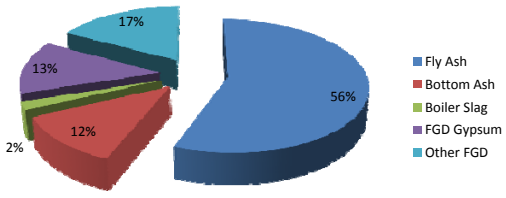
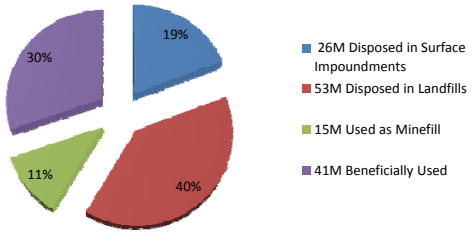
Coal Combustion Residues (CCRs)

Coal Combustion Residues Produced 2009



Management of CCRs



135 M tons of CCR were generated by coal-fired electric utilities in 2009
79M tons were disposed in landfills and surface impoundments
**by comparison 2M tons of RCRA hazardous waste were disposed in landfills & impoundments in 2009*

Current Regulatory Status of CCRs

- Bevill exemption excludes CCRs from being regulated as hazardous waste pending completion of a Report to Congress and a determination by the EPA Administrator either to promulgate regulations under RCRA Subtitle C or to determine that such regulations are unwarranted
- EPA submitted Reports to Congress & Issued Regulatory Determinations in August 1993 and May 2000 saying
  - Bevill exemption should be retained and
  - EPA should issue Subtitle D regulations
  - Beneficial use of CCRs did not pose a risk
- TVA Kingston Plant Release December 22, 2008 major release of CCRs due to a dam failure
- June 2010 Proposed Rules

June 2010 Proposed Rules

Subtitle C Option

- Complete phase out of all surface impoundments
- CCRs destined for disposal are regulated from the point of generation to the final disposition
- In-plant engineering retrofits to meet hazardous waste standards i.e secondary containment for conveyance equipment, boilers, silos etc
- Landfills must meet siting and design criteria Subtitle C
- Groundwater monitoring
- Tank based wastewater treatment systems

Subtitle D Option

- National liner, siting and stability criteria for new landfills
- Surface impoundments must retrofit to meet liner and siting requirements or close
- Groundwater monitoring

Overview of Comments Received by EPA on Proposed Rule

- 450,000 comments received
- 13,000 with “unique content”
- Environmental groups and individual citizens favor Subtitle C
- ASTSMO, individual states, industry groups favor Subtitle D

EPAs Next Steps

- EPA will issue Notice of Data Availability (NODA) in September
  - Chemical constituent data for CCRs
  - Facility and waste management unit data
  - Information on additional alleged damage cases
  - Adequacy of state programs **
  - Beneficial use
  - Approaches for updating the risk assessment and the regulatory impact analysis (RIA)
- HR 2273 proposes Subtitle D regs for ash
  - Supported by states

** State of Failure "How States Fail to Protect Our heath and Drinking Water from Toxic Coal Ash" August 2011

CCS Estimated Costs

Subtitle C $76M capital

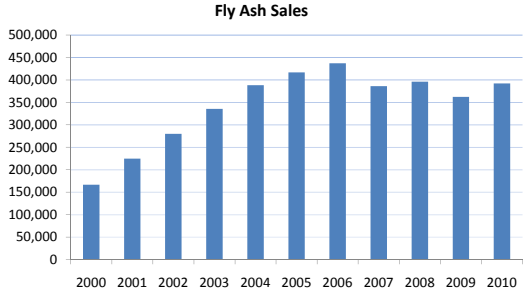
- Closure of Impoundments $15M
- Wet scrubber conversion $30M
- Bottom Ash conversion $25M
- Annual Loss of Ash Sales $17M fob/CCS
- Additional O&M are significant but haven't been evaluated

Subtitle D $15.5M

- Administrative O&M Requirements $.5M
  - Duplicative reporting efforts as currently required by state
  - Inspections & certifications
  - Expanded groundwater monitoring
- Potential for impoundment closure $15M

*CCS costs for Subtitle D are less than most in industry as all impoundments are lined

CCS Fly Ash Sales 2000 - 2010



An Economic Assessment of Net Employment Impacts from Regulating Coal Combustion Residues

- Considered unit retirements, changes in electricity prices, changes in the amount of CCRs recycled and increased expenditures on CCR management
  - Direct impacts – unit retirements & electricity price increases
  - Indirect impacts – changes in supplying industries i.e coal mining, waste management industry
  - Induced job impacts changes in local spending that result from job impacts

Veritas "An Economic Assessment of Net Employment Impacts from Regulating Coal Combustion Residuals" June 2011

An Economic Assessment of Net Employment Impacts from Regulating Coal Combustion Residues

Subtitle C Cost to Industry
$79 - $110 Billion over 20 years

Subtitle D Cost to Industry
$23 - $35 Billion over 20 years

Subtitle C Job Losses
183,900 – 316,000

Subtitle D Job Losses
39,000 to 64,700

Job losses
- Electric power generation
- Coal mining
- Food service
- Real estate establishments
- Repair construction of nonresidential structures

Job Gains
- Hazardous Waste Management
- CCR handling & Equipment manufacturing

***Midwest would have the highest number of job losses**

Veritas "An Economic Assessment of NEt Employment Impacts from Regulating Coal Combustion Residuals" June 2011

ARTBA Foundation Report

- Concrete represents 15% of total infrastructure in US
  - 75% of concrete utilized fly ash as part of blend
  - Annual average of FA% in concrete 14-16%
- 20 Years result in $105 Billion increase cost to build roads, runways and bridges
  - $5.23 Billion annual direct cost
    - $2.5 Billion in price of materials
    - $2.73 billion due to shorter pavement & service life of portland cement blends

ARTBA "The Economic Impacts of Prohibiting Coal Fly Ash Use in Transportation Infrastructure Construction" September 2011