

University of Kentucky Research Foundation Project

Project Presentation



Clean Coal Power Initiative - Round 1 -

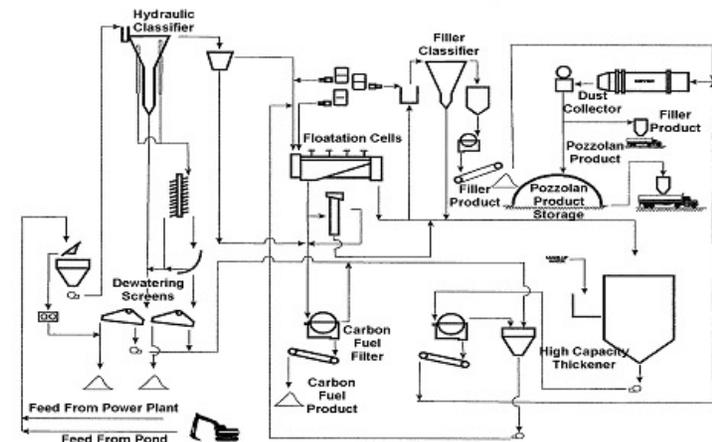
Advanced Multi-Product Coal
Utilization By-product
Processing Plant

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University of Kentucky Research Foundation

- **Next Generation Coal Ash Beneficiation Processing Plant addressing entire coal utilization by-product (CUB) stream and producing a variety of value-added products**
- **Demonstration at LG&E Energy Corporation's 2,000 MWe Ghent Power Plant, Ghent, KY**
- **Total Project cost: \$8.9 million (DOE share: \$4.4 million)**



CUB Processing Plant



Background

- **University of Kentucky Research Foundation will demonstrate an advanced coal-ash beneficiation processing plant that represents next generation in coal utilization**
- **Project Location: Ghent Power Station, Ghent, KY**
- **Team members include:**
 - Kentucky Utilities, a subsidiary of LG&E Energy Corporation, (Louisville, KY)
 - University of Kentucky Center for Applied Energy Research, (Lexington, KY)
 - CEMEX USA, (Houston TX)



Background (continued)

- **Process generates a range of useful products including:**
 - Pozzolan, a product that can replace up to 30% of Portland cement used to make concrete
 - Lightweight aggregate suitable for use in concrete masonry units such as blocks
 - A graded fill-sand for construction applications
 - Unburned carbon product used as a supplemental fuel
 - Very fine-sized material (~ 3-4 micron median particle size) suitable for use as a polymer filler or specialized pozzolan



Ghent Power Station



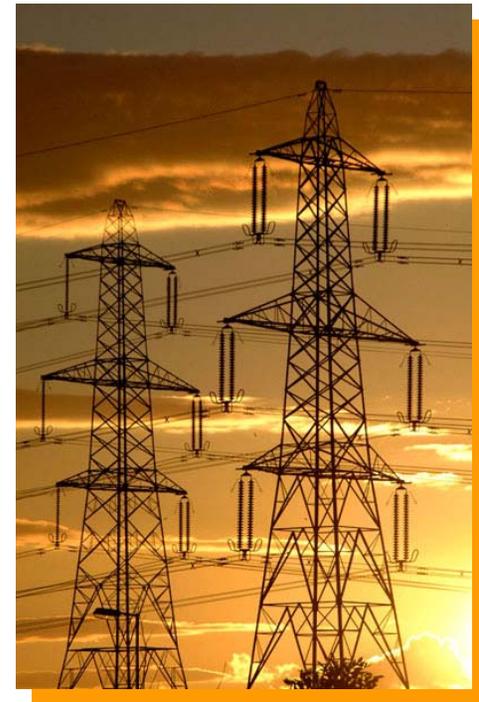
Unique Technology Aspects

- **University of Kentucky process for producing pozzolan used in concrete, achieves better concrete strength and performance, and can be used at higher substitution levels (30% vs. 20%)**
- **Process addresses entire coal utilization by-product (CUB) stream with a target of total CUB utilization and can use existing disposal pond ash**



Unique Technology Aspects (continued)

- **Process is based on hydraulic classification and froth flotation technology developed at University of Kentucky Center for Applied Energy Research**
 - Hydraulic classification
 - Froth flotation
 - Column flotation
 - Spiral concentrators
 - Solids dewatering
- **This project generates high-value and consistent quality products from waste ash**



Project Schedule

- **Start**
 - 2004
- **NEPA Process**
 - EA, FONSI expected by November 2004
- **Design**
 - 2006
- **Construction**
 - 2008 to 2009



Conclusions

- **A beneficial use for ash stored in power plant ash-settling ponds across U.S. will be demonstrated:**
 - Reducing need for new ponds
 - Extending life of existing ponds
 - Potentially eliminating need for new ponds
 - Reducing disposal costs
- **Pozzolan production (156,000 tons per year) will be used to replace an equivalent amount of Portland cement resulting in CO₂ offset**

