



**Presentation to the Faculty, Montana State University – Northern, Havre, Montana
By Dr. Duane Acker, member, 25x'25 Agriculture/Forestry Steering Committee and
President Emeritus, Kansas State University, July 9, 2008**

Chancellor Groseth, Dean Kegel, faculty, students and guests: On behalf of the Steering Committee of 25x'25, I express thanks for inviting us to your campus and commend you for your interest in the work of 25x'25, enhancing the energy security of our country.

Universities play an increasingly important role in U.S. society and its economic future. This country exists - - we exist - - in a highly competitive global economy and global society. Universities not only prepare many of the country's future leaders, through research, Extension and other education programs, universities help our citizenry and our industries adapt to and compete in that global society and global economy.

Billions of dollars move electronically among countries daily. One cannot buy a wardrobe or a week's groceries without purchasing items from another country. In turn, Montana's economy depends heavily on exports of wheat, beef and other products. Many of your graduates work in other countries; some no doubt work in this country under non-U.S. supervisors, in foreign-owned companies.

Nowhere, however, is global competition more evident or more consequential to our economy and our level of living than in energy. We depend heavily on import oil. We purchase tremendous volumes from the major sources, all politically fragile countries and areas, including Near East, Nigeria, Russia, Venezuela. And, other countries, with expanding economies, such as China and India, want and need that oil.

Our energy security and, consequently, our economic security and the security of our level of living are at high risk. As citizens and as leaders we have a responsibility to help diminish that risk, to help enhance our energy security.

25x'25 is a group of agricultural and forestry leaders who accept part of that responsibility. The land is where most of the energy of the sun, wind and water - - and geothermal energy - - is captured. We believe that those who control the land, largely farm, ranch and timber managers, have an obligation - - to see that such energy, especially that of the sun and wind - - is captured to the maximum extent and converted to useable form. They can help, and are helping, enhance U.S. energy security.

We have a vision, that: “By 2025, America’s farms, ranches and forests will provide 25 per cent of the total energy consumed in the United States, while continuing to provide safe, abundant and affordable food, feed and fiber.” More than 700 organizations and entities, national, state and local, have expressly endorsed this vision.

In recent days, the issue of fuel vs. food has received much attention. To avoid misleading people, we should divide this into two separate and different issues, fuel vs. food and fuel vs. animal products. Ethanol and biodiesel are made largely from the same grains that poultry, pigs, cattle and lambs eat. The prices of such feed grains have consequently increased. Animal products will cost more. As this adjustment takes place, animal producers are caught in the middle. Such is common whenever there is a big demand shift, in this case, for an energy product.

However, the impact on foods that people eat directly is negligible. People generally eat other carbohydrate sources - - rice, wheat, cassava, potatoes, and yams. Increased transportation/fuel cost has had more impact on those prices.

This demand for energy product from the land represents an extraordinary opportunity for economic vitality in Rural America. Conversion and transportation/transmission facilities need to be built, staffed and serviced. Biomass volume will increase.

Our effort is to encourage and support those who manage the land, and those related thereto, to see and accept the challenge and opportunity.

Colleges and universities, along with government laboratories and agencies and the private sector, also have an obligation. That obligation includes, for example, developing the genetic materials and yearlong production/handling systems for the biomass volumes needed, as well as the conversion technologies. Scientists need to search the index to Mother Nature’s Book of Knowledge. They need to turn open the pages in that book that have not yet been turned. They then need to read, interpret and teach students, industries, and the public from those pages.

Universities are a tremendous resource in this effort to enhance the country’s energy security. What are their highest priorities? We asked a number of recognized scientists and educators to identify what they considered highest priority for research and education. The result is a five page 25x’25 “position paper” published in the March, 2008 issue of the NACTA Journal. Here are some of the highlights of that paper. (The full paper is available at www.25x25.org/researchandeducation.)

Though conversion technologies for water and geothermal are relatively mature and long applied, much is yet to be done to enhance the economics of wind and solar conversion. Top priorities are modeling systems to mesh variable wind and solar generated electricity with other generation sources and the modeling of collection and transmission systems. The federal Department of Energy and the private sector carry major roles here; however, there is plenty of room for university creativity to have impact.

In the case of biomass conversion, scientists urge continued work on multiple biological and thermo-chemical technologies that may lead to a variety of energy products. An example issue is lowering enzyme cost for fermentation, by seeking or, by genetic engineering, developing those organisms that will produce more enzyme or enzymes that attack both five and six carbon sugars. Another is fractionating biomass feedstock, with certain components going to fuel, others to more valuable co-products. Significant to the ever changing timber industry would be adapting cellulosic conversion technologies for implementation in existing pulp or other wood processing plants.

Some may assume that with the extraordinary yield increases seen in U.S. grains, little work needs to be done in grain production systems. That is not the case. For U.S. energy security, as well as for maintaining affordable feed supplies for our animal product industry, we must accelerate those yield increases. And, we must do that while maintaining and enhancing the natural resource base - - the soil and water and plant/animal diversity on which sustainable agriculture is based.

We must also replicate in cellulosic crops, such as switchgrass or short-generation trees, as well as additional oil crops, the genetic and production system enhancements that have been achieved with corn, wheat and soybeans. There is an increasing need for plant and soil scientists, microbiologists, and other scientists who will lend a hand to this effort.

Biofuel quality and uniformity is especially important to both users and processors. We commend MSU-N and Montana leadership for stepping forward to address this need with your Biodiesel Certification Laboratory, and we also note that a fellow member of our steering committee, Al Ryder, was on hand for your open house in March.

Now, to education: Community and technical colleges respond quickly to employment needs. As investments are made in wind farms, biodiesel or ethanol plants, investors usually work closely with community colleges in developing needed curriculums and training programs.

Within universities the need is to incorporate energy as a product into curriculums, including into a broad array of both undergraduate and graduate courses, to fully acknowledge that agriculture, including forestry, has moved from a food, feed and fiber industry to a food, feed, fiber and fuel industry. Examples: In an agricultural engineering or crops course, production/harvesting systems for year-round delivery of biomass. In an animal nutrition course, maximizing the use of distiller's grains in poultry rations or searching future cellulosic conversion for ruminant ration ingredients. Or, in a political science, community development or sociology course, the steps that should be taken to achieve community acceptance of an ethanol or biodiesel plant or a wind farm.

Off-campus and state-wide education is a part of the task, via Montana State University's Cooperative Extension Service and other forms of continuing education. People need knowledge, from production and handling biomass to conversion technologies to cost/benefit of wind energy projects to energy conservation in homes and businesses.

There is much to be done. Each of us must do our part.

On behalf of the 25x'25 steering committee and its 700-plus vision-endorsing partners, I thank you for your interest and your attention, and I invite and encourage MSU Northern and each of you to play your role to the fullest, in helping enhance this country's energy security.

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