

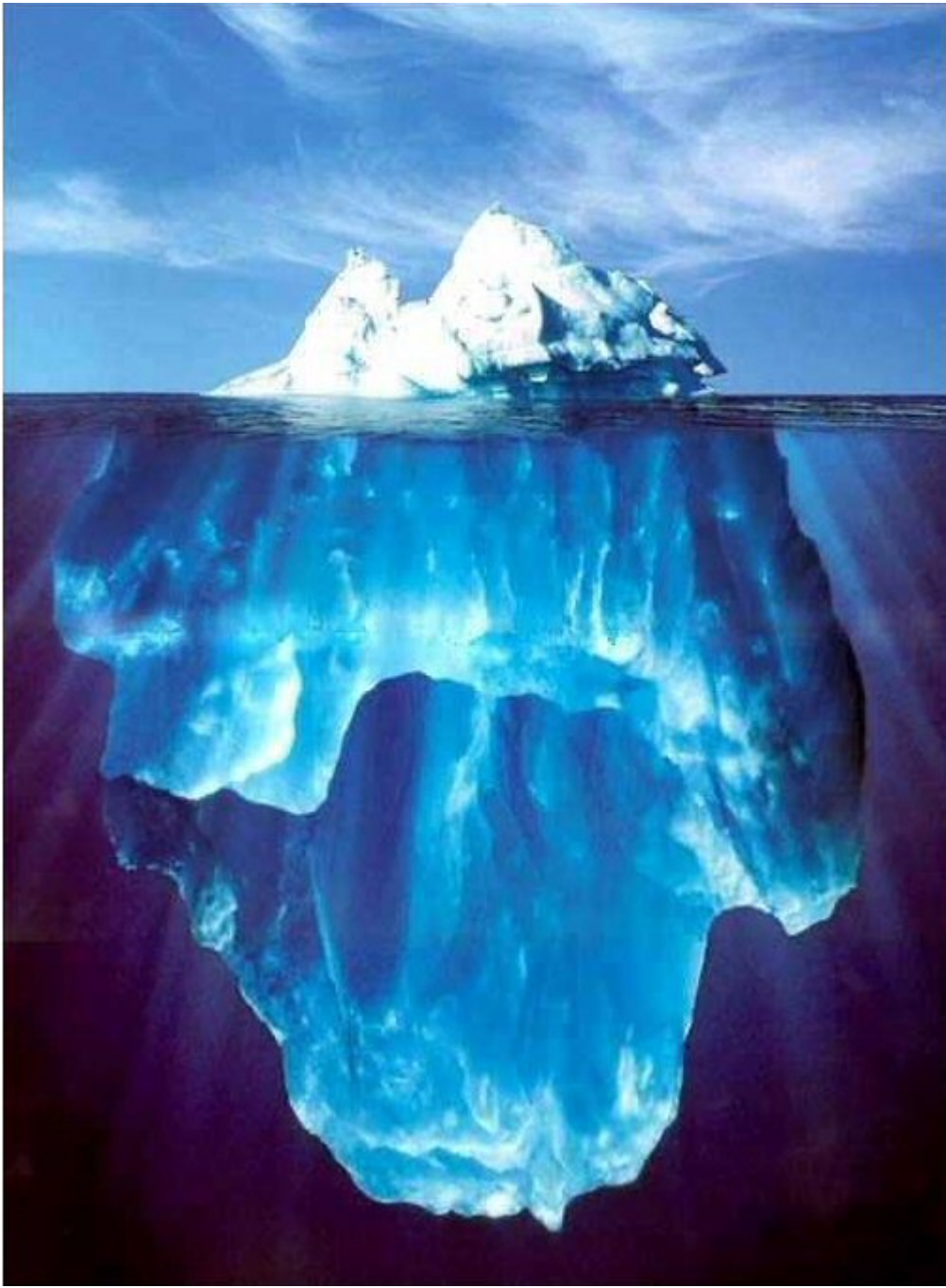


Renewable Energy Alternatives For Wisconsin





A significant challenge...



Renewable Energy Initiatives

Executive Order 145: Conserve Wisconsin

- Create high performance building standards
- 10% reduction per gross square foot by 2008, and 20% by 2010.

Wisconsin Act 141: Renewable Electrical Energy Goals

- 10% renewable by the end of 2007, and 20% by 2011.

Governor's Pilot Program to go "off the grid" in five years.

- Acquire or produce renewable energy equivalent to consumption.

Evaluation criteria

- Current fuel mix used in heating/cooling plants;
- Existing fuel permits for heating and cooling plants;
- Local utility offering a green power purchasing program;
- Campus participation in a green power program; and
- Support of the campus administration.

Four campuses selected:

- UW-Green Bay, UW-Oshkosh, UW-River Falls, and UW-Stevens Point.

Current UW Green Energy Purchases

Campus	Percent Purchased	Annual Cost	Funding Source
UW-Green Bay	10%	\$18,000	Segregated Fees
UW-Oshkosh	11%	\$35,000	Non-student PR
UW-Stevens Point	10%	\$25,000	Segregated Fees
UW-River Falls	Under negotiation		

Green Energy Options

Heating/Cooling plants:
renewable fuels

Paper pellets and wood

Bio-diesel fuel

Biomass gasification
reactors

Types of Biomass



Wood



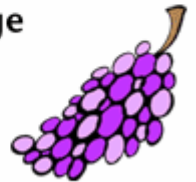
Crops



Garbage



Landfill Gas



Alcohol Fuels
www.ngdir.ir

Green Energy Options

Primary focus is electrical energy



- Annual Average WI home = 8,800 KWH
- Pilot project electrical energy goal >86 million KWH
- Act 141 20% electrical energy goal > 128 million KWH
- Two sources with the most potential:
 - Purchase green power from state utilities
 - Generate green power from wind tower turbine generators

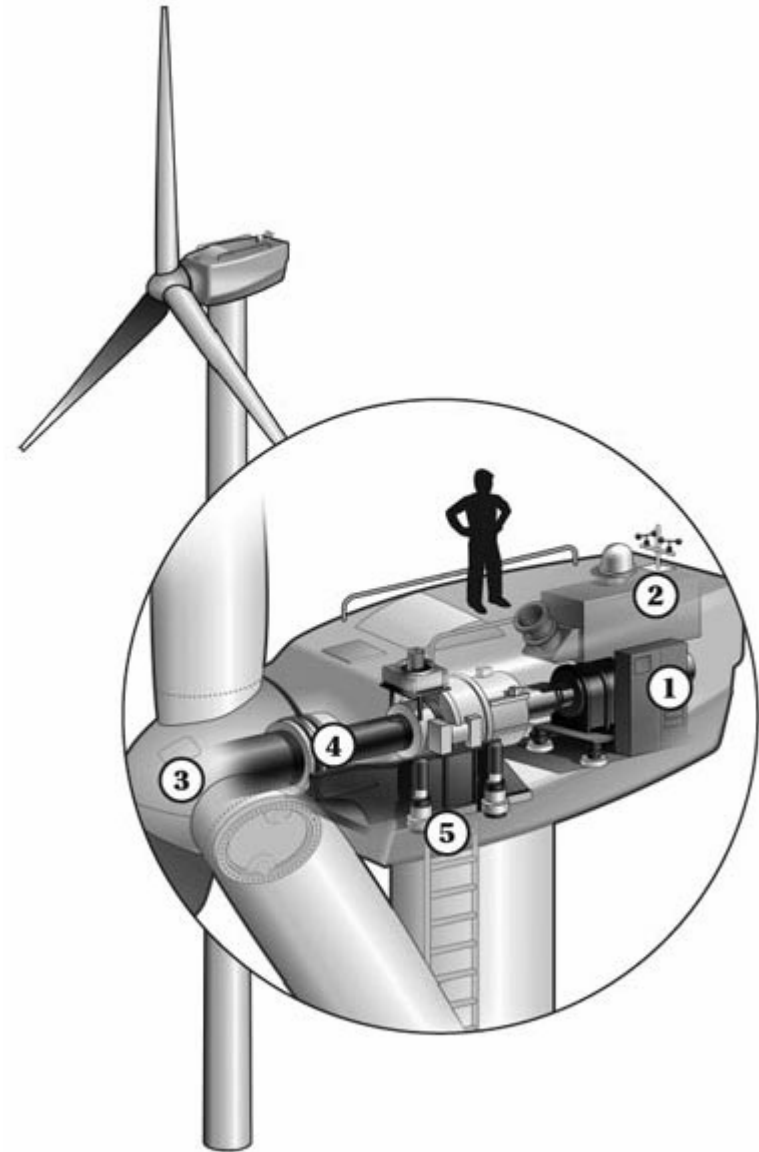
Green Energy Costs and Availability

- Green energy is typically purchased at a premium cost of approximately 1¢ per KWH.
- Three campuses may be able to purchase enough green power.
- Some potential funding sources
 - agency funds
 - agency utility appropriations
 - campus operating budgets
 - segregated fees, etc.



Wind Turbine Generators

- Provide electrical power directly to site or generated power can be sold to the local utility
- Tower site selection criteria:
 - Prevailing wind speeds
 - Wind flow obstructions (buildings, trees, etc.)
 - Adequate electrical distribution system (transmission lines)



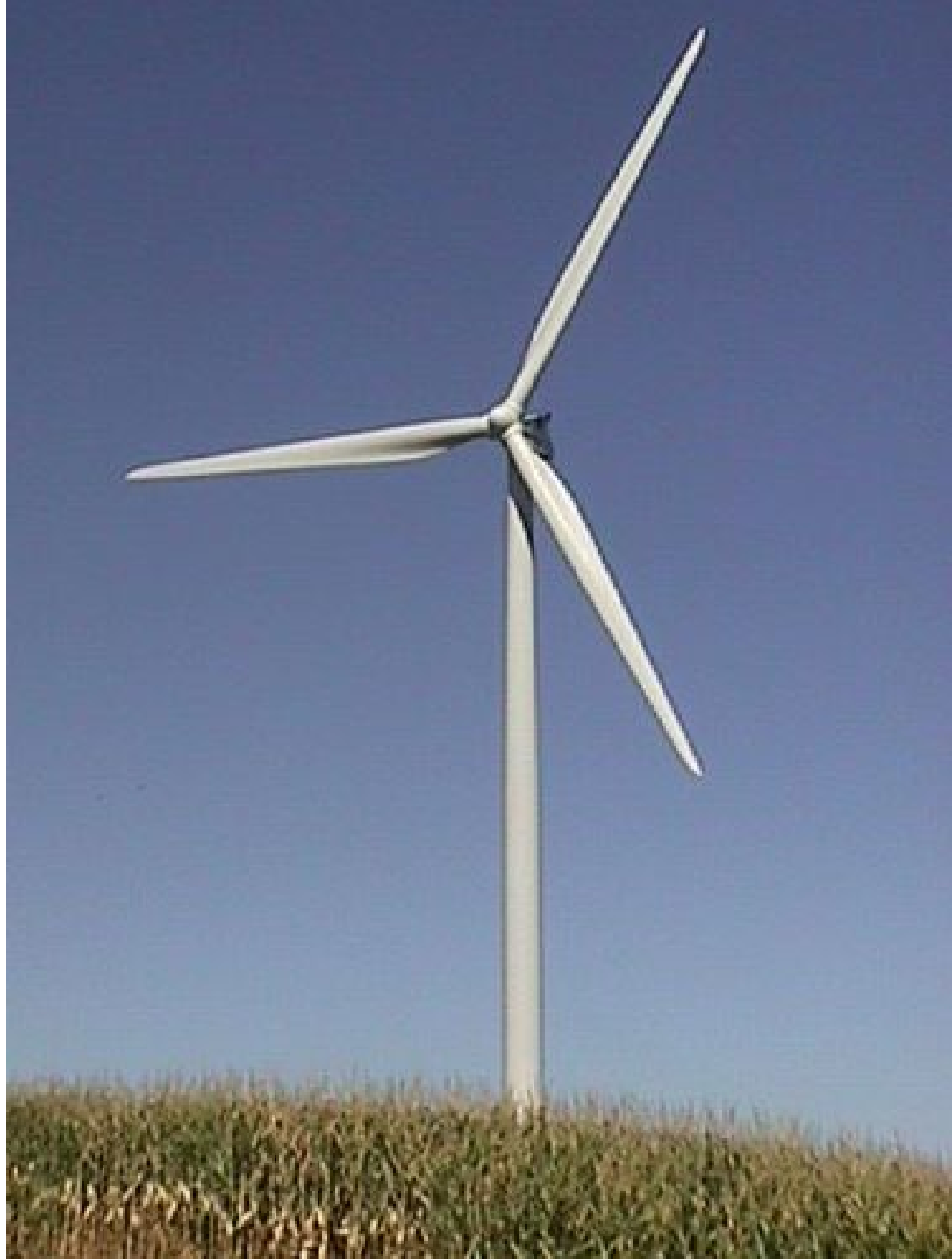
A Case Study – Carleton College

- Cost approximately \$1,900,000.
- State provides an incentive of \$0.015 per KWH for the first 10 years.
- Incentive is added to the \$0.033 per KWH income from the utility.
- The project offsets about 40% of the college's current electrical usage.
- Carleton expects payback in 9 to 11 years.

A Case Study – Carleton College

Wind tower turbine
generator installed in 2004.

20-year useful life.





Turbine and three 135 foot blades atop a 230 foot steel tower.

Wind Turbine Installation



1,650 KW turbine
produces approximately
4.6 million KWH per year.



Alliant Energy's New Bohemia Solar Project in Cedar Rapids, Iowa

Solar panels produce 7,200 watts of electricity.



Next Steps

UW System and DOA-Division of State Facilities staff have been meeting with utility providers around the state to learn more about their capabilities and plans.

UW System/DSF mini-summit on November 17th to continue the planning process with emphasis on renewable fuels.

