OHIO AIR QUALITY DEVELOPMENT AUTHORITY
CLEAN AIR & CLEAN ENERGY ARE GOOD BUSINESS

Air Focus

Issue One, 2008

News you can use from the Ohio Air Quality Development Authority

OAQDA Approves $1.98 Million for University-based Clean Coal Research Projects

As part of a shift in the funding basis for university-based clean coal research projects, the Ohio Air Quality Development Authority (OAQDA) recently approved $1,987,909 in Ohio Coal Development Office (OCDO) funds for 16 research projects at seven Ohio universities. Nine projects were funded for the 2007-2008 academic year, with the other seven funded for each of the next two academic years. Beginning in 2008, OCDO will award all grants on a two-year funding basis. The total approved this year includes $148,750 for Ohio University to administer the program.

OCDO funds represent 75 percent of the cost for each research project. The remaining 25 percent, or $672,483, will be borne by the seven universities, bringing total grant funding to $2,660,392. Six grants were awarded to The Ohio State University, three to the University of Cincinnati, and one each to the University of Akron, Case Western Reserve University, the University of Dayton, Ohio University, and the University of Toledo. Additionally, The Ohio State University is partnering with the University of Akron and the University of Cincinnati, respectively, on two other projects.

"The Ohio Coal Research Consortium (OCRC), which evaluated the proposals, felt that a shift to two-year funding would establish a more definite funding basis for our principal faculty researchers, and also enable them to better map-out their projects and recruit the best students to assist them," said Mark R. Shanahan, OAQDA executive director.

Shanahan said that other changes in the grants program included transfer of programmatic review responsibility from Ohio University to OCDO staff, and provision of additional mentoring support for university researchers by private-sector Consortium Review Committee members.

"The projects approved this year once again demonstrate the world-class research in clean coal technology taking place at our universities. They also reflect our unwavering commitment to develop energy efficient, environmentally sound ways to use Ohio's and the world's abundant supplies of coal," Shanahan said.

The 16 OCDO-approved grants are listed below according to category.

Mercury Capture Projects

• $80,000 to fund a one-year laboratory project at the University of Dayton to assess the role played by fly ash in determining the portion of flue gas

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OAQDA Approves Funding for Clean Air Projects at Six Ohio Power Plants

OAQDA recently authorized the issuance of up to $355.3 million in Air Quality Development Revenue Bonds to help finance the acquisition, construction, and installation of air quality facilities, including solid waste disposal facilities, at four power plants co-owned by Duke Energy, and two others owned by Ohio Power.

OAQDA financing of up to $165 million for Duke Energy will be used for its share of costs for facilities at the Miami Fort Electric

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AirWaves

The year that was – and will be

By Mark R. Shanahan, Executive Director, OAQDA

Mark Shanahan is the Executive Director of the Ohio Air Quality Development Authority.
Questions can be directed to him at 614-224-3383 or mark.shanahan@aqda.state.oh.us

Spring 2008 is here and brings with it some fresh and exciting opportunities for the Ohio Air Quality Development Authority. I would be remiss, however, if I did not address some of the highlights from 2007.

Early in that year, Governor Ted Strickland created the position of Governor's Energy Advisor. The Executive Order appointed OAQDA's Executive Director to the position and charged me with coordinating all state agencies' efforts to develop and implement a coordinated and comprehensive Ohio energy strategy.

One of our first challenges of 2007 was setting in motion a program to help state agencies meet the Governor's new guidelines for increased energy efficiency. We were also proud to assist in the creation of Governor Strickland's Energy, Jobs and Progress plan and related legislative initiative, which linked future economic development with energy reform, electricity security and advanced energy technologies.

OAQDA also maintained its long-standing commitment to supporting the development of those energy technologies. That commitment was reflected in the financial assistance provided by OAQDA for new ethanol plants to be built in Darke, Marion, and Wyandotte Counties. In addition, OAQDA provided nearly $2 million in funding for 16 clean-coal research projects at seven Ohio universities, as chronicled elsewhere in this issue of AirFocu$. We were also pleased to mark the drilling in Tuscarawas County of Ohio's first deep geologic test well – a project funded in part by OAQDA and aimed at dramatically increasing our understanding of the geologic structures that lie beneath our state.

As 2007 came to a close, the Authority was also wrapping up work on the first-ever strategic plan for our Ohio Coal Development Office (OCDO). You may recall that this process was set in motion as a result of an independent, third party review of the coal program commissioned by OAQDA in 2004. In our next newsletter, I will provide a fuller update of where we believe our new strategic plan will take the agency. Suffice it to say, we are enthusiastic about the prospects for a more focused and effective coal program in the years to come.

We also are hard at work preparing the Ohio Coal Development Agenda. This statutorily mandated, biannual document will provide an update on OCDO's specific activities and on the broader status of Ohio coal during that period.

Finally, we were very pleased that consensus was reached on the Governor's comprehensive energy reform legislation, Senate Bill 221. Approval of this landmark legislation by the Ohio General Assembly means that the state can now move forward to address electric service price regulation, establish alternate energy benchmarks for utilities, require carbon dioxide control planning, and achieve several other energy-related undertakings essential to Ohio's economic future.

I know I speak for all of us at the Ohio Air Quality Development Authority in saying that we are honored to be playing an even more substantive role in energy affairs during this period of dynamic change in our state.

Sincerely,

Mark R. Shanahan
Executive Director, OAQDA

Did You Know?

The average American consumer is responsible for the use of 3.8 tons of coal every year.

Source: Ohio Coal Association

OAQDA Approves Funding for Clean Air Projects at Six Ohio Power Plants

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Generating Station near the Village of North Bend (Hamilton County); the Killen Generating Station in Monroe Township (Adams County); the J. M. Stuart Generating Station located between Manchester (Adams County) and Aberdeen (Brown County); and the Conesville Generating Station near Conesville (Coshocton County). Financing in the amount of up to $25.3 million was also approved to refund a previously issued OAQDA bond.

In addition, OAQDA members also authorized up to $165 million in bonds to help finance air quality facilities at two Ohio Power plants – the Cardinal Generating Station, Unit 1, near Brilliant (Jefferson County); and the Muskingum River Generating Station, Unit 5, near Beverly (Washington County).

"We are very pleased that OAQDA, since its inception in 1970, continues to be a champion for improved air quality in Ohio. The new facilities financed by our members' actions this month will raise the bar for air quality in the communities where the plants are located," said Mark R. Shanahan, OAQDA executive director.

OAQDA Approves Funding for New Ethanol Plant in Darke County

OAQDA recently authorized the issuance of up to $55 million in Air Quality Development Revenue Bonds to help finance the acquisition, construction, installation, and equipping of ethanol production facilities to be built by The Andersons Marathon Ethanol, LLC (TAME). The funds also will be used for solid waste and sewage facilities for the plant.

The plant will have the capacity to produce 110 million gallons of ethanol per year. The plant will provide 200 to 300 construction jobs and 45 permanent jobs. Total investment in the new plant, including the OAQDA financing, will be $160 million.

"Given Governor Strickland's directive that alternative energy fuels must play a significant role in Ohio's energy future, this project is very good news for the state. In fact, this is just the latest in a growing number of ethanol and other alternative fuel facilities that OAQDA has been able to assist with tax-exempt financing," said Mark R. Shanahan, OAQDA executive director.

Energy Symposium Peeks into Future

Governor Ted Strickland's Energy Advisor, Mark Shanahan, provided the opening remarks for The Ohio State University's first-ever Symposium on Energy Systems Modeling.

This event brought together a distinguished group of U.S. experts to discuss the current state and future needs of this field, and in particular to explore the challenges of achieving resilience and sustainability in complex, interdependent systems. The event was co-sponsored by OSU's Data-Driven Decisions Laboratory and the Center for Resilience, with the support of Industrial and Systems Engineering.

Speakers included Susan Holte, Senior Technical Advisor, Energy Information Administration, and Allen Soyster, Director, NSF Engineering Education and Centers. OSU faculty from several departments presented their work on energy systems.

A full list of speakers and panelists, including slides, is at www.resilience.osu.edu/EnergySystems.pdf.

One common theme expressed during the day was that "all models are wrong (i.e., imperfect), but some models are useful." While accurate forecasting is unrealistic, it may be advisable to develop decision and policy models that accommodate uncertainty in data evolution. Future research should also pursue integration across a diverse portfolio of models to understand the social, economic, and environmental aspects of energy supply and demand.

Reprinted courtesy of the Center for Resilience at The Ohio State University.

OAQDA Wins International Website Award

The OAQDA Website recently won a Gold Award from the Association of Marketing & Communications Professionals (MarCom). MarCom Creative Awards is an international competition for marketing and communication professionals. Winners include media conglomerates and Fortune 50 companies.

From left:Mark Shanahan, Executive Director, OAQDA; Gayle Channing Tenenbaum, Chair, OAQDA; Carol Zimmerman, Vice President, Lesic & Camper Communications; and, Greg Krivicich, President, Marcy Design Group.

OAQDA Approves $1.98 Million for University-based Clean Coal Research Projects

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mercury that can be easily captured during coal combustion.

• $239,206 for two projects at the University of Cincinnati to test different adsorbents for their ability, not only to aid in the capture of mercury during combustion, but also to help reduce capture costs from a Department of Energy-estimated $30,000 per pound to as low as $1,000 per pound – a groundbreaking feat if successful. One project is funded for the next academic year, and the other for the next two.

Carbon Dioxide (CO2) Geologic Sequestration Projects

• $79,996 for a one-year project at Case Western Reserve University to study potential chemical reactions between CO2 and other chemical byproducts from combustion, and brine-rock from the Rose Run geologic formation in eastern Ohio. Data gleaned from the project will help guide the state's preparations for anticipated federal regulation of CO2 emissions.

• $159,998 for a two-year Ohio University project to evaluate how clean a CO2 gas stream must be for compression and transport from a power plant to an injection well. The university's Institute for Corrosion and Multiphase Technology is nationally renowned for its work on corrosion in gas transmission pipelines.

Clean coal Technologies of the Future

• $80,000 for a groundbreaking one-year University of Akron project that will attempt to determine design factors which could facilitate the building of a direct-coal fuel cell. Although considered by OCRC to be a high-risk study in terms of potential commercial development, the project nevertheless could transform the world of power generation with respect to the direct conversion of coal energy into electricity.

• $79,991 for a one-year chemical-looping project at The Ohio State University that could dramatically change the way coal is converted to power or chemicals. The project's chief goal is to construct a scaled-up chemical looping reactor that closely simulates a commercial reactor. Chemical looping is a technique that uses dual reactors to create pure streams of sequestration-ready CO2 and hydrogen. The project is viewed as one of OCRC's most important undertakings.

• $79,991 for a second, one-year chemical-looping project at The Ohio State University that will examine the reaction of syn-gas with iron oxide particles as it pertains to production of a hydrogen stream which is suitable as a feedstock for a Fischer-Tropsch reactor. Such reactors are used to create liquid fuels from coal.

• $160,000 for a two-year joint project between The Ohio State University and the University of Akron that, in its first year, will evaluate the use of iron particles in the first reactor of the chemical-looping combustor as a fuel for the direct-coal fuel cell. In its second year, the project will consider optimization of the size and composition of the supported iron for an integrated system.

• $159,986 for a two-year project at The Ohio State University to use the chemical-looping process with calcium oxide and calcium carbonate to convert a mixture of syn-gas and off-gas from a Fischer Tropsch reactor to a gas stream that is free of hydrogen sulfide and CO2. (Syn-gas is a mixture of carbon monoxide, CO2, and hydrogen generated during coal gasification.) The potential to remove sulfur to the parts-per-billion level , and to eliminate WGS catalysts in one reactor, is a major breakthrough concept. This project has also received additional funding from the Department of Energy. It is one of the most promising OCRC projects.

• $79,996 for a one-year project at The Ohio State University to develop and test different catalysts that can resist poisoning of carbon deposits and sulfur during the water-gas-shift (WGS) conversion of syn-gas into hydrogen.

Coal and Syn-gas to Hydrogen Projects

• $160,000 for a two-year University of Cincinnati project to demonstrate a method for removing hydrogen from a water-gas-shift reactor, via a defect-free inorganic membrane, as it is produced, rather than allowing amounts of the chemical to accumulate during conversion of coal to hydrogen. The goal is to better enable the complete conversion of carbon monoxide to CO2, to create a sequestration-ready stream of CO2, and to improve reactor efficiency.

• $160,000 for a two-year University of Toledo project that will use organic, rather than inorganic, membranes to produce relatively pure amounts of hydrogen in the WGS process for use in power generation or chemical production. This concept differs from similar, past OCRC projects in that this class of membranes can be commercially manufactured without defects.

• $79,996 for a one-year project at The Ohio State University to develop chemical catalysts that can help facilitate the production of hydrogen from coal syn-gas. $79,998 for a one-year project at The Ohio State University to develop catalysts that can remove carbon monoxide from hydrogen produced by the WGS method for use in PEM fuel cells. Importantly, such catalysts show promising mine-safety application as a component in gas masks worn by coal miners that can remove carbon monoxide from the air during mine fires.

• $160,000 for a two-year joint project between The Ohio State University and the University of Cincinnati that will attempt to demonstrate an improved total WGS reaction system by bringing an inorganic membrane, plus the catalysts, together as an enhanced reactor.

OAQDA Bond to Help Support Energy Conservation Project at State Facility

$900,000 in funds directed at Columbus facility serving people with disabilities

The Ohio Air Quality Development Authority (OAQDA) recently authorized the issuance of an Air Quality Development Revenue Bond, not to exceed $900,000, to finance an energy conservation and efficiency project at the Columbus Developmental Center (CDC).

Operated by the Ohio Department of Mental Retardation and Developmental Disabilities, CDC is located just west of downtown Columbus. Occupying 14 buildings with approximately 325,000 square feet of floor space, CDC operates as a residential care and training facility for 153 people diagnosed with severe and profound mental retardation. It also provides offices and meeting space for the Department director and staff.

Major components of the proposed air quality project, to be conducted by the Limbach Company, include installation of a Direct Digital Control system throughout the facility, lighting renovation, plumbing retrofits, and implementation of night setbacks through an energy management system. The project, which will be coordinated by the Ohio Department of Administrative Services, will cut CDC's current $502,295 annual energy bill by an estimated $135,938, or 27 percent. The savings will result in reducing annual releases of contaminants into the air, including carbon dioxide (494 metric tons), sulfur dioxide (five metric tons), and nitrogen oxides (two metric tons).

"In addition to assisting Ohio businesses, OAQDA aids public facilities such as CDC, in their efforts to improve air quality in Ohio. As is the case with this project, OAQDA financing also can help recipients improve the energy efficiency of their operations. These efforts are very much in line with Governor Strickland's commitment to establish a new, forward-thinking energy strategy for the state," said Mark R. Shanahan, OAQDA executive director.

OAQDA to Issue Bond to Help Reduce Air Emissions at Cadiz Auto Shop

Funding for the acquisition of new paint spray booths for Finney Automotive in Cadiz was approved by OAQDA at its June meeting. The Authority approved the issuance of an Air Quality Development Revenue Bond, not to exceed $530,000, to assist the company in acquiring the paint equipment, along with other necessary facilities to help in reducing air emissions and improving energy efficiency.

OAQDA also approved a small business assistance grant from its Clean Air Resource Center to help pay closing costs associated with the eligible portion of the financed amount. Finney Automotive will be located on Industrial Park Rd. in Cadiz.

"We are pleased that our bonding capacity enables OAQDA to assist both small and large Ohio companies in their efforts to improve air quality in Ohio, while also improving their internal operations. The biggest beneficiaries of these undertakings, of course, are the citizens of Ohio," said Mark R. Shanahan, OAQDA executive director.

Shanahan said OAQDA financing assists a broad variety of Ohio businesses in their efforts to operate in a more environmentally friendly manner. Those have included auto body shops, dry cleaning stores, printing companies, motor vehicle and air conditioning service repair, and a host of others.

Painesville Auto Shop to Reduce Emissions with Support from OAQDA Bond

The Ohio Air Quality Development Authority (OAQDA) approved the issuance of an Air Quality Development Revenue Bond, not to exceed $375,000, to assist K & S Auto Body in acquiring a new paint booth, along with other facilities and equipment to help the Painesville company in reducing air emissions and improving energy efficiency.

OAQDA also approved a small business assistance grant from its Clean Air Resource Center to help pay closing costs associated with the eligible portion of the financed amount. K & S Auto Body is located at 1450 N. Ridge Rd. in Painesville.

"OAQDA assists both small and large Ohio companies through our unique bonding capacity in their efforts to improve internal operations," Mark R. Shanahan, executive director of OAQDA, said.

He added that a variety of Ohio businesses have benefited from OAQDA financing, including printing companies, dry cleaners, motor vehicle repair facilities and air conditioning services repair businesses as well as auto body shops, to name a few.

AirFocus

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Executive Director
Mark R. Shanahan

General Counsel
Darrell A. Fields, Esq.

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Ohio Air Quality Development Authority
Clean Air Resource Center
Ohio Coal Development Office
1718 LeVeque Tower
50 West Broad Street
Columbus, Ohio 43215

voice: 614-224-3383
Fax: 614-752-9188
mark.shanahan@aqda.state.oh.us
www.ohioairquality.org

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About the Ohio Air Quality Development Authority

The Ohio Air Quality Development Authority (OAQDA) is a non-regulatory government agency created in 1970 to help Ohio business comply with clean air regulations. OAQDA provides financial help to hundreds of large and small businesses in Ohio, and has awarded more than $4 billion in bonds to finance air quality projects. Its small business program, the Clean Air Resource Center, also offers one-on-one technical assistance, confidential compliance assessment and grants to help defray the costs of financing for small businesses. With the addition of the Ohio Coal Development Office in 2003, OAQDA also oversees the State of Ohioís coal research, development and technology deployment efforts, one of the nationís largest state programs of its type. For additional information about OAQDA and its services, visit www.ohioairquality.org.

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