

Inside the APC Industry

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GHG Control Technologies: What's the Status?

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What Greenhouse Gas Emission Reduction Technologies are on the Horizon-The current dialogue over climate change and our nations' desire for clean, affordable, and reliable sources of power has compelled air pollution control vendors to respond by developing and bringing to bear in the market place technologies to reduce greenhouse gas emissions for both the industrial and power sectors. These technologies are in various stages of deployment and offer energy efficiency improvements and greenhouse gas emission reductions opportunities for both new and existing coal-fired power plants. ICAC and its member companies are at the forefront of the debate on what can be done. For more information on the technology options including control and measurement please visit ICAC's recently launched Greenhouse Gas Control Technologies page at: <http://www.icac.com/i4a/pages/index.cfm?pageid=3450>

Mercury Control Bookings: Rolling In

ICAC Tracking Commercial Mercury Control System Bookings – States are diligently pressing forward with state specific rules and Clean Air Mercury Rule implementation plans to control mercury emissions from coal-fired power plants. Due to these rules, the Institute of Clean Air Companies (ICAC) continues to update its list of commercial mercury control bookings from coal-fired power plants. The listing includes over 60 commercial sales with start up dates from 2007 to 2012. The installation list includes, plant size, regional location, coal type, prime OEM contractor and /or subcontractor, existing air pollution control equipment configuration, mercury control technology, new or retrofit plant, and regulatory driver information. The current list is available on ICAC's website, please visit www.icac.com.

Please See Mercury Installations: Rolling in: on page 3

New ICAC Data Acquisition and Handling Specification Available

Guidelines for Specification and Selection of Data Acquisition and Handling Systems for Continuous Emissions Monitoring Applications -The Institute of Clean Air Companies (ICAC), the national association of stationary source air pollution control and monitoring technology companies, recently released guidance on how to purchase and compare bids for data acquisition and handling system (DAHS) for continuous emissions monitoring applications.

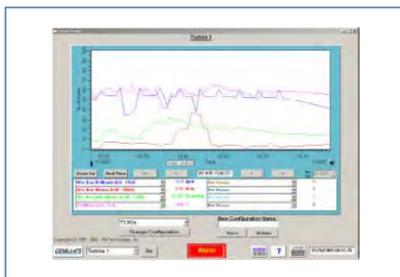
The ICAC guidance, titled "Guidelines for Specification and Selection of Data Acquisition and Handling Systems for Continuous Emissions Monitoring Applications" is a publication that provides information on preparing a specification for the solicitation and evaluation of bids for data acquisition and handling systems from manufacturers. Data acquisition and handling systems are components of emission monitoring systems (CEMS) that are used to collect measured emissions concentrations, flue gas flowrates, and other measured parameters to document or analyze stack flue gases from stationary sources.

David Foerter, ICAC's Executive Director, noted that, "continuous emissions monitoring system operators or plant engineers spend a significant amount of time working with data acquisition and handling systems, maybe more than any other CEMS subsystems. Therefore, the proper selection of DAHS cannot be overemphasized as the DAHS is responsible for reviewing emissions data, checking calibration values, responding to excess emissions problems and generating compliance reports. Sources will find ICAC's guidance useful as a reference in the selection and evaluation of emissions monitoring equipment for their specific application."

This document provides guidelines for specifying and collecting information necessary to solicit bids from manufacturers and suppliers of these systems for use in continuous emissions monitoring applications. It includes example bid specifications, request for quote forms, a bid evaluation form, and supporting discussion.

Contact ICAC at 202-457-0911 or icacinfo@icac.com to request a copy of the Guidelines for Specification and Selection of Data Acquisition and Handling Systems for Continuous Emissions Monitoring Applications, which is available at no charge to ICAC members and government officials and for \$20 to others.

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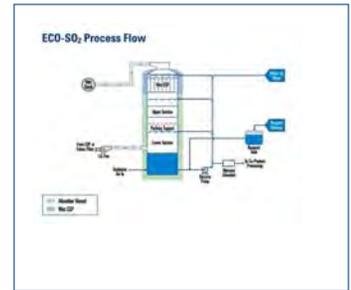


DAHS Trend Analysis

Members' Corner

Multi Pollutant Control: ECO-SO₂

ECO-SO₂ Technology Slated for Use at AMP Ohio Proposed Plant- American Municipal Power-Ohio, Inc. (AMP-Ohio) has committed to the use of Powerspan's emission control technology on the proposed American Municipal Power Generating Station (AMPGS) Project and has executed a memorandum of understanding with The Andersons, Inc. to process and market the ammonium sulfate fertilizer by-product of the process. The project is under development near the Ohio River in southern Meigs County, Ohio. The proposed 1,000 megawatt (MW) facility will utilize pulverized coal and incorporate the best of the latest generation of available and proven emissions control technology to ensure that it meets or exceeds all environmental regulations and emissions limitation requirements. The pollution control technology developed by Powerspan achieves outlet emissions levels at or below those of best available control technologies and produces a fertilizer co-product versus a synthetic gypsum produced from traditional limestone scrubbing technologies. The AMPGS plant will use the ECO-SO₂ technology to control sulfur dioxide emissions with co-benefits for control of mercury and particulate matter. In addition, the Powerspan system will be designed with features that allow for future expansion to make the plant "CO₂ capture ready," preparing the plant for the possibility of future CO₂ emission limits.



ECO-SO₂ Flow Diagram

For more information about Powerspan, contact Stephanie Procopis, (603)570-3000 or via email sprocopis@powerspan.com

Mercury Installations: Rolling in: from page 1

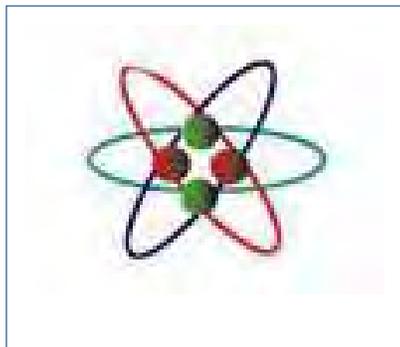
In conjunction with the list of commercial mercury equipment bookings ICAC's Mercury Control Division has also created a series of mercury control technology fact sheets. The fact sheets offer information on a number of different technology approaches that have been developed and tested for full scale applications including controls that specifically target mercury as well as those that enhance the removal of mercury from currently installed controls (FGD, SCR, etc). Some of the categories of mercury controls that have been developed include sorbent injection, catalytic oxidation, and multi-pollutant controls. The fact sheets are available at www.icac.com.

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Regulatory Implications of ASTM-D6866

A standardized tool for distinguishing recycled CO₂ from greenhouse CO₂ - Recycled CO₂, otherwise known as carbon-neutral CO₂, is carbon dioxide which was recently removed from the air through plant respiration, then returned to the air via recent combustion of plant derivatives. Common fuels which produce recycled CO₂ are biomass, ethanol, biodiesel, and municipal solid waste. Recycled CO₂ may be separated and subtracted from greenhouse gas inventories and in certain regulatory structures have a value in off-set markets. Until recently, calculation of recycled carbon within CO₂ emissions was accounted for by gross estimation of combustion fuel source. Both industry and regulators are now recognizing ASTM-D6866 as a more reliable, direct measure of recycled CO₂. ASTM-D6866 measures a natural tracer, the carbon-14 isotope (C₁₄). The carbon-14 isotope is abundantly present in all plant material and is absent in all fossil fuels. A relative amount of C₁₄ is compared in an unknown sample to that of a modern reference standard. The ratio of recycled CO₂ will be 100 percent and the ratio in fossil materials will be zero. By measuring the presence of C₁₄ in air and in emissions from combustion activities directly, recycled CO₂ vs. greenhouse gas CO₂ is readily apparent. Emissions comprised of a mixture of recycled CO₂ and fossil CO₂ can be identified with a single number result (e.g. 65 % recycled CO₂ and 35% greenhouse gas CO₂). In the current environment, this method of analysis provides regulators, industry, and financial markets with an accurate and precise measure for regulating and calculating off-set CO₂ emissions.

ASTM-D6866 was developed out of the U.S. Department of Agriculture's (USDA) BioPreferred program. Executive Order 13101 (Greening the Government through Waste Prevention, Recycling, and Federal Acquisition) lead USDA to implement a program whereby manufacturers of products containing carbon derived from renewable resources were preferred. The 2002 Farm Bill then elevated the requirement to give preferred Federal procurement status to manufacturers using the greatest amount of renewable carbon in their products. Manufacturers then made claims of renewable content in their products and USDA needed a means to validate those claims. Since the basic difference between renewable based products and petroleum based products is the recent-or-ancient origin of the carbon, the radiocarbon dating industry was able to provide the USDA with a solution. ASTM-D6866 is a standardized method of identifying the C₁₄ isotope and is suitable for applications within the regulatory environment. Laboratory analysis provides a single percentage value of renewable carbon content within any solid, liquid or gas and is now cited in 7CFR 2902 as a required measurement for participation in the USDA's BioPreferred program.



Carbon 14 isotope

“this method of analysis provides regulators, industry, and financial markets with an accurate and precise measure for regulating and calculating off-set CO₂ emissions.”

Advancements in Mercury Control

Johnson Matthey Licenses DOE Patent to Remove Mercury and Arsenic from New IGCC Coal Power Plants -Johnson Matthey recently announced that they had been granted an exclusive license by the U.S. Department of Energy's National Energy Technology Laboratory (NETL) for its high temperature sorbent technology and patent to remove mercury, arsenic and potentially selenium,

Regulatory Implications of ASTM-D6866 from page 4

The method is presently being considered by both regulatory and industry stakeholders, both domestically and abroad. ASTM- D6866 is in use in the US, United Kingdom (UK), European Union (EU), and Japan. In particular the waste-to-energy (WTE) industry has found ASTM-D6866 an effective tool to quantify their carbon footprint. See chart 1, for a list of other industries evaluating the use of ASTM-D6866.

Presently, there are 88 WTE plants in operation in the US. These plants produce 2.8 GW of electricity and represent an initial capital investment of \$18 billion dollars. The industry foresees ASTM-D6866 as a means to quantify their emissions for collection of full or partial Renewable Energy Certificates (RECs). Published results from WTE emissions show 60-75 percent of the CO₂ emissions from WTE stacks is recycled CO₂. The United Kingdom (UK) is reviewing ASTM-D6866 measurements as a means to allow UK WTE plants to qualify for Renewable Obligation Certificates (ROCs). Biomass combustors that provide "accurate and reliable" data relating their electricity output from their biomass carbon combustion can collect as much as \$80.00 per MWh from the Office of General Electricity Management (OFGEM). Presently, WTE plants in the UK do not qualify for the incentive program. Stakeholders are highly optimistic that OFGEMs review will lead to revised legislation allowing WTE plants to participate

cadmium and phosphorous from syngas produced by coal gasification. This license was a natural extension of a two-year Cooperative Research and Development Agreement (CRADA) between Johnson Matthey and NETL to evaluate and optimize palladium (Pd) sorbent material properties and performance. Unlike conventional sorbents such as activated carbon, which operate at ambient temperature, high temperature Pd sorbents remove mercury and arsenic at temperatures above 500°F, resulting in a major improvement in overall energy efficiency of the power combustion process.

About Johnson Matthey Stationary Source Emissions Control-Johnson Matthey SSEC is well known for its total systems approach to solving the customer's emissions problem. It is dedicated to the research, development and application of catalyst technology to improve quality of life by reducing air pollution. JM SSEC designs and supplies catalysts and engineers catalytic systems to control emissions of nitrogen oxides (NO_x), carbon monoxide (CO), hydrocarbons (HC), volatile organic compounds (VOC), hazardous air pollutants (HAPs) and particulate matter (PM).

Contact Information:

For more information about Johnson Matthey Stationary Source Emissions Control (SSEC), contact Wilson Chu, Marketing and New Business Manager, Johnson Matthey, 400 Lapp Road, Malvern, PA 19355, Tel: 484-320-2114, Fax: 484-320-2152, E-mail: chuw@jmsusa.com, Website: <http://www.jmssec.com>.

Regulatory Implications of ASTM-D6866 from page 5

in the incentive program.

Global economies are evolving towards greater and greater use of renewable resources as they respond to pressures for greater control of greenhouse gas emissions. Prominent incentives such as renewable certificates and carbon off-setting programs are catalyzing the use of more and more recycled carbon resources in efforts to gain energy independence; reduce dependences on foreign oil and to reduce greenhouse gas emissions. Recycled CO₂ is the by-product and endpoint in the lifecycle of these resources and, when quantified by ASTM-D6866, serves as a means to account for reduced greenhouse gas emissions.

Chart 1: Organizations Evaluating ASTM-D6866

Renewable Energy Association (REA) (UK)
All Party Climate Group (UK)
Voluntary Carbon Standards (VCS)
Electric Power Research Institute (EPRI)
Power Plants (WTE, Co-Firing, dedicated Biomass)
Portland Cement Industry
Biogenic Methane Industry
Verification Organizations
Trading Brokers: Clean Development Mechanism (CDM)
Original Equipment Manufacturers

Air Pollution Control Industry in the News: Members Press Releases

(8/27/07) ADA-ES Awarded a Contract for a Mercury Control System for a New Power Plant
<http://www.adaes.com/>

(8/14/07) CRI Catalysts Roll Out New Catalyst at GEOTEM Conference
<http://www.cricatalyst.com/pdfs/eocatlyst.pdf>

(8/9/07) B&W awarded replacement steam generators contract by Bruce Power.
<http://www.babcock.com/pgg/pr/prreleases.html>

(8/8/07) BP and Powerspan Collaborate to Demonstrate and Commercialize CO₂ Capture Technology for Power Plants
http://www.powerspan.com/news/release_31.pdf

(8/8/07) Tekran's Mercury Today Newsletter, Volume 1, Issue 6 - Special Summer Edition
http://www.tekran.com/uploadedFiles/contact/Tekran_NL6_080807.pdf

(8/7/07) Shaw Finalizes Contract for \$1.1 Billion Scrubber Projects at Three Mirant Power Plants
<http://ir.shawgrp.com/phoenix.zhtml?c=61066&p=irol-newsArticle&ID=1037586&highlight=>

(8/5/07) Johnson Matthey Licenses DOE Patent to Remove Mercury and Arsenic from New IGCC Coal Power Plants
<http://ect.jmcatalysts.com/profile-news-story.php?id=57>

Air Pollution Control in the News: from page 6

(7/25/07) Black & Veatch's Largest CT-121 Scrubber Project in North America Achieves Operational Success for DP&L.

http://www.bv.com/wcm/press_release/07252007_9767.aspx

(7/23/07) Shaw Awarded Engineering, Procurement and Construction Management Contract by PSEG Fossil for Air Emissions Controls Systems at the Hudson Generating Station

<http://ir.shawgrp.com/phoenix.zhtml?c=61066&p=irol-newsArticle&ID=1029203&highlight=>

(7/18/07) Shaw Awarded Engineering, Procurement and Construction Contract for New 800 MW Supercritical Power Plant and Flue Gas Desulfurization System by Duke Energy)

<http://ir.shawgrp.com/phoenix.zhtml?c=61066&p=irol-newsArticle&ID=1027410&highlight=>

(6/29/07) Prairie State Generating LLC Awards Wheelabrator a Contract for a Multi-Emission Control System

http://www.wapc.com/news_PrairieState.htm

(6/18/07) Norit Americas Awarded Twelve Mercury Control Systems <http://www.norit-americas.com/6.0.cfm?id=28>

(6/12/07) Washington Group International to Provide Design, Engineering Services for First Near-Zero Emissions, Coal-Fueled Power Plant

<http://investor.wgint.com/phoenix.zhtml?c=70435&p=irol-newsroomarticle&ID=1014367&highlight=>

(6/4/07) AMP-Ohio Finalizes Plans for Powerspan Emission Control Technology at Proposed Plant

http://www.powerspan.com/news/release_30.pdf

About ICAC

The Institute of Clean Air Companies (ICAC) is the national association of companies that supply air pollution control and monitoring systems, equipment, and services for stationary sources.

ICAC has promoted the air pollution control industry and encouraged improvement of engineering and technical standards since 1960. Our members are leading manufacturers of equipment to monitor and control emissions of particulate, VOC, SO₂, NO_x, air toxics, and greenhouse gases.

For more information about ICAC and other useful links see below:

ICAC Technical Briefings Program:

<http://www.icac.com/i4a/pages/Index.cfm?pageid=3281#techbriefings>

EPA Advance Coal Technologies Workgroup:

<http://www.epa.gov/air/caaac/coaltech.html>

National Environmental Technologies Laboratories (NETL) Carbon Capture and Sequations FAQ Portal:

http://www.netl.doe.gov/technologies/carbon_seq/faqs.html



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