



U.S. DEPARTMENT OF
ENERGY

Biomass Cogeneration Facility and K & L Area Heating Plants

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EM Environmental Management
safety ✦ performance ✦ cleanup ✦ closure



Acronyms

- Clean Biomass – forest logging residue, low-value forest products, wood waste residue (sawdust & chips), urban wood waste
- ECM – Energy Conservation Measure
- EPACK – Energy Policy Act
- ESPC – Energy Savings Performance Contract
- GHG – Greenhouse Gas
- MMBtu – Million British Thermal Units
- pph – pounds per hour
- MW – Megawatts (1 million watts)



Existing D-Area Powerhouse



■ Current Status

- ◆ Operating
- ◆ Makes one half (20 MW) of Site's electrical demand
- ◆ Costs approximately \$33 million annually to operate
- ◆ Maintenance concerns

Existing D-Area Powerhouse was built in 1953 and provides steam to nuclear and industrial activities in F-, H-, and S-Areas.

- Cogeneration Facility
- Four 330,000 pph coal-fired boilers



Existing K-Area Powerhouse



■ Current Status

- ◆ Operates during heating season
- ◆ Costs approximately \$1.4 million annually to operate
- ◆ Only produces steam for heating (no MW)
- ◆ Maintenance concerns

The existing K-Area Powerhouse was built in 1992 and provides steam to K- and L-Areas for heating during the winter season only.

- One 30,000 pph oil-fired boiler
- One 60,000 pph oil-fired boiler



Project Drivers

- D-Area Powerhouse is over 55 years old and well past its economic life. Condition and reliability are rapidly deteriorating.
- K-Area Powerhouse boilers are not cost effective in the current seasonal use mode or with the unpredictability of the increasing price of fuel oil.
- Regulatory drivers (MACT and PM 2.5) will require significant upgrades for continued operation.
- 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



Overview of Project

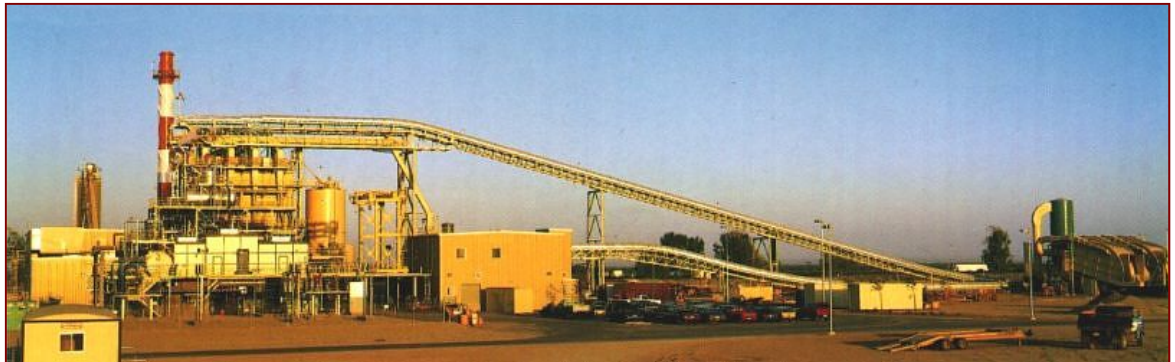
- Project executed as a Delivery Order under the DOE Biomass and Alternate Methane Fuel (BAMF) Super ESPC
- Delivery Order executed on May 15, 2009, between Ameresco Federal Solutions (Ameresco) and the DOE-SR
 - Ameresco is responsible for the project and for operations throughout the performance period of the delivery order
- Turnkey (finance, design, construct, operate and maintain)
- Implementation Cost: \$149,172,566
- Year 1 Savings: \$34M
- Contract Term: 19 Years



ECM-1: Biomass Cogeneration Facility

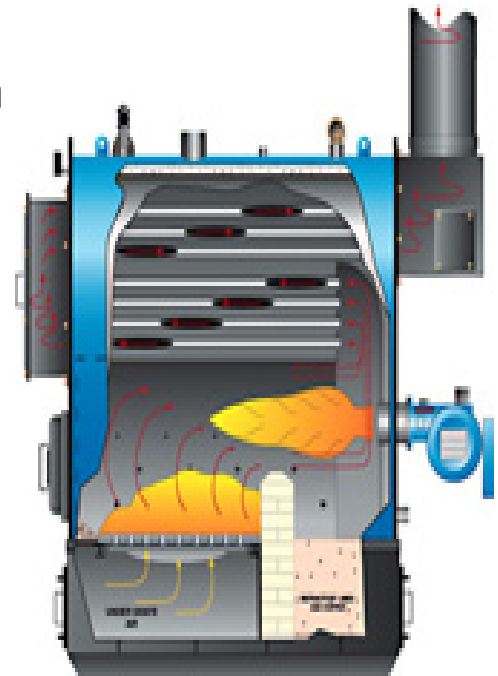
- Proposed Project Includes:
 - Two 120,000 pph biofuel fluidized bed boilers system
 - One 20 MW steam single extraction and condensing turbine
- Reduction in energy consumption by eliminating over 3.5 miles of steam distribution lines
- Annual Savings of over 500,000 MMBtu/yr & \$33M
- Significant source of Green Energy
- Ameresco will operate for 19 years

**WILL BE THE LARGEST FEDERAL
BIOMASS FACILITY**



ECM-2: K&L Area Heating Plants

- Proposed Project:
 - (2) biomass boilers 10,500 pph capacity each (using biomass fuel from Biomass Cogeneration Facility)
 - Full-sized fuel oil burners for back-up
 - Automated plant operations (remote operations)
- Deactivate 2.5 mile steam distribution line
- Annual Savings of over 4300 MMBtu/yr and \$1M
- Ameresco will operate for 19 years



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
 - SO₂ - by more than 3,500 tons a year
- 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



Fuel Sources



Fuel Supply

- The use of renewable energy fuel sources provides many positive economic and environmental benefits to SRS and the local community
- The Biomass Cogeneration Facility and the K & L Heating Plants will require approximately 322,000 tons of forest residue biomass per year as the primary fuel
 - Numerous sources of clean biomass within the 100 mile radius of SRS
 - Permitted to burn up to 30% shredded tires (Cogeneration Facility only)
 - Other biomass fuels (wood pallets)
- Ameresco is actively looking to contract with local suppliers of clean biomass and biomass fuels
- DOE, US Forest Service and Ameresco will work to locate and obtain biomass from SRS consistent with the natural resource management of SRS with no adverse effects on timber sale operations



ECM-1: Schedule

Project Activities

- Delivery Order Award
- Major Equipment Purchase
- Mobilization
- Site Work
- Construction Work
- Start-up & Commissioning
- Project Complete

Start Date

15-May-09
Following Award
14-Sep-09
25-Sep-09
22-Feb-10
12-Jun-11
15-Dec-11



In Conclusion



Biomass Cogeneration Facility / K & L Heating Plants

- Replace two (2) aging and inefficient plants
- Major Source of renewable energy source for DOE
- Positive Impact to the economy and environment
- ECM-1 construction schedule of 30 months
- ECM-2 construction schedule of 18 months

