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Hearing on Renewable Energy
January 10, 2007
Committee on Agriculture, Nutrition, and Forestry
United States Senate

The Future of Farming Beyond Food and Fiber: Energy and Environment

Chairman Harkin, Ranking Member Chambliss and Members of the Agriculture Committee:

I am delighted to be with you today to discuss the direct relationship between renewable energy and conservation. It is a particular honor to be here to present to the first meeting of the Agriculture Committee attended by Minnesota's new Senator, Amy Klobuchar. Senator Klobuchar joins Senator Coleman in promoting the policy visions of Minnesota, a state at the forefront of agriculture, renewable energy and environmental responsibility. I am the Senior Policy Analyst for the Minnesota Project, and a fact you might not know about us is that the outgoing Senator from Minnesota, Mark Dayton, founded the Minnesota Project twenty eight years ago this month. I have had the honor of working for the organization from the beginning, starting with my internship from graduate school at the Hubert H. Humphrey Institute for Public Affairs. Then-Senator Humphrey also served on this very Committee, so in a way a circle is being completed for me today.

The Minnesota Project connects people with policy, to build strong rural economies, vibrant communities, and a healthy environment. We focus on profitable farms that protect the environment, renewable energy, and markets for local foods. We are leaders in fostering collaboration among diverse organizations – and have played a role or led in the creation of the Sustainable Agriculture Coalition, the Midwest Agriculture Energy Network, the National Campaign for Sustainable Agriculture, Minnesota's Clean Energy Resource Teams, and 25 x 25. The Minnesota Project's long-time programs on conservation policy and renewable energy are now converging on the exciting opportunities of biomass energy.

The Farm Bill Shapes the Future

The significant question for the next farm bill, as for all farm bills, is what do we want for the future of agriculture? What policies will bring about an agriculture that benefits our children and future generations? We believe we are undergoing a fundamental shift in the American perception of farmers. Definitely, they produce our food and fiber, but now they are also called upon to produce renewable energy and clean water and a more stable climate. Policy enacted in the next farm bill can help farmers be even better stewards of the land while they help solve our nation's energy and climate change problems. What a fantastic opportunity we face, one that is bringing hope and a path to a bright future for rural America.

That is my main point today: that we must ***design the policies that simultaneously meet objectives for energy, the environment, and rural prosperity***. If we do it right, we can continue food production and expand the pool of biomass feedstocks in a way that achieves all of these objectives at the same time. On the other hand, ***if we do it wrong***, we may find that environmental tragedy and rural decline will overwhelm the hopes of renewable energy and create a backlash against the ethanol industry and farmers. We stand at the crossroads and must ***steer the change in the proper direction***.

Environmental Benefits of Biomass

To be specific, I'm talking about opening the door for ***agricultural production of cellulosic biomass on a major scale***. We need to shift the policy focus from annual energy crops, with attendant soil tillage, chemical use, erosion and habitat loss – to perennial crops, with the opportunity for building up soil quality, little soil disturbance, few chemicals, and managed habitat. Switchgrass is not the only feedstock; different cellulosic materials appropriate to every region of the country might include prairie grass mixtures, alfalfa hay, and woody crops like poplar trees, willow, and hazelnuts. Perennial energy crops are the best bet for cleaning up the nation's water quality and shrinking the Dead Zone in the Mississippi River's Gulf of Mexico. If done right, cellulose production could be an excellent way to restore wildlife habitat for hunters, birdwatchers, and fishermen.

Biomass from agriculture is the way for every region of the country to create an industry matched to its land and people. While ethanol is the likeliest way to use biomass, other conversion research shows that direct burning, gasification, conversion to electricity, thermal heat, hydrogen fuel cells, butanol, and even fertilizer may be produced by biomass. We share a vision of a locally owned energy plant every 25-40 miles – using different feedstocks, different processes, and making different energy products and bio-products.

Climate Change and Biofuels

Perennial biomass crops can also play a key role in global warming that has not been widely recognized. Biomass renewable energy is a triple winner at slowing climate change – if it is done properly.

- First, burning these fuels does not increase carbon emissions at all -- the carbon going into the air was taken out of the air while the crop was growing.
- Second, we can grow the biomass crop in ways that reduce the total carbon in the atmosphere by capturing the carbon in the soil. Untilled soil, with perennial grasses, woody crops, or no-till annual crops, captures the carbon held in the roots, leaves and stalks left on the soil. Agriculture is already implementing private-market carbon credit trading in the Midwest, rewarding farmers for sequestering carbon. A critical distinction is that ***tillage of any sort – plowing or even conservation tillage or disking – will undercut the carbon capture effect***.
- The third way for biofuels to be part of the global warming solution is by producing ethanol in plants powered by renewable fuels instead of fossil fuels like coal and natural gas. Indeed, the Central Minnesota Ethanol Cooperative in Little Falls, Minnesota, is doing just that – gasifying wood wastes and ag residues to run their operation. Their ethanol will go the farthest to displace fossil fuel carbon emissions.

Preparing the Way for Biomass

Corn ethanol is now a huge success and growing rapidly. It is not surprising that corn came first, since it builds on two very well established areas of expertise – growing corn, and making whiskey. Soy diesel and wind farms were logical next steps. But it also took two decades of carefully designed state and federal policies to provide the right mix of incentives.

We know corn and beans will approach their limits soon. Minnesota ecology Professor David Tilman reports, “Neither of these first generation biofuels can replace much petroleum without impacting food supplies. Even dedicating all US corn and soybean production to biofuels would meet only 12% of gasoline demand and 6% of diesel demand.” (Proceedings of the National Academy of Sciences, July 12, 2006.) Any attempt at great expansion in cropland acreage is going to meet a backlash of concern due to existing levels of water pollution and habitat loss. But cellulosic feedstocks can produce more net energy per acre than corn while protecting the environment. The full range of cellulosic crops could eventually produce a significant portion of the oil we now import from the Persian Gulf – making a necessary contribution to energy independence.

Fortunately, we can look to the future and create the policies that will bring biomass energy up to speed, and do it very quickly. It won't happen overnight – but the next five years, the duration of the 2007 farm bill, is precisely the window of opportunity we need to accomplish the necessary steps for biomass energy to blossom, just as wind and corn ethanol are blossoming now in response to previous policies.

Keep in mind, even biofuels are not the silver bullet – nothing is. Switching to renewables must go hand in hand with aggressive energy efficiency policies. If we double our demand for oil in the next twenty years, nothing farmers can do will help.

Sustainable Biomass

We suggest that cellulosic crops should be prioritized according to their sustainability. For example:

1. Perennial crops, with mixed species preferable to single species.
2. Crop rotations that include two or more years of perennials such as alfalfa.
3. Annual crops using a cover crop or no-till.
4. Annual crops using minimum tillage (in strips or ridges)
5. Annuals crops using conservation tillage

We are most excited about the most sustainable option, mixtures of grasses and other perennial plants that mimic the prairies, which may be the best option for delivering high production with low inputs, while also contributing to water quality and wildlife habitat.

On the other hand, conservationists are extremely concerned about overly aggressive removal of crop residues, like corn stover or wheat straw. Residues are slated to be the first cellulosic feedstocks used in American ethanol production. But residues are not just waste; those leaves and stems feed the soil and are central to soil quality. Leading scientists at the USDA Agricultural Research Service recommend that *stover should never be harvested from highly*

erodible acres, from moldboard-plowed fields, or from corn/bean rotation acres. On continuous corn, only 20-50% of stover is safe to remove if we want to retain the organic matter that builds healthy soils, thus ensuring the productivity of the land for future generations.

Policy Options

- The ***Conservation Security Program*** is perfectly designed as a working lands program to deliver incentives to encourage farmers to plant energy crops. It already offers incentive payments to farmers to use renewable energy, to produce renewable electricity, and to reduce their own net energy usage. It would be a simple matter to design a major new enhancement payment for establishing perennial energy crops according to a conservation plan that maximizes water quality, soil quality, crop diversity, and wildlife-friendly management practices. CSP has proven its popularity on the 16 million acres already enrolled – but it needs full funding as passed in the 2002 farm bill, and must be open to all farmers who can meet the rigorous soil and water requirement. Then it could be the vehicle for millions of acres of biomass establishment that meet high sustainability criteria.
- Some are eying the Conservation Reserve Program for biomass harvest, but we do not think it is appropriate to compromise the soil, water, and wildlife values for which this land retirement program was designed. Furthermore, we probably ought not to think about biomass as something you grow primarily on marginal land. Cellulosic ethanol must compete with oil and corn ethanol, and it is probably going to pencil out best with good productivity on good lands.
- ***Land already coming out of the CRP***, on the other hand, should receive significant incentives to keep that land in cover, including pasture, hay, and perennial biomass crops for future harvest. Automatic eligibility to enroll in the Conservation Security Program, access to other conservation programs, and other incentives ought to be offered to encourage post-CRP land to stay in permanent cover to retain the environmental benefits from the nation's CRP investment.
- Other ***new biomass establishment incentives*** are sure to be considered – such as a biomass reserve of several million acres. We think the basic goal should be to get farmers to start the transition to perennials, so that when the market appears in a few years, some farmers will be ready and others will quickly learn from their neighbors how to grow those crops and expand the supply chain. An alternative smart investment is a sustainable biomass innovation grants program, patterned after the Conservation Innovation Grants program, incorporating some aspects of a biomass reserve but on a targeted scale involving research and gradual growth of both supply and demand. In either case, an array of energy crops including switchgrass, other native prairie species, fast growing trees, and other emerging perennial energy crops should be encouraged, with a strong research component. We know these demonstrations may not actually be harvested and marketed until a local facility is constructed, but in the meantime the environmental benefits are there. Incentives should be flexible enough to allow farmers to try to make a profit in the meantime, such as by selling hay, hunting rights, seed, etc. Certainly, no additional incentives are needed for corn, corn stover, or soybeans.
- Develop ***sustainability criteria*** for all farm bill programs relating to renewable energy. Every program that funds research, grants, loans, cost-share or incentive payments related to renewable energy should use selection criteria that promote the most environmentally

sound options. A list of such criteria can be found in the farm bill platform released by the Sustainable Agriculture Coalition (www.msawg.org)

- **Locally owned, community based** production is an essential component of ensuring the sustainability of renewable energy. Rural communities need to have an equity stake in emerging ag energy industries in order to participate fully in the wealth that will be generated. Frankly, they need an ownership stake in order to welcome the facilities and infrastructure to their communities. Policy incentives need to be targeted to local ownership, including financing tools for farmers with limited liquid assets to invest. Support for development capacity is also key, including the Section 6401 Value Added Producer Grant Program, the Rural Cooperative Development Grant Program, and the Resource Conservation and Development Program.
- All land that produces biofuels --whether corn, residues, or perennial biomass -- ought to have access to **conservation programs** that assist both financially and technically on natural resource needs. For example, a field of mixed prairie grasses might set aside a few acres for a restored wetland, or provide an unmowed habitat area. Energy crop production should be accompanied by nutrient management, water quality protection, soil and tillage management, residue management, and wildlife habitat. Adequate funding for opportunities to enroll in the Environmental Quality Incentives Program, Wildlife Habitat Improvement Program, Wetlands Reserve Program, Conservation Reserve Enhancement Program, and Continuous Conservation Reserve Program can help.
- **Conservation Compliance** requirements ought to be reinvigorated. It is more important than ever for farmers to meet their erosion control plans on highly erodible acres as a precondition of any type of federal subsidy. Yet a GAO report on compliance (GAO-03-418) shows that USDA is not effectively implementing compliance. We should fix the enforcement problems, and then consider extending its reach to cover excessive erosion and nutrient management on all cropland receiving any program and insurance benefits.
- **Conservation Planning** is something that every farmer ought to be doing, but frankly it happens only rarely. We support a package of incentives and technical assistance so that farmers getting into renewable energy production can look at all their resource problems and opportunities. A new farm enterprise is the perfect time to create a conservation plan to prevent problems, create solutions, and find synergy. As for corn stover and other residue removal for energy, **consider requiring the ethanol plant itself to require a conservation plan** from every farmer who sells them residues. One cellulosic developer told me they would only contract for 25% of the stover from a farmer, because they want to keep the soil productive. In addition, the nation's private agronomists and crop advisors should be offered USDA training and certification to help farmers create conservation plans.
- **Research** is a top priority that requires accelerated public investment. Which combinations of plants work best in which regions; how to expand seed supplies; what are the best cultivation, harvest, and storage techniques; which enzymes work with which cellulosic crops; how can refineries be created with local ownership; what is the right design for localized scale refineries; how should we deal with the increased phosphorus from livestock fed ethanol byproducts; and can farmers return ethanol byproducts to the fields for fertilizer – these are urgent questions that the private sector might not invest in, but government should. The Initiative for Future Agriculture and Food Systems is one existing program that should include a major commitment to outcome-based research on

sustainable biomass and energy production systems. Another critical policy is to require that land-grant universities not license and control their new plant varieties or cellulosic enzymes, but rather keep them in the public domain so that farmers and local energy companies can benefit from the public research investment without excessive tech fees and licenses.

- ***A Research Clearinghouse*** should be created so we have a nationwide innovation information exchange program to expedite sharing of research and demonstration experiences, with a priority on diverse systems with perennial plants responding to regional needs and capabilities.
- ***Expand the funding for Section 9006 Renewable Energy*** grants and loan guarantees for farmers and rural communities to make improvements in energy efficiency and create renewable energy production systems.

Policies like those enumerated above will help America simultaneously spark profitable new industries in renewable energy at the same time that we solve our persistent natural resource problems. Farmers will prosper, rural communities will grow, climate change will slow, the environment will improve, and we will finally be on the road to energy independence.

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