



BIOECONOMY
COALITION OF MINNESOTA

Building a Vibrant and Sustainable Bioeconomy in Minnesota



1

Make

- Make Minnesota THE PLACE to build the bioeconomy.

2

Add

- Add value to forestry, agriculture and organic waste resources.

3

Reinforce

- Reinforce the bioeconomy as an essential part of the clean energy innovation sector.

4

Contribute

- Contribute to economic growth and environmental and public health benefits

Vision



wood.

centralMNrenewables

Operating Unit of GreenBiologies



DENCO II

FUELING AMERICA



auri

Agricultural Utilization Research Institute



BTS

part of TSEnergyGROUP



Enerkem



NatureWorks



CHAMBER OF COMMERCE



GREAT RIVER ENERGY

Natural Resources Research Institute

UNIVERSITY OF MINNESOTA DULUTH

Driven to Discover

re:chem

Renewable Chemicals and Materials Alliance



STOEL RIVES LLP

DOVETAIL PARTNERS INC



CHRISTIANSON CPAs & Consultants



minnesota power

AN ALLETE COMPANY

2018 Members

Priorities:

- Maintain base funding (\$1.5 million per year) for MN Bioincentive Program for FY2018 through FY2021
- Support BCM member projects at the legislature to advance bioeconomy in MN
- Convene Commercialization Consortium to advance research and development of bioeconomy in MN



Historic Success - Ethanol Producer Payments

- ▶ 1994-2012: Minnesota spent over \$450 million in producer payments to launch the state's ethanol industry
- ▶ \$0.20/gallon paid for production
- ▶ No upfront money
- ▶ Current ethanol industry:
 - ▶ 21 ethanol plants, 1.1 billion gallons
 - ▶ \$5 billion dollar industry

Production Incentive Program

- ▶ Why do this?
 - ▶ Make Minnesota a world-class destination for building commercial-scale advanced biofuel and renewable chemical plants
 - ▶ Production incentive can be included in private financing, and will attract projects to Minnesota.
 - ▶ Legitimate government role in helping to build “first-of-a-kind” facilities, for which other forms of financing do not exist.
 - ▶ Protection for the state. No payment occurs until production occurs.
 - ▶ State government doesn’t pick technology winners. They simply award the projects that cross the finish line.
 - ▶ Minnesota has history with this approach, through the state’s ethanol producer payment.

Production Incentive Levels

Advanced biofuels

- \$0.20/gal - cellulosic derived
- \$0.10/gal - sugar/starch derived
- Total payments capped per year, available for 10 years
- Up to 6 projects (or more if projects are smaller)

Renewable Chemicals

- \$0.03/lb - sugar derived renewable chemical or cellulosic sugar
- \$0.06/lb - cellulosic derived renewable chemical
- Total payments capped per year, available for 10 years
- Up to 6 projects (or more if projects are smaller)

Biomass Thermal

- \$5.00/MMbtu - agricultural or forestry feedstocks
- Total payments capped per year, available for 10 years
- Up to 5 projects (or more if projects are smaller)

\$23.8 Million temporary Annual Government Investment
 \$837.6 Million permanent annual economic impact
 \$1.5 billion temporary construction economic Impact

	Type	Employment	Labor Income (millions)	Output (millions)
Annual	Direct	590	\$36.8	\$470.3
	Indirect	2,150	\$115.8	\$304.0
	Induced	450	\$21.5	\$63.3
	Total	3,190	\$174.1	\$837.3
Construction	Direct	4,380	\$303.4	\$867.8
	Indirect	1,690	\$112.7	\$306.2
	Induced	2,620	\$122.1	\$357.2
	Total	8,690	\$538.2	\$1,531.4

Impact estimates based on University of Minnesota Extension Economic Impact Analysis
 *Over 15-20 years

FEEDSTOCK

Agriculture
Forestry
Organic Waste



BIOINDUSTRIAL PROCESSING

Fermentation
Thermochemical
Anaerobic Digestion



COMMODITY CHEMICAL

Advanced Biofuels
Renewable Chemicals
Biogas



PRODUCT DEVELOPMENT

Product Testing
Formulations
Compounding



END MARKET

Biojet Fuel
Compostable Packaging
Specialty Chemicals



Recycling

Areas of Focus



Wood: Minnesota's wood resources are in critical need of finding additional markets and end uses following plant shutdowns. We'll focus on creating additional pathways for wood in the form of innovative fuels, chemicals, and materials.



Waste: There is increasing availability of organic resources in the Twin Cities Metro area due to new policies encouraging increased organics recycling and diversion away from landfilling and waste-to-energy. We'll focus on utilizing these resources through gasification and anaerobic digestion.



Oil seed cover crops: Minnesota has many of the ingredients in place to build an aviation biofuels industry. We'll work to leverage existing initiatives like the Forever Green initiative, which is working to commercialize new oil seed crops like camelina and pennycress, and the Commercial Aviation Advanced Fuels Initiative.



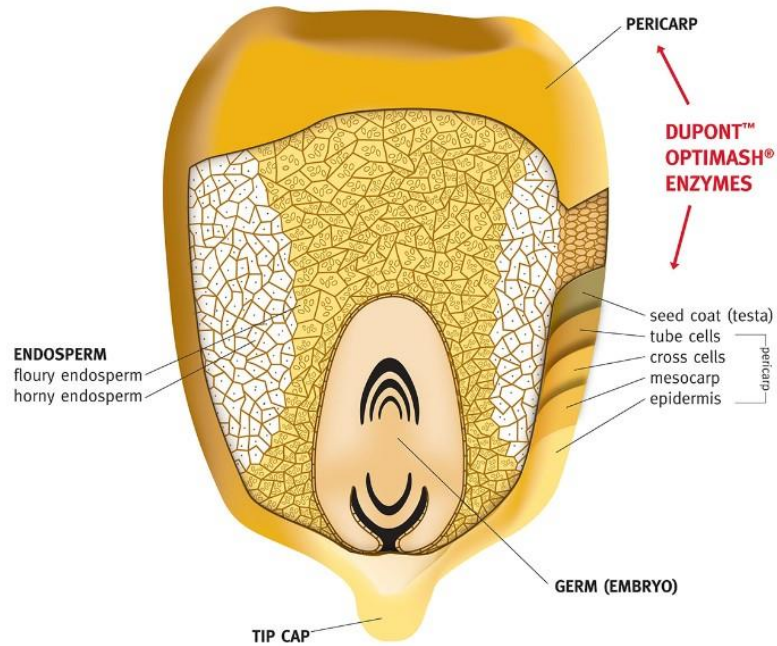
Ethanol: Two current market needs exist: advanced biofuels and new chemicals. We'll focus on assisting existing ethanol plants to retrofit, which will enable them to produce a wider variety of fuels and chemicals through advanced microbiology.

Butanol production



- ▶ 2 Minnesota ethanol plants have been converted to produce bio-butanol
- ▶ Among the first recipients of the production incentive
- ▶ Significant new investment in existing facilities

Corn kernel cellulosic ethanol



Cellulase
enzymes

- ▶ Utilize cellulose in corn kernels
- ▶ Produce additional ethanol from corn already being processing in ethanol plants

Municipal Solid Waste as Value-Added Product


New uses for waste:

- ▶ Gasification of waste to produce biofuels
- ▶ Anaerobic digestion to produce energy and fuels





New markets for wood

- ▶ Aviation biofuels, energy
 - ▶ Biobased chemicals, composite materials
 - ▶ Thermally-treated wood products
 - ▶ Mass timber construction
- 

New products from oils and fats

- ▶ Renewable diesel
- ▶ Soy-based road sealant
- ▶ Innovative oilseed production (camelina, pennycress)



Making Minnesota known as **The Place** to build the Bioeconomy

The Coalition aims to position Minnesota as a global leader in the Bioeconomy by working together on a shared strategy.

[Learn More](#)



BIOECONOMY BENEFITS

The Bioeconomy can help boost the economy, increase



INITIATIVES

We focus on growing the Bioeconomy by bringing



WHO WE ARE

We work to bring all players of the Bioeconomy

www.mnbioeconomy.org

Ways to Get Involved

Join

Join Bioeconomy Coalition

- Several committees: Policy, Membership & Finance, Commercialization Consortium

Subscribe

Subscribe to the newsletter at www.mnbioeconomy.org

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Follow Great Plains Institute on Facebook, Twitter, and LinkedIn for bioeconomy news updates

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