

Researching lower-cost options

Associated Electric Cooperative Inc.

A Touchstone Energy® Cooperative 



Power supply facts

Baking soda might leaven impact of environmental costs

Research conducted at New Madrid Power Plant shows members could save hundreds of millions of dollars on environmental controls, and the key ingredient is found in most households. It's baking soda, or sodium bicarbonate.

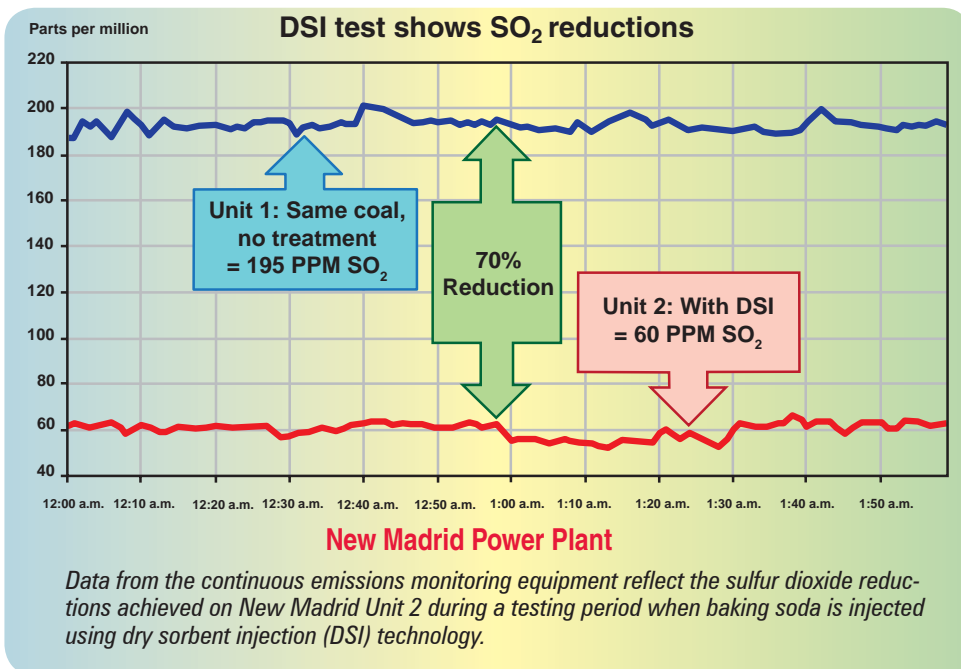
While it's not as simple as mixing up a batch of pancakes, injecting baking soda into the flue gas stream of power plant emissions captures sulfur dioxide. Tests achieved 60 percent to 80 percent reductions in SO₂ consistently, making dry sorbent injection (DSI) technology an effective tool to meet future environmental regulations.

It also costs less – a lot less: one-tenth the cost of conventional scrubbers. Cost estimates are about \$110 million to install DSI technology on five coal units versus \$1.3 billion for scrubbers on all five units.

Associated conducted short-term DSI testing in 2010 and 2011. Long-term research on New Madrid Unit 2 in 2012 ran about 90 days at a cost of \$2.8 million and included mobile silos and equipment to inject the baking soda. The objective: achieve SO₂ reductions with no adverse impacts on the operation and efficiency of the unit or existing environmental controls.

DSI research builds on Associated's environmental investments, particularly its conversion to low-sulfur coal in 1995 that reduced its SO₂ emissions 90 percent. Because its SO₂ emissions already are very low, Associated is in good position to meet the Environmental Protection Agency's air transport rule, now delayed by a court ruling, as well as future EPA air quality mandates by using DSI technologies versus scrubbers.

While DSI's annual operating and maintenance costs may be a little higher than scrubbers – DSI technology provides more operational and financial flexibility. Compared with conventional scrubber technology that can take more than three years to design and install, a permanent DSI can be installed in under a year.



Here's how it works

Baking soda is produced in Wyoming where the raw material (trona) is mined from 1,600 feet below the surface. Because it's very reactive with its surroundings, it's handled with dry conditioned air and transported in sealed rail cars.

Once at the power plant, it is moved with conditioned air to holding silos close to where it is injected into the plant's flue gas. From there, it's finely ground and injected into the ductwork carrying exhaust flue gas. There, it mixes and reacts to form sodium bisulfate, which is captured along with the ash particles by electrostatic precipitators (ESPs).

Research has shown no adverse impact on the performance of the precipitator equipment due to DSI. Staff also has discovered existing environmental controls that capture nitrogen oxides improve DSI capture of SO₂ as well.

DSI technology does increase the amount of material to the landfill by about 40 percent, requiring more solid waste transport and storage. Staff is monitoring the material to ensure it complies with solid waste regulations.