

## MINUTES OF THE SENATE AGRICULTURE COMMITTEE

The meeting was called to order by Chairman Derek Schmidt at 8:30 a.m. on March 3, 2004 in Room 423-S of the Capitol.

All members were present.

Committee staff present:

Raney Gilliland, Legislative Research  
Lisa Montgomery, Office of the Revisor of Statutes  
Robert Myers, Committee Secretary

Conferees appearing before the committee:

Dr. Richard Nelson - Engineering Extension, Kansas State University, Manhattan

Others attending:

See Attached List.

Dr. Richard Nelson appeared before the committee in order to give a briefing on the use of switchgrass as an alternative energy source. He stated that his presence before the committee was due to a call that he had received from a constituent within the district of Senator Lee, bringing to his attention the use of switchgrass there as an alternative source of both electricity and heat. Using a PowerPoint presentation as an aid to his briefing, he began with a quick overview energy issues, both nationwide and worldwide. He pointed out that petroleum will remain the primary source of energy through the year 2025, by which time electricity consumption is expected to have increased by almost 50%. Furthermore, he highlighted the fact that Kansas is a net energy importer, thus indicating the state's future reliance on increasingly unstable countries such as Saudi Arabia for petroleum imports. He used this reasoning to justify his claim that Kansas needs to begin developing its own energy base by way of exploring the use of different resources, such as switchgrass. He continued by giving a listing of biomass resources in Kansas, indicating that the following are the most plentiful:

- soybeans
- urban wood wastes
- primary and secondary wood wastes
- tallows, lards, and greases

In addition, with regard to these and other mentioned biomass resources in Kansas, he stated the following four general end-uses:

1. Combined heat and power (i.e., the burning of a biomass resource in order to generate electricity)
2. Large-scale thermal heat
3. Small-scale thermal heat
4. Liquid fuels, for example biodiesel and bioethanol

He concluded this aspect of his briefing by stressing that Kansas does indeed have an extremely energetic, economic, and environmental potential with regard to the production of bioenergy, pointing out though that it remains a very underdeveloped field.

Dr. Nelson switched to a more specific focus, providing the committee with an overview of switchgrass and its presence in Kansas. He noted that it has a root system of approximately ten to twelve feet, thus allowing for efficient use of water, even during periods of drought. In addition, he stated that 80% of one square mile planted to switchgrass would roughly equal the energy provided by 5,500 barrels of oil. He also indicated that it is a perennial plant, requiring only fertilization following its establishment on a given area of land.

Dr. Nelson stated that the burning of switchgrass would most likely be performed in competition against the use of coal as an energy source. He thus provided a list of both environmental benefits and energy advantages that make switchgrass an appealing alternative. The environmental benefits are as follows:

- rainfall and wind soil erosion reduction
- surface runoff reduction
- nitrogen and agricultural chemical mitigation
- increased soil organic carbon

## CONTINUATION SHEET

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- “closed” carbon loop (i.e., whatever carbon is produced from the burning of switchgrass at a facility is later used to help the growth of the next year’s crop)

The following are the mentioned energy advantages:

- switchgrass contains almost 16 million Btus of energy per ton
- switchgrass has a sustainable energy-profit ratio of 6 to14 at the field edge (i.e., for every unit of energy put into switchgrass, anywhere from 6 to14 units of energy are produced)
- co-firing switchgrass offers the lowest cost renewable electricity

He further portrayed switchgrass in a positive light due to its allowance of efficient of utilization of waste heat in combined heat and power (CHP) applications. He declared these CHP applications as being favorable, partly due to their utilization of already-proven technologies, for example turbines and reciprocating engines (Attachment 1).

The next meeting is scheduled for Tuesday, March 9, 2004.