



# **The Role of Biomass in Heating**

## **Great Lakes Policy Forum**

**Panel 3. Options for Build-Out of Sustainable Wood  
Bioenergy Industry in the Great Lakes  
September 9-10, 2009**



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**Biomass Energy  
Resource Center**

**Pam Porter, Biomass Energy Resource Center**



## Biomass Energy Resource Center (BERC)

BERC is a national not-for-profit organization working to promote responsible use of biomass for energy.

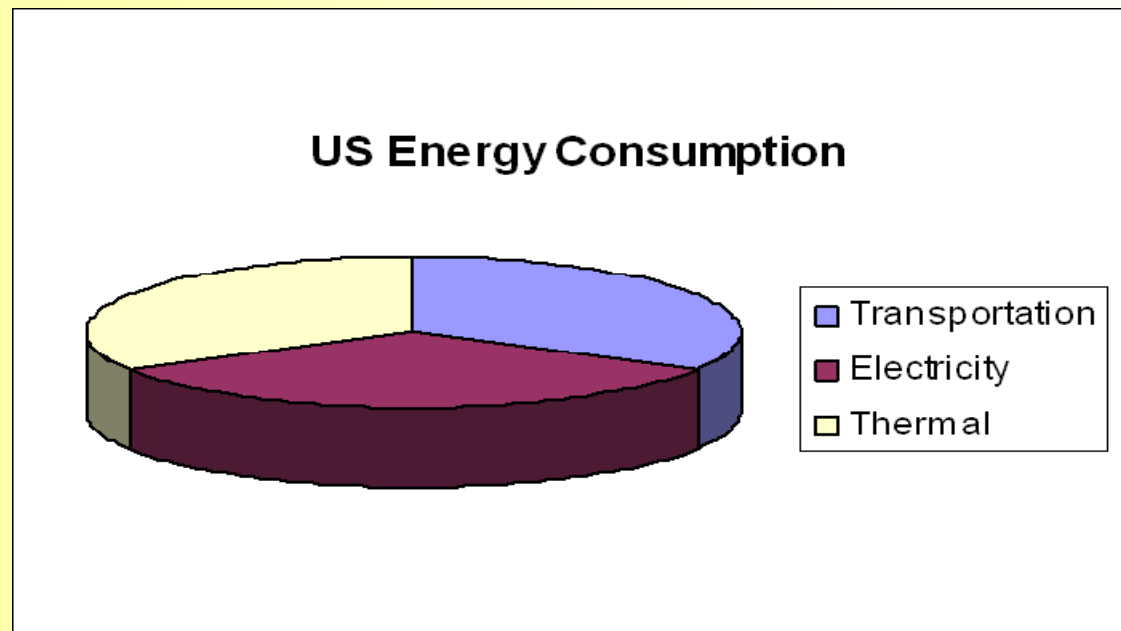
BERC's mission is to achieve a healthier environment, strengthen local economies, and increase energy security across the United States by developing sustainable biomass systems at the community level.



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# Approximately one third of US energy consumption is thermal



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Source: Energy Information Association.



## Wood to Energy Biomass Efficiency:

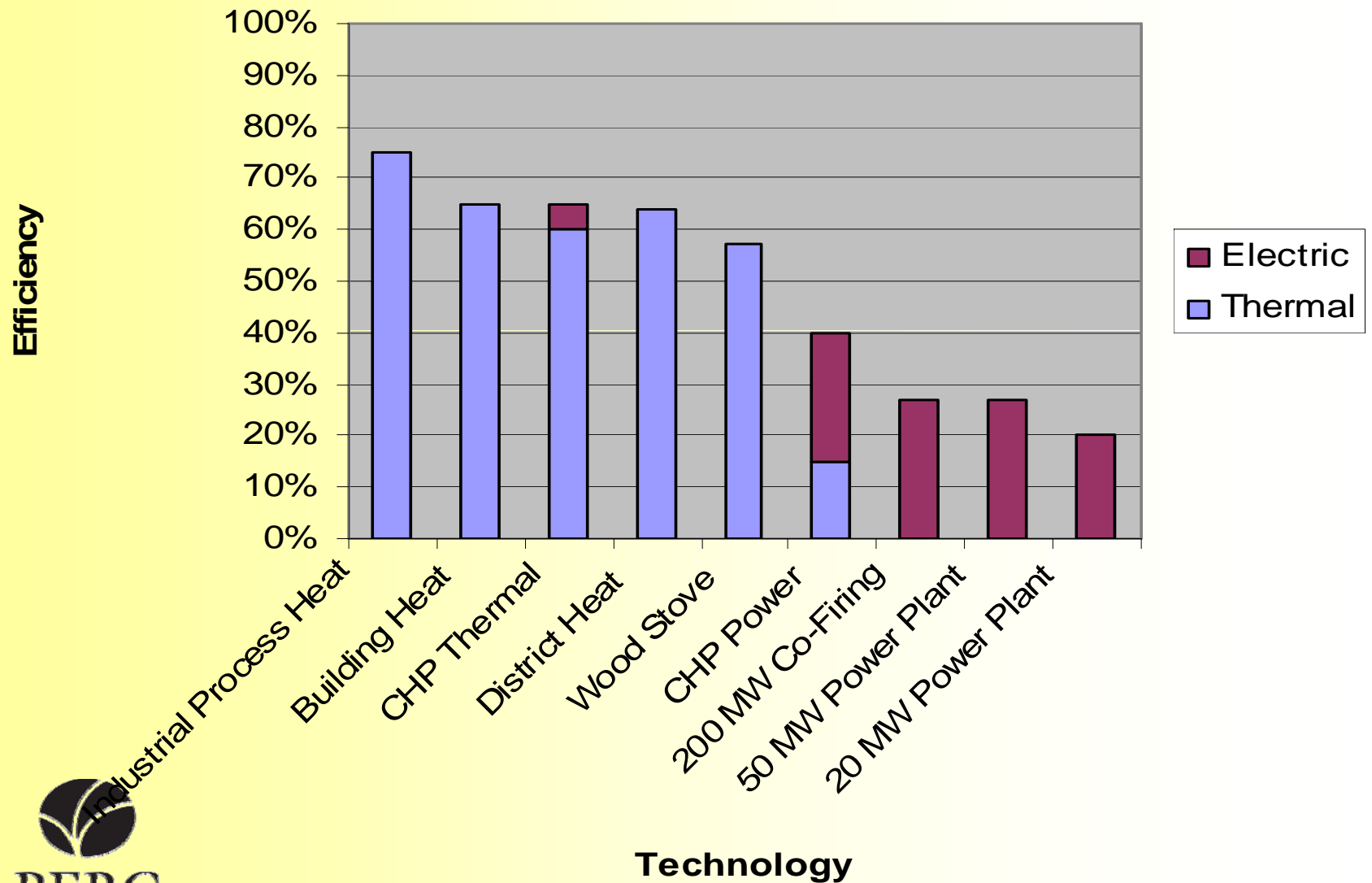
- Used for heat or heat-led CHP, woody biomass is approximately 75% efficient
- Used for generating electricity alone, woody biomass is 20-25% efficient
- Used for making ethanol, woody biomass is 40-50% efficient



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# Wood to Energy Conversion Efficiency (available technology)



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# The Challenge



- **Will the United States become a world leader in the innovation, production, economical and sustainable use of biomass energy, biofuels, and bioproducts created from local wood and agricultural resources?**



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# The Challenge



- Or, will the shift from a fossil-based economy to a bio-based economy lead to exploitation of biomass in a boom-and-bust cycle that does not sustain a region's economy, communities, energy supply, agricultural base or forests on a long-term basis?



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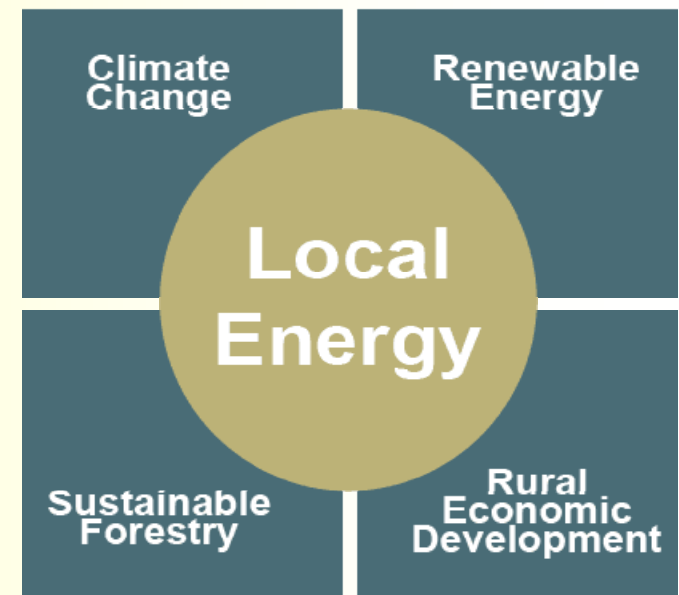
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# A Vision for Local Energy Systems

## A new way to look at communities and forests

- Demonstrate the feasibility of biomass heating in a community setting
- Save taxpayer money by retaining energy dollars
- Promote use of locally produced, renewable energy
- Help states meet goal of 25% renewable by 2025
- Create local jobs



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# "Modern" Biomass Heating Systems

- Automated fuel handling
- Hot water boiler and heat distribution
- Increased efficiency
- Lower emissions
- Lower time requirements
- Reliable operation



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# Comparison of wood use?

## *Industrial Uses:*

- Cellulosic ethanol  
tons 300,000-1,500,000
- Power plants 200,000-600,000 tons

## *Community Uses:*

- One school 1,000 tons
- 10% of schools in WI (200) 200,000 tons
- Small College (Middlebury College) 20,000 tons
- Cheese Plant (Muscoda, WI) 10,000 tons
- State office complex (VT) 5,000 tons
- Hospital (Ashland, WI) 2,300 tons
- Crotched Mountain Rehab Ctr. (NH) 3,000 tons
- Public housing (50 units) 450 tons



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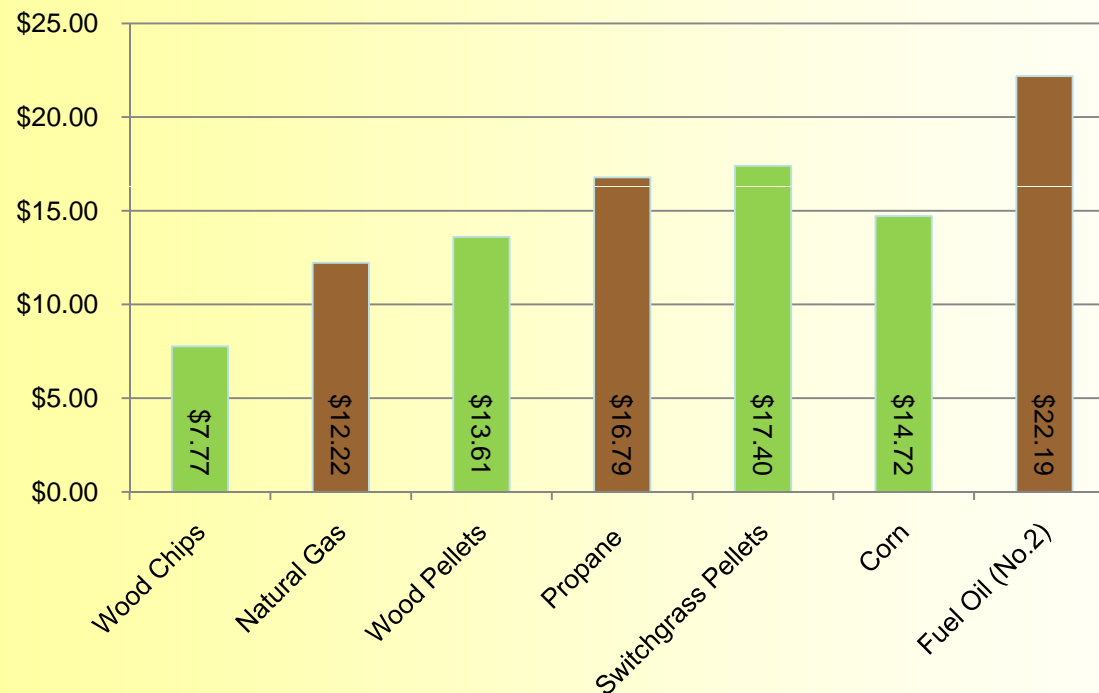
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**All in green tons**

# Comparative Cost of Heating Fuels

## Biomass: A Cost-Effective Fuel

Cost per MMBtu After Combustion - Midwest



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Heating with biomass is often less expensive than heating with fossil fuels.

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# Ashland, WI Memorial Hospital



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# "Fuels for Schools": Pilot Program

- 38% fuel savings biomass vs. natural gas
- 62,109 therms of energy displaced
- 1135 tons of biomass/year



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# Middlebury, VT. Courthouse



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# College District Heating & Cooling

- 40% reduction in GHG emissions
- 75 mile radius (20,000 tons/yr)
- 20,000 tons chips/year
- Willow plantation
- \$2 million annual cost savings (2008)
- CHP – 2-2.5 million kilowatt hours electricity (1/5 campus electricity needs)



**Middlebury College, Middlebury, Vermont**



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# Small District Energy



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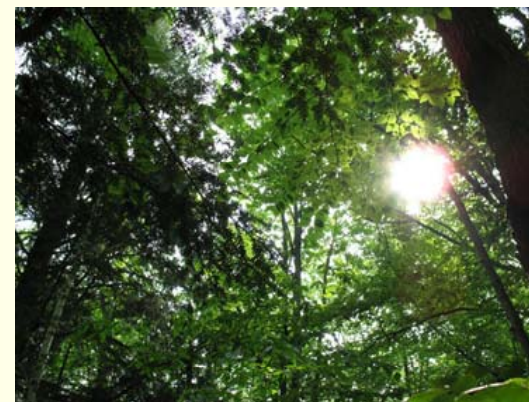


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