Air Quality and Emissions

We have consistently met the challenge of reducing emissions of nitrogen oxides (NOx) and sulfur dioxides (SO2) from our power plants. We support efforts to address further emissions reductions that foster achievable and cost-effective targets and timetables. And we believe a comprehensive approach to addressing power plant emissions, such as the Bush Administration's Clear Skies Initiative, heads us in the right direction in achieving those reductions.

Georgia Power has reduced emissions of NOx more than 50 percent and SO2 emissions nearly 42 percent since 1990. Based on current or expected regulations, we anticipate additional significant reductions from current levels of both SO2 and NOx by early next decade. We also anticipate significant reductions of mercury emissions.

In the meantime, we will continue to keep environmental considerations at the forefront of what we do, while meeting the obligations we have to our customers to supply reliable and affordable energy. We will work with many stakeholders in this process, including our customers, policy makers and interest groups, and we look forward to meeting these challenges together.

Hazardous air pollutants:

We share with EPA and others a desire to provide information about emissions from our plants to people living near or around our facilities. We appreciate and understand concerns that the public may have regarding emissions from our plants or any other industrial facility located near their homes and businesses, and we want to address those concerns, either through information we currently provide publicly or in face-to-face meetings.

Levels resulting from our power plant emissions are well below limits established by the U.S. Environmental Protection Agency for the protection of public health and the environment. Information regarding Southern Company's emissions of hazardous air pollutants, as classified by EPA, is available through our Web site at www.southerncompany.com/planetpower.

Emissions Control Systems

Background: The vast array of new environmental requirements requires that a suite of environmental control technologies be developed, demonstrated and available. These technologies must be integrated into a least-cost compliance strategy. In order to carry out this strategy, Southern Company is active in the development and commercial application of various technologies that are required to maintain compliance with these current and future regulations. A brief description of some of these technologies follows.

Electrostatic precipitators: Southern Company captures, on average, 99.5% of the primary particulates —ash, also called particulate matter or PM — through the use of electrostatic precipitators (ESP). These devices apply an electrical charge to ash particles and collect them on an oppositely charged plate. One popular option for improving ESP performance is flue gas conditioning. Flue gas conditioning alters the "resistivity" of ash to hold its charge by adding sulfur trioxide, ammonia, moisture, or sodium compounds.

An advanced PM control technology — Compact Hybrid Particulate Collector (COHPAC) — is in use at Southern Company's Plant Gaston. COHPAC adds a baghouse to an existing ESP to filter the particles that escape the ESP. The next step beyond COHPAC and ESPs for particulate collection would be to install a full-scale baghouse. A baghouse is simply a large filter that captures particulate matter, similar to how a vacuum cleaner bag works. Also being developed within Southern Company are pilot-scale particulate removal technologies — a wet ESP, which replaces the traditional dry ESP with a flow of water over the collecting plates; an electrified cyclone particulate collector called Electrocore; and an electrically stimulated fabric filter system combining the attributes of an ESP and baghouse.

Typical rebuilding of an ESP costs around $20 per kilowatt, COHPAC from $10-$35 per kilowatt, and a full-scale baghouse in the range of $75 per kilowatt. For a 500 MW unit, these options would cost $10 million for an ESP rebuild, $5 million to $17.5 million for COHPAC, and $37.5 million for a full-scale baghouse.

An alternate to rebuilding an ESP is being explored by Southern Company researchers. ROPE (Rapid Onset Pulsed Energization) is a Southern Company-owned technology under development that can improve the performance of existing and new electrostatic precipitators. It does so by increasing the speed at which power is applied to the ESP collection plates. ROPE has been demonstrated on a pilot ESP at Plant Miller and produced a three-fold improvement in the ESP's operations - essentially making the ESP perform as if it were three times larger than it is. Full scale demonstration of ROPE is underway. The cost for installing a ROPE system would be approximately $2 to $6 per kilowatt, or $1 million to $3 million for a 500 MW unit.

Scrubbers: Scrubbers have been demonstrated to capture in excess of 95% of flue gas sulfur dioxide (SO_2), hydrochloric acid and hydrofluoric acid from power plant flue gas. Wet scrubber designs include the more commonly used limestone scrubbing process. Advantages of wet scrubbing include the availability of limestone, the ability to use a wide variety of fuel sources, and the stability/uses of the gypsum by-product. Also, wet scrubbers provide high removal efficiency, typically in the range of 95%-98%.

The materials selected for use in scrubber construction can still present challenges. Southern Company has successfully applied the exclusive use of fiberglass reinforced plastics to scrubber design. The capital costs of installing a scrubber, on average, is $170 per kilowatt for a 500-megawatt unit, or $85 million dollars.

Mercury removal: Mercury is found in coal flue gas in both elemental and oxidized forms. Scrubbers can remove up to 50% of the total mercury released during coal combustion. However, EPA is considering requiring that nearly 80% of the mercury be captured. Efforts are underway to identify scrubber additives that could improve their mercury collection capability.

Alternately, mercury can be captured through the use of additives in the flue gas along with the use of an electrostatic precipitator or baghouse. Using the COHPAC configuration at Plant Gaston, Southern Company was the first to demonstrate full-scale power plant mercury control through activated carbon injection (ACI) upstream of the filter bags. Mercury emissions reductions averaged 78% using ACI with COHPAC. ACI will also be tested with an ESP, however, significantly lower mercury removal is expected due to the lack of a filter surface to deposit the carbon.

The cost for these mercury removal systems would range from $14,000 to $70,000 per pound of mercury removed (or $1 million to $4.5 million per year for a 500 MW unit). Disposal of the solids with the captured mercury would also have to be addressed.

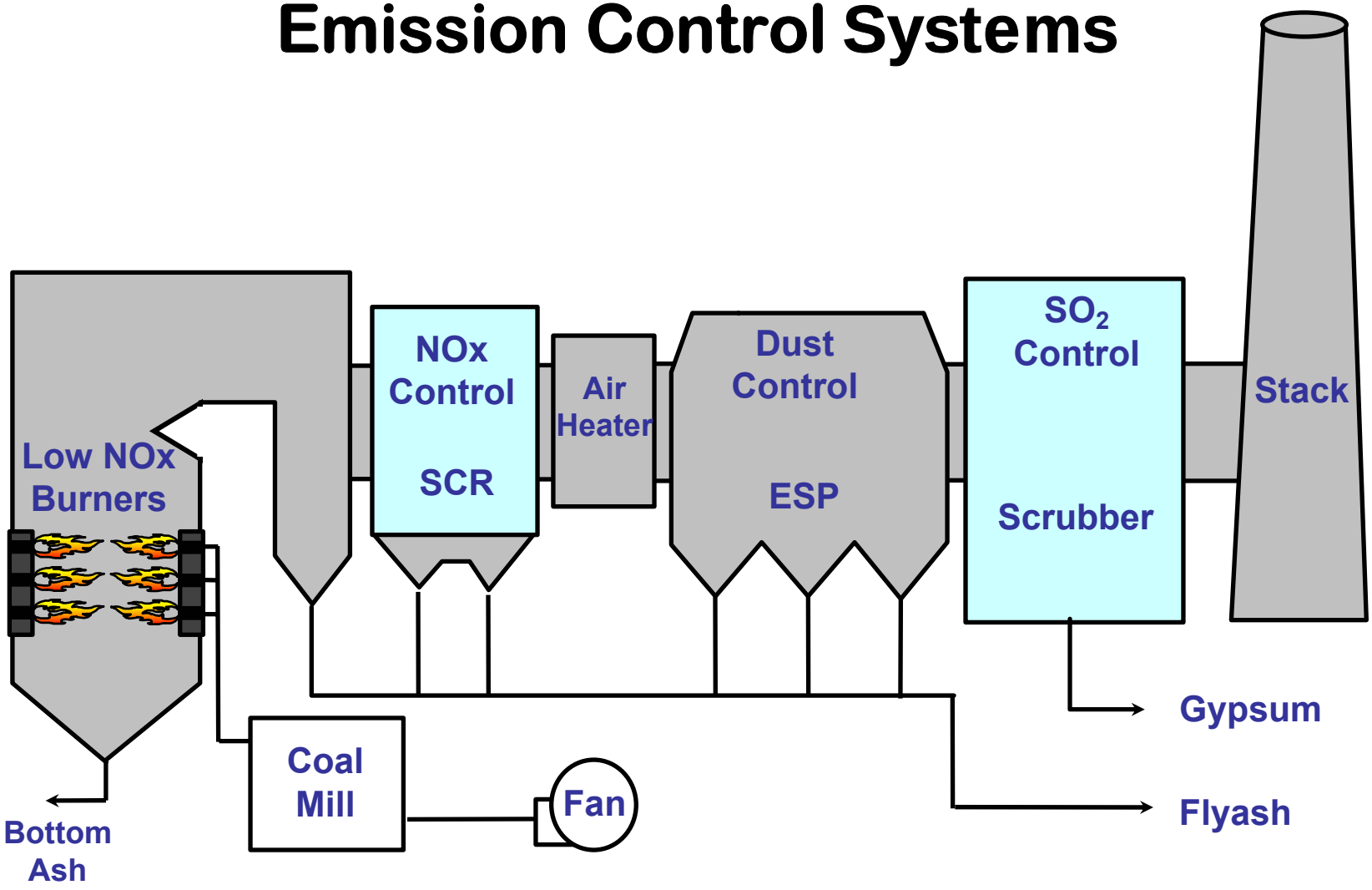
Selective Catalytic and Non-Catalytic Reduction Systems for NOx: SCRs are currently being installed across Southern Company — including plants Bowen, Hammond, Wansley, Gorgas, and Miller. SCRs typically reduce NOx emissions up to 85%-90% by reacting NOx with ammonia to create water and nitrogen. While current SCRs use ammonia as a reducing agent across a vanadium catalyst bed, the company is researching other agents and catalysts that might be used in order to reduce balance-of-plant and environmental impacts. The average cost for installing an SCR is $60 to $120 per kilowatt, or $30 million to $60 million for a 500 MW unit.

Selective Non-Catalytic Reduction (SNCR) takes advantage of the same chemical reactions as in the SCR process, but without the need for a catalyst because of much higher temperatures found within the boiler where the ammonia is injected in this technique. A demonstration of SNCR have shown best applicability in smaller boilers – less than 300 MW — and is likely to achieve NOx reductions of about 30%-40%. Still another NOx removal technique, gas reburn, requires that a hydrocarbon fuel be injected at appropriate temperatures in the boiler causing localized NOx reduction. Depending on the specifics of the site, NOx reductions can vary between 20%-60%.

Instrumentation systems: Southern Company continues to pioneer the development of neural network control systems for boilers and environmental control systems that automatically control these devices at optimum operating points. These systems are relatively inexpensive when compared with other emissions control alternatives and can be responsible for modest reductions — 20% or less — in emissions. Installation of such controls would typically be less that $500,000.

Southern Company also continues to seek more accurate and timely ways to measure and report emissions including research to develop: improved flue gas flow rate measurement methods, continuous particulate analyzers, continuous mercury analyzers, real-time particulate compliance assurance monitors, and more accurate sulfuric acid and dioxin emissions models for toxics release inventory reporting.

Emission Control Systems



NOx: Nitrogen Oxides

SO_2: Sulfur Dioxide

SCR: Selective Catalytic Reduction

ESP: Electrostatic Precipitator