



FINAL PROGRAM

Biomass'11

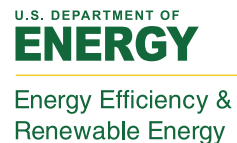
Renewable Power, Fuels, and Chemicals Conference

The Premier Biomass Event in the Midwest

July 26–27, 2011

Alerus Center
Grand Forks, North Dakota

Organizing Sponsors:



Signature Sponsor:



www.undeerc.org/biomass11



Biomass'11
Renewable Power, Fuels, and Chemicals Conference

Technical Program

Tuesday, July 26, 2011

7:15 a.m. **Registration Open** – Continental breakfast available

Conference Introduction and Welcome

8:15 a.m. **Introduction** – **Chris Zygarlicke**, Deputy Associate Director for Research, Energy & Environmental Research Center (EERC), Grand Forks, North Dakota

8:25 a.m. **Welcome** – **Gerald Groenewold**, Director, EERC, Grand Forks, North Dakota



Dr. Gerald Groenewold, Director of the EERC, leads a multidisciplinary science and engineering research team of over 330 people who focus on research, development, demonstration, and commercialization of energy and environmental technologies. The EERC has had more than 1120 clients from 51 countries and all 50 states, including many Fortune 500 companies, and its current research portfolio is \$194.4 million. With its long tradition of fossil fuel-related research and development, the EERC has broadened its scope to include a wide array of strategic energy and environmental issues and houses 11 Centers of Excellence, including the Centers for Renewable Energy and Biomass Utilization.

Opening Remarks – **The Honorable John Hoeven**, U.S. Senator, Washington, D.C. (via video)



Senator John Hoeven was sworn in as North Dakota's 22nd U.S. Senator in January 2011, after serving 10 years as Governor of the state of North Dakota. As Governor, he worked to build North Dakota's future by focusing on six pillars of growth: education, economic development, agriculture, energy, technology, and quality of life. Senator Hoeven has placed a strong focus on developing North Dakota's vast energy resources. Beginning in 2001, he initiated EmPower ND, a multiresource energy program for the state with incentives in each energy sector, as well as a conservation component. North Dakota is one of the largest energy-producing and exporting states in the nation, and Senator Hoeven has worked to advance the state's traditional energy resources, like lignite coal, oil, and gas, while promoting renewable energy opportunities, such as wind, ethanol, and biodiesel.

Session: Trends and Opportunities in Utilizing Biomass

EERC Session Coordinator/Chair: **Chris Zygarlicke**, Deputy Associate Director for Research, EERC, Grand Forks, North Dakota

8:45 a.m. **"State of Biomass,"** **Chris Zygarlicke**, Deputy Associate Director for Research, EERC, Grand Forks, North Dakota

9:00 a.m. **"U.S. Department of Energy's Office of Biomass: Enabling Bio-Industry with Research and Deployment of Biofuels, Biopower, and Bioproducts,"** **Corinne Valkenburg**, Technical Advisor, Office of Biomass Programs, Energy Efficiency and Renewable Energy, U.S. Department of Energy, Washington, D.C.

9:25 a.m. **"Trends in Biomass Power Production in North America and Europe: State of the Industry, Feedstocks, Renewable Energy Policies, and Technology Development,"** **Margo Shaw**, Senior Biologist, Golder Associates, Ltd., Winnipeg, Manitoba, Canada; with K. Bockasten, Golder Associates Ltd., Mississauga, Ontario, Canada; P. Girouard, Agronovita Inc., Ottawa, Ontario, Canada; and B. Johnson and D. St. George, Manitoba Hydro, Winnipeg, Manitoba, Canada

9:50 a.m. **"Sustainable Biobased Chemicals,"** **Brian Mullen**, Principal Scientist and R&D Leader, Segetis, Golden Valley, Minnesota

10:15 a.m. **BREAK** – Exhibit Hall open

Technical Program

Tuesday, July 26, 2011 (continued)

10:45 a.m. Panel Discussion: Real-World Economics of Biomass

Panel Moderator: **Chris Zygarlicke**, Deputy Associate Director for Research, EERC, Grand Forks, North Dakota

Panel:

"Creating Value: IP Position in Competitive Investment Environment," Adonis Neblett, Attorney, Fredrikson & Byron, P.A., Minneapolis, Minnesota

"Planning for Renewable Tax Incentives in 2011 and Beyond," Gregory Jenner, Partner, Stoel Rives LLP, Minneapolis, Minnesota

"Economics of Sourcing Cellulosic Feedstock for Energy Production," David Ripplinger, Bioenergy Research Team, with C. Gustafson, T. Maung, D. Saxowsky, J. Nowatzki, and T. Miljkovic, Department of Agribusiness and Applied Economics, North Dakota State University, Fargo, North Dakota

11:45 a.m. Keynote Remarks – The Honorable Jack Dalrymple, Governor of North Dakota, Bismarck, North Dakota



Governor Jack Dalrymple was sworn in as the 32nd governor of the state of North Dakota on December 7, 2010, and is working to grow and diversify North Dakota's economy and create good jobs and economic opportunities for its citizens. He is committed to managing the state with fiscal responsibility and with a new emphasis on infrastructure improvements and energy development. Governor Dalrymple brings to the office an outstanding record of farming, business, legislative, and executive leadership. He is a nationally recognized leader in value-added agriculture. He was the founding board chairman of the Carrington-based Dakota Growers Pasta Company, the third-largest manufacturer and marketer of dry pasta products in North America.

12:00 Noon LUNCH – Sponsored by **Otter Tail Power Company**  – Exhibit Hall open

Session: Biopower

EERC Session Coordinator/Chair: **Bruce Folkedahl**, Senior Research Manager, EERC, Grand Forks, North Dakota

1:00 p.m. "Real-World Biomass Power Production: Minnesota Power Experience," Michael Polzin, Renewable Fuels Coordinator, Minnesota Power, Duluth, Minnesota

1:25 p.m. "Hydrogen Sulfide Control in the Anaerobic Digestion of Dairy Manure," Robert Cowan, Research Engineer, with D. Ye and D. Stepan, EERC, Grand Forks, North Dakota

1:45 p.m. "Air Force Renewable Energy Enhanced Use Lease," Lawrence Tsang, Senior Consultant, Booz Allen Hamilton Inc., Air Force Real Property Agency, San Antonio, Texas

2:10 p.m. "Woody Biomass Test Burn at Wyandotte Municipal Services," Bruce Browers, Senior Consultant, Barr Engineering Company, Duluth, Minnesota

2:35 p.m. "Liquid Fuels from Biomass: A Mobile Indirect Liquefaction System," John Hurley, Senior Research Advisor, EERC, Grand Forks, North Dakota

3:00 p.m. BREAK – Exhibit Hall open

Session: Biofuels I

EERC Session Coordinator/Chair: **Benjamin Oster**, Research Engineer, EERC, Grand Forks, North Dakota

3:30 p.m. "Waste Flue Gas CO to Innovative Biofuel Production," Carl Wolf, Business Development Manager, LanzaTech, Roselle, Illinois

3:55 p.m. "Integrated Biorefinery Operations: Biomass Pretreatment Conditions and Their Impact on Biochemical and Thermochemical Products," Brian Cooper, Project Manager, with R. Mellon, Hazen Research, Inc., Golden, Colorado

Tuesday, July 26, 2011 (continued)

- 4:20 p.m.** **"From Corn Ethanol to Corn Hydrocarbons,"** *Luca Zullo*, Principal, VerdeNero LLC, Tonka Bay, Minnesota; with J. Sherman, GRT Inc., Santa Barbara, California; and G. Ommen, T. Harwood, and T. Kaestner, JetE LLC, St. Paul, Minnesota
- 4:45 p.m.** **"Biomass to Renewable Fuels and Chemicals via Thermochemical Pathways,"** *Allen Aradi*, Manager, Customer Technical Services, Alternative Fuel Technologies, with L. Gerritsen, Albemarle Corporation, Baton Rouge, Louisiana
- 5:10 p.m.** **"Pyrolysis of Agricultural Residues from the Canadian Prairies Using Mobile Technology,"** *Erin Powell*, Research Engineer, with G. Vlainic, Z. Wang, and D. Anweiler, Saskatchewan Research Council, Saskatoon, Saskatchewan, Canada
- 5:35–8:00 p.m.** **Exhibit Social** – With dinner-type appetizers and cash bar

Wednesday, July 27, 2011

- 7:30 a.m.** **Registration Open** – Continental breakfast available in Exhibit Hall

Session: Biofuels II

EERC Session Coordinator/Chair: **Ted Aulich**, Senior Research Manager, EERC, Grand Forks, North Dakota

- 8:30 a.m.** **"Energy Efficiency and Renewable Energy Programs in North Dakota,"** *Andrea Holl Pfennig*, Program Administrator, Division of Community Services – Energy Program, North Dakota Department of Commerce, Bismarck, North Dakota
- 8:40 a.m.** **"What Has Been Learned in Establishing a Sustainable Feedstock Supply Chain for POET Project LIBERTY,"** *Adam Wirt*, Regional Biomass Coordinator, POET, Sioux Falls, South Dakota
- 9:05 a.m.** **"Midlevel Blends of Ethanol and Infrastructure: Where Are We Headed?,"** *Ron Lamberty*, Vice President/Market Development Director, American Coalition for Ethanol, Sioux Falls, South Dakota
- 9:30 a.m.** **"Producing an Advanced Biofuel at Corn Ethanol Plants,"** *David Rein*, Process Engineer, Rein & Associates, Moorhead, Minnesota
- 9:55 a.m.** **BREAK** – Exhibit Hall open
- 10:30 a.m.** **"A Low-Cost Continuous AFEX Pretreatment Process for Cellulosic Ethanol – Using DDGs as a Feedstock,"** *David Jones*, Chief Business Officer, with C. Berry, J. Glassbrook, J. Videto, T. Campbell, and F. Teymouri, MBI International, Lansing, Michigan
- 10:55 a.m.** **"Synthetic Fuels and Chemicals from Biomass – Concepts, Technology, and Status of the Bioliq-Process,"** *Klaus Raffelt*, Scientist, with N. Dahmen, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
- 11:20 a.m.** **"Bio-Oil Production in a Conical Spouted Bed Reactor,"** *Martin Olazar*, Professor, with M. Amutio, G. Lopez, M. Artetxe, A. Erkiaga, A. Barona, and J. Bilbao, Chemical Engineering Department, University of the Basque Country, Bilbao, Spain
- 11:45 a.m.** **LUNCH** – Exhibit Hall open

Session: Biomass Feedstocks

EERC Session Coordinator/Chair: **Chad Wocken**, Senior Research Manager, EERC, Grand Forks, North Dakota

- 1:00 p.m.** **"Risks to Sustainability from Biomass Implementation,"** *David Haberman*, IF, LLC, Delray Beach, Florida

Technical Program

Wednesday, July 27, 2011 (continued)

- 1:25 p.m.** **"Promoting Standardization for Combustion Characteristics of Biomass Fuels," Carolyn Nyberg**, Manager, Analytical Research Laboratory, EERC, Grand Forks, North Dakota
- 1:50 p.m.** **"The Tallow Tree: An Overlooked Bioenergy Feedstock?," Gary Breitenbeck**, Professor, School of Plant, Environmental, and Soil Science, Louisiana State University Agricultural Center, Baton Rouge, Louisiana; with J. Hassannia and H. Wrigley, CTT BioEnergy, LLC, Baton Rouge, Louisiana
- 2:15 p.m.** **"Renewable Solid Fuels via Hydrothermal Carbonization (HTC) of Cellulosic Biomass," S. Kent Hoekman**, Research Professor, with A. Broch, C. Robbins, and W. Yan, Desert Research Institute, Reno, Nevada; C. Coronella, University of Nevada-Reno, Reno, Nevada; and L. Felix, Gas Technology Institute, Birmingham, Alabama
- 2:40 p.m.** **BREAK** – Exhibit Hall open
- 3:10 p.m.** **"The Viability of Harvesting Corncob and Stover for Biofuel Production in North Dakota," David Ripplinger**, Bioenergy Research Team, with T. Maung and C. Gustafson, Department of Agribusiness and Applied Economics, North Dakota State University, Fargo, North Dakota
- 3:35 p.m.** **"Development of Technologies to Enable Regional Biomass Processing for the Production of Fuels, Chemicals, and Animal Feed," Nancy Hodur**, Assistant Research Professor, North Dakota State University, Fargo, North Dakota; with B. Bals and T. Campbell, Michigan State University, Lansing, Michigan; D. Jones and F. Teymouri, MBI International, Lansing, Michigan; and L. Leistriz, North Dakota State University, Fargo, North Dakota
- 4:00 p.m.** **"Torrefied Biomass: A Premium Drop-In Fuel in Coal Power Plants," Ezra Bar-Ziv**, Professor, Department of Mechanical Engineering, Michigan Technological University, Houghton, Michigan
- 4:25 p.m.** **Adjourn** – Tours of EERC available (sign up at the registration desk)

Tour will take approximately 1 hour; transportation is available. By signing up for the EERC tour, you will see much of the EERC's 245,000-square-foot facilities and learn of the hundreds of research, development, demonstration, and commercialization projects taking place. The tour will begin with an explanation of how the EERC operates, its business model, and philosophy. It will proceed through the analytical laboratories as well as 54,000 square feet of technology demonstration facilities (which feature biomass gasification, biofuels production, carbon capture, combustion, and hydrogen production and reforming technologies). Buses will return attendees to the Alerus Center.



Organizing Sponsors

Energy & Environmental Research Center (EERC) and the EERC Centers for Renewable Energy and Biomass Utilization

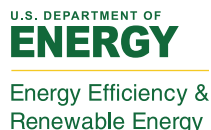
The EERC is recognized as one of the world's leading developers of cleaner, more efficient energy as well as environmental technologies to protect and clean our air, water, and soil. The EERC, a high-tech, nonprofit division of the University of North Dakota, operates like a business and pursues an entrepreneurial, market-driven approach to research and development in order to successfully demonstrate and commercialize innovative technologies. The EERC leverages and enhances government research dollars by developing working partnerships with industry, government, and the research community.

Currently, the EERC employs more than 330 people and is aggressively expanding its staff. Since 1987, the EERC has had more than 1120 clients in all 50 states and 51 countries. In FY2010, more than 93 percent of its contracts were funded by nonfederal sources. The EERC's research portfolio totals more than \$194 million and consists of a wide array of strategic energy and environmental programs.



The EERC's Centers for Renewable Energy and Biomass Utilization, one of 11 Centers of Excellence at the EERC, is a worldwide leader in developing technologies for, and promoting the use of, biomass, wind energy, and alternative fuels. With support from the U.S. Department of Energy Biomass Program, the EERC is currently working with a suite of corporate partners to advance technologies for producing ethanol, biodiesel, and other valuable chemicals; turn forest and agricultural residues into valuable resources for heat and power production; integrate biomass gasification with state-of-the-art solid oxide fuel cell technologies; create a suite of new fuel formulations for aviation and transportation; and advance new technologies to provide renewable liquid fuels for battlefield and domestic military operations.

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Signature Sponsor

North Dakota Department of Commerce

The North Dakota Department of Commerce includes the Division of Community Services (DCS), where the Office of Energy Efficiency & Renewable Energy resides. DCS offers training and technical assistance to local units of government, state agencies, and others with community development, rural planning, policy research, and grant program implementation. In addition to serving as the State Energy Office, DCS administers several other federal and state programs, including Housing, Self-Sufficiency, and Weatherization. DCS actively promotes and supports energy efficiency and renewable energy development in North Dakota.

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Partnering Sponsors

Albemarle Corporation

Albemarle Corporation, headquartered in Baton Rouge, Louisiana, is a leading global developer, manufacturer, and marketer of highly engineered specialty chemicals for consumer electronics, petroleum refining, utilities, packaging, construction, automotive/transportation, pharmaceuticals, crop protection, food safety, and custom chemistry services. The Company is committed to global sustainability and is advancing its eco-practices and solutions in its three business segments: Catalysts, Polymer Solutions, and Fine Chemistry. *Corporate Responsibility Magazine* selected Albemarle to its prestigious "100 Best Corporate Citizens" list for 2010 and 2011. Albemarle employs approximately 4000 people and serves customers in approximately 100 countries.

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Fredrikson & Byron

Fredrikson & Byron provides full service work to biofuels- and biomass-related businesses. Our attorneys combine deep intellectual property and technical expertise with an understanding of the business of the industry to serve clients. Fredrikson & Byron is a 240-attorney law firm based in Minneapolis, with offices in Bismarck and Fargo, North Dakota; Des Moines, Iowa; Monterrey, Mexico; and Shanghai, China. We've built a reputation as the firm "where law and business meet" by bringing business acumen and entrepreneurial thinking to our work with clients and by operating as business advisors and strategic partners as well as legal counselors. The firm's primary areas of practice include banking, corporate, employment, energy, renewable energy, franchise, government relations, health care, intellectual property, international, litigation, real estate, securities, and tax. We serve a broad range of clients, including multinational corporations, public companies, privately held businesses, entrepreneurs, government agencies, and family businesses. Fredrikson & Byron's attorneys also

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work with individuals on estate planning, family law, and immigration matters. We are the exclusive Minnesota law firm member of the World Services Group, a worldwide network of professional service providers. More information about the firm is available at www.fredlaw.com.

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Luncheon Sponsor

Otter Tail Power Company

Otter Tail Power Company is composed of a diverse group of employees working to provide electricity to customers as reliably, economically, and environmentally responsibly as possible. Headquartered in Fergus Falls, Minnesota, the company serves more than 129,000 customers in 422 communities and rural areas in 50,000 square miles of western Minnesota, eastern North Dakota, and northeastern South Dakota. Big Stone Plant (414-MW nameplate) at Milbank, South Dakota; Coyote Station (414-MW nameplate) at Beulah, North Dakota; and Hoot Lake Plant (128.5-MW nameplate) at Fergus Falls, Minnesota, generate most of the company's electricity.

The company owns five hydroelectric stations on the Otter Tail River near Fergus Falls, Minnesota, and one on the Mississippi River near Bemidji, Minnesota, that generate less than 1% of its electricity. The company owns 138 MW and purchases at least 45 MW of wind generation. In 2011, the company expects to generate and purchase renewable energy equivalent to about 15% of its retail sales. In addition, the company operates about 100 MW of peaking capability in combustion turbines at Jamestown, North Dakota; Lake Preston, South Dakota; and Solway, Minnesota. The company also buys and sells bulk power on the wholesale market. Otter Tail Power Company demonstrates a commitment to paying it forward as the company improves the quality of life in the areas in which it does business. Reliable, economical, environmentally responsible electric service, and community involvement: Otter Tail Power Company is ON for you.

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Accessory Sponsor

Xcel Energy

Xcel Energy is a major U.S. electric and natural gas company, with annual revenues of \$10.3 billion. Based in Minneapolis, Minnesota, Xcel Energy operates in eight states, providing a comprehensive portfolio of energy-related products and services to 3.4 million electricity customers and 1.9 million natural gas customers. We have a straightforward strategy we call Building the Core. We invest in our core businesses to provide safe, reliable energy to customers at a reasonable price. We demonstrate our commitment to the environment, and we serve our communities.

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Internet Café Sponsor

Grand Forks Region Economic Development Corporation

Uniquely positioned among industry, education, government, and citizens, the Grand Forks Region Economic Development Corporation (EDC) is the central point of contact for primary sector businesses looking to expand or develop in the Grand Forks region. The EDC provides access to a plethora of resources for new and expanding companies, including business support programs, incentives, and expertise to ensure a company's growth.

Grand Forks' diversified and vibrant business environment supports companies of many kinds and will work with your company every step of the way to ensure a smooth and successful expansion in Grand Forks.

Contact:

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Web Site: www.grandforks.org



Principal Media Sponsor

BBI International

Since 1995, BBI International has produced globally recognized bioenergy events and trade magazines. BBI owns and operates the largest, longest-running ethanol conference in the world—the International Fuel Ethanol Workshop & Expo (FEW)—as well as the International Biomass Conference & Expo and its allied regional events and the International Biorefining Conference & Trade Show. The company publishes *Ethanol Producer Magazine*, *Biomass Power & Thermal*, *Biodiesel Magazine*, and *Biorefining Magazine*, as well as a number of ancillary products, including maps, directories, e-newsletters, and other Web-based industry resources.

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Renewable Power, Fuels, and Chemicals Conference

The Premier Biomass Event in the Midwest

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