Boom and Bust: Tracking Global Proposed Coal Plants

Christine Shearer & Ted Nace, CoalSwarm
Global Coal Plant Tracker

• First public map and database of proposed coal plants: EndCoal.org

• Wiki pages on CoalSwarm.org for each proposed plant

• Multi-national effort (US, Vietnam, Japan, Philippines, China, India, Turkey, Europe, and South America)

• Ongoing updates every 6 months
Boom and Bust
TRACKING THE GLOBAL COAL PLANT PIPELINE
Christine Shearer, Nicole Chio, Justin Guay, Lauri Myllyvirta, and Ted Nace
Coal Boom: Net Global Coal Capacity Additions

Source: Platts WEPP January 2015 and CoalSwarm analysis
Recent surge nearly double US coal capacity
## Countries with highest coal capacity (2014)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>832,696</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>322,491</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>164,953</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>54,388</td>
</tr>
<tr>
<td>5</td>
<td>Russia</td>
<td>48,656</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>41,750</td>
</tr>
<tr>
<td>7</td>
<td>South Africa</td>
<td>38,402</td>
</tr>
<tr>
<td>8</td>
<td>Poland</td>
<td>32,196</td>
</tr>
<tr>
<td>9</td>
<td>Australia</td>
<td>28,116</td>
</tr>
<tr>
<td>10</td>
<td>South Korea</td>
<td>26,944</td>
</tr>
</tbody>
</table>
30 Countries Add 348 GW and 800 New Coal Generation Units Since 2010

227 GW
China

68 GW
India

~80 GW Per Year of New Coal Plants Now Under Construction

Tracked global coal plant proposals since 2010
Status Categories

• **Announced:** Proposed plants that have been announced but have not moved forward.

• **Pre-permit development:** Sponsors seeking environmental approvals, land, and water.

• **Permitted:** Proposal has all necessary environmental approvals.

• **Construction:** Site preparation and other development underway.
Findings
Proposed Global Coal Capacity (2014)

- Construction: 276 GW
- Permit: 164 GW
- Pre-permit: 471 GW
- Announced: 448 GW
## Top Regions for Proposals (MW)

<table>
<thead>
<tr>
<th>Region</th>
<th>Announced</th>
<th>Pre-permit development</th>
<th>Permitted</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia</td>
<td>226,432</td>
<td>235,209</td>
<td>49,860</td>
<td>138,917</td>
</tr>
<tr>
<td>South Asia</td>
<td>94,337</td>
<td>149,991</td>
<td>75,973</td>
<td>69,471</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>55,525</td>
<td>20,850</td>
<td>18,555</td>
<td>28,934</td>
</tr>
<tr>
<td>Europe/Turkey</td>
<td>36,217</td>
<td>49,650</td>
<td>5,807</td>
<td>18,102</td>
</tr>
<tr>
<td>Africa and Middle East</td>
<td>20,425</td>
<td>6,042</td>
<td>11,118</td>
<td>12,764</td>
</tr>
</tbody>
</table>
Regional distribution of projects under construction

- East Asia: 50.4%
- South Asia: 25.2%
- Southeast Asia: 10.5%
- Europe and Turkey: 6.6%
- Africa and Middle East: 6.6%
- Other: 9.6%
Regional distribution of projects under development
## Outcome of proposals, 2010-2014

<table>
<thead>
<tr>
<th>Region</th>
<th>Halted</th>
<th>Completed</th>
<th>Ratio of Halted to Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia</td>
<td>194,625</td>
<td>227,650</td>
<td>1:1</td>
</tr>
<tr>
<td>South Asia</td>
<td>313,420</td>
<td>80,340</td>
<td>4:1</td>
</tr>
<tr>
<td>Europe</td>
<td>96,600</td>
<td>14,599</td>
<td>7:1</td>
</tr>
<tr>
<td>North America</td>
<td>23,653</td>
<td>14,677</td>
<td>2:1</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>22,260</td>
<td>13,701</td>
<td>2:1</td>
</tr>
<tr>
<td>Latin America</td>
<td>17,890</td>
<td>4,016</td>
<td>4:1</td>
</tr>
<tr>
<td>World total</td>
<td>709,952</td>
<td>356,866</td>
<td>2:1</td>
</tr>
</tbody>
</table>
China’s Share of Proposals (GW, 2014)

![Chart showing China's share of proposals across different stages: Announced, Pre-permit, Permitted, and Construction. The chart compares the Rest of World (red) and China (blue).]
Proposed coal plants shifting to Western China

<table>
<thead>
<tr>
<th>Region</th>
<th>Newly Operating (2010-2014)</th>
<th>Developmental Pipeline</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast</td>
<td>74,020</td>
<td>46,860</td>
<td>-37%</td>
</tr>
<tr>
<td>Central</td>
<td>53,290</td>
<td>86,380</td>
<td>62%</td>
</tr>
<tr>
<td>Northeast</td>
<td>17,500</td>
<td>7,070</td>
<td>-60%</td>
</tr>
<tr>
<td>Western</td>
<td>80,390</td>
<td>137,710</td>
<td>71%</td>
</tr>
</tbody>
</table>
China Net Capacity Energy Additions (GW)

Source: Platts, China National Energy Administration
China facing a capacity glut

• China coal use fell in 2014
• Coal plant capacity utilization at 54% (WEO 2014)
• Growth of alternative energies
• New air pollution rules and climate agreements
India’s coal boom has withered

• For every coal plant completed from 2012-2014, six plants were abandoned
• Construction dropped from 101 GW in 2012 to 69 GW in 2014 (31%)
• Since 2012, less than 10 GW has entered construction
• Slowdown due to citizen opposition, coal supply shortages, and political corruption
East Asia (MW)

![Graph showing renewable energy capacity in East Asia for South Korea, Taiwan, and Japan.]

- **South Korea**: Large bar in purple, indicating a significant amount of construction capacity.
- **Taiwan**: Smaller bar with construction and pre-permit development components.
- **Japan**: Bar divided into construction, permitted, pre-permit development, and announced segments.
East Asia

• Japan, S Korea, and Taiwan rank 4th, 7th, and 9th in coal consumption, mostly imported

• South Korea ($4 billion) and Japan ($3 billion) lead in export credits into coal plants (OECD data, 2003-2013)

• Japan increasing financial support of ultra-supercritical combustion in developing nations
Africa

• South Africa: Medupi and Kusile under construction, each 4,800 MW – among the largest coal plants in the world

• China heavily investing in proposed coal plants and mines in Zimbabwe and Nigeria

• India and Japan investing in coal projects in Mozambique
Eastern Europe (MW)

Russia
Turkey
Poland

Construction
Permitted
Pre-permit development
Announced
Eastern Europe

- Turkey 3\textsuperscript{rd} highest nation in proposals – many projects would be fueled by \textit{indigenous lignite}
- Polish leadership has \textbf{opposed} EU carbon limits and \textbf{increased domestic coal} mining
- Russia \textbf{expanding existing coal} power stations and \textbf{coal exports}
2°C Carbon Budget (Gt): 870-1,240 Gt CO₂ by 2050

- Existing infrastructure, 729 Gt
- Current coal proposals, 115 Gt
- Remaining, 28 Gt
Summing Up

- **1,080 GW** of proposed new coal capacity, but much of it won’t be built
- **Coal plant growth slowing** in India and China
- East Asia **hyping “ultra-supercritical” technologies**
- Many new proposals in **areas with high coal reserves**: Turkey, Poland, Zimbabwe
- Even at recent 1 in 3 completion rate, current proposals would **push us to 2°C warming**
Thanks! More info at coalswarm.org