Biomass Cogeneration Facility

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AMERESCO
Green • Clean • Sustainable

Savannah River Site Citizens Advisory Board
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Clean ● Green ● Sustainable ● Steam

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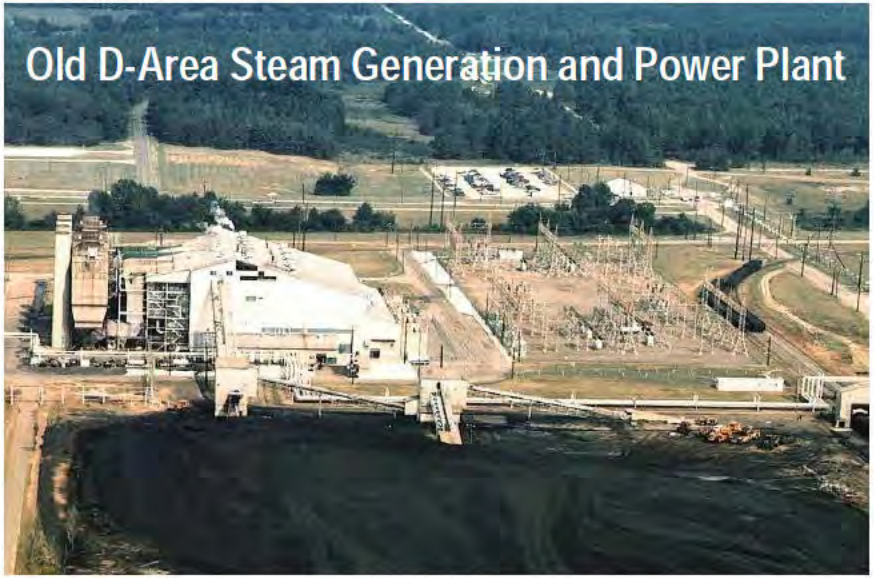
Project Drivers



- D-Area Powerhouse was over 55 years old and well past its economic life. Condition and reliability were rapidly deteriorating.
- Steam demand will remain for current and future critical missions, but will be reduced over time.
- Several Federal mandates require Federal Agencies to conserve energy

Project Benefits

Environmental

- 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

Contract Overview

- Project 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

Integrated Project Team

- Integrated Project Team formed in September 2009
- Included CO, FPM, representatives of FRs, Safety, Permits, Savannah River Nuclear Solutions (SRNS), technical representatives as required
- Met weekly for the two year construction of the project
- Responsible for:
  - Working required Utility Interfaces
  - Resolving Contract Issues
  - Maintaining Integrated Schedule

Site Prep and Construction

1

2

3

4

5

6

September 2009 – June 2011

Commissioning and Start-up

Steps of Commissioning & Startup

- Ameresco System Commissioning of 30 systems
- Ameresco Equipment Performance Testing
- DOE–SR Team Readiness Assessment

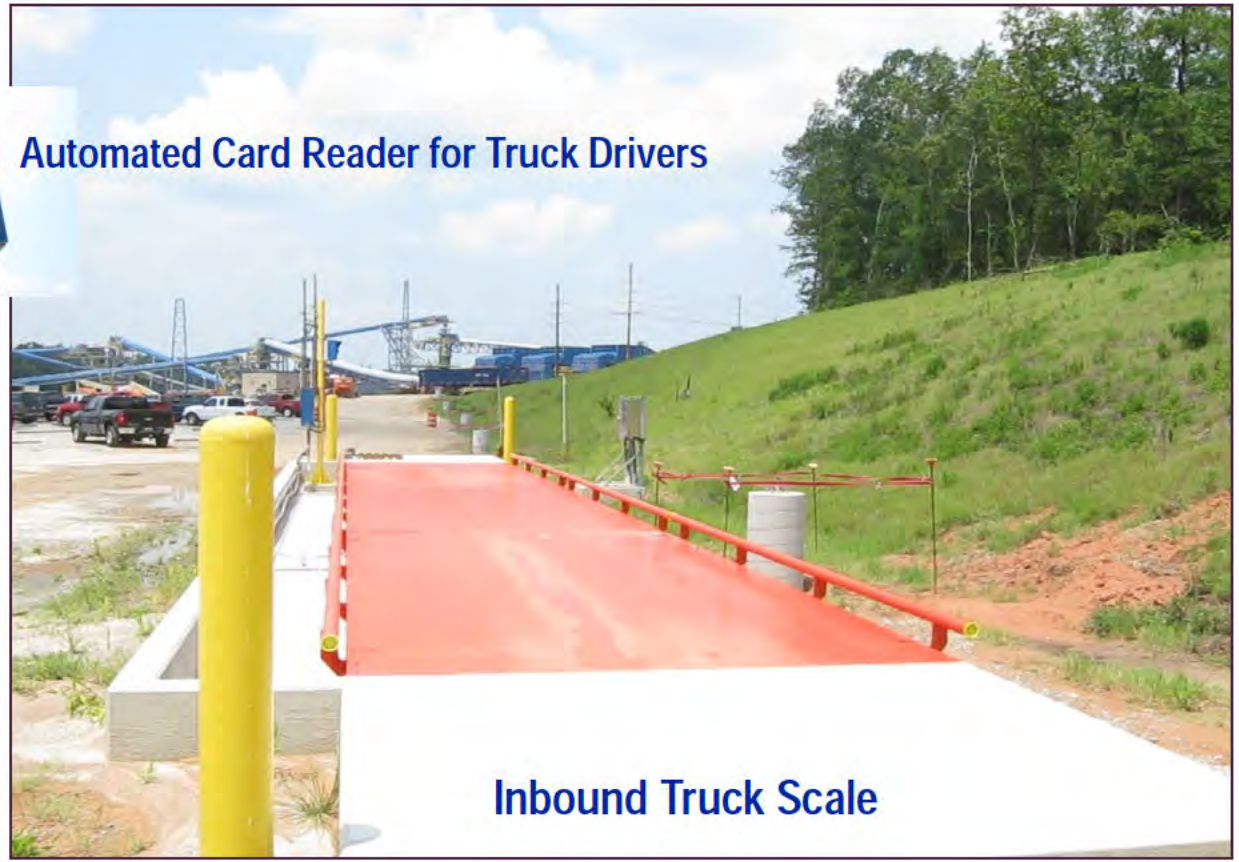
June 2011 – December 2011

Operations

January 2012

Processing of Biomass at BCF

Automated Card Reader for Truck Drivers



Inbound Truck Scale

Processing of Biomass at BCF (cont.)

Above Ground Truck Dumps & Hoppers at BCF

- Three off loading pads
- Each hopper hold two truck loads

- Dump Time 6-8 minutes
- One truck load every 15 min

Processing of Biomass at BCF (cont.)

Disc Scalping Screen & Hogg Tower

Transfer Station

Radial Stacker – Re-claimer

Types of Biomass being used at SRS

Woody

- Whole-tree chips ✔
- Forest/Logging Residues ✔
- Roundwood ✔
- Primary/Sawmill Chips ✔
- Mill Residues ✔
- Urban/Municipal Wood Waste ✔

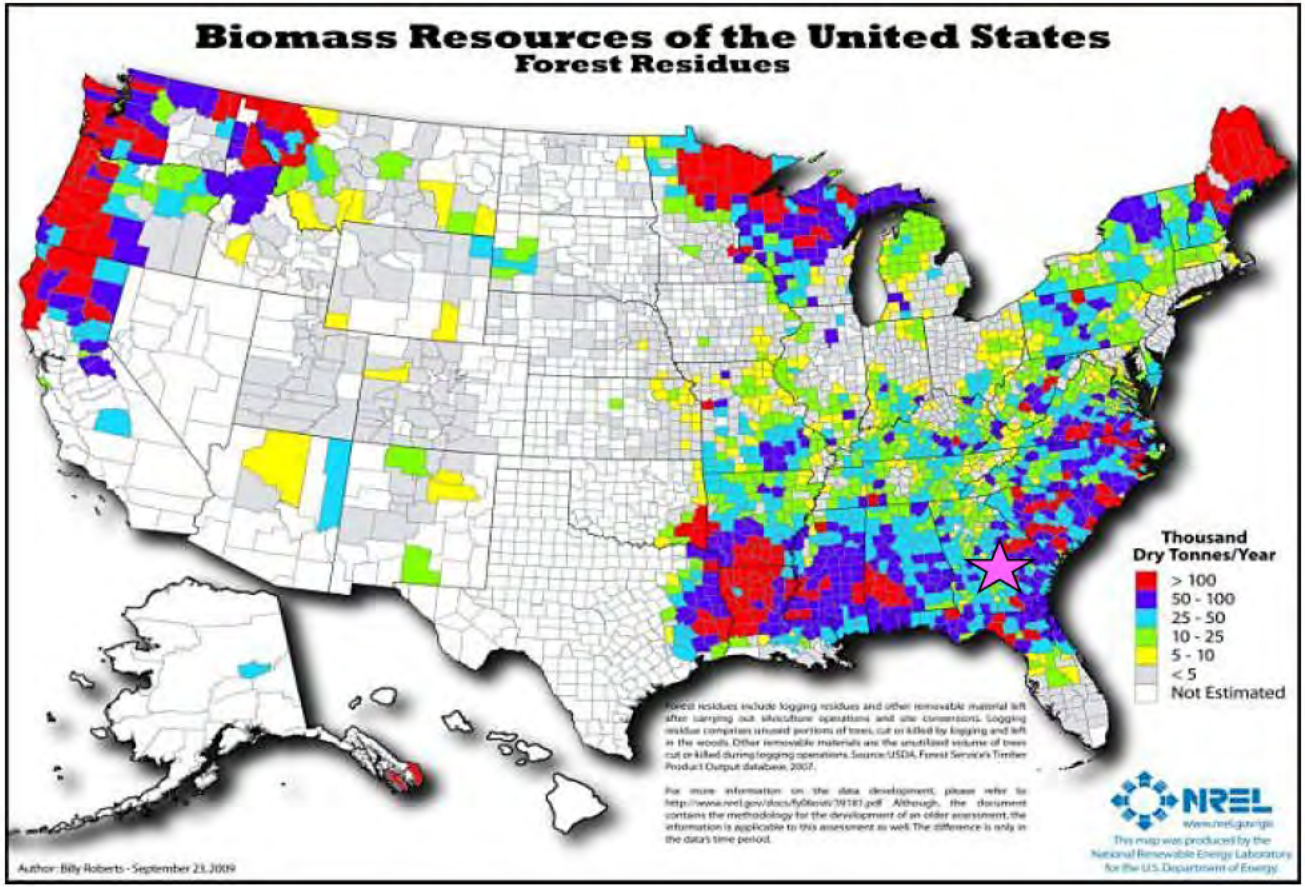
Non-Woody

- Agricultural Sources
- Animal/Livestock Wastes
- Solid Wastes

Woody Biomass Supply Chain Characteristics

- Many "suppliers" and many "consumers"
  - Thousands of timberland owners in SC
  - Hundreds of wood consuming facilities in SC
  - U.S. Forest timber sales
- Highly fragmented
  - Landowners
  - Consultant
  - Supplier (Wood Dealer)
  - Producer (Logger)
  - Hauler (Trucker)
  - Primary / Secondary Biomass Consuming Facilities (Chipmills, Papermills, Sawmills, OSB Mills, Pellet Mills, Cogeneration Plants)
- Transportation dependent
  - Miles to delivery point
  - Diesel fuel costs
- Weather dependent
  - Seasonal
  - Geographical (localized / regional)

Biomass Availability Around SRS



Wood Fiber Flow

- Majority of BCF woody biomass fuel supply originates from within the light green counties in South Carolina
- Practical limit for fuel wood is about 50 miles
- Majority of saw and pulp wood from SRS flow out to larger high production mills

Summary of First Two Years of Operation

Biomass Cogeneration Facility commercial operations began on January 10, 2012

- After the first two years of operation:
  - No recordable safety issues equating to 180,000 person hours without incident
  - Delivered an average of 200,000 pounds per hour of steam
  - Generated 3.1 billion pounds of steam for site for export to SRS facilities and for "green" power generation
  - Facility consumed more than 20,000 tons of tires and 500,000 tons of clean biomass, consisting of local forest residue and wood chips
  - Entire first year with no steam interruption, one steam interruption second year
- Project has provided 100% process steam and up to 30% of the SRS power and from renewable fuel
- Project is a great example of private industry and the federal government forming a partnership and working together for success.

Biomass Plants at DOE Savannah River Site

AMERESCO

Biomass Cogeneration Facility

- The BCF includes (2) 120,000 PPH boilers and one 20 megawatt turbine
- The steam and power produced from the facility is exported to the SRS distribution system.
- Ameresco is responsible for operations, maintenance, and fuel procurement at BCF and K&L Plants

A-Area Biomass Plant

- One 30,000 PPH biomass boiler

K & L Area Biomass Heating Plants

- Two identical biomass boilers were installed, one at K Area and one at L-Area
- Boilers 10,500 PPH capacity each

Questions

Thank you for your time!

Questions?

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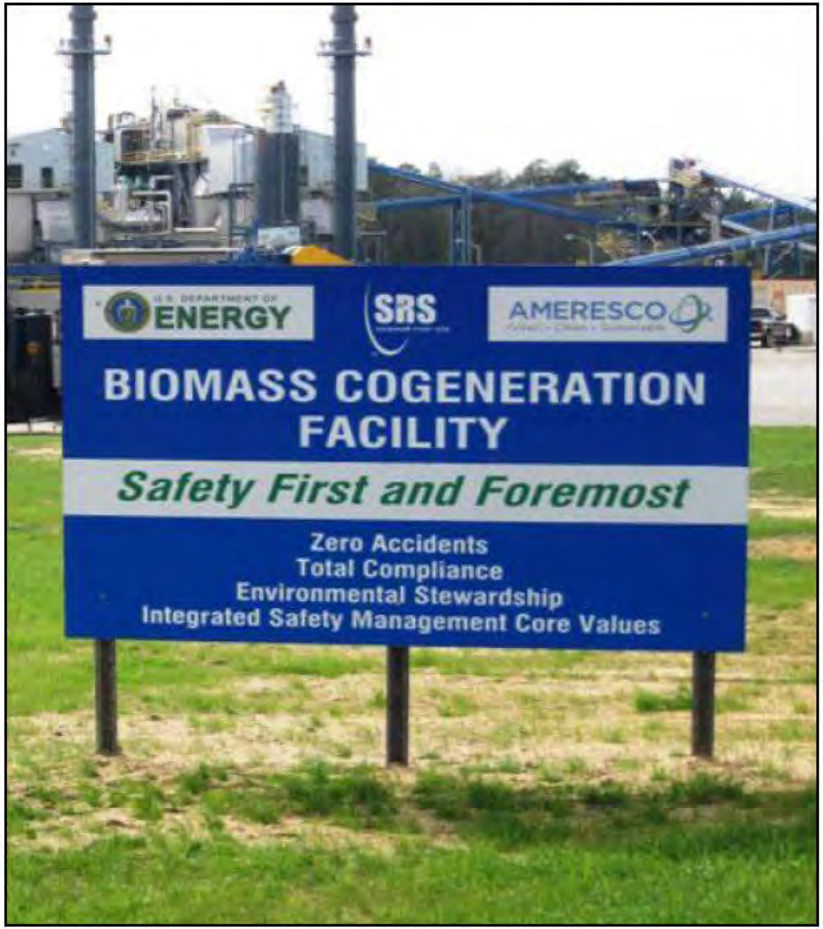
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