Switchgrass co-firing at Plant Gadsden

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Southern Company, Southern Research Institute, Agtech, EPRI, and the US Department of Energy are sponsoring a program to evaluate cost and benefits of co-firing switchgrass with coal in existing coal fired boilers. As part of this multi-phase project, a full-scale demonstration was conducted at Alabama Power Company's Plant Gadsden. The objective of the testing was to determine handling, operating, combustion, and emissions characteristics of the co-firing process.

Plant Gadsden #2 is a 70 MW tangentially fired unit. When initial laboratory studies indicated that switchgrass blended with coal would not flow in bunkers for co-milling, a pneumatic system was designed to convey switchgrass directly into the unit at up to 10% of the total fuel energy. The system was designed to receive switchgrass in large round bales, shred the material to approximately 1" minus, and then pneumatically convery the grass into the boiler through separate burners.

The system was designed to allow injection at two different burner elevations, and testing was planned for several switchgrass loadings and grind sizes. Tests were conducted to evaluate the effect of switchgrass co-firing on boiler efficiency and on unit operations. In addition, data were taken to determine the effect of switchgrass on emissions such as sulfur oxides, nitrogen oxides, and particulates. This paper describes the conduct and some of the preliminary results of the tests.