Biomass Cogeneration Facility
Savannah River Site, Aiken SC

CAB Briefing
January 25, 2011
Biomass Cogeneration Facility

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Biomass Cogeneration Facility

Project Drivers

- Steam and electricity on site is currently provided by two facilities
  - D-Area Powerhouse is over 55 years old and well past its economic life. Condition and reliability are rapidly deteriorating.
  - K-Area Boilers are not cost effective in the current seasonal use mode or with the unpredictable increasing price of fuel oil.

- Steam demand will remain for current and future critical missions, but will be reduced over time

- There are several Federal mandates that require Federal Agencies to conserve energy
  - Statutory requirement of EPACT 2005 to increase use of renewable energy to 7.5% by 2013
  - Executive Order 13423 and DOE-HQ initiatives mandate maximum use of renewable energy sources and Energy Savings Performance Contracts
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Contract Overview

- Project will be executed as a Delivery Order under the DOE Biomass and Alternate Methane Fuel (BAMF) Super Energy Savings Performance Contract (ESPC)

- Contract signed on May 15, 2009 between Ameresco Federal Solutions (Ameresco) and the DOE-SR
  - Ameresco is responsible for the project and for operations throughout the performance period of the contract

- Turnkey (finance, design, construct, operate and maintain)

- Implementation Cost: $149,172,566

- Contract Term: 19 Years
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About the Biomass Project

Biomass Heating Plants:
- Two biomass boilers will be installed, one located at K Area and one located at L Area.
- Biomass boilers 10,500 pph capacity each
- The boilers at the K & L Areas will use fuel from the main plant and provide steam only.
- Full-sized fuel oil burners for backup
- Automated plant operations (remote operations)

Biomass Cogeneration Facility:
- The proposed plant will include (2) 120,000 pph boilers.
- The 850 psig steam produced by the boilers will pass through a single extraction 20 megawatt turbine.
- The biofuel used will consist primarily of clean biomass waste, with a small percentage of bio derived fuel (BDF).
- The steam and power produced from the facility will be exported to the SRS distribution system.
- The Biomass plant is an ESPC project, privately funded.

WILL BE THE LARGEST FEDERAL BIOMASS FACILITY
Biomass Cogeneration Facility

Project Environmental Benefits

- Overall annual air emissions rates will decrease:
  - Particulate Matter by > 400 tons a year
  - NOx by >2,500 tons a year, and
  - SO$_2$ by more than 3,500 tons a year

- Greenhouse Gas (GHG) emissions reduced by 100,000 tons a year significantly decreasing the carbon footprint of the SRS

- Use of renewable energy

- The amount of river water currently drawn from the Savannah River will decrease by over 1.4B gallons per year
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Safety

- Approximately 135 workers on site
- Over 200,000 safe man-hours
- No reportable incidents in 16 months
- Three first aid (minor cuts)
- One accident (truck cab rotation)
- Weekly inspections by DOE
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**Phase 1 – Site Work**

September 2009 - March 2010

- Emphasis on
  - clearing and grubbing
  - site stabilization
  - establishing the cut and fill balances
  - installation of the erosion controls and stormwater system
  - installing the fire water system
  - and establishing the tie-ins for electrical, water, sewer, and telecommunications
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Final Site Prep

March 2010

- Site preparation complete
- Ready for first concrete placement
March 2010

- Mudmat poured, rebar set, and forming completed for the first boiler pad concrete placement on March 6, 2010.
- Boiler pad and truck dumping station pad completed in June
- Stacker/Reclaimer pad and conveyor piers placed
- Hog tower, Magnet and Transfer tower pads placed
- Cooling tower and Turbine pad placed
June 2010 - Present

- First steel for the boiler combustor installed in early June
- Steel erection 90% complete
- Boiler parts from EPI have arrived ahead of schedule
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Burma Road Construction (from 3,000 ft)
### Biomass Cogeneration Facility

<table>
<thead>
<tr>
<th><strong>Key Milestones</strong></th>
<th><strong>Date</strong></th>
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<tbody>
<tr>
<td>✔ Delivery Order Award</td>
<td>15-May-09</td>
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<tr>
<td>✔ Major Equipment Purchase</td>
<td>Following Award</td>
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<tr>
<td>✔ Mobilization</td>
<td>14-Sep-09</td>
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<tr>
<td>✔ Site Work Complete</td>
<td>31-Mar-10</td>
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<tr>
<td>✔ Boiler Pad Complete</td>
<td>04-Jun-10</td>
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<tr>
<td>✔ Boiler Delivery</td>
<td>15-Oct-10</td>
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<tr>
<td>□ Turbine Delivery</td>
<td>07-Apr-11</td>
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<tr>
<td>□ Boiler Erection Complete</td>
<td>23-May-11</td>
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<tr>
<td>□ Electrical/Piping Installation Complete</td>
<td>03-Aug-11</td>
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<tr>
<td>□ Start-up &amp; Commissioning Complete</td>
<td>01-Nov-11</td>
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<tr>
<td>□ Turnover</td>
<td>15-Dec-11</td>
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K and L Area Heating Plants

June 2010

- Boiler Pad excavation complete, mudmat poured, and pad placed in May.
- Hurst boiler placed in June on schedule.
K and L Area Heating Plants

August 2010

- Work on K an L Heating Plants well underway
  - Piping
  - Electrical
  - Siding
  - Roofing
K and L Area Heating Plants

November 2010

- Construction Complete
- Start-up and Commissioning
- DOE Readiness Assessment and Acceptance

Boilers ready to provide steam on November 24, 2010
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Summary/Look Ahead

- Replace two (2) aging and inefficient plants
- Major source of renewable energy for DOE
- Positive impact to the economy and environment
- Success start-up of Biomass Heating Plants in K and L Area
- Construction of large Biomass Cogeneration Facility is on schedule
- Start-up, commissioning and DOE acceptance on track for December 2011