RENEWABLE ENERGY & SUSTAINABLE PRACTICES

Northeast Wisconsin Technical College

Green Bay, Wisconsin

April 16, 2008

Northeast WI Technical College

- Two year technical college
- 9 county district, population 400,000+
- 4 campuses and 5 regional centers
- 6200 FTE
- Headcount enrolment of 41,000
- Operating budget of $90,000,000
- 74 technical associate degrees and / or diplomas
- 81 certificates
- Corporate Training and Development
- Continuing education

New Programing

Feeling your way through the fog: Determining skills needed for jobs that do not yet exist

A looming challenge for community colleges is determining the skills that are needed for jobs that do not yet exist. In essence, we are feeling our way through the fog and will likely bump into obstacles hidden from view.

Doing the Research

- Occupational research not much help – based on today not tomorrow
- Field work
  - Schneider Trucking, Schreiber Foods, Sanimax, Georgia Pacific, Wisconsin Public Service
  - World Bio Conference and others
  - Consortium for Education and Renewable Energy Technology

Reading the tea leaves

- Should Schneider trucking start a mixing process whereby they would mix diesel and bio-diesel and resell it?
- There is not enough arable land to produce enough biomass to meet energy needs
- Making ethanol takes more energy than ethanol delivers
- Will political policy outstrip capacity?
- Wind power is most likely to be used to meet the Governor's 10% goal
- Let the market dictate direction and demand – not subsidies and tax credits

What Now?
Three arenas of action
(some riskier than others)

- Production of equipment that produces energy
- Production and distribution of energy
- Consumption of energy

Production of Equipment to Produce Energy

- Least risky
- Essentially the same manufacturing skills needed to make most other products.
- 14,000 new manufacturing jobs in Northeast Wisconsin (Renewable Energy Policy Project, 01/2006)
- New North and Wind Turbines

So…

- Continue to ramp up manufacturing skills education
- Integrate basic science courses in chemistry and biology
- Create advance courses/certificates for persons wishing to obtain specialized training

Energy Production and Distribution

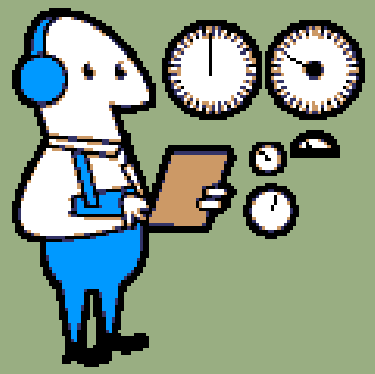
- Iffy proposition
- Distribution – OK Production – who knows?
- Core skills common to all production?
  - Chemistry
  - Biology
  - Boiler operation fairly general across board for transferring energy

So…

- Start small
- Workshops, seminars, certificates, diplomas, degrees
- Focus on course work that has the highest transference of skills across fields
- Integrate within existing programs wherever possible

Energy Consumption

- Start at home – Use as learning tools
  - Performance-based contracts
    - Energy production and consumption controls
    - 3 years savings $630,000 – 21% better than goal
  - Biomass conversion
    - Gasification of wood chips
    - 15 year payback
  - Computer shutoff - $24,000 in the first year
  - Energy committee with specific reduction goals



Energy Information integrated throughout curriculum

- Architectural Design
- HVACR
- Building Construction
- Electricity
- Gas Utility
- IT Sciences
- Landscape and Horticulture
- Automotive and Diesel Technology
- General Education Courses

So…

- Focus on additive courses, seminars, workshops
- Advanced certificates
- Build energy education opportunities in the design campus energy projects
    - Sunflowers and green roofs

Resisting the Pressure

- Who will be the first?
- Who will get the grant money?
- Who will get the degree granting authority?
- How do you avoid getting cut out of the “next best thing”?

Measured Approach

Our Solar Sunflowers

- One example of integrating renewable energy technology into our culture and curriculum

Partners

- Northeast Wisconsin Technical College
- Wisconsin Public Service
- Green Bay Botanical Garden
- Focus on Energy
- Wisconsin Technical College Foundation
- Private donors: Bob and Leslie Shade
- Jeff DeLaune
- Students

Location

- Green Bay Botanical Garden
  - 47 acre gardens located adjacent to NWTC
  - Pedestrian Traffic
- Landscape Horticulture Building
  - 5000 s.f. satellite building adjacent to the green Bay Botanical Garden Visitor Center
  - ½ of electricity used in facility will be generated by our solar sunflowers.

Tracking the Sun

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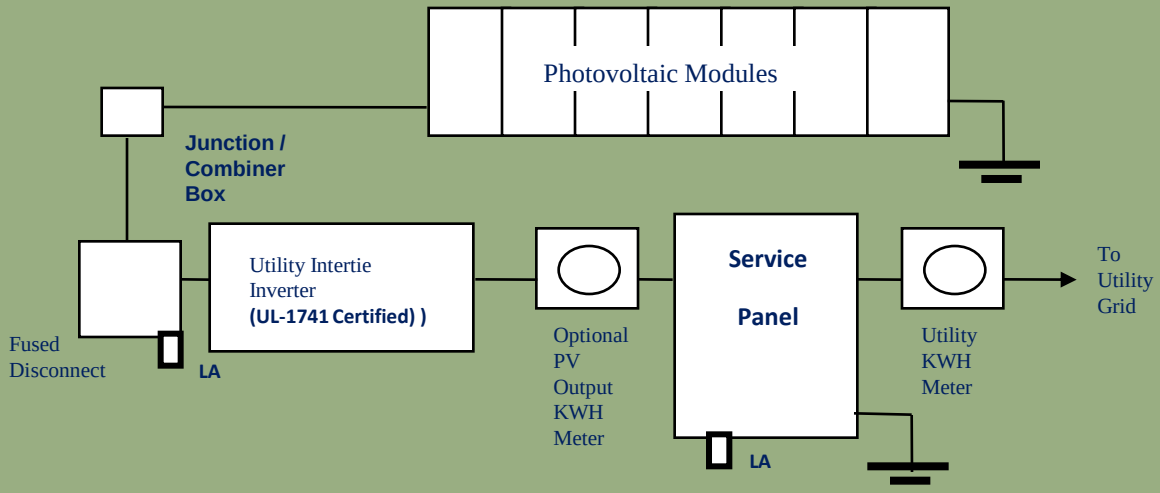
The System

- **SOLAR ENERGY is converted into direct current electricity by the solar modules. The direct current is converted into alternating current by the inverter, feeding it directly into the buildings electrical panels.**

- System Capacity: 4 Kilowatt, 2 – 2016 Watt PV Arrays
  - Estimated Energy Production: 6000 kilowatt hours per year
    - About enough energy to power a conservative household
  - Offsets burning 6000 lbs of coal annually
  - Offsets 14,000 lbs of CO2 production annually
  - Equivalent Energy of 10 barrels of oil per year

SYSTEM COMPONENTS

- **Solar Modules:** Manufactured by Sharp
  - Sharp is the worlds largest manufacturer of solar modules with production in Tennessee
- **Dual Axis Trackers:** Wattsun, by Array Technology
  - The trackers locate the brightest spot in the sky to optimize energy production morning to night
- **Inverters:** SMA made in Germany
  - SMA is the worlds largest inverter company

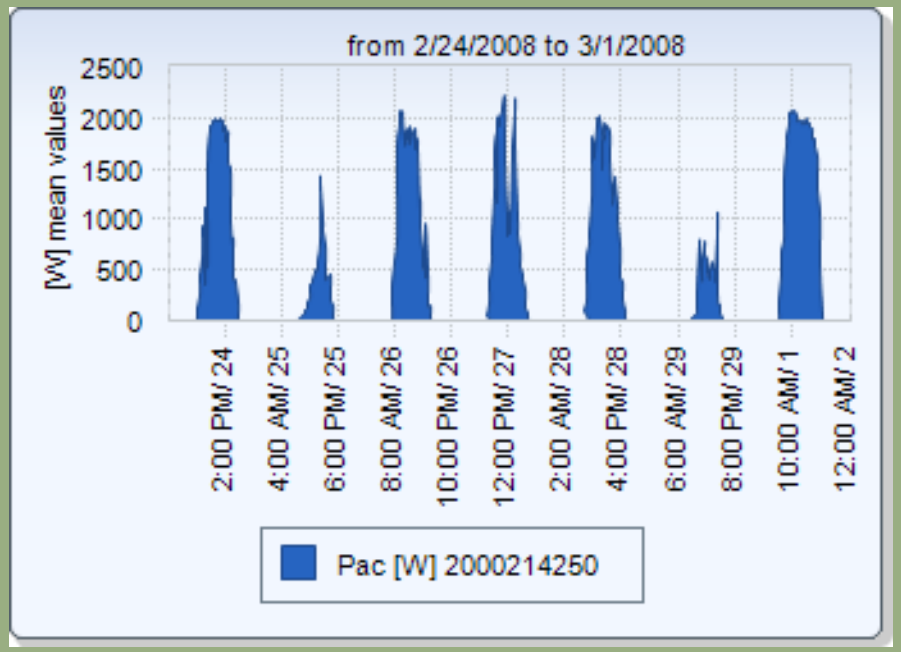


Installation

- System installation began in the spring of 2007
  - Masonry
  - Electrical Power Distribution
  - Electricity
  - Electronics
  - Electrical Apprenticeship
  - Landscape Horticulture

Results

- Installation completed August 2007
- Trackers began operation on August 28, 2007
  - CO_2 Offset: 1984 kg
  - Energy cost reduction: $284
  - Energy : 2834 KWH
- Continuous use by program students



Mayor's Beautification Award

Mayor's Beautification Committee
Presents this

Recognition Award

to

NWTC / WPS

for

Environmental Design

and is hereby commended
for furthering the work of City Beautification

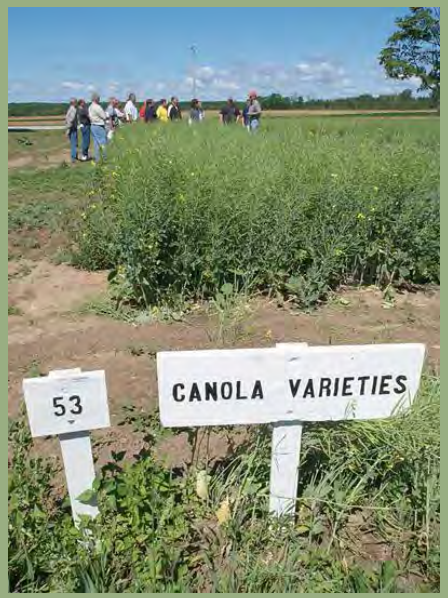
Given the eighth day of November
Two Thousand and Seven

Mayor of the City of Green Bay

Chairman of Mayor's Beautification Committee

The Future

- 5 certificate offerings
  - Renewable Energy – Solar
  - Renewable Energy – Wind
  - Sustainable Design
  - Biofuels
  - Sustainable Food Supply
- Energy Management Degree
- Green Modules infused in curriculum
- Additional Renewable Energy Projects



Questions, Comments, Suggestions?

Presentation Information

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