, Natural Gas, Wind, and Nuclear

Figure 13

Proposed Nameplate Capacity (GW)

Source: Ventyx – Velocity Suite 1/13/2012
Current Wind Capacity Additions by Years

Figure 14

- Announced
- Permitted
- Near Construction
- Under Construction
- Actual

Operational Dates

Source: Ventyx – Velocity Suite (1/13/2012)
Current NGCC Capacity Additions by Years

Figure 15

Source: Ventyx – Velocity Suite (1/13/2012)
Current NG-GT Capacity Additions by Years

*Figure 16*

Source: Ventyx – Velocity Suite (1/13/2012)
Watts Bar Unit 2
Construction begun in the 1970s, suspended in 1988 at 80% complete, currently revived with completion due 2012.

Source: Ventyx – Velocity Suite (1/13/2012)
Five new coal-plants totaling 2,343 MW were Commissioned in 2011.

Progressing/Commissioned projects by January 2012 have had a net increase of 3 plants; a net change in capacity of 1,388 MW (+10%) over Progressing projects.

1,599 MW of new capacity has been Announced and 2,890 MW have been canceled.

- Of 2,890 MW canceled plants, 54% were Announced phase and 46% were Progressing.

Compared to previous years, fewer projects are being Announced to offset recent Commissioning.