



The EERC is modifying the existing “Slurry” Building to be able to accommodate a larger fuel production system to produce liquid jet fuels for testing by the U.S. Air Force. EERC Senior Research Manager Ted Aulich stands on a walkway in the facility, which will soon be modified to house the fuel production system. Aulich is the project manager for the fuel production project.

EERC gears up for jet fuel production

The Energy & Environmental Research Center (EERC) has formed a strategic partnership with Accelergy Corporation, a global leader in the production of high-grade domestically sourced liquid fuels, to commercialize a suite of technologies for the production of liquid fuels from coal and biomass.

Under the terms of the agreement, Accelergy will license the EERC-developed biomass conversion process technology from the EERC Foundation as part of Accelergy’s coal-biomass-

to-liquid (CBTL) process (licensed from ExxonMobil Research and Engineering Company) to accelerate the development of specialty liquid jet fuels used by the military from cleaner, nonpetroleum sources. This follows a mandate by the U.S. Air Force (USAF) to procure 50% of its fuel from cleaner and domestic sources by 2016.

Project Manager Ted Aulich estimates the total research project cost at \$3.5 million, including \$250,000 in construction costs and \$600,000 in

equipment costs to remodel the Slurry Building for the pilot-scale project. The project is being funded by Accelergy Corporation and the U.S. Department of Energy.

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“The EERC’s mission has always been to create solutions for our country’s energy challenges through technological advancements and strong partnerships with private sector companies like Accelergy,” said Gerald Groenewold, Director of the EERC. “This development marks a milestone in the production of cleaner, 100% synthetic fuel through our combined technologies, sets a standard for the industry to follow, and paves the way for its rapid adoption.”

“Accelergy is the first to provide a 100% synthetic jet fuel for USAF with high thermal stability, increased energy density, lower environmental impact, and competitive costs,” said Tim Vail, CEO of Accelergy. “With the production of these fuels that utilize carbon as a feedstock, we are one step closer to setting a benchmark for the industry, as well as commercializing our fuels. The facility at the EERC allows us to produce meaningful quantities of fuel, confirm our performance estimates, and further refine our fuel products. With the test results in hand, the Air Force and defense contractors can then explore the full range of options for employment of advanced synthetic fuels in next-generation aircraft designs.”

Utilizing proprietary microcatalytic liquefaction technologies and direct biomass conversion technologies, Accelergy’s integrated CBTL process domestically produces a tunable

range of low-net-carbon fuels, including premium gasoline; diesel; Jet-A; and military JP-5, JP-8, and JP-9 jet fuels. The CBTL process is unique in its ability to maintain a high overall thermal efficiency while significantly reducing the greenhouse gas emissions associated with comparable refining methods.

Production from the EERC pilot facility will commence in the third quarter of 2010, with fuel deliveries to the Air Force Research Labs commencing in late 2010/early 2011. The pilot facility will also provide a valuable tool for evaluating new coal and biomass feedstocks as the technology moves toward commercial deployment.



Ben Oster, a Research Engineer at the EERC, holds a sample of jet fuel made from plant oils. This fuel will be combined with coal-derived fuels made in the renovated Slurry Building to yield high-performance jet fuels.

Accelergy Corporation establishes corporate office at the EERC

Accelergy Corporation, a global leader in the production of clean liquid fuels, based in Houston, Texas, has established a corporate office at the EERC at the University of North Dakota (UND) in Grand Forks in order to support its numerous research, development, and commercialization activities taking place at the EERC and in North Dakota. The EERC’s regional economic development strategy is to attract and serve as a major regional hub for clean tech companies.

Accelergy Corporation is pushing to commercialize the EERC Foundation’s proprietary jet fuel technology as part of its CBTL process and is accelerating the development of specialty fuels used by the military.

“This substantial development program has been structured around the EERC and Accelergy’s unique combined technology platform producing ultraclean drop-in-capable transportation fuels from domestic coal and biomass resources, which are competitive with petroleum fuels in both price and greenhouse gas emissions,” said Carsten Heide, EERC Associate Director for Intellectual Property Management and Technology Commercialization.

The partnership with Accelergy is leading to significant infrastructure investments at the EERC and will push commercialization opportunities in North Dakota to build an advanced tactical fuels production complex.

–Derek Walters

New employees



Tyler Bloms has joined the Research Information Systems Group as a Programmer/Analyst under Andy Palmiscno. Bloms' work involves

developing databases, software applications, and database-driven Web applications for EERC projects and systems and for external clients.

"My time at the EERC so far has been great. Everyone has been very accommodating, which has made the transition into a new job very easy," said Bloms. "I enjoy the fast pace and wide variety of work that there is at the EERC for a programmer. Every day I learn something new and interesting, which makes work a lot more enjoyable."

Originally from Minot, North Dakota, Bloms has lived in Grand Forks for most of his life. He attended college at the University of Minnesota - Duluth (UMD) and received his B.B.A. degree with a major in Management Information Systems in May of 2009. He attended college on an athletic scholarship and played baseball for 4 years at UMD.

Bloms enjoys being outdoors and playing sports. In the summer, it is golf and softball, and in the winter, he usually travels to Wisconsin to snowmobile with friends.



A. Dewey Cooper is an Environment, Health, and Safety Specialist at the EERC, where he is responsible for supporting and enhancing the

EERC's Environment, Health, and Safety Programs encompassing environmental management systems, hazardous materials, waste management, radiation, air quality, wastewater, storm water, occupational health, and safety.

Cooper's professional areas of interest include microenvironments as they pertain to compliance regulations, the environmental "bubble concept," and the applicability of these regulations to small environments. "Let's just say one size does not always fit all as it pertains to regulations," said Cooper.

While in the Navy from 1988 to 1996, Cooper earned a B.S. in Chemistry from Excelsior College in Albany, New York, and is working on a master's degree in environmental policy at the American Military University. Cooper is a Registered Environmental Manager and has over 10 years of experience providing environmental compliance services to USAF, the U.S. Department of Defense, and the private sector. He's worked in many unique environments as well, including Korea, the Hawaiian Islands, Wake Island, Saipan, and Guam.

Cooper and his wife share a common passion: "We travel overseas a lot, every chance we get," he said. While in Korea and overseas, Cooper obtained his private pilot's license and

completed 30 hours of flying time. He's "looking forward to flying the open skies of North Dakota" soon.

"My most unique travel experience is being on a remote island (400 meters wide and 2.4 km long) in the Pacific Ocean," said Cooper. "You really do not hear it when you get off the plane, but when you go to sleep at night, the constant roar of the ocean reminds you where you are at, and the first few nights are sleepless."



Research Engineer **Dr. Robert Cowan** works with the Plains CO₂ Reduction (PCOR) Partnership to address global climate change

through carbon capture and storage (CCS), including developing and testing novel capture technologies and dealing with CCS transport and engineering issues. He also works with the Northern Great Plains Water Consortium, assisting with the development of programs to minimize and treat water used or produced during CCS activities and to minimize hydrogen sulfide during the production of methane from anaerobic digestion of dairy manure.

Cowan's interests center on the areas of CO₂ capture and microbial systems. His strengths in the area of CO₂ capture include the interactions of aqueous chemistry and CO₂ partitioning and CO₂ absorption kinetics—particularly with enzyme-facilitated transport. In the microbial systems, he has considerable expertise in

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New employees continued

biological wastewater treatment, industrial wastewater treatment, and design and operation of anaerobic (methanogenic) systems. Cowan coauthored a book entitled “Respirometry for Environmental Science and Engineering,” which can be found in the EERC Library, and he has authored proposals in the area of algal growth for biofuel production.

“The EERC really does provide its employees the opportunity to do the things they like to do and the structure and support required to be successful,” said Cowan. “The level of support and encouragement I have received from everyone is amazing.”

Prior to his position at the EERC, Cowan served as Laboratory Director and Senior Scientist at Carbozyme, Inc., in Monmouth Junction, New Jersey, a small company working on a membrane-based CO₂ capture technology. He has a Ph.D. in Civil (Environmental) Engineering, an M.S. in Chemical (Biochemical) Engineering, and a B.S. in Chemical Engineering, all from the State University of New York at Buffalo. He also taught a course called Introduction to Environmental Engineering at Princeton University.

At present, Cowan’s wife and daughter are still in New Jersey, but when they are together, the Cowans like to go to musicals and plays, go camping with friends, or just watch TV together after a long week of work. A former triathlete, Cowan snowboards and downhill skis with his daughter and enjoys cross-country skiing, soccer, racquetball, biking, swimming, golfing, and fishing.



Dr. Guoxiang Liu, Research Engineer, works with the Oil and Gas Group in the PCOR Partnership to develop geophysical models of the

subsurface and run dynamic simulations to determine the long-term fate of produced/injected fluids, including hydrocarbons, CO₂, and brine, using oil and gas industry simulation software. His principal areas of interest and expertise include numerical modeling and fluid analysis in oil and gas, carbon sequestration, risk assessment, contaminant remediation, and related energy and environmental areas.

“The projects in the Oil and Gas Group have been so exciting, and that has made me very happy,” said Liu. “I have also enjoyed the friendly and helpful cooperation and partnerships at the EERC.”

Dr. Liu received his Ph.D. degree in Civil and Environmental Engineering from West Virginia University, his master’s degree in Computer Science from Leiden University in the Netherlands, and his bachelor’s degree in Analytical Chemistry from Yunnan Normal University, People’s Republic of China. He will soon defend his second master’s degree in Mechanical Engineering with a focus on Computational Fluid Dynamics at West Virginia University. Prior to working at the EERC, Dr. Liu taught courses in Numerical Analysis and Evolutionary Algorithms at West Virginia University.

A native of the People’s Republic of China, Dr. Liu said he found his calling just by “luck”—during his

first trip to Europe; he happened to talk to a friend who worked in carbon capture and storage. That discussion led to his interest and engagement in the area.

Liu and his wife like to watch movies and play badminton and ping pong, and they enjoy walking, camping, bicycling, and fishing.



Jonathan LaBonte is the Storekeeper/Clerk at the EERC, where he assists staff in the purchasing, shipping, and receiving of goods and

materials, including providing customer service in the Toolroom and office supply areas. He also assists in the tagging and reporting of equipment to asset management and is responsible for handling the gas cylinders.

“I am really happy to work in such a family-oriented environment,” said LaBonte.

LaBonte received his B.S. degree in Environmental Geology and Technology from UND in May of 2004. LaBonte has always been interested in research into the environment. While in school, he volunteered for a summer compiling geometric data from mapping potholes in the upper Turtle River Watershed area. He also conducted research into genetically modified maize on a National Science Foundation grant full-time for 3 years with the UND Biology Department. Before working at the EERC, LaBonte worked for Ashley Furniture Home Store, eventually working his way

up to head of the Assembly and Delivery Division.

LaBonte's hobbies include running, Frisbee golf, ice fishing, city league hockey, basketball, trap shooting, rock and fossil hunting, wildlife observation, all forms of music (he has 10,000 songs on his iPod), and gardening (he already had his garden planted by mid-April). He plans to bring one of his hobbies with him to the EERC: LaBonte and several other EERC employees are forming a UND intramural hockey team in time to compete next winter.

"I have lots of hobbies," said LaBonte, "but my biggest passion is being a good father to my daughter, who's 2 and a half." LaBonte says his daughter likes to play in the park and the pool and especially likes to help her dad with watering the garden.



Erik Moe, Research Engineer, works in the areas of hydrogen systems, renewable fuels, advanced energy systems, and emission

measurement and control. Specific duties include conceptual process design, design and construction of experimental systems, and planning and conducting experimental tests.

Moe currently works with advanced biomass gasification systems and in designing a mobile biomass-to-methanol system. He also drafts equipment designs.

"I am really excited about my position because, as in the case of

the advanced biomass gasification system, I get to be involved with every aspect of the project from start to finish. As part of the engineering support services department, it is nice getting to work with a variety of different projects and getting input from different project managers," Moe said.

"I am a big fan of mechanical design and drafting, but I have developed a passion for the detail, time, and effort that is put into the testing of systems here at the EERC," said Moe. "I am really interested in the testing of complex fuels as well as fuels that haven't been widely tested. This has also opened my eyes to the cleanup of wastewater and syngas and the rules and regulations surrounding them."

Moe received his B.S. degree in Mechanical Engineering from UND in 2008 and is now pursuing an M.B.A. Moe participated in football and track throughout college and says it was a great experience in his life.

Originally from International Falls, Minnesota, Moe is an avid outdoors enthusiast whose hobbies are hunting, fishing, biking, running, skiing, basketball, football, golf, and traveling.



Chris Riendeau is a Research Technician with the Mercury and Related Sampling Group at the EERC, where his work involves fabrication, setup, and

teardown of sampling and other equipment; maintenance,

calibration, and troubleshooting of bench-, pilot-, and full-scale test equipment for mercury, particulate, and hazardous air pollutant testing and materials-handling equipment for emission control technologies; on-site field sampling; and data collection and reduction. Riendeau's principal areas of interest and expertise include SO₃, U.S. Environmental Protection Agency Methods 26 and 29, and Ontario Hydro method sampling.

"I enjoy doing field sampling work and traveling," Riendeau said. "I also enjoy working with a great bunch of people who make a difference."

Originally from Red Lake Falls, Minnesota, Riendeau lives in East Grand Forks, Minnesota, and attended East Grand Forks Technical College for autobody mechanics. Before coming to the EERC, he built and did finish work on windmill blades, worked for an agricultural producer operating and maintaining equipment, and worked in a concrete plant building prefabricated concrete walls.

Riendeau's hobbies include four-wheeling, kneeboarding, snowboarding, and spending time at his lake cabin.

—Sandy Van Eck

Transitions



Teresa Bonev has been promoted to Project Management Specialist with the Renewable Energy Group in addition to her duties as

Assistant to Deputy Associate Director for Research Chris Zygarricke and Administrative Assistant Supervisor. Her position has expanded to take on the administrative aspect of project management for projects involving the Renewable Energy Group and the Centers for Renewable Energy and Biomass Utilization. She holds a B.S. in Business Administration (Management) from Oklahoma State University.

“I am fortunate to work with many talented individuals and contribute to the success of their projects. I am excited about the challenges of this new position and look forward to expanding my professional knowledge and experience,” said Bonev.



Dr. Junhua Jiang has been promoted to Research Manager in the Electrochemistry Group at the EERC, where he manages projects in a variety of

renewable energy program areas including the development and innovation of advanced power sources, renewable energy storage and conversion technologies, green processes for renewable fuels and chemicals, and advanced energy

and environmental materials. Prior to his current position, he served as a Research Scientist with the same group. Jiang received his Ph.D. in Electrochemistry from Wuhan University, People’s Republic of China, and his B.Sc. degree in Electrochemical Engineering from Harbin Engineering University, People’s Republic of China.

“The EERC provides great opportunities to address today’s energy and environmental challenges,” said Jiang. “I truly enjoy working with so many friendly and talented people here.”



Marc Kurz has been promoted to Research Manager in the Renewable Energy and Biofuel Technology Group. He coordinates and

operates renewable fuel reactor systems and associated analytical equipment and oversees projects focused on fuel production from a variety of renewable and fossil-based feedstocks. Prior to his current position, he served as a Research Scientist with the same group. Kurz received his B.S. degree in Environmental Geology and Technology from UND.

“I am very honored (and humbled) to be working with such a talented group on so many interesting and challenging projects,” said Kurz.

“I look forward to the many future opportunities this position offers as biofuels continue to play an integral part of the energy future.”



Dr. Ye Zhuang has been promoted to Research Manager at the EERC, where he develops and manages research projects focused on air toxic

metals, emission control technologies, biomass utilization, and technical and economic evaluation of various emission control systems. Prior to his current position, he was a Research Engineer at the EERC. Zhuang received his Ph.D. degree in Environmental Engineering and Science from the University of Cincinnati and his M.S. and B.E. degrees from Beijing Polytechnic University.

“First, I would like to thank my colleagues for their support. Good team work is important in daily research,” Zhuang said. “Secondly, I think this is an exciting opportunity for me to continue my career development.”

–Sandy Van Eck

EERC alumnus Tamara and family visit

Tamara (Vind) Baker visited the EERC with her husband, Jim, recently to show off their newest family member. Guerbenson Estime's ("Ben's") adoption from the Haitian orphanage Children of the Promise had been in process for several months when a massive earthquake struck Haiti in January. Two-year-old Ben was one of those children whose adoption was fast-tracked, and he arrived in the States to meet his parents on February 25. Tamara worked at the EERC in records management until 2006. The Baker family lives in Sacred Heart, Minnesota.

-Sandy Van Eck



Photo by Trish McGuire.

Jim, Ben, and Tamara (Vind) Baker.

Intel Science Talent Search winner

As many of you already know, Ben Sun, EERC Computer Programming Assistant and son of Jenny Sun, Research Chemist, recently won seventh place in the 2010 Intel Science Talent Search and a \$25,000 scholarship. What you may not know is that all 40 Intel Science Talent Search finalists went to Washington, D.C., for a weeklong event that included interacting with leading scientists, displaying their research at the National Academy of Sciences, and meeting with national leaders. While in D.C, Sun was able to talk with both Senator Byron Dorgan and Congressman Earl Pomeroy.

-Trish McGuire

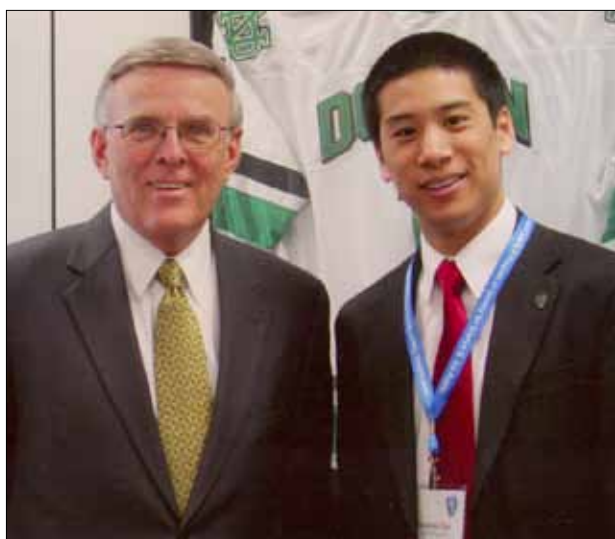


Photo courtesy of Senator Dorgan's Office.

U.S. Senator Byron Dorgan (left) with Ben Sun.

Artistic awards

Liz Russell, former EERC Library Assistant and daughter of Jane Russell, Technical Editor, recently won a 2010 Northern Visions Award sponsored by Senator Byron Dorgan at the statewide North Dakota Juried Student Art Show hosted at the Taube Museum of Art in Minot. As a result, her painting will be on display in Senator Dorgan's office through the end of his term. Russell previously won Honorable Mention for the same painting at the North Dakota State University Annual High School Juried Exhibit at the Renaissance Gallery in Fargo.

-Trish McGuire



Photo courtesy of the Central High School Centralian.

"Alone" by Liz Russell.

Harju appointed as committee chair for IOGCC



Congratulations to John Harju, EERC Associate Director for Research, who has been appointed the Chairman of the Energy Resources, Research, and Technology

Committee of the Interstate Oil & Gas Compact Commission (IOGCC). Harju's term with the IOGCC will run through January 2012. The IOGCC is a multistate government agency that promotes the conservation and efficient recovery of domestic oil

and natural gas resources while protecting health, safety, and the environment. The IOGCC advocates for environmentally sound ways to increase the supply of American energy. It accomplishes this by providing governors of member states with a unified voice to Congress, while also serving as the authority on issues surrounding these vital resources.

"The focus of the Energy Resources, Research, and Technology Committee is to debate, study, and develop positions on economic, technical, and safety issues that confront domestic oil and natural gas production," said Harju. "I'm truly honored by this appointment and am extremely excited to carry on the important work of this committee."

-Derek Walters

EERC receives hydrogen education and outreach award

The EERC received word from the National Hydrogen Association (NHA) that it will be the recipient of NHA's Robert M. Zweig Public Education Award to be presented in May at NHA's Annual Awards Ceremony in Long Beach, California. The EERC "is being recognized for its robust environmental research program and contribution to the advancement of hydrogen education." The EERC was also recognized for hosting events such as the 2009 NHA Summer Strategy Planning Meeting, Hydrogen Works: The Premier Professionals Training Course, the International Conference on Air Quality, and Senator Byron Dorgan's Hydrogen Summit.

"The event people and Administrative Resources staff at the EERC do outstanding work on these events, technical conferences, and online courses for Continuing Education, so it is great for the EERC to receive an award relating to our combined efforts in hydrogen education," said EERC Director Gerald Groenewold.

-Trish McGuire



Conference support staff at work.

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SMALL WIND TURBINE WORKSHOP
 May 18, 2010, Grand Forks, ND

Biomass '10
 Renewable Power, Fuels, and Chemicals Workshop
 July 20-21, 2010, Grand Forks, ND

GASIFICATION SHORT COURSE
 September 29, 2010
 The Woodlands Marriott
 The Woodlands, Texas

Air Quality VIII
 October 24-27, 2011, Arlington, VA

EERC EDGE

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