Summary of the October 2009 Forum
Center for BioEnergy Sustainability (CEBS)
"Social Dimensions of Sustainable Bioenergy Development"

Amy Wolfe introduced Kathleen Halvorsen from Michigan Technological University's Department of Social Sciences and the School of Forest Resources and Environmental Science, who specializes in natural-resource and forestry policy.

Michigan Technological University (MTU) has been working on a project on woody bioenergy entitled Wood to Wheels. It also has groups investigating climate-change-related beliefs; willingness to pay for cellulosic ethanol; overcoming obstacles to biomass utilization; federal policies; diffusion of cellulosic ethanol technology; and interconnections among nonindustrial forest landowners, sustainability, and bioenergy.

In the social-science landscape, there are has three major environmental concerns:

1. Environmental sustainability and bioenergy;
2. Impacts on communities and landowners; and
3. Overcoming obstacles to large-scale, sustainable, bioenergy development.

Research has found that people believe a lot of misinformation about global warming. Now, 65% of Americans are greatly or fairly worried about global warming. However, only 35 to 40% think it will affect *them*.

Questions that are being addressed by her research include: What climate-change-related beliefs do the residents of the upper Midwest public hold? And how do these beliefs affect the populace's support for energy-related mitigation strategies?

Interviews, a large-scale survey (1500 residents with a 52% response rate), and a telephone survey of 9% of the nonrespondents were conducted. On a scale of 1 to 5 (strongly disagree to strongly agree), respondents indicated that they

- Were familiar with the topic of climate change (4.6 mean response)
- Were concerned about climate change (3.6)
- Believed that climate change will have serious impacts (4.0)
- Were skeptical about climate change's existence and causes (2.5)
- Had accurate knowledge of climate change causes and solutions (3.7)
- Had inaccurate knowledge of climate change causes and solutions (3.6)
- Held New Environmental Paradigm beliefs (3.9)
- Were willing to support mitigation strategies through personal sacrifice (e.g., by adopting biofuels, energy taxes, and conservation) (3.0)

The survey showed that the respondents had a lot of misinformation as well as a lot of good information.

A regression analysis was performed on the statements of concern about climate change. The factors that were statistically significant were the belief that climate change will have serious impacts, skepticism about climate change's existence and causes, the holding of New Environmental Paradigm beliefs, and political orientation. A regression analysis of the willingness to support mitigation showed that the statistically significant factors were concern about climate change, accurate knowledge of climate-change causes and solutions, the holding of New Environmental Paradigm beliefs, age, income level, and political orientation. Willingness to pay more for cellulosic ethanol turned out to be

related to income, female gender, liberal political views, climate-change beliefs, and climate-change solutions.

Some important questions are raised by this work and need to be answered. To address these questions, an enhanced public and community dialogue, realistic information regarding the costs and benefits of bioenergy development, and an expanded public-agency and academic role in facilitating the growth of the bioenergy industry are needed.

What has been found is that the existing process of grain ethanol development can be problematic, future development may benefit communities and small landowners, and the community capacity to choose needs to be enhanced.

In terms of feedstock availability, MTU has been looking at public lands. One issue is the very restrictive Energy Independence and Security Act Renewable Fuel Standard (EISA RFS) definition of renewable biomass. It excludes anything coming off federal public lands. Another issue is experience with state and federal fire-risk reduction, which demonstrates the difficulties involved with the efficient, large-scale removal of biomass from forests.

Case studies were conducted of a number of biomass-use projects, and 150 interviews were conducted at ten sites where fire-risk-reduction projects are being carried out. Surprisingly, the findings often undercut conventional wisdom. Conventional wisdom says that one needs a guaranteed supply of woody biomass. In actuality, people are bypassing federal lands. Conventional wisdom says that biomass is a low-value product. In actuality, it can be pretty valuable. Conventional wisdom says that transportation costs can be prohibitive. In actuality, transportation costs are important but have a lot of dependence on the extent and quality of roads. Conventional wisdom says that collaboration is needed among nongovernmental organizations, landowners, industry, and governments to make this work. In actuality, demand rather than collaboration is really important. And conventional wisdom says that NEPA compliance would be prohibitive. In actuality, NEPA's demands are not so great, and environmental concerns often require the forest thinning.

Other findings from the case studies are that the availability of forest-product waste is market dependent; most family forests have no or poor management plans; ensuring supply dependability is difficult; energy independence is a powerful argument; and 70% of landholders said that they would sell forest residues as bioenergy feedstocks.

Surveys in and around Iowa showed interest, skepticism, and caution among farmers. Conversion of agricultural land to woody-biomass production was seen as profitable if there is a system of carbon credits in place. In addition, 65% of upper Midwest farmers said that they would be willing to sell their crop residues for cellulosic ethanol production.

In terms of innovation diffusion, federal policies, and cellulosic ethanol, it was found that

- Cellulosic ethanol is cost-competitive with gasoline and grain ethanol.
- There are three life-cycle stages: landowners, producers, consumers.
- The problems associated with landowner oversight and risk reduction are huge; and the majority of components focused on reducing risk to producers; landowners and consumers are overlooked.
- Landowner oversight is particularly problematic.

The Michigan Center for Energy Excellence is currently seeking to deepen the understanding of obstacles to cellulosic ethanol development in Michigan and is looking at ways to overcome some of those obstacles. The nonindustrial private forest (NIPF) research component is currently conducting interviews to determine forest managers' experience and future plans; the values, beliefs, and goals that are held regarding sustainability (in terms of wildlife, soils, wetlands, timber, and invasive species); the values, beliefs, and goals held regarding woody bioenergy opportunities and cellulosic ethanol markets; and the willingness to pursue energy cropping.

The key social-science questions about bioenergy and sustainability are

- What is a realistic assessment of feedstock availability, given the complex constraints and landowner goals?
- How does one provide community and public capacity to weigh tradeoffs and make bioenergy decisions?
- What are the linkages between cutting-edge biophysical science findings about bioenergy sustainability and public values?

In summary, the work at MTU has shown that an understanding of climate change is linked to support for cellulosic ethanol, there is a high willingness to support cellulosic ethanol, new tools are needed to provide a public/community dialogue and information regarding tradeoffs, feedstock availability from public and private lands is a key issue, and federal policies do not focus enough on landowners or consumers.

Discussions during the question-and-answer period established that, from Gallup Poll data, it appears that the general concern about global warming has been stable pretty much over the past decade. At the same time, personal concerns about the effects of global warming (that it will actually hurt a person) seem to have increased. However, those people who recognize the threat of global warming still comprise a minority, and that is a problem.

The data gathered by the surveys indicate that older people are more willing to pay extra for cellulosic ethanol. That factor probably covaries with income level. In general, older people tend to be less environmentally conscious.

Many people in the survey area are aware of the availability of wood for home heating. However, few people understand the role of wood in mitigating global warming.

Among the wrong beliefs about climate change that people hold are that greenhouse gases can be filtered out with a catalytic converter and that the ozone hole is causing climate change (20% of respondents).

Currently, forest-product residues are already being used for competing purposes. This is especially true with paper mills and other wood-processing mills. The big question is how much it will cost to get those residues off the land. Crop residues would be available for removal if the farmer were paid enough. Nutrients, friability, moisture conduction, and other soil-health aspects were not considered.

Asked what "enhance the capacity to choose" meant, Halvorsen replied that the community needs to understand what it is getting into and that information resources are therefore needed. Communities need to build up their values. They need to become aware of opportunities that are available to them. A network of people is needed to bring about that awareness. There are not enough extension agents, and private foresters come from a different school of thought.

There are certain minimum plot sizes that are meaningful. The National Woodland Owners Survey of the USDA Forest Service looks at plots that are 10 acres and larger; loggers want at least 40 acres; and industry wants to operate with 200 to 500 acres. Other values (e.g., the provision of wildlife habitat) come into play with smaller landholdings.

Presentation Slides