



Left to right: EERC Associate Director Tom Erickson, U.S. Senator Kent Conrad, EERC Director Gerry Groenewold, and University of North Dakota President Robert Kelley tour the EERC facilities.

Senator Conrad: EERC is research “crown jewel”

U.S. Senator Kent Conrad (D-ND) visited the Energy & Environmental Research Center (EERC) on April 19 to tour the facilities and discuss critical energy security projects with Director Gerald Groenewold and research staff. The tour was followed by a press conference, where Senator Conrad commented that he and Senator Saxby Chambliss (R-GA) have formed a bipartisan group of 14 senators, seven Democrats and seven Republicans, to “bolster” the New Energy Reform Act of 2008 with comprehensive legislation targeted at reshaping America’s energy future and reducing its dependence on foreign oil. That 2008 legislation was achieved by another bipartisan group of senators led by Senators Conrad and Chambliss, who also lead the Senate’s “Gang of Six,” formed to develop a comprehensive bipartisan plan to cut the national deficit.

“This is a matter of national security,” Senator Conrad said of his energy policy initiative. “This is a matter not only of our military security, this is a matter of our economic security.”

After the Senate’s Easter recess, Senator Conrad said he will introduce energy legislation that is designed to be a template for the group to further develop. He said he was “waiting for additional feedback from North Dakota to finalize some of the details” of that legislation, which will include several initiatives that could be influenced by the EERC’s ongoing “world-class research” into the next generation of energy production.

“Frankly, that’s one of the reasons I’m here today, to gather additional ideas and to seek the help of the EERC in fashioning this legislative offering. This bill will invest in clean sources of electricity, including clean coal, following up on the breakthrough work being done right here,” Senator Conrad said. He added that the legislation would also seek to develop more advanced vehicles and promote alternative fuels.

“I was really excited to see what you’re doing with respect to hydrogen here” because two of the biggest roadblocks

have been storage and infrastructure, said Senator Conrad, who went on to say that the EERC had proved that the United States would not have to spend “hundreds of billions of dollars to replicate the infrastructure that’s used to deliver gasoline and diesel fuel all across America.” Instead, hydrogen on-demand stations developed at the EERC can be added onto existing gas stations all across America. “Because the EERC demonstrated there is a way to avoid the storage problem, that absolutely transforms the equation. So praise to all of you for what you have done,” he added.

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Another goal, Conrad said, is to increase domestic oil and gas production to offset some of the \$750 million/day spent on foreign oil. Conrad said the Bakken Formation in western North Dakota is “in many ways, America’s ace in the hole. We’ve got hundreds of billions of barrels of oil in North Dakota, Montana, and southern Canada.” North Dakota has more than tripled its oil production since 2007, he said, and could increase that number even more by using EERC research to increase extraction of the oil trapped underground from “2% to 3%, up to 50%.”

“Now, that’s going to take investment, that’s going to take additional research, but all of those things are possible. This provides us with an opportunity for truly transformational change in our energy position going forward,” said Senator Conrad

Senator Conrad thanked Groenewold for his “leadership and vision that are making a profound difference, not only in this community and this state, but in this country and, I believe, around the world.” He added, “I have long believed that the EERC is one of the

crown jewels of the United States’ research effort.”

“Senator Conrad wanted to talk to us regarding his new bipartisan national energy policy legislation. He had an interchange of ideas with researchers here and was able to see firsthand some of our most recent work,” said Groenewold. “His visit was an honor to everyone here and a recognition of the important work done at the EERC.”

—Sandy Van Eck



Dorgan finds resources at EERC

Former U.S. Senator Byron Dorgan visited the EERC in March to discuss current EERC energy research initiatives with Director Gerald Groenewold and EERC researchers. He unveiled his new role as Cochair of the new Bipartisan Policy Center (BPC) Energy Project, which will focus on key national energy policy issues, including energy security, supply, reliability, cost, and sustainability.

“Senator Dorgan came here to brief us on what he’s doing,” said Groenewold. “We reviewed our resources and current projects and how we can help him and his colleagues. We lead the world in a number of energy topics, so everything we do could feed into the policy center in one way or another.”

Senators Dorgan (D-ND) and Trent Lott (R-MS) will cochair the BPC Energy Project, which launched April 12.

General Jim Jones (retired), former National Security Advisor to President Obama, will serve as National Security Chair, and Oil Spill Commission Cochair Mr. William K. Reilly, a former U.S. Environmental Protection Agency Administrator under President George H.W. Bush, will serve as Energy and Environment Chair.

The group released an *Open Letter to the American People and America’s Leaders: A New Era for U.S. Energy Security*, which noted that “new energy challenges” faced by the United States after “recent events in the Middle East, North Africa, Japan, and the Gulf of Mexico” will “demand a fundamental reassessment of America’s energy policy goals, decision-making structures, and policies—a reevaluation that places energy security at the very center of energy policy.”

Dorgan and Lott will meet with

government, industry, and other leaders over the coming weeks to develop a detailed policy agenda focused on near-term legislative opportunities and long-term policy impacts in the areas of domestic oil and natural gas production, an examination of energy subsidies, clean energy financing, power sector emissions and reliability, and efforts to reduce U.S. oil intensity. The Project will issue periodic reports on key issues.

“I was very honored that he wanted to come here,” said Groenewold. “He’s extremely knowledgeable about energy and supportive of the work we do here, so his decision not to run for the Senate again is not the end of our relationship by any means.”

The EERC benefited from Senator Dorgan’s championship of and interest in energy throughout his years in government. Over a 6-year period, he directed \$16 million to the EERC’s National Center for Hydrogen Technology® (NCHT®), an amount that was leveraged to over \$65 million with investment from corporate partners.

BPC is a “think tank” established in 2007 by a bipartisan group of former Senate Majority Leaders to develop and promote solutions to problems such as health care, energy, national and homeland security, transportation, and economic policy.

—Sandy Van Eck



Associate Director John Harju, Director Gerry Groenewold, and Associate Director Deb Haley look on as Associate Director Tom Erickson (far right) explains the equipment and projects in the NCHT building to NETL Deputy Director Scott Klara and NETL Director Anthony Cugini (yellow helmets, left to right).

NETL director and deputy director visit EERC

Dr. Anthony Cugini, Director, and Mr. Scott Klara, Deputy Director, of the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) visited the EERC at the end of March to tour the facilities, see the EERC’s projects and capabilities, and meet with Director Gerry Groenewold and the Associate Directors to discuss ongoing programs and the long-term partnership between the EERC and NETL. This was the first visit for Cugini, who was named director of the national laboratory in January 2010.

“Dr. Cugini has taken over a very complex and nationally important organization—NETL—at a very difficult time when they don’t know what their budgets will be,” said Groenewold. “They came here, first of all, because Cugini had never seen the place. He wanted to see what kind of strategic partnerships we have, what can be expanded, and how we can work together. He wanted to get a sense of our culture and how we think.”

NETL is a national laboratory operated by DOE’s Office of Fossil Energy, with 1200 federal and contractor employees

at five sites: Pittsburgh, Pennsylvania; Morgantown, West Virginia; Houston, Texas; Albany, Oregon; and Fairbanks, Alaska. NETL supports DOE’s mission to advance the national, economic, and energy security of the United States by implementing a broad spectrum of energy and environmental research and development programs both at its laboratories and off-site through partnerships, cooperative research and development agreements, financial assistance, and contractual arrangements with universities and the private sector.

Cugini has been with NETL since 1987, where he most recently oversaw its Office of Research and Development. Cugini first worked as a research chemical engineer for NETL’s predecessor, DOE’s Pittsburgh Energy Technology Center, from 1987 to 1999. He then served as division director of the Fuels and Process Chemistry Division and went on to create and direct the lab’s Computational and Basic Sciences Focus Area. He has a Ph.D. in chemical engineering.

Since 1983, the EERC and DOE NETL have enjoyed a long and productive partnership through the Fossil

Energy Cooperative Agreement. The Agreement has two basic components, the Basic Research Program to generate fundamentally new insights for technology development and the Joint Venture Program, which supports technology development toward commercialization, requiring at least 65% cash cost share from nonfederal partners.

“The relationship with NETL is at the core of most of our efforts—our mercury programs, our hydrogen work, the huge CO₂ sequestration projects through the Plains CO₂ Reduction (PCOR) Partnership Program, and our oil and gas projects. Even our biomass programs started with NETL. Name the topic and, if it’s fossil energy, it’s in there,” said Groenewold. “We have so many corporate partners, and we bring those partnerships to the Joint Venture Program, which runs through NETL. That’s a very valuable resource for NETL to have out here, and vice versa. NETL is valuable to us. It is our largest client, and it has been for decades.”

—Sandy Van Eck

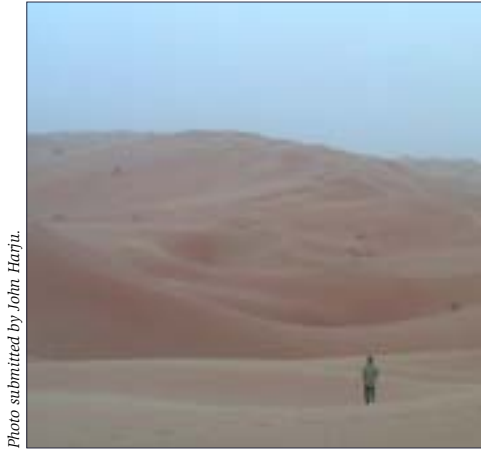


Photo submitted by John Harju.

Saudi Arabia: Location for carbon sequestration meeting

John Harju, Associate Director for Research, and Ed Steadman, Deputy Associate Director for Research and former PCOR Partnership Program Manager, were recently invited to the Carbon Sequestration Leadership Forum (CSLF) Projects Interactive Workshop held in Al Khobar, Saudi Arabia.

“We were contacted by the Secretariat of the CSLF and asked to participate because two of our existing PCOR Partnership demonstration projects are CSLF-recognized projects: the Zama acid gas enhanced oil recovery, CO₂ sequestration, and monitoring project at Apache Canada Ltd.’s Zama oil field in northwestern Alberta and the Fort Nelson carbon capture and storage project with Spectra Energy in northeastern British Columbia,” said Harju. “DOE’s Regional Carbon Sequestration Partnership (RCSP) Program as a whole is also recognized as a project by the CSLF, but we were invited as key project leads on these two major North American carbon capture and storage-related efforts that are specifically recognized.”

CSLF is an international climate change mitigation initiative whose

mission is to facilitate the cost-effective development of techniques for capture and safe long-term storage of CO₂, while making those techniques available to other countries. The European Commission and 24 countries, including the United States and Saudi Arabia, are members of CSLF, which was established in 2003 and endorsed by the G-8 Summit in 2005. More than 130 representatives from 17 countries participated in the workshop, including representatives from DOE and the IEA (International Energy Agency) Greenhouse Gas R&D Programme. The RCSP’s Southeast Regional Carbon Sequestration Partnership (SECARB) was also represented at the workshop.

“The meeting turned out to be a great opportunity to exchange experiences and lessons learned with many of the world’s leading experts in carbon capture and storage,” Steadman remarked.

Saudi Aramco, the national oil company of Saudi Arabia and the largest oil company in the world, funded Harju and Steadman’s trip, and they were hosted by Ali Al-Meshari, Supervisor of the QTIF/ABSF Reservoir Management Unit of Saudi Aramco.

“Very impressive, distinguished person to deal with—a great host. Everything was just right. There were lots of moving parts with this trip, but he facilitated getting our visas, and no matter what hiccup came up, he was that person you could always talk to who could instantly make things happen. Our hosts were fabulous and made it a very pleasant experience to be so far from home,” said Harju.

Harju and Steadman’s one-way flight totaled over 14 hours (Minneapolis to Amsterdam and then to the island country of Bahrain, where they were driven by car across the long causeway to Saudi Arabia.) Most days were taken up with the workshop and networking, but one evening reception involved dinner and traditional song and dance at a palace along the Arabian Gulf that belongs to a member of the Saudi royal family. One day the group was

flown by private jet across the country to Saudi Aramco’s Shaybah oil field in the Empty Quarter.

“It’s basically uninhabited there—just a few oil wells and a lot of sand dunes several hundred feet tall,” said Harju. “Shaybah is a single oil field currently producing 750,000 barrels of oil a day of Saudi light, all coming from only 250 wells. As a point of reference, the entire state of North Dakota is currently producing 360,000 barrels a day from 5000 wells—roughly half the volume from 20 times the wells. This is one of the most prolific reservoirs ever discovered, so for me, personally seeing the facilities and so on was an incredible experience.”

“We saw both dune and sabkha environments in the desert. For a bunch of geologists, that’s pretty spectacular. A sabkha looks like a large salt flat. It’s a peculiar depositional environment with major implications related to subsurface hydrocarbon reservoirs,” said Harju. “They are mostly found in the Middle East now, but we were looking at the present-day version of something that happened 100 million plus years ago here in the Williston Basin.”

The sabkha wasn’t the only connection to North Dakota Harju and Steadman found in Saudi Arabia. As it happens, a UND graduate from Linton named Thomas Barger began his career on a surveying crew in Saudi Arabia in the late 1930s and eventually became president and CEO of Saudi Aramco. Barger retired in 1969, but his legacy lives on at the company.

The workshop networking has already proven to be important. Harju said the EERC is currently in discussion with several workshop participants regarding CO₂-related projects that could be conducted in the PCOR Partnership region and elsewhere in the future.

—Sandy Van Eck

Photo submitted by Ed Steadman.

Wind turbine workshop held



The Small Wind Turbine Workshop was held on March 8, 2011, at the EERC in Grand Forks, North Dakota. The course provided individuals with an overview and information geared toward helping individuals learn how to install, operate, and maintain small wind turbines on their property,

including the issues to address prior to installation (tax breaks, site permitting, electrical needs, etc.). Workshop presenters were Brad Stevens, Research Manager, EERC; Jack Hanson, Technical Advisor and System Designer, Solar and Wind Energy Consultants, LLC; and Blaine Rekken, Energy Services Supervisor, Nodak Electric Power Cooperative.

—Sandy Van Eck



Behind the scenes: The making of a documentary

In May and June of 2009, EERC Research Manager Dan Daly accompanied the Prairie Public Broadcasting film crew to the northern Great Plains, northeastern India, and the African country of Cameroon to film “a day in the energy life” of typical families. Here begins the account of his experience behind the scenes creating the PCOR Partnership documentary “Global Energy and Carbon: Tracking Our Footprint,” which premiered on Prairie Public and is available at www.undeerc.org/PCOR.

The original idea came from PCOR Partnership Program Manager Ed Steadman based on his experiences

doing volunteer work in Honduras. Ed wanted to show that “one size could not fit all” when it came to reducing carbon emissions. He thought that while it may be easy to agree that cutting greenhouse gas emissions is a good idea, the effects on local economies and quality of life varies greatly in different parts of the world.

It is one thing to talk about the differences in energy use and carbon footprint among cultures and economies but quite another to see them firsthand. Bob Dambach, Director of Television for Prairie Public, felt strongly that being on location and showing households using energy in their daily lives would make the point better than hearing experts talk about it.

The result was a concept for a documentary showing how “typical households” around the world use energy. Their energy usage would then be used to discuss carbon emissions and carbon management options. With the support of Ed and Bob, Research Scientist Charlene Crocker and I put together a project prospectus. Associate Director John Harju reviewed our concept and agreed to discuss the proposed project with the other Associate Directors and EERC Director Gerry Groenewold. In early February of 2009, we got the green light.

The next step was finding families who would agree to represent their

cultures and economies. That meant we needed to get a commitment from families in the United States, as a postindustrial economy; either China or India (both rapidly emerging economies); and a developing economy. Because Prairie Public wanted to portray a “quintessential heartland” image, it lined up families in the Midwest. To represent a developing nation, we decided on India because English was spoken and access and movement would be easier than in China. Poonam Ghirdhar, a film production student and an intern at Prairie Public, got us two families in Delhi, India (her native country), with a phone call to her mom in Kolkata. That left Africa or South America. Charlene Crocker explained the project to officemate and fellow EERC Research Scientist Alex Azenkeng, who set us up with two families in the area of Buea, Cameroon, on the Atlantic coast of central Africa (his family and family friends). Poonam and Alex enthusiastically agreed to be our guides in their home countries and cultures.

Now that we had the countries and most of the families selected, a tentative filming schedule set (spring and summer 2009), and the travel teams secured, we started detailed research on energy use in the countries and began to draw up a list of shots and possible film locations.

Next time – visas, needles, and “What? You want to film IN MY HOUSE?”

—Dan Daly

Fond farewells: Hendrikson, Toman retire



Associate Director for Business and Operations John Hendrikson enjoys a laugh during his retirement party roast.

John Hendrikson, Associate Director of Business and Operations, retired after 30-plus years of work. During that time, he's kept current buildings in top shape and overseen the construction of new buildings; overseen the management of departments that keep the EERC functioning as a successful business; and been involved in the marketing of EERC research programs

and in the coordination of proposal preparations with senior research managers and deputy associate directors.

Hendrikson's dedication to the EERC included early-morning winter snowstorm drives to the EERC to make sure roads were clear and, during the flood of 1997, camping out at the EERC along with his wife to make sure that the pumps were working

in order to protect the building and equipment from floodwaters.

And while the EERC will miss Hendrikson's dedication to his job, his coworkers will also miss his dry sense of humor.

When asked for comments, Hendrikson replied, "I'm leaving. I'm

saving gas. It's my energy-efficient contribution.

"But, in all seriousness, I would like to thank everyone here for the support you've provided over the years. Gerry has provided us all a great place to work and pursue our goals," added Hendrikson. "I've thoroughly enjoyed working with the technical staff at the EERC but reserve a special place in my memory for the guys out back who work in operations and in the shop groups. While the technical staff develops projects and plans how they will be accomplished, the guys in these areas translate the ideas into things that can actually be accomplished. I will miss the day-to-day interactions with everyone at the EERC but look forward to being full time at the new lake home and plan to do some traveling to warmer climates in the winter."

—Trish McGuire



Director Gerry Groenewold and Research Scientist Don Toman at Toman's retirement party.

Research Scientist Don Toman recently retired from the EERC after 31 years. During his time at the EERC, he designed, fabricated, modified, and worked with various types of pilot- and bench-scale combustion systems. Toman also sampled particulate and gaseous emissions from full-scale

systems from Canada to Australia.

"When I was young, we heated our house with coal that we burned in a converted pot belly stove," said Toman. "We got the coal from the New Leipzig Mine in chunks up to 6 feet, which we broke down with axes and pry bars and transferred to a coal shed by hand. We would carry the coal to the house and down to the

cellar in 5-gallon buckets and carry out the ash in the same buckets. At that time, I never dreamed I would ever have a career in the coal business!"

Toman came to the EERC with a B.S. degree in Natural Sciences and a natural ability to design and

fabricate whatever tool or equipment was needed to get the job done. Throughout the years, Toman picked up additional skills on the job in plumbing, welding, computer programming, data acquisition, electronics, and electricity. Many fresh-out-of-college engineers were placed with Toman to learn the ropes.

While Toman says he will miss designing and bringing solutions to issues at hand and will miss the great people that work at the EERC, it seems he'll stay busy.

"I am looking forward to spending time with my wife, Carmen, and my grandkids," said Toman. "Time will now allow me to tackle the 'honey-do list' as well as pursue my hobbies, which include woodworking, shooting sports, hunting, music, golf, and gunsmithing."

—Trish McGuire



Weight Watchers participant Linda Brown gets support on her weight loss accomplishments from Dureanna Robertson, Jen Knudson, and Kari Schmidt.

Making healthier choices

One of the ways the EERC shows its commitment to work wellness is by being a host site for UND's Work Well Weight Watchers® program.

Several people at the EERC have chosen to make changes in their lives that improve their health. A number are already reaping the rewards. The following are the experiences of a few employees.

Weight Watchers

Kari Schmidt, Administrative Assistant, joined the UND Work Well Weight Watchers program in March 2010.

"I started to face reality when I went to see my doctor," said Schmidt. "I was 38 and, according to body mass index charts, I was obese. My dad had a heart attack at 48. I saw a lot of similarities in his lifestyle and mine, and my preteen daughter was starting to follow some of my habits, so I was committed to making a change."

Another program participant, who wished to remain anonymous, said, "I wanted to lose weight but was struggling to do it on my own. The idea of camaraderie during this struggle and the convenience of having a session here at the EERC were huge factors in my deciding to join."

"The Weight Watchers program is very livable and family friendly," said Delane Johnson, leader of the EERC Weight Watchers program. "The focus and support given are toward changing behavior by teaching about proper nutrition, the importance of activity, and that no food is off limits."

"Weight Watchers says, basically, you can eat your piece of pizza, your piece of pie, or whatever, but be accountable for it," said Schmidt. "That was my thing. I was never accountable for what I ate before. I just ate what I wanted when I wanted, whether I was hungry or not."

"I have learned a lot through Weight Watchers about healthy living," said Anonymous. "It taught me how to eat and plan healthy meals."

According to Johnson, the success at the EERC has been phenomenal. Since the meetings at the EERC began in September 2010, participants have lost over 625 pounds, with six people attaining lifetime status, which means they met their weight loss goal and maintained it for 6 weeks.

"My successes were a 50% drop in my triglycerides, a 7.5-inch decrease in my waist size, being able to tie my shoes

with ease, and having more energy," said Anonymous.

"I lost 57 pounds on the program," said Schmidt. "I learned to make better choices, and all of a sudden, those unhealthy choices don't seem so great anymore. I think it helps my children, by showing them healthier options."

"I love watching people succeed not only with weight loss but with coming to the realization that it is really about choice and lifestyle versus being on a diet," said Johnson. "Frequently, members share health benefits of lower cholesterol and blood pressure, better sleep, and less joint pain."

As an added incentive, UND Work Well will provide benefited employees with \$50 in return for attending 80% of the series meetings. And if you cannot make any of the three UND meetings (the EERC, Merrifield Hall, and School of Medicine and Health Services), you can attend meetings at another location and still qualify for the Work Well \$50 return.

Gluten Intolerance

Stacie Klegstad, Administrative Assistant, had recurring headaches, migraines, and stomachaches for several years. Her daughter had also been having stomachaches and was on medication but with no relief. The decision was made to take her to a gastrointestinal doctor, who recommended she go on a gluten-free diet. "It did help her. So my neurologist suggested that I go on it, too, and it helped me," said Klegstad. "I feel better and don't get nearly as many headaches as I used to."

Gluten intolerance or celiac disease damages the lining of the small intestine and interferes with the absorption of foods. Gluten is a protein in wheat, barley, rye and, possibly, oats that can be found in many foods and other products, so living in the bread basket of the Midwest and being gluten-intolerant can be a challenge.

"At first, all I ate was hot or cold rice cereal and meat and vegetables," said

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Klegstad. "I have expanded my cooking abilities because of the celiac meetings I go to, and many stores have gluten-free products, so you don't have to give up your favorite foods."

Klegstad now eats more fruits and vegetables and less processed food but finds restaurant and potluck eating are the most challenging to her right now.

"I was never a huge chocolate fan, but now, chocolate is my friend!" said Klegstad. "It's gluten-free!"

Whether you decide to join a program like Weight Watchers, which also supports those who are gluten-intolerant, or do it on your own, the benefits of healthier choices make it worthwhile.

To find out more about the Weight Watchers program, you can visit a meeting (Wednesdays at noon at the EERC) or contact Delane Johnson (rogerljohnson@gra.midco.net) or Work Well Coordinator Kim Ruliffson (kimberly.ruliffson@email.und.edu or 777-0210). You can join anytime as the cost is prorated from the day you begin the program.

-Trish McGuire

Bluegrass idol



Photo submitted by Ed Olson.

Ed Olson at the microphone during a large jamming session.

Senior Research Advisor Ed Olson has another title: Bluegrass Idol. Olson won the award on the 2011 Bell Buckle Bluegrass Cruise by performing "The Ship Titanic" song in a humorous way.

"With a lot of energy, facial expressions, high-falsetto phrases sprinkled in, and sarcastic echoes ('It was sad, tooooooo bad'), any trace of morbidity was absent," said Olson. "Bluegrass and folk music can get away with this style. And having a very good backup band (Becky Buller and Monroe Crossing) doing the echoes helped a lot."

Olson has been singing and playing the banjo for several years in a local band with Senior Research Advisor Darren Schmidt, who rekindled Olson's interest in bluegrass. This was the first time Olson went on a cruise that catered to bluegrass music.

"It was heaven. We played and sang every day, with some days up to 10 hours," said Olson. "I'm definitely going again."

-Trish McGuire

Intern completes program



Daniel Schwitalla recently finished his internship at the EERC working on the Coal Ash Behavior in Reducing Environments (CABRE) III project. Schwitalla will graduate this spring

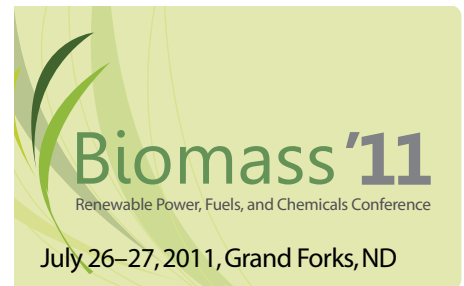
with a bachelor's degree in chemical engineering from the Technical University Bergakademie Freiberg in Freiberg, Germany, where he plans to continue on for his master's degree. Schwitalla's work for the

CABRE III project primarily involved correlating operational parameters of the entrained-flow and fluidized-bed gasifiers.

"I was very impressed with how well the EERC incorporates informality while still retaining productivity. You rarely see that at any company anywhere," said Schwitalla of his time here. "People here are very friendly and eager to teach but still highly professional and hard working."

-Sandy Van Eck

Upcoming events



EERC EDGE

The EERC Edge is published for employees and friends of the Energy & Environmental Research Center at the University of North Dakota. Send comments and story suggestions to Sandy Van Eck, Editor, (701) 777-5023 or svaneck@undeerc.org.

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