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# Bioenergy **UPDATE**

February 2001

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*Special Edition*

**BIOENERGY 2000 CONFERENCE REPORT**

**BIOENERGY  
2000**



**Moving Technology  
into the Marketplace**

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## BIOENERGY 2000 CONFERENCE REPORT

**Preface:** *Bioenergy* 2000 was the ninth in what is now a biennial series of bioenergy conferences sponsored by the Regional Biomass Energy Programs. For nearly 20 years the RBEPs have worked to support the development of renewable biomass power and transportation fuels. The goal of the RBEPs is to help fill the gap between successful R&D and final commercialization of technologies. The RBEPs play an important role in providing objective and reliable information to consumers and policy officials helping to support bioenergy development. The RBEP's regional networks for information exchange help to make ideas a commercial reality; *Bioenergy* 2000 is a key part of that work.

*Bioenergy* 2000 was a "bioenergy" conference in name only. In 2000, following the desire to build an integrated biotechnology industry, the organizers attempted to broaden the

mission of the conference by including bioproducts in addition to biomass fuels and chemicals, and expanding the usual audience by inviting new participants to the conference. In 2000 the organizers added more interactive sessions designed to provide guidance to federal agencies tasked with moving the federal bioenergy initiative forward.

The organizers of the *Bioenergy* 2000: "Moving Technologies into the Marketplace" embarked upon a departure from the previous eight conferences, one inspired by the August 1999 Executive Order 13134 signed by President Clinton—"Developing and Promoting Biobased Products and Bioenergy". The ambitious goals, featuring a tripling of our use of biobased products and bioenergy by 2010, and the mandated interagency collaboration, offered an incentive to set aside a significant portion of the conference agenda to draw upon the collective wisdom and experience of the conference attendees and provide suggestions to the National Biobased Products and Bioenergy Coordinating Office. This conference report is a summation of that effort.

The Conference planners organized fifteen sessions over three days. Each of the three days addressed a single technology or product focus: Biopower, Biofuels, and Bioproducts respectively. Five concurrent panels with common, cross-cutting themes and issues met for each of the three days for one and one-half hours. The five panels were: (1) Policy and Regulatory; (2) Environment; (3) Resources; (4) Financial and Business Development; and (5) Technology & Research.

Each of the fifteen panels featured a moderator charged with recruiting 2-4 experts and drafting a white paper of prominent issues for discussion. The short discussion paper focused

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the panel discussions for the participants and led to exchanges with the audience for 30-45 minutes after short presentations from each panelist. On the first day of the Conference, all attendees were urged during the morning Plenary to go to the same track for each of the three days. Each panel was assigned a note-taker to summarize the salient issues and points of agreement. Attendance at the fifteen policy sessions ranged from 20 to 90 participants.

Panel moderators and Conference organizers met immediately after the third day morning sessions ended and organized the common themes, findings and recommendations which characterized the three days of panels for each of the five tracks. For ninety minutes on Wednesday afternoon, the final day of the formal sessions, the moderators presented their summary findings and recommendations to representatives of DOE, USDA, and EPA representing the coordination office, and to an audience of 120 participants. Special thanks are due the panelist moderators and members (see pages 8-9).

**Introduction:** On August 12, 1999, President Clinton signed Executive Order 13134, "Developing and Promoting Biobased Products and Bioenergy." The Order will guide coordination of Federal efforts to accelerate the development of 21<sup>st</sup> century biobased industries that use trees, crops, agricultural, forest, and aquatic resources to make an array of commercial products including fuels, electricity, chemicals, adhesives, lubricants, and building materials. In an accompanying Executive Memorandum, the President set a goal of tripling U.S. use of biobased products and bioenergy by 2010. Reaching this goal would generate billions of dollars of new income for farmers, create employment opportunities in rural

communities, and reduce greenhouse gas emissions by as much as 100 million tons per year - the equivalent of taking more than 70 million cars off the road. The President's Executive Order established a permanent Interagency Council on Biobased Products and Bioenergy consisting of the Secretaries of Agriculture, Commerce, Energy, and the Interior, the Administrator of the Environmental Protection Agency, the Director of the Office of Management and Budget, the Assistant to the President for Science and Technology, the Director of the National Science Foundation, and the Federal Environmental Executive to develop a detailed strategic plan that will be presented annually to the President. In June 2000, the Biomass Research and Development Act of 2000, was passed giving the Initiative its existing structure and authorizing \$49 million in R&D funds.

The executive order has focused new attention on especially the efforts of DOE and USDA to redouble their efforts in R&D and policy initiatives to meet the ambitious goals set forth by the President. Within DOE, the Offices of Biomass Power, Fuels Development, and Industrial Technologies, all have contributed resources for the Bioenergy Initiative. Within USDA, the Economic Research Service, the Economists Office, Commodity Credit Corp., and the Rural Utility Service, among others, have expanded their mission in bioenergy and bioproducts.

Appropriations requests from DOE have increased and Congress has demonstrated bipartisan support for the Initiative. Yet most of the details remain to be decided. As the coordination committee continues its meetings, and actions by Federal agencies in support of the Initiative are planned, the participants at *Bioenergy 2000* offer their observations and recommendations.

The remainder of this paper is

organized into three sections: (a) Obstacles; (b) Key Issues; and (c) Policy and Regulatory Recommendations for State and Federal Governments.

Obstacles: Three major barriers to the development of bioenergy and bioproducts stand out:

- economics, linked to the issue of valuing social and environmental externalities;
- consumer and key stakeholder awareness of bioenergy technologies and feedstocks;
- the absence of a concerted, coordinated strategy among federal government agencies and among state public utility commissions, energy offices, and environmental regulators.

As is most evident in discussions of biopower and biofuels, the demonstrable environmental advantages of biomass feedstocks and technologies are not reflected in the pricing of biomass electricity or cellulosic ethanol. In costs, wood-fired electricity cannot compete with fossil fuels or even wind in certain locales; even ethanol from grain requires a federal tax subsidy to compete with gasoline. While biomass-fueled power plants can operate at seven cents per kWh and cellulosic ethanol may be manufactured for \$1.50-2.00 per gallon, these costs are 20-50% higher than present day fossil fuels can achieve.

Whether the issue is eligible biomass feedstocks in renewable portfolio standards for power plants, the environmental and performance characteristics of biodiesel, or genetically modified tree species to accelerate annual yields, bioenergy and bioproducts do not receive a fair hearing. Misinformation, outdated perceptions and ignorance plague the general public and specific constituencies - including environmentalists and regulators. The early, uneven experiences with

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MSW plants, the strategies of some developers to permit a plant without adequate citizen participation, and the absence of a “glam” factor associated with biopower plants have all contributed to bioenergy’s image problems. Some even argue that the poor understanding about biomass feedstocks and technologies stems from a deliberate misinformation campaign carried out by the fossil fuels, automobile, and waste management industries. Others point to the difficulty of fixing attention upon a renewable resource composed of so many varied feedstocks, technologies and end uses, and very few large companies to command a focus. Yet there is little debate among those working with bioenergy and bioproducts that the general public’s poor awareness about the potential of both is a major barrier to their widespread adoption.

Historically there has not been consistency or coordination in government’s response to expanding the role of bioenergy and bioproducts. Part of the challenge resides in how many instruments of government have some jurisdiction over the fate of the feedstocks and their applications—agriculture, environment, energy, solid waste management, electric utility regulation, and economic development, among others. For some of these responsibilities, the federal government is the major player; for others, it is state government. And in siting power plants or ethanol facilities, local government is the key decision-maker.

Since bioenergy and bioproducts are viewed quite differently from the perspectives of agencies charged with promoting energy production, from those protecting the environment, from those spurring economic development, the need for an overarching mission statement must reside in the upper reaches of

the executive branch—from mayors, governors, and Presidents. That shared mission can only materialize when the constituent parts of government sit down and agree among themselves how best to proceed. Coordination and collaboration between government agencies and industry must also be expanded. The Bioenergy Initiative’s Coordination Office itself is a positive, significant step to effect that collaboration.

**Key Issues:** Virtually every panel touched upon several of the same themes and issues each regarded as critical to the accelerated deployment of bioenergy and bioproducts technologies. These include:

*The need for collaboration among government agencies and between government agencies and industry*—Addressed vigorously by almost every panel, the plea that agencies at all three levels of government work closely with one another and with the private sector resounded at the Conference. International collaboratives were also recommended.

*The breadth and number of policy concerns which impact bioenergy and bioproducts*—air and water pollution, solid waste and landfill management, climate change mitigation, agricultural wastes management, distributed generation, rural economic development, national security, fossil fuel supply and price. This disparate set of issues is a major reason for the call to collaboration among government agencies.

*The importance of educating key constituencies concerning the facts about bioenergy and bioproducts*—Too many myths, stereotypes and misperceptions plague public acceptance of biomass. Educating journalists and the environmental community are two priorities in turning around public opinion. Two additional key publics are regulators

and industry, whose commitment to new technologies will be necessary before widespread adoption can take place.

*The importance of life-cycle analyses in the consideration of energy technology and product manufacturing options*—Life-cycle costing is both an appropriate policy choice and a booster for bioenergy and biotechnology. In both economic and environmental terms, biomass emerges more favorably when the life cycle impacts are fully considered.

*The strategic importance of co-products*—Especially because bioenergy and bioproduct technologies are not yet cost-competitive with their fossil fuel counterparts, concepts such as biorefineries and co-firing gain currency. Where biomass can utilize an existing infrastructure, share an ongoing manufacturing facility or power plant, and/or participate in a process which yields several products, the technologies can triumph. The planned Masada Oxynol ethanol plant in Middletown, New York, utilizing municipal solid waste and recycling several products, is a prime example. And nowhere are the need and opportunity for co-products more salient than among our nation’s farmers.

*The critical need to adopt and enforce appropriate environmental standards*—Especially because most bioenergy technologies are not today cost-competitive—particularly biopower, biodiesel and cellulosic ethanol—environmental considerations are the drivers that matter most. The debate over what fuel additive should replace MTBE in California and across the country is a prime opportunity for ethanol. So, too, biopower can take a more prominent place in renewable portfolio standards which carefully and appropriately factor in environmental impacts. In the next decade,

emissions trading, carbon credits, agricultural run-off regulations, landfill management enforcement, and ozone enforcement should all promote bioenergy and bioproduct technologies.

*The need to build market demand for bioenergy and bioproducts*—Today's attention centers inordinately on building the supply infrastructure for biopower, biofuels and bioproducts. Equally as important are efforts to increase the market demand, which policy initiatives can accomplish. For example, the best way to build quickly a cellulosic ethanol industry is to establish a renewables fuel requirement, expressed as a percentage of total transportation fuel.

*The importance of focusing DOE development efforts on a limited set of core technologies*—the Office of Biopower focus on modular technologies, the emphasis on gasification and the Office of Fuels focus on processing technologies for cellulosic ethanol are critical. DOE wins support for its selection of technology priorities.

### **Policy and Regulatory Recommendations for State and Federal Government:**

#### **A. Research & Development**

Promote technologies that:

- Cut processing costs
- Reduce gasification costs
- Lower biorefinery capital costs
- Improve feedstock quality and uniformity, lower costs, by undertaking genetic research, infrastructure and supply logistics, including processes for handling and harvesting whole plant
- Explore new pathways for biobased products, such as biobased plastics

These are recommendations

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consistent with the federal government's priority to fund long-term, higher risk technologies which are not yet ready for the marketplace. While there is also support for some basic research, the technologies which can address the issues above over the next decade deserve priority attention. So, too, continuing R&D investments in feedstocks are important, with special attention to be paid to understanding and improving the collection, storage, and delivery infrastructure required for both crops and wastes.

#### **B. Procurement**

Government is a major purchaser of fuel and materials. Its procurement actions alone can move emerging technologies into the marketplace more quickly.

Procurement should:

- Incorporate life cycle economic and environmental cost analysis
- Adopt clear, understandable goals for green products
- Offer a green premium for fleets, materials and electricity
- Achieve greater consistency across federal and state agency lines

Attributes and costs not currently accounted for in market pricing should be better understood and made explicit, where possible. Life cycle costing should examine costs from feedstock acquisition to final disposal. Net energy balances should also be determined. Once bioenergy and bioproduct technologies have gained a strong foothold in the economy, the preferences may be relaxed or phased out.

#### **C. Incentives**

Incentives are required to level the playing field with the fossil fuels. Until bioenergy can fairly compete with fossil fuel technologies, private firms will need assistance to mitigate their risks and to cut costs. The recommended incentives should include:

- Investment tax credits to speed the recovery of capital costs associated with new plant and equipment
- Production tax credits, such as those offered for closed loop biopower plants
- Operating incentives to make initial capital costs competitive until economies of scale can drive down costs and/or market demand bids up prices
- Insurance programs to reduce risk of installing new commercial scale technology
- Other business incentives focused on non-profit firms, including federal power marketing administrations

#### **D. Regulation/Policy**

A critical driver for the advancement of bioenergy and bioproduct technologies is appropriate regulation keyed to our environmental protection goals and standards. Among the key attributes of a forward-looking environmental regulation strategy are these elements:

- A renewable-fuel requirement for automobiles and light trucks
- Renewable Portfolio Standards that are informed and consistent for biomass feedstocks and technologies
- Flexibility in the permitting of new technologies, especially for those pertaining to biobased products to assist their ability to compete with fossil-based products
- The implementation of strong emissions trading and carbon credits as cornerstones of regional, national, and international air pollution policy
- The establishment of green labeling requirements
- The creation of a Biomass Reserve Program on marginal agricultural lands
- Adoption of systems approaches and integrated analysis in policy and R&D deliberations
- The thinning of high-fire risk forest lands can be a significant source

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of biomass resources

#### *E. Education*

Among renewable technologies, biomass is singularly misunderstood. Among too many environmentalists, biomass means municipal solid waste. Among others, harvesting wood means old forests will be cut down, and wood-burning means dirty air. Among consumers, corn-based ethanol has a negative energy balance and fuel volatility overwhelms any vaguely known benefits. Among fleet managers, biodiesel is suspect for its performance during cold weather. Among the general public, genetically modified materials are harmful.

To counter the misperceptions shared by so many, the panelists recommend targeting some key constituencies with education and outreach campaigns:

- Environmental organizations
- Journalists
- Industry
- Environmental regulators

If accurate, timely information can be conveyed via reports, workshops, web sites, press releases, documentaries, testimonials, tours, demonstrations, television and radio news, acceptance of bioenergy and biobased products will grow quickly. The efforts of groups like Green-E, defining clearly acceptable biomass feedstocks and technologies, and disseminating widely their consensus-derived findings, render that task easier to fulfill. Similarly, the collaboration between DOE, EPA, and the Regional Biomass Programs in staging state workshops to promote ethanol production have been very useful in educating specific publics. The importance of education and outreach for bioenergy and biobased products cannot be overstated.

#### *F. Collaboration*

The National Coordination Office established to implement the

President's Bioenergy Initiative is a prominent example of what must take place throughout government, between government and private industry, and between the United States and other nations. Among other virtues, collaboration facilitates the ease of locating for interested parties accurate and relevant information about bioenergy and biobased products. Collaboration can hasten the time that R&D pays off for promising technologies and accelerate acceptance of emerging technologies by important constituencies and the general public.

Given the multi-disciplinary aspects of the scientific bases for bioenergy and bioproducts, collaboration is necessary to examine the obstacles, address the promise, and evaluate new technologies. Among specific recommendations are a Grain/Biomass Task Force, collaboratives between government agencies and municipal power agencies and farmers cooperatives, and international information exchanges targeting individual technologies and feedstocks. Greater collaboration among regions, by state governments and regional biomass programs, was also urged.

Seeking a synergy among agricultural, energy and environmental policies is both a prescription for fulfilling the national interest and a prerequisite for accelerating the penetration of bioenergy and biobased products. The coordination office is one of many needed cooperative undertakings. Without a major commitment to collaboration across agency and geographic boundaries, the President's Initiative goals are merely an exercise in wishful thinking.

#### **Regional Biomass Program Honors Five at Bioenergy 2000.**

Every two years at the biennial Bioenergy conference, the U.S.

Department of Energy's Regional Biomass Program recognizes an individual or organization that has made a significant contribution to the bioenergy development. At *Bioenergy 2000*, the following were honored:

**Southeastern—Dr. Donald L. Van Dyne, University of Missouri-Columbia, Department of Agricultural Economics (professor emeritus).** Dr. Van Dyne has been active in various venues of renewable energy development throughout his career. Early on he worked on solar energy issues with the United States Department of Agriculture, but in the past several years at the University of Missouri he has contributed in many ways to the development of bioenergy at the state, regional and national levels.

He has also done very important work in furthering the development of biodiesel in the United States. His 1992 report to SERBEP, *Biodiesel Production Potential from Industrial Rapeseed in the Southeastern U.S.*, built on research done in Missouri, documented the financial and policy issues relevant to successfully commercializing biodiesel in the United States.

A key, if not capstone, report produced by Dr. Van Dyne is *The Economic Feasibility of Converting Ligno-Cellulosic Feedstocks into Ethanol and Higher Value Chemicals*. This report is of national significance as it documents the financial and technical feasibility of the carbohydrate refinery concept long discussed by the Institute of Local Self Reliance and others.

His mentoring of graduate students has provided both valuable data for bioenergy development and well trained graduates to work in government and industry to further these goals. Dr. Van Dyne has been very vital in filling information gaps at state, regional and national levels. On top of his professional accomplishments, Dr. Van Dyne is

*Call for papers  
Fifth Biomass Conference of the Americas*

Orlando, Florida, September 17-21, 2001  
Papers and posters, September 18-20  
Optional technical tours, September 21

Preliminary Topics—Papers are invited on the following topics:

- Biomass resources - advances in biomass production, residues availability, soil sustainability, and related environmental topics
- Bioenergy products - advances in conversion for a wide range of bioenergy products
- Integrating emerging technologies with conventional energy systems - exploring synergisms
- Biobased products - advances in production of commodities, intermediate products, fine and specialty chemicals, and natural fibers and derivatives
- Biomass refineries: the link between biobased and bioenergy products - food/forest products refineries; emerging refineries based on sugars, syngas, and new fractionation technologies
- Environmental and ecological impacts of bioenergy and biobased products - includes life cycle analysis and impact assessment methodologies
- Public/private partnerships - examples of success stories
- Social acceptability of bioenergy and biobased products - international, regional, national, and local approaches and methodologies
- Policies for market development - federal, state, and local programs; policy framework development to accelerate penetration; and incorporation of externalities

For additional information:  
Fifth Biomass Conference of the Americas  
National Renewable Energy Laboratory  
Attention: Dee Scheaffer  
1617 Cole Boulevard, MS-1613  
Golden, Colorado USA 80401-3393  
FAX: +1 303 275 2905

known as a gentleman of high principles and a thoroughly collegial attitude.

**Western—Dr. Larry Baxter, Brigham Young University.** The Western Regional Biomass Program selected Dr. Larry Baxter for his many years of work as a researcher in biomass combustion. Dr. Baxter's work has focused on experimental measurements and theoretical predictions of fuel impurities during combustion. Additional research interests include nitrous oxides and other pollutant emissions, turbulent particle dispersion, and computational fluid dynamics. Prior to his recent appointment to Brigham Young, Dr. Baxter worked 13 years

for the Sandia National Laboratory's Combustion Research Facility. He was principal investigator on projects dealing with biomass, coal, black liquor, radionuclide-contaminated fuels and pyrophoric materials combustion and combustion-related diagnostic development.

Dr. Baxter has authored more than 35 peer-reviewed publications in the area of combustion and related disciplines, and has written two encyclopedia articles and edited one book. Dr. Baxter has a B.S. and Ph.D. in chemical engineering from Brigham Young University.

**Northeast—Vermont Department of Public Service, Montpelier, Vermont.** The Northeast

Region has selected the Vermont Department of Public Service for its many years of support to the development of bioenergy in the State of Vermont and its willingness to work beyond its state boundaries to share its knowledge and help other states. In the past 20 years The Vermont Department of Public Service has formed a strong working relationship with the Department of Forests, Parks, and Recreation and other state agencies to create a "living laboratory" in the state for bioenergy development.

Vermont has been host to tours by hundreds of school officials, forestry industry, and public officials

*(Continued on page 11)*

## BIOENERGY 2000 PANELISTS

**Monday, October 16**

### BIOPOWER

#### *Policy & Regulation*

Moderator: Alan Noguee, Union of Concerned Scientists  
Panelists: Brent Aldefer, Competitive Utility Strategies  
Dale Bryk, Natural Resources Defense Council  
Katherine Hamilton, American BioEnergy Association  
Kevin Porter, National Renewable Energy Laboratory

#### *Environment*

Moderator: Meredith Wingate, Center for Resource Solutions  
Panelists: Stacey Bolton, Enron Energy Services  
Ed Gray, Antares Group, Inc.  
John Irving, Burlington Electric  
Sam Swanson, Pace Energy Project

#### *Resources*

Moderator: Kenneth Skog, Forest Products Laboratory  
Panelists: Janet Cushman, Oak Ridge National Laboratory  
Daniel De La Torre Ugarte, University of Tennessee  
Peter Ince, U.S. Department of Agriculture Forest Service  
Kurt Mackes, Colorado State University  
Alexander Moiseyev, Forest Products Laboratory

#### *Financial & Business Development*

Moderator: Evan Hughes, Electric Power Research Institute  
Panelists: Martha Rollins, Tennessee Valley Authority Public Power Institute  
Dave Ostlie, Energy Performance Systems, Inc. and EPS/Beck Power, LLC  
Robert Elms, North American Carbon, Inc.  
Tim Maker, Energy Efficiency Associates

#### *Technology & Research*

Moderator: Kevin Craig, National Renewable Energy Laboratory  
Panelists: Phil Dougherty, U.S. Department of Energy  
Raymond Costello, U.S. Department of Energy

**Tuesday, October 17**

### BIOFUELS & CHEMICALS

#### *The Bridge to the Corn Ethanol Industry*

Moderator: John Ferrell, U.S. Department of Energy  
Panelists: Kyd Brenner, National Corn Refiners Associations  
Gerson Santos-Leon, U.S. Department of Energy  
Gary Welch, Williams Bio-Energy  
Jim Hettenhaus, CEA, Inc.  
Cindy Riley, National Renewable Energy Laboratory  
Mark Yancey, National Renewable Energy Laboratory

#### *Policy & Regulations*

Moderator: Mary Giglio, Renewable Fuels Association  
Panelists: Jim Czub, New York Corn Growers Associations  
Joe Jobe, National Biodiesel Board  
Elisa Lynch, Bluewater Network  
Daryl Harms, Masada Oxynol

## BIOENERGY 2000 PANELISTS (cont'd)

### *Environment*

Moderator: Peter Iwanowicz, American Lung Association

### *Resources*

Moderator: Kyd Brenner, National Corn Refiners Association

Panelists: Thomas Earley, Promar International

### *Financial & Business Development*

Moderator: Claire Giesen, U.S. Department of Agriculture

Panelists: Jim Goff, U.S. Department of Agriculture

### *Technology & Research*

Moderator: Robert Wooley, National Renewable Fuels Association

Panelists: Norm Hinman, BC International Corp.

Bob Reynolds, Downstream Alternatives, Inc.

Tom Schechinger, Biomass Agri-Products, LLC

## **Wednesday, October 18**

### **BIOPRODUCTS**

#### *The New Old World of Bioproducts*

Moderator: Doug Faulkner, U.S. Department of Energy

Panelists: James McLaren, Inverizon International, Inc.

Todd Werpy, Pacific Northwest National Laboratory

#### *Policy & Regulation*

Moderator: Marvin Duncan, U.S. Department of Energy

Panelists: Steve Johnson, Current Technologies Corp.

M.E. Tumbleson, University of Illinois-Urbana

Don J. Viviani, Environmental Protection Agency

Ron Buckhalt, U.S. Department of Agriculture

### *Environment*

Moderator: Craig Crawford, Canadian Agricultural New Uses Council

Panelists: John Bennett, Sierra Club of Canada

Terry McIntyre, Environment Canada

Mark Stumborg, Agriculture and Agri-Food Canada

### *Resources*

Moderator: Marie Walsh, Oak Ridge National Laboratory

Panelists: John Blaisedell, North Carolina Recycling Business Assistance Center

Steve Jolley, Wheelabrator Shasta Energy Company

### *Financial & Business Development*

Moderator: Robert Harris, U.S. Department of Energy

Panelists: Ron Buckhalt, U.S. Department of Agriculture

Daryl Harms, Masada Oxynol

Cliff Humphrey, National Rural Electric Cooperative Association

### *Technology & Research*

Moderator: David Glassner, Cargill Dow

Panelists: Kathleen Clarkson, Genencor International, Inc.

Ramani Narayan, Michigan State University

Doug Rivers, MBI International

Esteban Chornet, National Renewable Energy Laboratory

## Calendar of Events

### February 18-20, 2001

Las Vegas, Nevada  
*6th Annual National Ethanol Conference: Policy & Marketing*  
Bryan & Bryan, Inc.  
PO Box 159  
Cotopaxi, CO 81223  
Tel: +1 800 567 6411  
email: marci@bbiethanol.com  
www.bbiethanol.com

### February 26-27, 2001

Minden, Louisiana  
*Eco-Industrial Park Roundtable*  
Kathy Craft  
Northwest Louisiana Commerce Center  
2618 York Avenue  
Minden, LA 71055  
Tel: +1 877 459 5120  
www.cfe.cornell.edu/wei/feb01roundtable.html

### March 6-7, 2001

Lexington, Kentucky  
*2001 Kentucky Forest Industries Association Annual Meeting*  
Bob Bauer, Executive Director  
Kentucky Forest Industries Association  
106 Progress Drive  
Frankfort, KY 40601-8695  
Tel: +1 502 695 3979  
Fax +1 502-695-8343  
www.kfia.org

### March 28-April 1, 2001

Salt Lake City, Utah  
*Hearth & Home Expo 2001*  
Hearth Products Association  
1601 Kent Street, Suite 1001  
Arlington, VA 22209  
Tel: +1 703 522 0086  
Fax: +1 522-0548  
Email:  
hpamail@hearthassociation.org  
www.hearthassociation.org

### March 30-April 1, 2001

Shanghai, P.R. China  
*Second International Exhibition on New Energy & Clean Energy 2001*  
Coastal International Exhibition Co., Ltd.  
Rm 3808 China Resources Building  
26 Harbour Road  
Wanchai, Hong Kong  
Tel: 852 2827 6766  
Fax: 852 2827 6870  
Email: general@coastal.com.hk  
www.coastal.com.hk

### April 7-10, 2001

Nashville, Tennessee  
*67th Annual Meeting of the Forest Resources Association*  
Linda Rosenberg-Gibson  
Forest Resources Association Inc.  
600 Jefferson Plaza, Suite 350  
Rockville, MD 20852  
Tel: +1 301 838-9385  
Email:  
lrgibson@forestresources.org

### April 8-11, 2001

Cambridge, UK  
*The XIIIth Global Warming International Conference & Expo*  
Fax: +1 630-910-1561  
www.GlobalWarming.net

### May 23-24, 2001

Louisville, Kentucky  
*Distillers Grains Technology Council*  
Fifth Annual Symposium, Distillers Grains/Distillery Operations  
www.distillersgrains.org

### May 15-18, 2000

Pittsburgh, Pennsylvania  
*2001 Conference on Unburned Carbon on Utility Fly Ash*  
*2001 Conference on Selective Catalytic Reduction and Selective Non-Catalytic Reduction for NOx Control*  
National Energy Technology Laboratory  
U.S. Department of Energy  
626 Cochran Mill Road  
PO Box 10940  
Pittsburgh, PA 15236-0940  
Tel: +1 412-386-5981  
Fax: +1 412-386-4775  
www.netl.doe.gov

### June 19-22, 2001

St. Paul Minnesota  
*17th Annual International Fuel Ethanol Workshop & Trade Show*  
Bryan & Bryan, Inc., PO Box 159  
Cotopaxi, CO 81223  
Tel: +1 719 942 4353  
email: marci@bbiethanol.com  
www.bbiethanol.com

### July 15-19, 2001

Snowshoe, West Virginia  
*24th Annual COFE Meeting, Appalachian Hardwood: Managing Change*  
Joseph F. McNeel, Director  
West Virginia University, Div. Of Forestry  
P Box 6125  
Morgantown, WV 26506-6125  
Fax: +1 304 293 2441  
Email: jmcneel@wvu.edu

### September 17-21, 2001

Orlando, Florida  
*Fifth Biomass Conference of the Americas*  
Dee Scheaffer  
National Renewable Energy Lab  
1617 Cole Boulevard, MS-1613  
Golden, CO 80401-3393  
Fax: +1 303 275 2905  
www.nrel.gov/biomass

over the years. In addition, the Department has sent experts from Vermont to neighboring states to help encourage the development of wood-chip and biomass district heating systems. DPS has been a major player in the FERCO gasifier demonstration project at the McNeil generating plant in Burlington and has shared project management duties with the Vermont Department of Agriculture on the Vermont Methane Demonstration Project. Recently, the Department of Public Service has led an effort to form a regional biomass energy center to provide technical assistance on bioenergy development in the Northeast.

**Great Lakes—Dr. Raphael Katzen, Katzen International, Inc.**  
The Great Lakes Regional Biomass

Energy Program presented its Outstanding Achievement Award to Dr. Raphael Katzen for his years of leadership in the ethanol industry. Dr. Katzen holds a B.Ch.Eng., M.Ch.D., and Ph.D. from the Polytechnic Institute of Brooklyn. He is both a Certified Chemist and a Registered Professional Engineer. In 1955, Dr. Katzen formed Katzen International, Inc., a company that has grown substantially over the years and now includes a group of highly experienced chemical and mechanical engineers, biologists and designers who have been active in a wide variety of chemical and related process industries, specializing in the ethanol industry.

Dr. Katzen and his company have completed projects in over 25

countries. He has provided technological and engineering services for ethanol production facilities with capacities ranging from less than one million to over 230 million liters per year. Feedstocks used include raw sugar, cane juice molasses, cheese whey, corn and waste paper. Dr. Katzen has been a pioneer in the development and commercialization of vapor phase dehydration systems for the production of anhydrous ethanol. Although he is now semi-retired in Florida, Dr. Katzen is still involved with his company in Ohio and continues to provide his expertise to the ethanol industry in the United States and throughout the world.

*Pacific Northwest & Alaska—Howard Haines, Montana Department of Environmental Quality.* Howard Haines is an engineer in the Pollution Prevention

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Program at the Department of Environmental Quality. He has been successful at developing partnerships between private industry and the public sector to solve environmental and energy problems. Mr. Haines was the lead investigator for the Truck In the Park project. This project helped to introduce Yellowstone National Park to fuel-grade biodiesel for their trucks. After nearly 100,000 miles the Truck in the Park project proved that using biodiesel is safer and more environmentally friendly than the use of petro-diesel.

Mr. Haines has also been the lead investigator for the Snowmobile In the Park project. Yellowstone National Park recognized that a snowmobile created pollution 40 times greater than a car. As a result, a research effort was set up to reduce the level of pollution emitted by the use of snowmobiles and to improve the Park's natural environment. The main focus of the study and subsequent field trials was to use bio-lubricants and ethanol fuel as the primary means to reduce emissions. Over the course of the study significant improvements have been made affecting the operation of snowmobiles by making them cleaner and less polluting.

### Switchgrass Project

The Ottumwa Generating Plant, in Chillicothe, Iowa, a 650-megawatt, coal-fired facility, has been retrofitted to burn switchgrass along with its primary fuel as part of a test project. The power plant, owned by Alliant Energy, consumes 450 tons of coal an hour to crank out electricity for about 200,000 homes. It started burning switchgrass as well in late November. By the end of January, the plant will have burned 4,000 tons of the thick-stemmed, native perennial that is easily grown, harvested and baled in southern Iowa. During the next few years, further tests will measure the impact of burning grass on the boiler's efficiency as another 35,000 tons of switchgrass is mixed with coal. Testing will be completed by 2005. The goal is to replace up to 5 percent of the coal with grass. The grass resembles straw and is packaged in large rectangular bales 8 feet long and 4 feet wide. The bales are fed by conveyor into a machine that chops and grinds them into a dust that is blown into the furnace. Preliminary tests conducted October 2000-January 2001 fired at a test rate of 12 tons per hour and offset nine tons of coal, generating approximately 12 megawatts of power. For more information contact Marty Braster, Project Coordinator, Chariton Valley RC&D, +1 641 437 4376.

### Electric Power Trends 2001

The transformation of the North American electric power industry away from economic regulation and toward market competition began more than a decade ago. This fundamental restructuring is still unfolding. Known challenges abound and new ones are beginning to surface, including the emergence of boom/bust cycles, apparent structural flaws such as the disconnect between wholesale and retail markets, transmission gridlock and balkanized markets that threaten reliability, and the increasing and uncertain impact of e-commerce. These issues and more are discussed in *Electric Power Trends 2001*, a publication featuring comprehensive analysis on the driving forces reshaping the electric power business in North America.

The full dataset from *Electric Power Trends 2001* is available on 3.5" diskette. Cost is as follows: 1-4 copies of report plus diskette, US \$495 each; 5-10 copies, US \$395 each. Applicable sales tax and a shipping and handling fee of \$7.50 per single copy and \$5.00 each for multiple copies will be added to each order. Order from Vantage Source Order Desk, 101 Arthur Andersen Parkway, Sarasota, FL 34232, fax +1 941 341 4312, tel +1 800 872 2454 (US, Mexico, Canada) and +1 941 341 2020 (international).