



Session: Resource Recovery
Wednesday, September 24
10:15am – 12:15pm
Room N261, Las Vegas Convention Center, Upper Concourse

Title: Oxidation Technology for Ventilation Air Methane: First U.S. Field Trial

Presenter: Richard A. Winschel and Deborah A. Kosmack (CONSOL Energy Inc.)
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Abstract:

CONSOL Energy Inc., in conjunction with MEGTEC Systems, Inc., the U.S. Department of Energy's National Energy Technology Laboratory, and the U.S. Environmental Protection Agency, designed, built, and operated a commercial-size thermal flow-reversal reactor (known as the VOCSIDIZER, made by MEGTEC Systems) to evaluate its suitability to oxidize coal mine ventilation air methane (VAM). Coal mining, and particularly coal mine ventilation air, is a major source of anthropogenic methane emissions, an important greenhouse gas. Oxidation of methane to carbon dioxide and water reduces its global warming potential by about 87%. The concentration of methane in the ventilation air is very low (<1.5%) and flow rates can sometimes exceed 300,000 scfm for a single mine fan, so oxidation of this methane is difficult. This test program was conducted with simulated coal mine VAM in advance of deploying the technology on active coal mine ventilation fans. The demonstration project team installed and operated a 30,000 scfm VOCSIDIZER oxidation system on an inactive coal mine in West Liberty, WV. The performance of the unit was monitored and evaluated during months of unmanned operation at mostly constant conditions, and during various parametric performance tests. An economic evaluation of the technology as applied to both methane oxidation and to energy recovery at a coal mine will be performed in the near future.

The testing program demonstrated that the VOCSIDIZER can oxidize $\geq 95\%$ of the low and variable concentration of methane in the simulated ventilation air while emitting only very low levels of the criteria pollutants, over the range of its design specification limits. The months of testing provided substantial operating and maintenance experience.

The performance of the system, its operating and maintenance history, and implications for deployment of the technology on mine fans will be discussed in this presentation.

This technology provides new opportunities to reduce greenhouse gas emissions by the reduction of methane emissions from coal mine ventilation air. A commercial-size installation (180,000 scfm) on a single mine ventilation bleeder fan could reduce methane emissions by 14,200 to 23,700 short ton per year (the equivalent of 236,000 to 394,000 metric tonne carbon dioxide).

Given its relative proximity to the Pacific Rim markets and lack of existing port capacity on the Russian east coast, the project requires a new port. This car thawing, coal storage and ship loading facility will be constructed at Muchka Bay near the Port of Vanino. This new port is located near SUEK's new 12 Mtpy capacity port scheduled to be operational in late 2008