



Seizing Opportunity: Forestry & the BioEconomy

September 20-21, 2007
Ruttger's Sugar Lake Lodge, Grand Rapids, MN

***A Conference Sponsored by
Iron Range Resources and Blandin Foundation***

Conference Proceedings

On September 21st, nearly 150 business leaders, policymakers, researchers, and other forestry interests came together under the banner of *Seizing Opportunity: Forestry and the Bioeconomy*. The conference, co-sponsored by the Blandin Foundation and Iron Range Resources, drew not only a standing-room-only crowd but also extensive media interest and coverage from local and regional newspapers, radio and television.

The goals of the conference were to:

- Improve understanding of the emerging global bioeconomy and the opportunities that currently exist, or that can be created, for Minnesota's forest products industry;
- Develop an action agenda to help northeastern Minnesota businesses and communities take advantage of emerging opportunities;
- Help the forest products industry to parity with the agricultural industry at the state's bioeconomy planning table; and
- Jumpstart technology and investment interest in northeastern Minnesota's forest derived resources.

The conference focused on aligning actors in the region to take best advantage of emerging technologies and markets for the region's forest products industry.

Among many highlights, the Governor hosted his weekly radio address from the conference:

<http://www.governor.state.mn.us/mediacenter/goodmorningminnesota/index.htm>

Included in the governor's extensive comments at the conference was the following quote: "I could not be more excited that you are gathered around this theme. With the help of the Blandin Foundation and Iron Range Resources, we can envision what the future holds for the forestry industry in Minnesota. It is a tremendous opportunity and one that I believe we should invest in."

The conference included several keynote speakers as well as panel presentations. Several presentations are summarized in this document. The full conference agenda and additional presentation materials are available at the conference website:

http://www.blandinfoundation.org/html/public_vital_conf_Bio_07a.cfm

Keynote Presentations

Opportunities in the Emerging BioEconomy: Seeing the Forest through a Different Lens

Dr. Robert Elde, University of Minnesota, Dean, College of Biological Sciences

Dean Elde highlighted the need for forest-based biofuels and bioproducts. His presentation included examples of success stories from other countries and a discussion of the "forest biorefinery" concept. The presentation also provided an overview of the University of Minnesota's renewable energy research and a vision of the future bioeconomy.

In Dean Elde's estimation the most significant near term opportunities within the bioeconomy are likely to be biofuels, and there are two specific areas where Minnesota could quickly move forward to seize opportunities in the bioeconomy.

The first strong possibility is to identify an existing pulp mill where the waste stream can be readily used to produce cellulosic ethanol. Efforts are underway to analyze the waste from three mills in the state. If the qualities of the waste stream are found to be appropriate, a commercial scale biofuels facility could be developed in partnership with that mill. There may be additional opportunities that could be developed around existing mills as well.

A second opportunity is to pursue thermochemical gasification to produce ethanol. Ultimately there is the long-term potential for single operations that integrate biochemical and thermochemical approaches. Partnerships and new initiatives in these areas are developing around the country and Minnesota could be a larger part of the movement. A strategy which builds upon an existing pulp mill's capacity, as well as research at the University of Minnesota that highlights carbon negative possibilities, could strengthen Minnesota's position in the marketplace.

For Minnesota to be effective in developing its bioeconomy potentials, new investments and research approaches will be needed. Minnesota is at a disadvantage on a national scale because we do not have one of the bioresearch centers or a national laboratory. Minnesota will need to identify additional sources of funding and develop regional or multi-state partnership to pursue the emerging opportunities.

Minnesota's Position in the Big Picture: Imagining the Possibilities

Dr. Shri Ramaswamy, Department Head, Bioproducts and Biosystems Engineering, University of Minnesota

Potential petroleum demand/supply imbalances pose a significant challenge for the people and economies of all regions, but particularly those regions such as Minnesota and the Lake States that do not have petroleum or other fossil fuel reserves. On the other hand, regions rich in biomass such as Minnesota and the Lake States may have a substantial opportunity going forward to ensure future energy supplies while enhancing economic growth.

In 2005, renewables accounted for about 86 trillion Btu of Minnesota's energy production or about 7.1 percent of total energy consumption and in 2006 renewable energy production included about 11 percent of electricity, 10 percent of gasoline, and 2 percent of diesel. The state currently ranks 4th in production of wind energy, 4th in production of ethanol, and 8th in production of biodiesel.

It is clear that there is considerable potential for generating electricity from agricultural and forest biomass in Minnesota given the right economic conditions. There is also substantial potential for increasing liquid fuels production from biomass, with the caveat that the technology needed to bring about that payoff is as yet unproven from a commercial standpoint. For example, in the case of bio ethanol, the complex sugars of forest biomass are not the same as in corn and considerable research is yet required to get to the point of economic feasibility. Production of industrial chemicals from biomass offers another great yet-untapped opportunity for Minnesota. The vast majority of industrial chemicals and feedstocks for production of products ranging from plastics and butyl rubber to synthetic fibers and pharmaceuticals are derived from petroleum. As petroleum becomes more expensive, and perhaps less available, the need for new supplies of a wide range of chemicals will arise; the technology for producing many such chemicals from biomass now exists, or is in various stages of development. The stage is set for the emergence of biorefineries, capable of producing energy, chemical, and fiber products from wood and other forms of biomass.

What success will look like is not as yet clear, but one model would be a network of biorefineries across the landscape, coupled with a number of secondary manufacturers of chemical products including bio-plastics, lubricants, medicinal products, synthetic fibers, and so on. Ideally these new industries would generate significant local employment, taxes, and enhancement of quality of life (socially, environmentally, and economically), and would be sustainable over the long term.

Minnesota has several characteristics that support the state's potential to contribute to biomass energy developments. Minnesota's available biomass resources, biomass harvesting standards, and existing forest industry capacities all offer the state a strong starting position. However, the challenges and opportunities associated with biomass energy are larger than any single industry or state interests. For Minnesota to maximize its contribution to the emerging bio-economy and to maximize the benefits to the state's citizens and economy, our actions and strategies need to consider efforts by other public and private interests within and beyond Northern Minnesota.

As Minnesota considers how it might more extensively use its forest resources to increase its participation in the emerging bio-revolution, it is important that decision leaders understand fully what is potentially involved. The prospects for improved energy security, expanded economic activity, and new employment prospects are exciting. Careful thought and planning is needed to ensure that development is not haphazard and that development outcomes mesh with other state values and goals. Whatever is done, it is vitally important that efforts to bolster supplies of one critically important resource – energy, not result in depletion of other critically important resources – soil and clean water.

For more information, see the report: An Assessment of the Potential for Bioenergy and Biochemicals Production from Forest -Derived Biomass in Minnesota, A Report for the Blandin Foundation and Iron Range Resources Prepared by Dovetail Partners, Inc. and the University of Minnesota

http://www.blandinfoundation.org/html/documents/vfvc_bio_07/BlandinIRRBioenergyPaper082907.pdf

State of the State's Forest Resource: What is the Resource? Who Owns It?

Bill Berguson, Program Director, Natural Resources Research Institute

The greatest likelihood of profitable biorefinery development based on woody biomass is in conjunction with pulp and paper operations. Minnesota, therefore, as a significant producer of paper in the U.S., with eight operating paper mills, is in a reasonably good position to capitalize on the biorefinery/bioenergy/biochemicals potential. Minnesota's proximity to the number-one paper producer, Wisconsin, is probably also a positive factor as it increases the likelihood of developing critical mass. Also a favorable factor of wood-based biorefinery development is the presence in the region of leading agri-business companies and cooperatives that are currently leading the way in ethanol and biodiesel development.

Success will likely require an aggressive program of strategic planning and research, investment, collaboration with established energy and industrial chemical producers, and perhaps serendipity. Success may also require incentives in some form to encourage or jumpstart a fledgling industry.

- Legislators and policymakers concerned about the economy of the forested areas of Minnesota should be mindful of the potentially negative impact of energy subsidies on the forest products industry should a competitive environment grow between private industry and government-subsidized industries using the same raw material.
- Support for research at the state level to develop conversion and biomass production technologies, aspen thinning options and impacts, forest harvest residue bundling equipment and conversion technologies is needed,
- Ethanol produced from local wood resources may be competitive with gasoline at current prices,
- Smaller-scale conversion technologies that are publicly available are needed and may require targeted research and development by the State,
- Picking ultimate winners is difficult and the most competitive options will depend on technology advancements in the fields of liquid fuels conversion and batteries.

For more information, see the report: Minnesota's Woody Biomass Resources and Opportunities in the Emerging Energy Sector

A Report for the Blandin Foundation and Iron Range Resources

Prepared by Bill Berguson, University of Minnesota, Natural Resources Research Institute

http://www.blandinfoundation.org/html/documents/vfvc_bio_07/Bill%20B%20-%20Forest%20Resources%20and%20Emerging%20Energy%20Issues.pdf

Conference Outcomes

The conference identified three key opportunities for follow-up action:

- Aligning BioEconomy Opportunities with the Recommendations Developed by the Governor's Task Force

The Governor's Task Force Report includes a recommended harvest level of 5.5 million cords. This harvest level will need to be achieved within the framework for meeting new renewable energy guidelines, maintaining environmental protections, and while helping the industry and local economies reposition themselves to participate in the bioeconomy. The forest industry has the opportunity to significantly contribute to meeting these goals and to serve as a source of energy, products and fuel.

- State Investment in Pilot Scale Projects at Existing Forest Product Facilities

The Task Force included a recommendation to "provide state investment in pilot scale projects at existing forest products facilities to test next generation bioenergy technologies." This recommendation offers clear opportunities to support bioeconomy developments in a strategic way that takes advantage of Minnesota's existing capacity. To ensure action on this recommendation, Iron Range Resources will convene a group that will develop specific pilot project ideas. Developing pilot projects and research efforts that support the development of a bioeconomy in northern Minnesota will be a priority for Iron Range Resources.

- Developing a Regional Research Agenda

The conference highlighted the need for a regional research agenda, and the need to create opportunities for scientists and researchers from across institutions to partner. Collaborative efforts are likely to increase both efficiencies and impacts by making the capacities of the Upper Midwest region more comparable and competitive with current research leaders on the West and East Coasts. Regional success will require collaboration and strong partnerships between government, for-profit and non-profit sectors.

Participant Feedback about the Conference

Conference evaluations indicate that nearly every participant (98 percent) agreed that the conference improved their understanding and appreciation of the challenges and opportunities of the growing bioeconomy for Minnesota's forest industry. The same percentage indicated that the conference helped establish or reinforce professional contact with people who are working towards enhancing the role for forestry resources in the bioeconomy. Most participants (85 percent) agreed that the event laid the foundation to begin developing an action agenda to help businesses and communities take advantage of the bioeconomy.