
Bioenergy in Minnesota: Overview

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Izaak Walton League

- National Conservation Organization with 40,000 members
- Renewable Energy and Global Warming Solutions
- Wilderness and Public Lands
- Outdoor Ethics
- Clean Water Issues (Streams, Wetlands, Great Lakes)
- Agriculture Program (Farm Bill, Fish Kill Advisory Network)





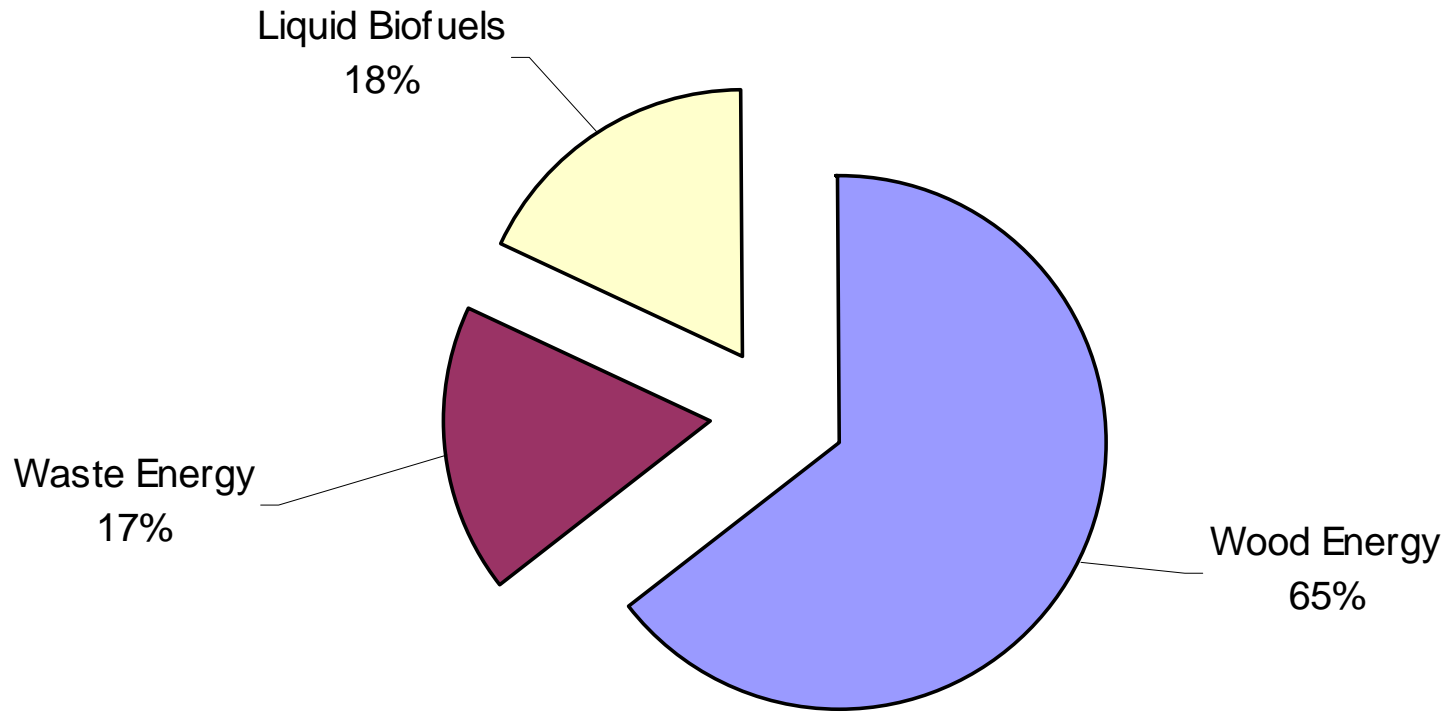
What is Bioenergy?

The Use of Organic Material for:

- Heat/Thermal (displacing natural gas/propane)
- Electricity (likely displacing coal)
- Liquid Fuels (displacing gasoline/diesel/petroleum)



U.S. 2005 Biomass Energy Consumption by Sector (Trillion Btu)



Source: Energy Information Agency



Industrial Scale Bioenergy



Rahr Malting (Shakopee)

- Barley, sawdust, switchgrass

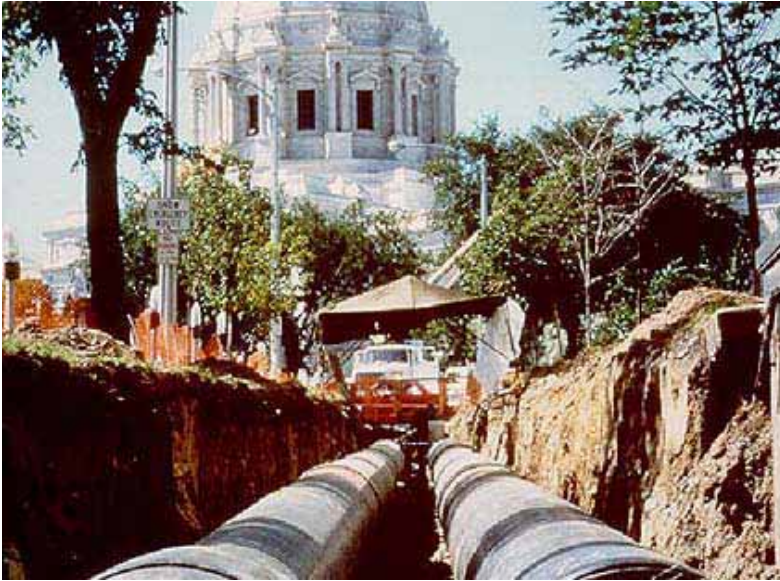


Central Minnesota Ethanol Coop (Little Falls)

- Corn for fermentation to liquid biofuels
- Woodchips for heat input



Commercial/Residential Scale Bioenergy



District Energy St. Paul
Urban wood waste

University of Minnesota Morris
Campus Heating System
Agricultural residues



Home Heating Systems
Wood pellets, corn kernels



IWLA's Interest in Bioenergy

(1) Displacing Fossil Fuel

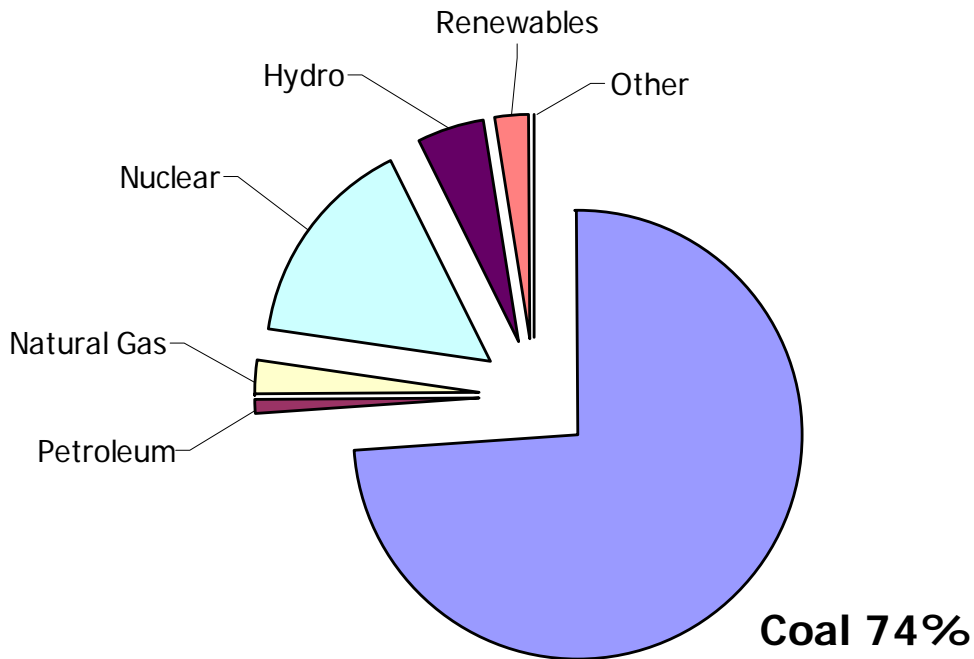
(2) Finding Solutions to Global Warming

***** IWLA New Report *****

A Whole New Game: The effects of climate change on hunting, fishing, and outdoor recreation in Minnesota

(3) Promoting better Land Use /
Conservation on Working Lands

Upper Midwest: 2004 Fuel Use in the Electric Power Sector



Upper Midwest: 2004 Fuel Use by Electric Power Sector
Source: Energy Information Agency, US DOE, 2004 State Generation
Includes Minnesota, Iowa, Wisconsin, South Dakota, North Dakota



Impacts of Current Energy Fuel Sources



- **Extraction.** Mountain top removal and mining that pollute the land and rivers
- **Combustion.** Air pollution and global warming gases from burning coal
- **Wastes.** Ash, sludge, and toxic chemical wastes
- **Water Use.** Coal plants need billions of gallons of cooling water and harm fish and wildlife.

Source: Union of Concerned Scientists



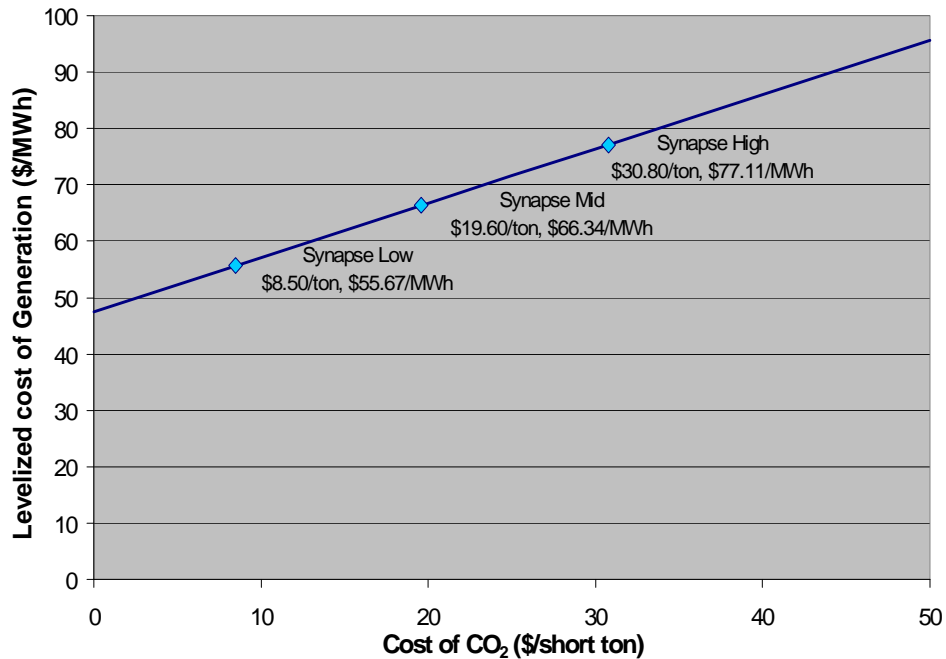
Market Forces Driving Bioenergy

Heat – Rising price of Natural gas and Propane

Power – Looming carbon costs on fossil fuels will make them more expensive

Transportation Fuel – Oil hit \$100/barrell on Wednesday

Pulverized Coal costs in 2015 under various CO₂ prices*



2007 passed State Energy Policies

Driving Bioenergy

- **State Global Warming Legislation Goals:** Reduce emissions to 15% below 2005 levels by 2015, 30% by 2025 and 80% by 2050.
- **Renewable Electricity Standard:** 30% by 2020 for Xcel Energy and 25% by 2025 for other utilities.
- **25 x 25 State Goal:** State's agricultural, forestry and working lands should provide 25% of the energy consumed in the state by 2025.
- **Petroleum Reduction Goal:** 20% by 2015 and 25% by 2025.



Could Drive Perennial Grasses



- **Renewable Fuels Standard:**
5% carve out for cellulosic biofuels
- **Reinvest in Minnesota – Clean Energy Program**
- **Native Prairie Seed Technical Committee**



2007 Processes & Funding Driving Bioenergy

Next Generation Energy Board established

- Policy priorities coming out Feb.1, 2008
- Has \$3 million granting authority

Governor's MN Climate Change Advisory Group

- Agriculture, Forestry, and Waste Technical Working Group
- Transportation and Land Use Technical Working Group
- Report coming out Feb.1, 2008

Money allocated for bioenergy project grants, permitting





Implications

- The market and policy drivers for bioenergy are big.
- Is already impacting the landscape.
- Could have even greater impacts if not done right.
- Perennial grasses are being looked at as the future crop for bioenergy – could benefit wildlife on working lands.



Moving Forward



- **Decreased Consumption – heat, power, and transportation fuel**
 - Efficiency & Land Use Planning
- **Comprehensive State Bioenergy Planning**
 - Mapping of resources for sustainable siting of facilities (i.e. water, wildlife)
- **Standards Development/Certification**
 - Growing methods
 - Harvesting guidelines
 - Water impacts





Being Clear on Terms

“Cellulosic”

Corn Stalks v. Perennials

“Carbon Neutral”

Replanting and Full Growth Cycle

“Biomass”

Definition at Legislature includes municipal waste (garbage)



Research Funding and Commitment Needs

- 1. Research for Bioenergy Standards Development**
 - Ecological, wildlife, and landscape based.
- 2. Measurement for Carbon Storage**
 - So conservation practices can get carbon credits
- 3. Push for R&D on Technologies that can take more diverse crops.**
 - Round up Ready mono-crop switchgrass.
 - Landscape needs should dictate technology, not the other way around
- 4. R&D on Technologies that are smaller scale & efficient.**
 - Less Feedstock Needs = less pressure on landscape, water needs



A scenic sunset over a lake. The sky is filled with soft, colorful clouds in shades of orange, pink, and purple. In the foreground, a person is silhouetted against the water, standing on a small boat and fishing with a rod. The water reflects the colors of the sky. On the right side, a large, leafless tree branch hangs over the water. The overall mood is peaceful and serene.

Thank You!

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