



MINNESOTA DEPARTMENT
OF AGRICULTURE

NextGen Energy Board

2012 Report to the Legislature

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Executive Summary

The NextGen Energy Board was created by the Governor and the Minnesota Legislature in 2007. By law, the Board's purpose is to explore policies and opportunities for the state "to most efficiently achieve energy independence, agricultural and natural resources sustainability, and rural economic vitality." The Board is comprised of 20 members—including 8 who are appointed by the governor—from state government, the legislature and stakeholder groups.

In 2010 and 2011, changes to policies and the economic climate for biofuels at both the state and federal level led the Board to modify its scope to focus on three high-level goals: 1) increase the use of our state's bioenergy resources; 2) encourage energy self-reliance and security in the state; and, 3) promote environmental and economic sustainability in the production and use of homegrown renewable fuels. The Board's strategies and objectives are based on these goals.

In 2008, the Board provided approximately \$3 million in grants to eight bioenergy projects across the state. These projects ended by June 2011—five projects were completed in full while three projects were terminated early. In 2012, the Board awarded approximately \$2.4 million to nine bioenergy projects, which are just beginning and will be completed by June 2013.

Introduction

This report is submitted pursuant to Minnesota Statutes §41A.105, subd.3:

NextGen Energy Board; Duties.

The board shall research and report to the commissioner of agriculture and to the legislature recommendations as to how the state can invest its resources to most efficiently achieve energy independence, agricultural and natural resources sustainability, and rural economic vitality. The board shall:

(1) examine the future of fuels, such as synthetic gases, biobutanol, hydrogen, methanol, biodiesel, and ethanol within Minnesota;

(2) develop equity grant programs to assist locally owned facilities;

(3) study the proper role of the state in creating financing and investing and providing incentives;

(4) evaluate how state and federal programs, including the Farm Bill, can best work together and leverage resources;

(5) work with other entities and committees to develop a clean energy program; and

(6) report to the legislature before February 1 each year with recommendations as to appropriations and results of past actions and projects.

Background

Minnesota is a recognized national leader in policies and programs that promote bioenergy while ensuring local production benefits. The state was first in the nation to implement statewide 10 percent ethanol and 2 percent biodiesel blending requirements, as well as a producer payment program to incentivize homegrown ethanol production. Minnesota continues to lead with increasing mandates for ethanol and biodiesel in future years.¹ Minnesota is also a national leader in E85 infrastructure with more than 360 fueling stations and 73 blender pumps for flex-fuel vehicles in use across the state.²

In recent years, the biofuels industry as a whole has enjoyed enormous support—coupled with significant challenges. The federal Energy Independence and Security Act of 2007 established the Renewable Fuel Standard (RFS2), which guarantees a market for current and future biofuels by mandating 36 billion gallons of renewable fuels by 2022.³ Additional federal support for biofuels—such as grants, loans and tax breaks—demonstrate further optimism at the national level. The biofuels industry has experienced rapid growth among existing plants seeking to innovate and in cellulosic and other advanced biofuel developments.

At the same time, however, public perception of biofuels has waned with the emergence of debates about crops used for food versus fuel, land use, and other potential social and environmental impacts. In addition, cellulosic technology—while continuing to advance—is still not commercially viable or economically feasible at scale. Market and technological feasibility has also been called into question in terms of the availability of blender pumps for mid-level biofuel blends, the reliability of those fuels in conventional vehicles, and the logistics of transporting and storing large amounts of bulky biomass to cellulosic biofuel production sites. Declining perceptions coupled with the U.S. economy's slow

¹ Cellulose is the main component of the cell walls of plants. Cellulosic materials that can be made into energy products include wood waste, corn stover (leaves, stalks, and cobs), native prairie grasses (switchgrass, miscanthus, etc.) and non-edible parts of plants, among others.

² E85 is a blend of 85 percent ethanol and 15 percent gasoline; flex-fuel vehicles are specially designed to run on gasoline or any blend of up to 85 percent ethanol.

³ P.L. 110-140.

recovery has led to a reduction in both state and federal support for biofuels, straining the current industry and hampering the development of advanced biofuels.

NextGen Energy Board Role and Composition

The Next Generation Energy Board was established in 2007 as part of the [Next Generation Energy Act](#). The Board's role is to research and recommend how the state can invest its resources to most efficiently achieve energy independence, agricultural and natural resources sustainability and rural economic vitality.⁴ The Board is specifically tasked with developing recommendations and building consensus for the development of “next generation” biofuels in the state, as defined in statute (see Appendix A).⁵

The NextGen Energy Board was formed during a period of relative optimism and with a focus on the Minnesota market. However, the increased attention on biofuels and other biomass-based energy at the national level—both in terms of optimistic support and negative perception—presents a unique opportunity for the Board to hone its strategy and continue working to steer Minnesota in a positive direction.

The Board is comprised of 20 members, eight of whom were appointed by Governor Dayton in 2011:*

- Senator Doug Magnus
- Senator Julie Rosen
- Senator Rod Skoe
- Representative Rod Hamilton
- Representative Tom Hackbarth
- Representative Larry Hosch
- Commissioner Tom Landwehr, Minnesota Department of Natural Resources
- Commissioner Dave Frederickson, Minnesota Department of Agriculture
- Commissioner Mark Phillips, Minnesota Department of Employment & Economic Development
- Commissioner Paul Aasen, Minnesota Pollution Control Agency
- Commissioner Mike Rothman, Minnesota Department of Commerce
- Teresa Spaeth, Agriculture Utilization Research Institute (AURI)
- Tony Thompson*, Minnesota Institute for Sustainable Agriculture
- Amanda Bilek*, Great Plains Institute
- Thom Petersen*, Minnesota Farmers Union
- Wayne Brandt*, Minnesota Forest Industries
- Dick Hemmingsen*, University of Minnesota Initiative for Renewable Energy and the Environment (IREE)
- John Frey*, Minnesota State Colleges and Universities (MnSCU)
- Neal Feeken*, The Nature Conservancy in Minnesota
- Paul Stark*, Minnesota Farm Bureau

⁴ Although not directly germane to the NextGen Energy Board’s charge, the Board acknowledges the importance of energy conservation and the use of renewable energy sources other than biomass, such as solar, wind and geothermal, to supplement biomass energy initiatives. Placing biomass energy initiatives in this context will help ensure that these initiatives remain consistent with sustainable, available biomass and environmental needs.

⁵ MS §41A.105.

* Denotes NextGen Energy Board members appointed by Governor Dayton.

NextGen Energy Board Strategic Vision

Strategic Vision

The NextGen Energy Board supports policies and programs for the production and use of bioenergy to replace fossil fuels and provide maximum benefit to the state's economy. Minnesota's bioenergy policies have created prosperity for Minnesota farming communities, improved air quality, reduced carbon emissions, displaced petroleum use and encouraged public acceptance of biofuels for widespread use. The NextGen Energy Board's vision promotes the continued improvement of existing biofuels industries and supports innovation in the next generation of bioenergy feedstocks and technologies while ensuring local benefits and sustainable solutions.

The NextGen Energy Board has identified three high-level goals that guide the objectives and strategies for meeting its strategic vision: 1) increase the use of our state's bioenergy resources; 2) encourage energy self-reliance and security in the state; and, 3) promote environmental and economic sustainability in the production and use of homegrown renewable fuels.

Objectives

Through a series of facilitated discussions, the NextGen Energy Board narrowed its focus on meeting the following objectives to promote the goals of the strategic vision.

- 1) To increase the use of our state's bioenergy resources:
 - Prioritize investments and incentives for fossil fuel replacements that capitalize on Minnesota's resources, talents and technologies while ensuring sustained benefits to the state.
- 2) To encourage energy self-reliance and security:
 - Strengthen Minnesota's current biofuel industries—including corn-based ethanol and soy-based diesel—to sustain first generation and increase next generation biofuels production;
 - Expand renewable fuel economic opportunities for Minnesota communities and individuals.
- 3) To promote sustainability:
 - Ensure the efficient, innovative and sustainable use of energy and natural resources as well as continued improvement in air quality;
 - Support the development of bioenergy feedstocks and systems;
 - Increase public awareness about the benefits of developing and maintaining biofuels in Minnesota.

Strategies

To help achieve the stated objectives, the Board adopted the following strategies.

- 1) To increase the use of our state's bioenergy resources:
 - Promote policies and programs for displacing fossil fuel use with energy conservation and the production and use of homegrown renewable resources.
- 2) To encourage energy self-reliance and security:
 - Build on existing biofuels industries to increase technological capacity for producing next generation biofuels;
 - Integrate research and development, education initiatives, technology transfer, production incentives and market creation focused on current and next generation fuels;
 - Create and retain local community and other investments in current and new biofuels enterprises;
 - Create market-based policies that allow farmers, loggers, landowners, and producers to benefit economically from the next generation of bioenergy production.
- 3) To promote sustainability:

- Encourage the evolution of current biofuels production technology toward processes that are more energy efficient, use less water and consume less fossil energy;
- Develop sustainable production systems for bioenergy crops, crop residues and materials that minimize fossil and other resource inputs while maximizing environmental benefits.

NextGen Energy Grant Program

The 2011 Grant Program

Grant Proposal Development

The 2011 Minnesota Legislature appropriated \$2.5 million to the Minnesota Department of Agriculture (MDA) for advanced bioenergy grants through the NextGen Energy Board.⁶ The legislation also included certain eligibility criteria for the grant program—for instance, by law specifies that grants to private entities are limited to \$500,000 to nongovernmental entities to \$150,000. That summer, the Board developed objectives and criteria for the grants through a series of meetings and a polling survey. The survey asked Board members to rank the importance of a variety of goals for the grant program, such as stage of project development, type of technology, environmental and economic factors, etc. The survey results indicated the Board's preference for a wide range of project types including early-stage R&D as well as construction-phase projects and both high- and low-risk projects (see Appendix B). These results and Board discussions led to the development of the final Request for Proposals (RFP).

Grant Review and Recommendations

In September 2011, MDA issued the [RFP](#);⁷ applications were due on November 4th. Throughout the open application period, MDA received numerous questions that were posted and answered in an FAQ posting on MDA's website.⁸ MDA received a total of 18 eligible applications. A technical review team was convened that included one bioenergy staff person from each of the state agencies represented on the NextGen Board (the Minnesota Departments of Agriculture, Employment and Economic Development, Commerce, Natural Resources and the Pollution Control Agency). The members of the technical team spent approximately two weeks reviewing and scoring proposals independently, based wholly on the criteria set out in the RFP. The team then convened for meetings over a period of three days to review proposals as a group, adjust scores as needed to determine a final group score, and finally rank the proposals in order of those that best met the criteria.

In late November, the technical team provided an electronic summary of its findings to the NextGen Board; Board members then had one week to review the summary and request full proposals for further review. On December 8th, the Board met to hear detailed input from the technical team and make its final recommendation to the Commissioner.⁹ The team provided a broad overview of all project proposals, followed by a more detailed presentation on the top-ranking proposals. The team suggested that eight proposals best met the criteria and should be considered by the Board for funding. The Board voted to recommend those eight projects to the Commissioner; then, based on grant negotiations

⁶ Laws of Minnesota 2011, Ch. 14, Sec. 3, subd. 4.

⁷ The RFP can be viewed on MDA's website: <http://www.mda.state.mn.us/en/renewable/nextgen.aspx>.

⁸ MDA's FAQs website can be accessed at this link: <http://www.mda.state.mn.us/renewable/nextgen/bioenergygrantfaq.aspx>.

⁹ By law, the Board recommends projects to the Commissioner of Agriculture; the Commissioner makes the final decision on projects that receive funding.

between those eight grantees and MDA, the Board voted to give the Commissioner authority to fund subsequent projects should funds remain.

2011 Bioenergy Grant Recipients

The Commissioner of Agriculture ultimately funded nine projects for a total of \$2.4 million.¹⁰ These projects were chosen based on the degree to which they met the eligibility requirements and criteria established in the RFP; by law, the Board and Commissioner are also required to make a “good faith effort” to choose projects that represent a variety of projects and are widely distributed across the state.¹¹ The projects are as follows:

Koda Energy LLC, Shakopee, MN - \$480,000

The funds will pay for construction of a biofuels staging and processing facility in Scott County. The facility will aggregate and process (drying, size reduction) various biomass fuel stocks for use in Koda's CHP biomass facility located seven miles from this new facility. Fuel stocks include urban wood waste (a contract in place with the city of Minneapolis), agri-byproducts and potentially dedicated energy crops.

West Central Renewable Ammonia Development, Bloomington MN - \$450,000

The grant will fund a second-stage feasibility study for a proposed biomass- to-ammonia plant near Willmar, MN. This project would convert 95,000 tons of biomass to 45,000 tons of anhydrous ammonia annually. The feasibility study will encompass the tasks of biomass supply and crop development, site preparation, vendor pricing and selection, process integration, marketing development, and financial analyses.

SarTec Corporation, Anoka, MN - \$400,000

SarTec invented the Mcgyan technology that is used by Ever Cat Fuels, a three million gallon capacity biodiesel production plant in Isanti, Minnesota. SarTec plans to design and construct a smaller scale, on-farm processing plant using the existing Mcgyan technology. The unit will be tested and operated by farmer-partners with the intent of having them either using the fuel on their farms, or selling it to blenders.

Al-Corn Clean Fuel, Claremont, MN - \$248,000

Al-Corn is researching the integration of second-generation biofuels production within their existing and/or an expanded ethanol plant. In partnership with JetE of St. Paul, the facility would produce on spec renewable jet and/or diesel fuel (made from a mix of crop oil and animal fats) in addition to corn ethanol. The results will provide a production roadmap that other ethanol producers will be able to use.

Renville Renewable Energy LLC, St. Paul, MN - \$220,000

Funds will support the development of Phase 2 costs for an anaerobic digester and associated systems located adjacent to a poultry facility in Renville. The project proposes to use multiple waste streams - both agricultural processing and production wastes - collected from the Renville area as co-digestion

¹⁰ By law, the Minnesota Department of Agriculture is allowed to assess an administrative fee for the NextGen Grant Program. MDA chose to charge fees at a level of 4%, distributed evenly across projects.

¹¹ Laws of Minnesota 2011, Ch. 14, Sec. 3, subd. 4.

material. Biogas will be cleaned to the standard of pipeline grade natural gas. Also included in the study will be the production of nutrient-rich liquid and solid byproduct (crop nutrients) from the digester effluent.

Northern Excellence Seed LLC, Williams, MN - \$200,000

This project builds on the installed 150-kW biomass gasification unit already installed on Northern Excellence's Williams site. The award will help make this system operational using the company's seed screenings. Syngas from the gasifier will provide the energy to produce electric power that will be sold to the grid.

Central Lakes College and Ag Energy Center, Staples, MN - \$193,000

This grant award at Central Lakes College is a continuation of previous funding (including NextGen 2008). Various oilseed crops (camelina, spring canola, winter canola, high oil soybeans, sunflowers) or planting methods (camelina/soybean double cropping) will be grown and converted to biodiesel at the site using small-scale processing technology. Feed trials will be conducted using the meal products created from oil extraction. A commercial planting of miscanthus, the winner of CLC's biomass crop trials, will be established, harvested and processed for biofuel.

Jerry Jennissen, Jer-Lindy Farms, Brooten, MN - \$137,000

The funds will be used to improve operation of the current anaerobic digestion system on the farm. The system in place has been operational since 2008. Some of the improvements include use of additional substrate to improve gas production, an innovative genset design to improve overall efficiency in output of electricity to the grid, and improved quality of the digester's cattle bedding co-product.

Rural Advantage, Fairmont, MN - \$72,000

The grant will fund a Phase 1 feasibility study and business plan to assist Prairie Skies Biomass Co-op in developing operational procedures, membership policies and feedstock contracts for a 300 ton/day torrefaction facility in Madelia, MN. The facility would convert raw agricultural biomass to an advanced biofuel to be sold to offsite markets.

Grant Management Process

MDA is responsible for overseeing and monitoring the NextGen Energy Grant Program. MDA follows the State of Minnesota's grant monitoring guidelines; it also employs some of the Department's own policies and procedures.¹²

By law, the current funding for NextGen grants is available through June of 2013. NextGen grantees will be required to submit quarterly progress reports to MDA through this time period. Grantees will also submit invoices with documentation on a quarterly basis; MDA will pay grantees incrementally based on these quarterly reports and invoices. Per state policy, MDA is also required to conduct at least one monitoring visit per year.

The NextGen Board will also receive a quarterly update from MDA on the status of NextGen grants. MDA also plans to ask each grantee to attend Board meetings periodically to provide in-person reports to the Board.

¹² See the Office of Grants Management's policies at: http://www.admin.state.mn.us/ogm_policies_and_statute.html.

The 2008 Grant Program

The 2007 Minnesota Legislature appropriated \$3 million for NextGen Energy grants to bioenergy projects.¹³ Projects awarded during the first cycle were completed or terminated by June 2011, when the appropriation expired. The following describes the final status of each project.

Central Minnesota Cellulosic Ethanol Partnership – Little Falls

The Central Minnesota Cellulosic Ethanol Partnership (CMCEP) was awarded \$910,000 to conduct the final stage of a study to determine the feasibility of building, owning and operating a 10-million-gallon-per-year cellulosic ethanol plant. In September 2010, SunOpta—the primary partner on the project—merged with Mascoma Corp.; Mascoma continued to conduct work and report to MDA in accordance with the grant agreement. CMCEP issued its final report to the Board in May 2011, indicating that the project would be feasible at the Little Falls site. The report included milestones for construction start in May 2012 and production in November 2013; however, the NextGen grant only covered the feasibility study portion of the project.

Chippewa Valley Ethanol Company – Benson

The Chippewa Valley Ethanol Company (CVEC) was awarded \$700,000 to introduce new biomass gasification technology to its approximately 48-million-gallon-per-year corn ethanol plant, but commercialization of the process was significantly delayed due to the drastic reduction in natural gas prices beginning in mid-2008. In January 2010, the NextGen Board approved a request from CVEC to reallocate grant funding to studying densification of biomass char, a byproduct of gasification. CVEC began densification trials in 2010 but ultimately determined that the project could not be completed within the grant timeframe; CVEC's grant contract with the State of Minnesota was mutually terminated. Approximately 5 percent of grant funds were expended with the remainder returned to the general fund.

Minnesota Valley Alfalfa Producers – Raymond

The Minnesota Valley Alfalfa Producers (MnVAP) were awarded \$400,000 to demonstrate more efficient pelletizing of biomass using specialized technology in which a variety of biomass materials—such as crop waste, grasses and woodland biomass—are processed into uniform-sized pellets that can be more easily stored and transported. MnVAP successfully completed their project in June 2011 when the final equipment was delivered and installed/fabricated.

Rick Neuvirth Farm – Elkton

The Rick Neuvirth Farm was awarded \$220,000 to construct and install an anaerobic digester and electric generator to produce and use biogas, heat and electricity. Throughout 2009 the Neuvirth Farm conducted feedstock assessments and began preliminary engineering and integration work through site design and equipment specifications. However, due to adverse economic conditions and the loss of several sows from local diseases, Neuvirth Farm suspended the project for an undetermined length of time. The grant contract between the State of Minnesota and the Neuvirth Farm was mutually terminated in August 2010; no grant funds were expended and all were returned to the general fund.

Northern Excellence Seed – Williams

Northern Excellence Seed was awarded \$200,000 to construct a 100-kilowatt-per-hour gasifier that demonstrates the viability of burning waste biomass such as grasses to produce electricity. The project

¹³ Following additional actions taken by the Minnesota State Legislature in 2008, approximately \$2.7 million was available for the 2008 NextGen Energy Grant program.

was completed in 2010 with an initial startup of the gasifier and successful syngas production. Additional equipment and issues are required for full-time operation of the system.

University of Minnesota Department of Forestry – St. Paul

The University of Minnesota's Department of Forestry was awarded \$100,000 to study the sustainability of the state's approximately 16 million acres of forests, as well as the long-term availability of biomass in the state. The Department of Forestry completed the project and delivered its final report to the NextGen Board in October 2010.¹⁴

Central Lakes College Ag Center – Staples

The Central Lakes College Ag Center (CLCAC) was awarded \$100,000 to establish and evaluate perennial energy crops (four native prairie plants and camelina for biodiesel). CLCAC issued a final report in June 2011, with results indicating that wheatgrass produced the highest yields and miscanthus was most able to withstand cold-weather conditions. Economic modeling on camelina suggested that using the most cost effective strategies would yield a price of \$2.39 per gallon of biodiesel. CLCAC has entered into additional partnerships to continue this work with the University of Illinois and SarTec and EverCat fuels.

University of Minnesota-Morris

The University of Minnesota at Morris is in the process of installing a biomass gasifier to provide campus heating and help reduce campus energy costs. The campus partnered with the West Central Research and Outreach Center to form the University of Minnesota Renewable Energy Research and Demonstration Center at Morris. This Center was awarded \$50,000 to assess the potential for a biomass servicing company to handle the logistics of collecting, transporting, and storing the large amounts of biomass needed for energy production. Due to technical difficulties, installation and operation of the biomass gasifier at Morris was put on hold while the campus continued feedstock processing and densification trials. The project was terminated in February 2011 with no grant funds expended and all returned to the general fund.

Recommendations and Action Items

In 2010, the NextGen Energy Board adopted new recommendations to meet its strategic vision and objectives.¹⁵ The Board did not establish new recommendations in 2011 in an effort to focus on the new grant program. The following provides a brief summary of the Board's recommendations and action items to date:

Recommendation #1: Coordinate efforts and programs in support of biofuels development

- A. Action Item: Work across agencies to create an inventory of state, federal and utility programs and other organizations focusing on bioenergy development; outline roles and responsibilities; identify synergies and/or duplication; recommend potential partnering and/or coordination efforts/programs.**

¹⁴ The report can be accessed via the following link:

http://www.forestry.umn.edu/prod/groups/cfans/@pub/@cfans/@forestry/documents/asset/cfans_asset_260126.pdf

¹⁵ The Board's 2008 recommendations are no longer outlined here. Please reference reports from 2008, 2009 and 2010 for details and updates on those recommendations.

Status: The Minnesota Department of Employment and Economic Development (DEED) serves as the lead agency for a new multiagency collaboration called Minnesota Business First Stop (MBFS). MBFS builds on the Green Enterprise Assistance statute 116J.438 and Governor Dayton’s first Executive Order (11-04), as well as supporting legislation from 2011 on 150-day permitting. It is designed to assist businesses who are developing, expanding or siting in Minnesota to navigate multiple state resources and expedite business needs. The partner state agencies include the Minnesota Departments of Agriculture, Commerce, Economic Development, Labor and Industry, Natural Resources, Transportation, the Iron Range Resources and Rehabilitation Board, and the Minnesota Pollution Control Agency.

B. Action Item: Research programs and policies for biofuels development in other states and identify potential benchmarks or models for Minnesota.

Status: The Minnesota Department of Agriculture has conducted some initial research on the Iowa Power Fund, which was established in 2007 to fund energy research, development, early stage commercialization and education projects. Since its creation, the Fund has invested more than \$71.6 million directly in 50 competitive projects.

The Department will continue to identify other state-funded programs for bioenergy; MDA also tracks ethanol and biodiesel mandates in other states.

C. Action Item: Build on and leverage Minnesota’s assets and strengths in entrepreneurship and state agency resources.

Status: In addition to MBFS, DEED’s nine regional Small Business Assistance Centers are available to assist entrepreneurs with loan applications or business plans that may be smaller or more local in nature.

Recommendation #2: Leverage federal programs that support the Board’s strategic vision

A. Action Item: Align federal resources—such as federal Farm Bill grants and loans, and the federal Renewable Fuel Standard—with state programs and policies to capitalize on opportunities for Minnesota.

Status: State agency staff work to target federal opportunities for Minnesota by staying apprised of program details and deadlines and disseminating information to clients and stakeholders. Agencies have also provided letters of support to endorse various Minnesota entities applying for federal funds, as well as technical assistance during the grant application process. Staff also plans to continue working with industry and landowners to establish program areas in Minnesota for projects to benefit the state under opportunities like the Biomass Crop Assistance Program.

In 2011, Minnesota Department of Agriculture and Minnesota Office of Energy Security analyzed all U.S. Departments of Agriculture and Energy grant and loan opportunities to determine how Minnesota compares to other states in receiving these funds. These analyses will help inform staff on how to help Minnesota entities increase their competitiveness in applications for federal funding.

State agencies and stakeholder organizations have discussed potential legislative changes to allow advanced renewable fuels to qualify under the state’s biofuels mandates. Such action could seek to align Minnesota’s policies with federal renewable fuel requirements.

The Midwestern Governor's Association Advanced Transportation Fuels Advisory Group recently released a report with recommendations to move advanced biofuels forward in the region. Some goals included: creating state and regional funding sources for commercialization of near-term next generation biofuels; supporting state-level biofuel production for economic development; supporting continuation of the Renewable Fuel Standard (RFS2); working with federal agencies to reconcile federal CAFE and greenhouse gas regulations with RFS2; and creating state technical assistance programs for biofuel producers. A total of 26 individuals representing diverse interests of MGA states – including the Minnesota Department of Commerce – collaborated to create the recommendations.

Recommendation #3: Improve public awareness/perception of biofuels through better and more current information

A. Action Item: Create a catalog of existing, current research and/or data on biofuels development and issues; identify knowledge gaps.

Status: The Agricultural Utilization Research Institute (AURI) and the University of Minnesota's Initiative for Renewable Energy and the Environment (IREE), both of which serve on the NextGen Board, are engaged in in-depth research on bioenergy development opportunities in Minnesota. AURI's recent research projects are accessible online at <http://www.auri.org/help/research/>; AURI's Minnesota Renewable Energy Roundtable also serves as an important resource. IREE's research portfolio is available at <http://iree.environment.umn.edu/portfolio>.

In 2009, the Minnesota Department of Commerce led the Minnesota Clean Energy Technology Collaborative (CETC). CETC issued a Roadmap that outlined Minnesota's research and development vision, along with an action plan and related milestones, to ensure achievement of Minnesota's clean energy goals.¹⁶ The Roadmap focused on the following areas for bioenergy:

- Evaluations of future sustainable biomass availability
- Optimization in feedstock processing and conversion
- Fermentation-derived fuels
- Demonstration of gasification-derived fuels and applications for high value products
- Cost reductions in syngas cleaning
- Employment of thermal biomass pre-treatment to produce uniform feedstock
- Anaerobic digester-derived fuels for maximizing biogas-to-electricity, process heating and biomethane production

B. Action Item: Undertake research/data collection gaps identified by Action Item A.

Status: In progress.

C. Disseminate current, sound science on biofuels issues such as land use change, energy balance, food and fuel, etc.

¹⁶ The Roadmap is accessible online at http://www.state.mn.us/mn/externalDocs/Commerce/Clean_Energy_Technology_Roadmap_021010103656_CleanEnergyTechnologyRoadmap.pdf.

Status: The Minnesota Department of Agriculture's Agricultural Marketing and Development Division engages in outreach and promotion of the state's biofuels mandates and programs. Staff regularly attends and presents at industry and policy events both locally and nationally; produces and distributes brochures, reports and other marketing materials on Minnesota's ethanol and biodiesel industries; and works with industry to stay up-to-date on noteworthy developments.

Recommendation #4: Engage in efforts to overcome regulatory barriers in bioenergy development

A. Action Item: Ensure state agency coordination throughout the permitting process.

Status: As mentioned above, the Dayton Administration established the Minnesota Business First Stop program under the leadership of DEED, in collaboration with DNR, PCA, MDA, Commerce, IRRRB and MNDOT. This interagency network will help guide a wide range of companies, including bioenergy developers, through state requirements and services. MBFS is a key mechanism for coordinating the delivery of state services to new business enterprises, including in the area of permitting.

The Agricultural Utilization Research Institute is working with the Minnesota Pollution Control Agency, University of Minnesota, Minnesota State Mankato, and industry to compile information and assess renewable biomass feedstock emissions for heat and energy production that will assist in biomass project air permitting. Partners are trying to establish the commercial scale boiler capacity to test various biomass streams to obtain appropriate emissions data for permitting. The capacity for this necessary testing does not currently exist in Minnesota. Interest in replacing natural gas with alternative biomass streams has waned because prices for natural gas have decreased significantly. However, energy projects that utilize biomass will continue to emerge, and adequate testing capacity for emissions data specific to different feedstock streams is needed. Funding for this effort could be supported by the NextGen Board.

The Minnesota Pollution Control Agency and the Minnesota Department of Natural Resources have each adopted a formal goal of making permit decisions within days of receiving complete permit applications. In the most recent permit efficiency report, DNR achieved that goal in more than 99% of relevant permits. In 2011, the MPCA also issued 99% of permits related to new jobs via expansion or new construction within the 150 day target and roughly 81% of all permits within 150 days.

B. Action Item: Establish outreach efforts to inform bioenergy developers of permitting requirements/processes at an early stage.

Status: The MBFS program will provide a key forum for early coordination between permitting agencies and bioenergy project developers. MBFS will enable partner agencies to increase awareness of projects and provide companies with a venue to meet with a range of state agencies. These meetings and referrals will accelerate the point at which companies can productively engage with permitting agencies.

The Minnesota Pollution Control Agency created a team of experts to assist Minnesota's ethanol industry with its environmental compliance issues beginning in early 2010. This team was comprised of three experienced staff members dedicated for one year to assist and educate the industry on its environmental responsibilities, practices and policies with the goal of increasing compliance rates. Assistance was offered through a variety of strategies such as voluntary audits, monthly newsletters, monthly web chats and in-person training.

C. Action Item: Pursue legislative action to accelerate and facilitate the permitting process to avoid hindering bioenergy development in Minnesota.

Status: In progress.

See Recommendation #4, Action Item A.

Governor Dayton has also issued Executive Order 11-32 in 2011, directing the Environmental Quality Board to evaluate opportunities and make recommendations to accelerate the environmental review process. Permitting agencies continue to work on streamlining application and review processes.

Appendix A: NextGen Energy Board Legislation

2010 Minnesota Statutes §41A.105

(created by Minnesota Session Laws 2007, Chapter 45, Sec. 47)

NEXTGEN ENERGY.

Subdivision 1. **Purpose.** It is the goal of the state through the Department of Agriculture to research and develop energy sources to displace fossil fuels with renewable technology.

Subd. 2. **NextGen Energy Board.** There is created a NextGen Energy Board consisting of the commissioners of agriculture, commerce, natural resources, the Pollution Control Agency, and employment and economic development; the chairs of the house and senate committees with jurisdiction over energy finance; the chairs of the house and senate committees with jurisdiction over agriculture finance; one member of the second largest political party in the house, as appointed by the chairs of the house committees with jurisdiction over agriculture finance and energy finance; one member of the second largest political party in the senate, as appointed by the chairs of the senate committees with jurisdiction over agriculture finance and energy finance; and the executive director of the Agricultural Utilization Research Institute. In addition, the governor shall appoint seven members: two representing statewide agriculture organizations; two representing statewide environment and natural resource conservation organizations; one representing the University of Minnesota; one representing the Minnesota Institute for Sustainable Agriculture; and one representing the Minnesota State Colleges and Universities system.

Subd. 3. **Duties.** The board shall research and report to the commissioner of agriculture and to the legislature recommendations as to how the state can invest its resources to most efficiently achieve energy independence, agricultural and natural resources sustainability, and rural economic vitality. The board shall:

- (1) examine the future of fuels, such as synthetic gases, biobutanol, hydrogen, methanol, biodiesel, and ethanol within Minnesota;
- (2) develop equity grant programs to assist locally owned facilities;
- (3) study the proper role of the state in creating financing and investing and providing incentives;
- (4) evaluate how state and federal programs, including the Farm Bill, can best work together and leverage resources;
- (5) work with other entities and committees to develop a clean energy program; and
- (6) report to the legislature before February 1 each year with recommendations as to appropriations and results of past actions and projects.

Subd. 4. **Commissioner's duties.** The commissioner of agriculture shall administer this section.

Subd. 5. **Expiration.** This section expires June 30, 2014.

Laws of Minnesota 2011, Chapter 14

Sec. 3. DEPARTMENT OF AGRICULTURE ...

\$2,500,000 the first year is for bioenergy grants. The NextGen Energy Board, established in Minnesota Statutes, section 41A.105, shall make recommendations to the commissioner on grants for owners of Minnesota facilities producing bioenergy, organizations that provide for on-station, on-farm field scale research and outreach to develop and test the agronomic and economic requirements of diverse stands of prairie plants and other perennials for bioenergy systems, or certain nongovernmental entities. For the purposes of this paragraph, "bioenergy" includes transportation fuels derived from cellulosic material, as well as the generation of energy for commercial heat, industrial process heat, or electrical power from cellulosic material via gasification or other processes. Grants are limited to 50 percent of the cost of research, technical assistance, or equipment related to bioenergy production or \$500,000, whichever is

less. Grants to nongovernmental entities for the development of business plans and structures related to community ownership of eligible bioenergy facilities together may not exceed \$150,000. The board shall make a good-faith effort to select projects that have merit, and, when taken together, represent a variety of bioenergy technologies, biomass feedstocks, and geographic regions of the state. Projects must have a qualified engineer provide certification on the technology and fuel source. Grantees must provide reports at the request of the commissioner. No later than February 1, 2013, the commissioner shall report on the projects funded under this appropriation to the legislative committees with jurisdiction over agriculture finance. The commissioner's costs in administering the program may be paid from the appropriation. This is a onetime appropriation and is available until June 30, 2013.

Appendix B: RFP Development – Survey Results

Turning Results by Question

Session Name: New Session 8-11-2011 3-02 PM

Created: 8/11/2011 3:05 PM

1.) Consistent with Next Gen Board Objectives (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	66.67%	8
Criteria	33.33%	4
Somewhat important	0%	0
Should not be considered	0%	0
Totals	100%	12

2.) Proposal Clarity and Project Definition including measures of success (multiple choice)

	Responses	
	(percent)	(count)
Key criteria	78.57%	11
Criteria	21.43%	3
Somewhat important	0%	0
Should not be considered	0%	0
Totals	100%	14

3.) Project Team Qualifications (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	46.15%	6
Important	46.15%	6
Somewhat important	7.69%	1
Should not be considered	0%	0
Totals	100%	13

4.) Financial Capacity of Applicant (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	30.77%	4
Important	61.54%	8
Somewhat important	7.69%	1
Should not be considered	0%	0
Totals	100%	13

5.) Time to commercial application (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	0%	0
Important	50%	7
Somewhat important	50%	7
Should not be considered	0%	0
Totals	100%	14

6.) Regulatory compliance history (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	21.43%	3
Important	50%	7
Somewhat important	28.57%	4
Should not be considered	0%	0
Totals	100%	14

7.) Economic Impact: Jobs Created / Retained (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	15.38%	2
Important	46.15%	6
Somewhat important	30.77%	4
Should not be considered	7.69%	1
Totals	100%	13

8.) Economic Impacts: Profits generated and retained in MN (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	14.29%	2
Important	57.14%	8
Somewhat important	28.57%	4
Should not be considered	0%	0
Totals	100%	14

9.) How about Farmer ownership (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	7.69%	1
Important	0%	0
Somewhat important	53.85%	7
Should not be considered	38.46%	5
Totals	100%	13

10.) Economic Impact: Competitive position of MN based technology / equipment (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	15.38%	2
Important	76.92%	10
Somewhat important	7.69%	1
Should not be considered	0%	0
Totals	100%	13

11.) Economic Impacts: Competitive position for MN bioenergy production (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	28.57%	4
Important	50%	7
Somewhat important	21.43%	3
Should not be considered	0%	0
Totals	100%	14

12.) Impacts: Replicable in MN (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	35.71%	5
Important	35.71%	5
Somewhat important	28.57%	4
Should not be considered	0%	0
Totals	100%	14

13.) Environmental Impact: Carbon reduction potential (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	42.86%	6
Important	42.86%	6
Somewhat important	7.14%	1
Should not be considered	7.14%	1
Totals	100%	14

14.) Environmental Impact: Others: Water efficiency, prevent pollution, enhance Soil/Water/Wildlife conservation (multiple choice)

	Responses	
	(percent)	(count)
Key Criteria	35.71%	5
Important	57.14%	8
Somewhat important	7.14%	1
Should not be considered	0%	0
Totals	100%	14

15.) Project Financial Leverage/Match (multiple choice)

	Responses	
	(percent)	(count)
All cash match	7.14%	1
At least 25% cash	71.43%	10
All in-kind ok	21.43%	3
Totals	100%	14

16.) Priority Development Stage: (multiple choice)

	Responses	
	(percent)	(count)
Early / R&D (1-3)	14.29%	2
Mid Stage (prototype) (3-5)	7.14%	1
Commercial stage (5-7)	14.29%	2
We need a wide portfolio across development stages	64.29%	9
Totals	100%	14

17.) Risk Tolerance (multiple choice)

	Responses	
	(percent)	(count)
Very low – (Do what we know works)	0%	0
Limited –	7.69%	1
Manage risk –	38.46%	5
Calculated risk – (Invest in transformation)	53.85%	7
Totals	100%	13

18.) It is most important to: (multiple choice)

	Responses	
	(percent)	(count)
Produce energy for use in MN	7.69%	1
Produce energy to sell to customers outside of MN	0%	0
Don't worry about it, either way it is good.	92.31%	12
Totals	100%	13

19.) It is most important to produce: (multiple choice)

	Responses	
	(percent)	(count)
Transportation fuels	0%	0
Alternatives to any kind of oil	7.69%	1
Space and process heat	7.69%	1
Electric power	0%	0
We should not target	84.62%	11
Totals	100%	13

20.) It is most important to: (multiple choice)

	Responses	
	(percent)	(count)
Put steel and seed in the ground	7.69%	1
Support entrepreneurs with technical assistance	0%	0
Answer key questions about feedstocks and technology	7.69%	1
We need a wide portfolio of project types	84.62%	11
Totals	100%	13

21.) It is most important to focus on: (multiple choice)

	Responses	
	(percent)	(count)
In-plant production and technology	0%	0
Biomass feedstock production and supply chain	0%	0
You can't have one without the other	100%	13
Totals	100%	13

22.) Other 1 (multiple choice)

build on existing biofuels industry in Minnesota

	Responses	
	(percent)	(count)
Key Criteria	0%	0
Important	38.46%	5
Somewhat important	46.15%	6
Should not be considered	15.38%	2
Totals	100%	13

23.) Other 2 (multiple choice)

technical viability/demonstration of technical merits

	Responses	
	(percent)	(count)
Key Criteria	33.33%	4
Important	25%	3
Somewhat important	41.67%	5
Should not be considered	0%	0
Totals	100%	12

Appendix C: 2011-2012 NextGen Energy Board Activities

June 2011: Introduction of New Board, Election of Officers; 2010 Legislative Session Review; Planning and Priorities; Grant Program Discussion.

The new NextGen Energy Board met for the first time in June. With 14 new members, the Board took time for introductions and to elect new officers (Chair – Commissioner Frederickson; Co-Vice-Chairs – Sen. Magnus and Rep. Hamilton). Greta Gauthier (MDA) provided an overview of energy-related issues from the 2010 legislative session. The Board updated its goals and priorities and discussed plans for future meetings and objectives. Christina Connelly (MDA) and Mark Lindquist (DNR) gave an update on the 2008 NextGen grantees and kicked off a discussion about the 2011 grant program.

August 2011: MN Policies and Procedures; RFP Criteria Development; Grants Oversight/Process

Stacie Christensen (Admin) provided a presentation on open meeting laws and other legal issues relevant to the Board. Alyssa Haugen of the Office of Grants Management discussed conflict of interest and grants policies with the Board. Mark Lindquist (DNR) led the Board in a polling technology exercise to help identify priorities and set criteria for the 2011 grant program RFP. Christina Connelly (MDA) discussed grant monitoring procedures and the post-grant evaluation process at MDA.

October 2011: AURI Update; Biogas Presentations; Grant Program Update

Al Doering kicked off a session on biogas developments in Minnesota with an update on AURI's work in this area. The Board then heard from Dennis Haubenschild (Haubenschild Farms) and Beau Griffey of US Energy Services on biogas opportunities and development models. Greta Gauthier (MDA) reminded Board members of the process for the 2011 grant program.

December 2011: 2011 Bioenergy Grant Recommendations

The NextGen Technical Team discussed its review process and presented its findings to the Board on bioenergy grant proposal scores and rankings. The Board discussed projects and recommended a final set to Commissioner Frederickson.