Presentation to the Governor’s Nuclear Advisory Committee

Biomass Cogeneration Facility and K&L Heating Plant

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Acronyms

- Clean Biomass – forest logging residue, low-value forest products, wood waste residue (sawdust & chips), urban wood waste
- ECM – Energy Conservation Measure
- EPACT – Energy Policy Act
- MMBtu – Million British Thermal Units
- pph – pounds per hour
- MW – Megawatts = 1 million watts
- O&M – Operations & Maintenance
**D-Area Powerhouse**

**Current Status**
- Operating
- Makes one half (20 MW) of Site’s electrical demand
- Costs approximately $33 million annually to operate
- Maintenance Concern

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

- Co-generation facility
- Four 330,000 pph coal-fired boilers
The existing K-Area Plant 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

Current Status

- Operates during heating season
- Costs approximately $1.4 million annually to operate
- Only produces steam for heating (no MW)
- Maintenance Concern
Project Drivers

- D-Area Powerhouses 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
Overview of Project

- 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

- Year 1 Savings: $34M

- Contract Term: 19 Years
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

**ECM-1: Biomass Cogeneration Facility**

WILL BE THE LARGEST FEDERAL BIOMASS FACILITY
ECM-2: K&L Area Heating Plants

- **Propose Project:**
  - (2) biomass boilers 10,500 pph capacity each (using biomass fuel from main plant)
  - Full-sized fuel oil burners for backup
  - 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
Overall annual air emissions rates will decrease:
- Particulate Matter- > 400 tons a year
- NOx by >2,500 tons a year, and
- SO₂ 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 2.8B gallons per year
ECM-1: Fuel Sources
The use of renewable energy fuel sources provides many positive economic and environmental benefits to SRS and local community.

Biomass 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
- 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

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<tr>
<th>Project Activities</th>
<th>Start Date</th>
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<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>
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<td>Site Work</td>
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<tr>
<td>Construction Work</td>
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<td>Start-up &amp; Commissioning</td>
<td>12-Jun-11</td>
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<td>Project Complete</td>
<td>15-Dec-11</td>
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In Conclusion

Biomass Cogeneration Facility / K&L Area 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
- Groundbreaking Ceremony planned for October 1, 2009