A Producer’s Perspective
Coal Combustion Products Utilization Update

CBU Workshop
Green Construction Materials
Using
Coal Combustion Products
May 2, 2008
by
Art Covi
Environmental Land Quality
We Energies Service Territory
Utility Service

- Electric Customers: 1.1 million
- Gas Customers: 1.0 million
- People Served: 2.4 million
Natural Pozzolans have been utilized for over 2000 years.
CCPs Produced by We Energies

Fine Aggregate: Bottom Ash "Sand"

Fly Ash "Spheres"

FGD Gypsum
Benefits to We Energies

CCP Re-Utilization

- Avoidance of new landfill costs, and maintenance of current landfill capacity for potential future needs.
- Reduced operating costs and customer savings associated with landfill construction and operations.
- Revenues for valuable commodities such as Class C Fly Ash and FGD Gypsum.
Environmental Benefits of CCP Use

- Reduces greenhouse gas emissions
  - 1 ton of fly ash used in concrete to replace cement, offsets about 1 ton of CO2 produced in making cement.
- Reduces landfill needs.
- Reduces quarry and mining needs.
- Promotes resource conservation and reduces energy use.
- Conserves natural resources for future use
- Improves roads and buildings; Longer life & quality reduces environmental impact.
- This is the right thing to do….. Going Green
National CCP Use

Source: American Coal Ash Association

44% in 2007
Current Annual Quantity of Coal Combustion Products

- Fly Ash: 574,000 tons
- Bottom Ash: 127,000 tons
- Gypsum: 73,000 tons
- TOTAL: 774,000 tons
## Power Plant Production (% Utilization)

<table>
<thead>
<tr>
<th>Plant</th>
<th>Production</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCCP</td>
<td>7,200 tons</td>
<td>(100%)</td>
</tr>
<tr>
<td>VAPP</td>
<td>101,000 tons</td>
<td>(100%)</td>
</tr>
<tr>
<td>OCPP</td>
<td>136,000 tons</td>
<td>(100%)</td>
</tr>
<tr>
<td>PIPP</td>
<td>159,000 tons</td>
<td>(88%)</td>
</tr>
<tr>
<td>PPPP</td>
<td>371,000 tons</td>
<td>(102%)*</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>774,200 tons</strong></td>
<td>(98%)</td>
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</tbody>
</table>

*Total percent utilization includes P4 landfill recovered ash.
CCP Utilization
(tons)

- Concrete (Fly Ash) 261,000
- Ash Fuel 106,000
- Sub-Base (Bottom Ash) 101,000
- Cement Raw Feed 92,000
- Manufactured Aggregate 75,000
- Wallboard Manufacturing (FGD Gypsum) 70,000
- Stabilization (Soil & Asphalt) 43,000
- Miscellaneous 17,000
CCP Utilization:
Concrete  261,000 Tons
CCP Utilization:
Ash Fuel  106,000 Tons Re-Burned

Displaced more than 2,278 railcars of coal, since 2000!
CCP Utilization:
Sub-Base [Bottom Ash] 101,000 Tons
for floor slabs and roads
CCP Utilization:

Cement Raw Feed  92,000 Tons
Set-time Retarder
CCP Utilization:

FGD Gypsum 70,000 Tons
Drywall Manufacturing
CCP Utilization:

Stabilization [Fly Ash]  43,000 Tons

Roadbed Improvement
CCP Utilization:

Miscellaneous Uses

- Flowable Fill [Low Strength]
- Manufactured Aggregate
- Conductive Concrete

17,000 Tons
Oak Creek Expansion
New Generation Power Plant

- CCP Quantities to Double starting in 2009!
- Ash Fuel Reburn System – Recovered Ash Fuel
- Additional fly ash and bottom ash
  - Developing Markets for F Ash, Gypsum, Bottom Ash
  - Use depends on Type and Quality [F Ash ]
- Gypsum – Negotiations in Progress,
- OCXP Coal Pile Base using ash fuel
- Construction - Advocating CCP Utilization
Regulations on Coal Combustion Products

Beneficial Use of Industrial Byproducts
NR 538
Rules Regulating CCP’s

• NR 538 - WDNR rules for Beneficial Reuse of Industrial By-Products
  – Five Categories
    • Category 1 - Least restrictive
    • Category 5 - Most restrictive
  – Twelve Approved Applications
  – Self implementation and monitoring
  – Annual certification submittal to WDNR

Recently updated, revisions effective Feb. 1, 2006
Rules Regulating CCP’s

- CCP is a RCRA Subt. D Non-hazardous material regulated by each state
- Use of fly ash in concrete is allowed in every state
- Most states exempt CCP from solid waste regulations if beneficially used
  - Wisconsin: Self implementing rules for five categories of byproducts that allow 12 types of exempted uses
  - Illinois: Exempted uses
  - Indiana: Exempted uses
  - Michigan: Exempted uses per statute and now drafting self-implementing rules
Wisconsin NR 538 Approved Uses

- Raw Material for Manufacturing a Product
  - Concrete
  - Cement
  - Ceramics
  - Lightweight Aggregates
  - Asphaltic Concrete
  - Wallboard
  - Plaster
  - Paints, plastics, roof shingles, mineral wool, ...
Wisconsin NR 538 Approved Uses

- Waste Stabilization / Solidification
- Landfill Daily Cover
- Supplemental Fuel Source
- Confined Geotechnical Fill
  - Confined Geotechnical Fill (under paved parking lots, roads and buildings)
  - Soil Stabilization
  - Utility trench and abutment backfill
  - Controlled Low Strength Materials (CLSM, flowable fill)
  - Slabjacking
Wisconsin NR 538 Approved Uses

- Bonded Surface Course
- Transportation Embankments
- Unconfined Geotechnical Fill
- Unbonded Surface Course
- Bonded Surface Coats
- Decorative Stone
- Cold Weather Road Abrasive
NR 538 - Other Requirements

- Storage Restrictions
- Record Keeping
- Non-Residential Use for some Applications
- Use Above Groundwater Table
- Property Owner Notification Form
- Public Participation (>30,000 Cu. Yds.)
- Monitoring for large embankments
Contacts

- **We Energies**
  - Art Covi (414) 221-4618
  - Bob Meidl (414) 221-2249
  - Tim Muehlfeld (414) 221-2206
  - Bruce Ramme (414) 221-2440