Resource Recovery – Appropriate Regulation – Good Economics

- Coal Ash – Valuable Resource
- Understand Uses - Recognize Value
- Protecting Value Through Proper Regulation
  - Maintain State Authority to Regulate
  - Appropriate Approach to Protect Environment and Economic Value
  - Legislate-Regulate Based on a Balance of Science/Resource Value/Economics
Coal Combustions Products

Coal Ash: CCW, CCB, CCP, CCR
- Fly Ash, Bottom Ash/Slag, FGD/Gypsum
- 2011 - Total Produced – 130 MM Tons
  - Fly Ash: 60 MM Tons Generated
  - Bottom Ash: 17 MM Tons Generated
  - FGD/Gypsum: 25 MM Tons Generated
Soil Chemistry vs. Fly Ash

- Coal = C% + Soil %
- Carbon = Energy
- Soil = CCR
- Elements in Soil Similar to CCR

Source:
Coal Ash Co-Products Industry

- Production – 130+ MM TPY
- Utilized – 57+MM TPY - 43.5% - Value Driven
  - Ready Mixed Concrete
  - Wallboard
  - Roofing Shingles
  - Carpet Backing
  - Lightweight Plastics
  - Lightweight Aggregates
  - Agriculture Sulfur Source
  - Oil & Gas Drilling

- Utilizing ash avoids raw material extraction
- Ash applications reduces CO2 emissions
## CCP Concrete Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Utilization</th>
<th>% Utilization</th>
<th>CCPs Concrete</th>
<th>% in Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>128,703,572</td>
<td>45,523,256</td>
<td>35.40%</td>
<td>13,090,433</td>
<td>29%</td>
</tr>
<tr>
<td>2003</td>
<td>121,744,571</td>
<td>46,384,405</td>
<td>38.10%</td>
<td>12,679,134</td>
<td>27%</td>
</tr>
<tr>
<td>2004</td>
<td>122,465,119</td>
<td>49,089,818</td>
<td>40.10%</td>
<td>15,239,721</td>
<td>31%</td>
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<tr>
<td>2005</td>
<td>123,126,093</td>
<td>49,612,541</td>
<td>40.30%</td>
<td>16,353,334</td>
<td>33%</td>
</tr>
<tr>
<td>2006</td>
<td>124,795,124</td>
<td>54,203,170</td>
<td>43.40%</td>
<td>17,194,883</td>
<td>32%</td>
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<tr>
<td>2007</td>
<td>126,307,998</td>
<td>51,219,310</td>
<td>40.60%</td>
<td>14,515,690</td>
<td>28%</td>
</tr>
<tr>
<td>2008</td>
<td>136,073,107</td>
<td>60,593,660</td>
<td>44.50%</td>
<td>14,015,616</td>
<td>23%</td>
</tr>
<tr>
<td>2009</td>
<td>125,482,586</td>
<td>55,642,011</td>
<td>44.30%</td>
<td>10,610,410</td>
<td>19%</td>
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<tr>
<td>2010</td>
<td>130,181,364</td>
<td>55,337,426</td>
<td>42.50%</td>
<td>11,669,321</td>
<td>21%</td>
</tr>
<tr>
<td>2011</td>
<td>130,077,275</td>
<td>56,572,318</td>
<td>43.50%</td>
<td>12,282,718</td>
<td>22%</td>
</tr>
</tbody>
</table>

Data retrieved from ACAA: American Coal Ash Association
CCP Production & Utilization

**CCP Production and Utilization**

- **CCP Production**
- **CCP Utilization**
- **CCPs Utilized in Concrete**
- **CCP Utilization %**

Tons

- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011

Utilization %

- 30.00%
- 32.00%
- 34.00%
- 36.00%
- 38.00%
- 40.00%
- 42.00%
- 44.00%
- 46.00%
- 48.00%
- 50.00%

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Economic Impacts

- CCP Resource value - $6-$11B/yr
- CCPs – 3% of new home construction costs - <½ $$ of replaced products
- Cement-$80-$100/t
- Fly Ash- $20-$40/t
- Life-cycle costs decrease w/ fly ash
Bottom Ash LWA

• Processed to replace LWA
• Typical Block - 35 – 38 lb
• Bottom Ash LWA Block – 28-32 lb
• Product priced in $15-$30/t
• Replaced product - $30-$50/t
• Avoids Mine Operation
• Avoids Kiln Operation
• Avoids Disposal
Agriculture Products

SO$_2$ Reduction - S reduced
FGD Gypsum - Nutrients

SO$_2$ Air Quality, 1980 - 2010
(Based on Annual Arithmetic Average)
National Trend based on 121 Sites

1980 to 2010: 83% decrease in National Average

- Fuel value recycled – IGCC
- Fly Ash replaces cement
- Lightweight Aggregates
- Gypsum used in wallboard – 45% of US wallboard production
Coal Ash Regulation - History

- 1980 - Bevill Amendment to RCRA – Exempted CCBs
  - EPA to "conduct a detailed and comprehensive study and submit a report" to Congress on the "adverse effects on human health and the environment, if any, of the disposal and utilization” of coal combustion products
- 1988 and 1999 EPA Reports to Congress
  - Recommended CCPs should not be regulated as hazardous waste
- 1993 EPA Regulatory Determination
  - Found regulation as a hazardous waste “unwarranted”
- 2000 EPA Final Regulatory Determination
  - Concluded CCPs “do not warrant regulation [as hazardous waste]” and that “the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes”
Coal Ash Regulation - History

- 2008 – December – TVA Failure Releases CCR
  - EPA States that it will regulate coal ash to prevent similar accidents
- 2010-June 21 – EPA CCR Proposed Rules
  - Regulate disposal as either “C” or “D”
  - Landfill protective features are essentially the same
  - 450K+ comments filed - Utilization industry focus on “Stigma”
  - Economic Justification-Flawed Assumption – “C” drives recycling
- Environmental/Industry - Lawsuit to force deadline on EPA
  - Slow progress in 2013
- EPA Effluent Limits Guidelines
  - EPA indicates that discharge rules may push CCR Rule toward “D”
Summary

• Coal Ash Is A Valuable Resource
• Coal Ash Is Non-hazardous – Science Support
• Landfill Standards Same Under “C” Or “D”
• “C” Label Will Harm Recycling
• States Successfully Manage MSW Which Is More Difficult
• States Can & Should Maintain Regulatory Control Over Coal Ash
• State Laws And Regulations Should Contemplate Proper Disposal & Promotion Of Resource Preservation
• Utilization Of CCPs Is The Best Economic And Regulatory Policy Approach
Reference & Contact Info

- **American Coal Ash Association**
- **Utility Solid Waste Activities Group**
  - [http://www.uswag.org/ccbc.htm](http://www.uswag.org/ccbc.htm)
- **Veritas Jobs Impact Study**
- **ARTBA Roads & Bridges Impact Study**
- **EPRI Technical Reports**
  - [www.epri.com](http://www.epri.com)
    - Comparison of Coal Combustion Products to Other Common Materials – Chemical Characteristics. Technical Report 1020556
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