



**Minnesota Renewable Energy Society**

*connecting minnesotans with renewable energy resources*

# The Solar Flare

e-Bulletin from the Minnesota Renewable Energy Society

**April 2009**

## **April 2009 Highlights** - (See details in following pages)

- Monthly Member and Board Meeting – April 9
- Metro CERTs Spring Resource & Networking Event – April 15
- Solar Energy: Everything You Always Wanted to Know About Solar Water Heating – April 18
- Elk River Energy Expo – April 18
- Celebrate Earth Day at the Midtown Global Market – April 18
- Introduction to Renewable Energy Options & Opportunities – May 2
- Living Green Expo – May 2-3
- Solar Boat Regatta – May 16
- Green by design – June 10-11

## **Upcoming Events**

### **April 2009 Member & Board Meeting**

Thursday, April 9, 2009

6:00 PM – Guest Speaker

7:00 PM – Board Meeting

Location: Flannery Construction

[1375 St. Anthony Avenue, St. Paul, MN](http://www.flanneryconstruction.com)



Join us for the next MRES Board Meeting on April 9 at Flannery Construction. Our guest speaker will be [Brandon Hathaway](#) from the University of Minnesota, who will discuss [solar fuels and solar thermal research](#) at the U of M. Research at the Solar Energy Laboratory in the department of Mechanical Engineering at University of Minnesota considers several approaches for harnessing the most plentiful energy source available to us on Earth, radiant energy from the sun. Some of the newest approaches to utilizing solar energy on a larger scale are the production of solar fuels that may be utilized to offset traditional non-renewable fuels. This presentation will focus on these solar fuel projects, which produce hydrogen and other gaseous fuels which may then be utilized in many different ways.

Brandon Hathaway is a graduate research fellow at the University of Minnesota working on a Ph.D. degree in Mechanical Engineering studying solar energy and solar thermo-chemical processes under professors Jane Davidson and David Kittelson. Originally from Huron, South Dakota, he obtained his B.S. in Mechanical Engineering from the Rose-Hulman Institute of Technology in Terre Haute Indiana in the spring of 2007 and now resides in the Marcy Holmes neighborhood of Minneapolis.

## Metro CERTs Spring Resource & Networking Event

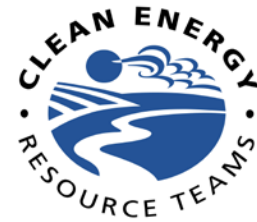
Date: April 15, 2009

Time: 3:00-7:30PM

Location: Science Museum of Minnesota

120 W. Kellogg Blvd

St. Paul, MN 55102



Join Metro Clean Energy Resource Teams (CERTs), Affiliates, Partners and Friends to celebrate a year of community energy projects and to hear about new energy resources coming on-line. The program will be followed by food, drinks and time for networking.

Agenda:

3:00-5:30pm – Program

- Metro CERTs Network: Year in Review
- The Stimulus Package: Resources for your Local Energy Project
- GreenStep Cities: Learn about a new resource for MN cities and hear some examples of how some are leading the way.
- Community Energy Projects: Getting Started, Successes, Challenges and Lessons learned.

5:30-7:30pm

- Networking, light appetizers & cash bar

Go to the [Metro CERTs webpage](#) for more information.

RSVP to Diana McKeown

Phone: 612-278-7125 or E-mail: [dmckeown@greeninstitute.org](mailto:dmckeown@greeninstitute.org)

## Solar Energy: Everything You Always Wanted to Know About Solar Water Heating

Saturday: April 18, 2009

Course Location:

Century College

3300 Century Avenue N.

White Bear Lake, MN

Phone: (651) 779-3341



Century College and the Minnesota Renewable Energy Society have co-developed this one-day introductory course for homeowners and people interested in learning the basics of how to design a solar hot water heating system for residential applications.

The essentials of creating domestic hot water from the solar radiation are covered. You will learn to evaluate solar site resource, when solar hot water is the right solution, the economics and incentives for solar hot water, and system design principles. System components, system sizing, solar thermal panels, storage tanks, heat exchangers, and plumbing connections will be all explored.

Ralph Jacobson, a 25 year veteran of solar system installations, is the course instructor. He is a materials engineer, NABCEP certified in both solar PV and solar thermal installation. Ralph is currently involved in developing a strategy for growing the solar industry in Minnesota and developing training programs for the building trades. He is also on the Board of Directors of the Minnesota Renewable Energy Society and the owner of [Innovative Power Systems](#).

People interested in taking the solar thermal course may register on the [Century College website](#).

Course ID: 001827

## Elk River Energy Expo

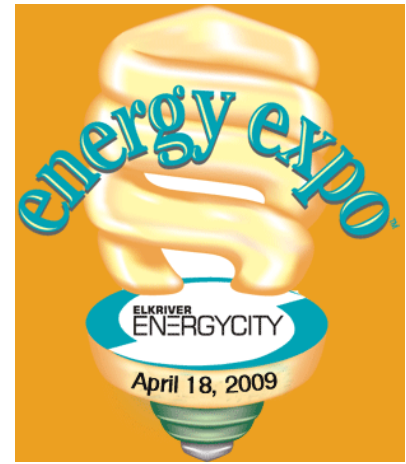
Saturday April 18, 2009

10 a.m. to 3 p.m.

Twin Lakes Elementary School

10051 191st Avenue NW, Elk River, MN

The third annual [Elk River Energy Expo](#) will be held Saturday April 18, 2009 from 10 a.m. to 3 p.m. at the Gold LEED certified Twin Lakes Elementary School featuring exhibitors on energy and resource conservation technologies, innovations, and practices; children's performances by Tricia and the Toonies and CLIMB Theatre; presentations of awards for Energy Ennys and Energy Innovations contests by students of Spectrum High School, and a bus tour of Energy City demonstration sites.



### Keynote Speaker:

Joe Shuster, author of Beyond Fossil Fools, The Roadmap to Energy Independence by 2040. Joe will speak at 10:00 a.m. following the introduction by Mayor Klinzing.

## Introduction to Renewable Energy Options & Opportunities

Saturday, May 2, 2009, 8:30 AM to 5:00 PM (8:00 a.m. check-in)

Location: Flannery Construction, 1375 St. Anthony Avenue, St. Paul, MN

MRES offers Introduction to Renewable Energy (RE) Options & Opportunities: the course includes technology alternatives and options, including Solar PV (solar electric), Solar Hot Water & Space Heating, Passive Solar Hot Air Heating, Wind Energy, Energy Efficiency, RE environmental issues, RE costs, rebates & incentives, finance options, and RE career opportunities.



- Learn about energy efficiency and why it is important.
- Learn how RE impacts the environment.
- Learn basics about RE technologies and options, including solar PV (electric), solar hot water and space heating, passive solar and active solar hot air heating, and wind energy systems.
- Learn about RE costs; environmental issues; rebates, incentives, and financing options; and RE resources.
- Learn about RE installations in Minnesota: lessons learned and success stories.

This MRES class is intended for homeowners, community leaders, business owners, green and RE career seekers, people interested in RE, and the general public (intended for age 18 and over). Don't wait too long to register; this class has been very popular and has filled well before it begins.

[Course registration](#) and details are on the MRES website.

\$55 MRES members; \$75 non-members

## Living Green Expo

May 2 - 3, 2009

Saturday: 10 a.m. to 6 p.m.

Sunday: 10 a.m. to 5 p.m.

Minnesota State Fair Grounds (Saint Paul)

The 8th annual Expo features 250 exhibitors of products, services, and information, along with over 60 workshops on a variety of sustainability and green living topics. Expo attractions include music, food, demonstrations, and hands-on activities for families. MRES will be exhibiting indoors, and the Solar Trailer will also be at the event.



## Solar Boat Regatta

Saturday, May 16, 2009

10:00 a.m.–4:00 p.m.

Beach at Phalen Park, Wheelock Parkway and Phalen Drive, St. Paul

The Minnesota Renewable Energy Society (MRES) and Great River Energy are pleased to announce the 17th Annual Solar Boat Regatta!

MRES' Solar Boat Regatta provides an opportunity for middle and high school students (as well as individual boat builders) to build a boat that runs on solar power. They compete in a number of races, culminating with a one-hour endurance race. This event has given hundreds of junior and senior high school students valuable and unique experience with solar electricity, wiring, motors, fluid dynamics, boat design, construction, and teamwork. By racing the solar powered boat that they have put together, students experience the thrill of competition and the pride of accomplishment that comes with creating something useful and fun.



Javier Monesterio - 2008  
Winner of Experimental Class

MRES partners with teachers and teacher organizations to enhance the competitive nature of the event, expanding the number of schools participating, and extending solar education throughout the school year.

For 2009, the race will take place at Phalen Lake in St. Paul, MN. There is another event (Waterfest 2009) happening on the same day on this lake and we hope to increase attendance and interest in our event by sharing the lake. Waterfest is happening down the shoreline, so it will not affect the Regatta. The event is free and open to the public; however, there is a fee to enter a boat in the races.

Registration for Race Participants:

- Registration Fee: \$25 (through April 10, 2009)
- Registration Fee: \$50 (April 11–May 1, 2009)

Register Online: [www.SolarBoatRace.net](http://www.SolarBoatRace.net)

**Volunteers are needed.** For questions about the Solar Boat Regatta, visit [www.SolarBoatRace.net](http://www.SolarBoatRace.net) or contact the Minnesota Renewable Energy Society at [regatta@mnRenewables.org](mailto:regatta@mnRenewables.org) or (612) 308-4757

## Celebrate Earth Day at the Midtown Global Market

April 18, 2009

11:00am–4:00pm



Midtown Global Market, in partnership with Do It Green! Minnesota and Edible Twin Cities magazine, invites everyone to celebrate Earth Day on Saturday, April 18, 2009. Visitors are invited to meet local farmers and producers. There will be cooking demonstrations, sampling, children's activities, and live music from 11 a.m. to 4 p.m.

This year's theme is to "Think Globally, Act Locally," and teach people how to enact sustainable efforts in their lives. Representatives from Do It Green! Minnesota will be on site with eco action tables offering easy ways to green-up your lifestyle. The first 100 people to take an "Earth Pledge" with Do It Green! Minnesota can make and take home a bottle of all-purpose, non-toxic cleaner.

For more information go to: [www.midtowntglobalmarket.org/Earth](http://www.midtowntglobalmarket.org/Earth)

### Green by design

*Fourth annual statewide conference*

June 10 and 11, 2009

The Depot · Minneapolis

Presented by:

Minnesota Green Communities

Keynote Speaker: Hunter Lovins



The 4th annual statewide Green by Design conference and training is aimed at providing housing developers, builders, contractors, architects, city planners, environmentalists, funders, and other professionals the tools needed to build energy efficient, healthy, and sustainable housing. Multiple tracks will be offered, including sessions by local and national experts that focus on various elements of the Green Communities criteria (a set of nationally recognized green affordable housing standards) and other related topics. Examples of successful green building projects, including both multifamily and single-family developments, new construction and rehabilitation, will be highlighted throughout the conference.

Topics of interest include: Residential Green Building • Minnesota Housing Green Funding Requirements • Green Rehabilitation • Ensuring Healthy Homes and Communities • Green Opportunities and Issues Surrounding the Foreclosure Crisis • Sustainable Land Use Planning • Equitable Green Economic Development • Green Building Materials • Energy Conservation and Climate Protection Strategies • Rural and Urban Greening Strategies • and other great topics on green building, design, and public policy.

Click here for more information and to register online at: [www.mngreencommunities.org/gbd](http://www.mngreencommunities.org/gbd)

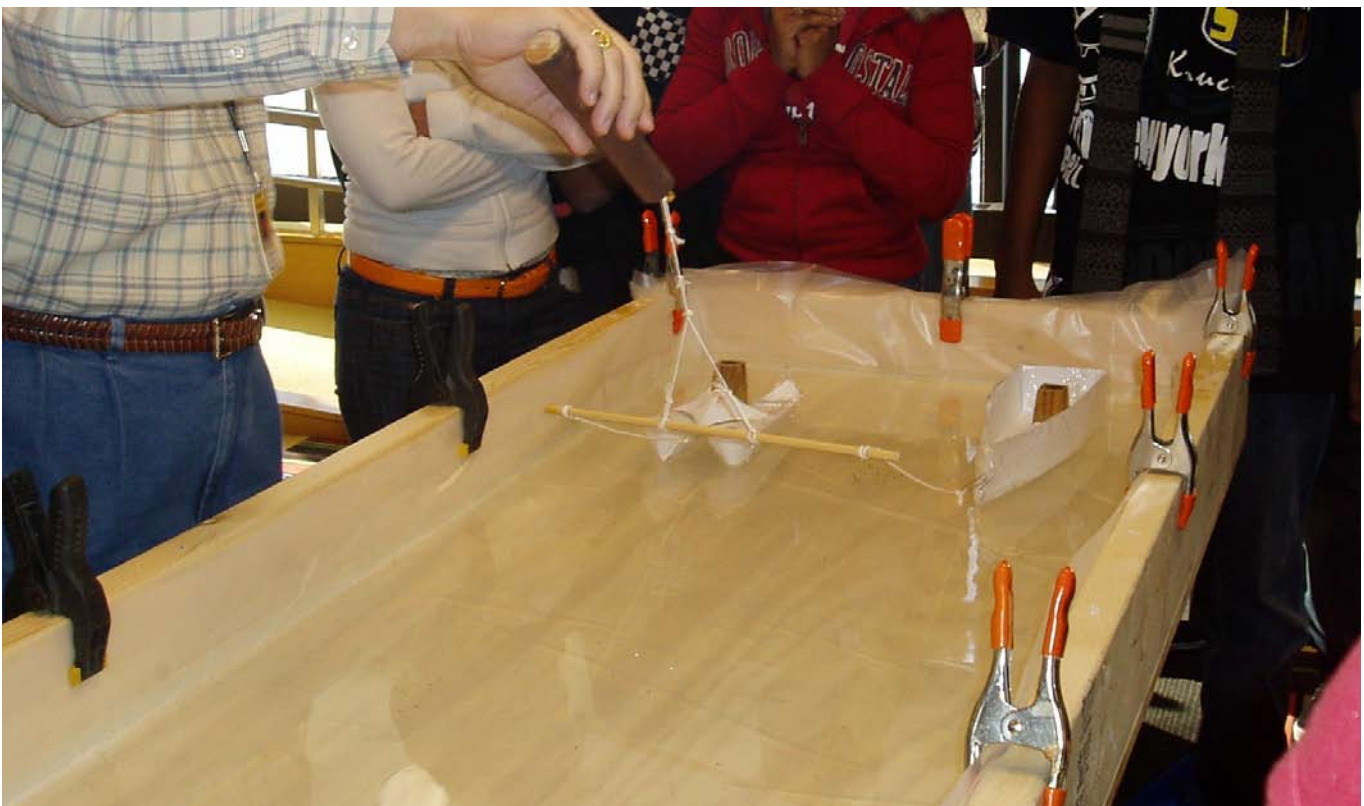
## Roosevelt High School Students Prepare for Solar Boat Regatta

by Steve Greenway

Minneapolis – GE has been involved in a mentoring program with Roosevelt High School for about eight years. We are always looking for new ideas to get the students involved in the STEM disciplines (Science, Technology, Engineering and Math). As the Environmental Leader for GE Volunteers in the Twin Cities, I was looking for a project that also addressed alternative energy. Since my hobby is woodworking and I've always had an interest in boats the Solar Boat Regatta seemed a perfect fit.

Selling the idea to GE and Roosevelt was easy, getting the students involved was a little more challenging. Most of the students had never built anything before and had very little experience with woodworking tools so there was some trepidation about building a boat.

We started off by having groups of students design and build small model boats from posterboard. The goal was to construct a boat that would float with a small weight in it, could be towed with minimal resistance and was stable enough not to tip over during the tow-test.



*Tow-testing boats at GE.*

About twenty different designs were constructed, then wrapped in plastic and tested for towing resistance. The boat with the least resistance was the winner and used as the starting point for the full-size boat.

[continued on page 7]

[continued from page 6]

A few weeks later we held a Solar Boat Open House at the high school. About a dozen students signed up for the project. The first week in March we started refining the boat design and after testing a few more variations we finalized our design. We built a larger scale model of the final design as our guide and began construction for the full size boat.

After some shop safety training the students picked up the necessary woodworking skills quickly.

Most of the students have busy schedules so we have the shop open after school four days a week for the solar boat project. We have a core team of about six students who show up most every Monday and Wednesday and the other students come and help when their schedules allow.



*Three weeks into construction*

For a while the enthusiasm was waning as the boat appeared to be little more than a pile of wood scraps, but after three weeks everything started coming together and the excitement level grew.



*A month into construction and it is starting to resemble a boat.*

[continued on page 8]  
[www.mnRenewables.org](http://www.mnRenewables.org)

[continued from page 7]



*Attaching a side panel with epoxy*



*Filling screw holes after attaching the second side panel.*

## Minnesota Department of Commerce Launches New Energy Website

*Energy.mn.gov will provide more direct access to energy related content*

St. Paul, Minn. – The Minnesota Department of Commerce announced today it has launched [www.energy.mn.gov](http://www.energy.mn.gov), a new website housing all of the energy-related content for the Department's Office of Energy Security. In addition to the new name and location, the energy content has been completely reorganized and updated.



“This new website with its unique URL will allow citizens, legislators, energy providers, and researchers direct access to the newly reorganized energy-related content we have at the department,” said Bill Glahn, Director of the Office of Energy Security.

The energy content is now organized into six different categories on the new website:

- Efficiency – Conservation and efficiency measures for your home, business, school and other public buildings.
- Renewables – Information on wind, solar, bioenergy and hydrogen fuels.
- Utilities – Information on routing and siting, Conservation Improvement Programs, utility reporting, and links to utilities.
- Project funding – Incentives and rebate opportunities for energy projects and energy investments.
- Data and Reports – Reports, data and policy activities on energy production, supply, distribution and renewables.
- Low Income Assistance – Contacts and information about energy assistance and weatherization programs.

One of the most popular features on the energy website right now is information regarding the federal stimulus package, including the ability for citizens to weigh in on how policymakers should spend the state's share of the energy stimulus funds.

The energy website also contains a new feature called Ask the Energy Guy, an interactive forum allowing visitors to ask our experts questions regarding energy efficiency, conservation and renewable energy.

## Comprehensive Database Offers information on Renewable Energy Incentives



DSIRE is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. Find incentives for your community online:

[www.dsireusa.org](http://www.dsireusa.org)

## Tell MRES About Your Training Needs!

The Minnesota Renewable Energy Society (MRES) is responding to the growing demand for renewable energy education through the offering of professional and career development courses, on-line webinars, and general information renewable energy classes. As MRES continues to build course offerings, it wants to hear from you!



Michelle Gransee-Bowman at Training for 2008 Eco-Experienc

Please [click here](#) to assist MRES in developing courses to meet your training needs and take the survey.

*Note:* Currently, MRES is especially interested improving training offerings to meet female needs: so female responses to this survey will be used to develop a Women's Renewable Energy Course. MRES will use the information in the development of all courses, so please take this short survey today and help MRES support your efforts in learning more about renewable energy!

## Wait List for Second Small Scale Wind Turbine Class & Third Class Planned

Maple Grove, Minn. – The second three-day small scale wind turbine class will be held at Great River Energy on April 15-17 this month. Roy Butler of Four Wind Renewable Energy is teaching the class again.

This class has filled again at capacity of 50 attendees, and it has a waiting list of about 15 people as of the April Solar Flare publication time. MRES is planning on offering a third wind turbine class this year in an attempt to meet the demand for this very popular class. People can continue to get on the waiting list on the MRES webpage for the small scale wind turbine class as long as the wait list remains posted.



When the date is set for the next small scale wind turbine class, it will be announced in the Solar Flare and on the MRES website. People on the wait list will have first priority for the next class.

Class Registration & wait list: [www.mnrenewables.org/events/classes/](http://www.mnrenewables.org/events/classes/)

Inquiries: [info@mnRenewables.org](mailto:info@mnRenewables.org) or (612) 308-4757

## MRES at Air National Guard Base and Sustainable Community Conference



MRES Board member - Loren Abraham - speaking on Solar Energy at [133rd Airlift Wing of the Minnesota Air National Guard](#) at the Air National Guard Base in St. Paul/Minneapolis on March 19th



MRES member - Joe Bowman - behind the MRES exhibit at The 2009 *Twin Cities Sustainable Community Conference* held at [The Paul and Sheila Wellstone Center for Community Building](#) in St. Paul by the [Alliance for Sustainability](#) on March 19th

## Xcel Energy's SmartGridCity™

by Michelle Gransee-Bowman



St. Paul, Minn. (March 12, 2009) – A cool and clear evening welcomed Jeff Geidd of Xcel Energy and an audience of over 45 members and guests to the monthly MRES member meeting presentation at Flannery Construction. With utilities in eight different states, Xcel is the largest generator of wind energy and fifth largest generator of solar energy in the United States.

With the recent roll out of the first Xcel's [SmartGridCity](#) in Boulder, CO, Xcel is touting its new program as the most comprehensive available. Yet they have no specific time frame for a system wide rollout. With 50,000 customer meters, easy access to needed grid components, as well as web-savvy environmentally aware customers, [Boulder was named the nation's first SmartGridCity](#) by Xcel. Also important to this pilot project was establishing partnerships with various key players including the University of Colorado, the National Center for Atmospheric Research, the National Institute of Standards and Technology, as well as local city leaders. Geidd spoke of the objectives of this test SmartGridCity:

- Create a catalytic event
- Leverage public/private sector partnerships/R&D
- Don't choose a technology winner in advance. Deploy multiple technologies, rate structures, in-home devices, etc.
- Test multiple benefit hypotheses...don't predetermine outcomes
- Establish an on-going testing and validation environment that will serve as a continuous Smart Grid innovation center

Sample benefits that Xcel is testing include immediate factors such as reliability and improved data; probable benefits like more customer control and demand response are anticipated and possible benefits expected include a greater use of renewables and reduction of electricity and CO<sub>2</sub> emissions.

The groundbreaking for this system took place in April 2008 with seven key partners investing in the project. Since that time more than 100 miles of fiber has been installed, and it's approximately 45% complete with 15,000+ two-way meters installed. One key interest for Xcel is to eventually provide a variety of pricing options and to manage varying levels of demand. Geidd explained that in a traditional grid operation, a utility monitors the overall output, but very little of the grid's operation; they control flow by starting or stopping power plants and design the system for the worst case scenario or highest demand needs, which has resulted in overbuilt systems. With an aging electrical structure, increased environmental concerns, intermittency of renewable energy resources, and customer demand for more choices and information, change from a traditional grid system is necessary.

As a power company, Geidd explained that Xcel is concerned with maintaining traditional strengths of reliable power and reasonable prices. They see the need to transform businesses to meet environmental and customer demands, hence the desire to make it "smart." The components that Xcel sees as part of a [smart grid](#) include: real-time two-way communication, the monitoring and automation from power plant to premise, the capacity to deliver real time information and choice to customers as well as a dynamic and self-healing system that responds to environmental signals. According to Geidd, Xcel's SmartGrid will ultimately provide choice, environmental impact, and an overall better experience.

MRES hosts informational speakers prior to each month's board meeting, on the second Thursday of each month at 6 pm. Monthly meeting notices are posted on the MRES website. The presentations are free and open to the public.

## Renewable Energy Careers

### DEED Reports on 2007 Solar and Wind Jobs in Minnesota

In the wind and solar power generation category (NAICS code 221119), Minnesota reports there are 14 firms and 134 jobs, with average weekly wages of \$1,070 in 2007. The industry expanded quickly, jumping 50.6 percent from 2005 to 2007 (from 89 to 134 jobs), and industry employment has nearly tripled since 2000, when there were 46 jobs in the state. There were 17 firms and 572 jobs with average weekly wages of \$905 in 2007 in Minnesota, classified as Wind Turbine and Power Transmission Equipment manufacturing (NAICS code 33361). These data do not include Moventas, a Finnish builder of gearboxes for wind turbines that announced plans in September to open a production facility in Faribault, about 40 miles south of the Twin Cities in Rice County. The facility is expected to employ 100 people initially.

In Minnesota 179 firms provided 1,880 jobs with average weekly wages of \$1,042 in 2007, which was classified as Wind and solar power line construction (NAICS code 237130). The industry has grown 6.4 percent from 2005 to 2007. There were 21 firms and 588 jobs in 2007 with average weekly wages of \$914 in Minnesota, which was classified as Wind-generated and solar-energy electrical power regulation - Utility Regulation and Administration (NAICS code 926130).

Note: As of the second quarter 2008, employment in NAICS 221119 was at 212, up from 123 in 2nd quarter of 2007. [Source](#) "Something in the Wind"; data per MN [DEED](#), Cameron Macht, Feb. 2009.

### Minnesota Green Jobs Task Force

St. Paul, Minn. – The Green Jobs Task Force published its [Final Action Plan](#) in late February. The plan received a range of [media attention](#) that included [Minnesota Public Radio](#) and more recently national coverage in March by [MSNBC](#).

The Green Jobs Task Force organized the plan to optimize the growth of the green economy in Minnesota. It proposes legislative initiatives and education and workforce training strategies to encourage green economic development while staying consistent with five key environmental policies defined in Minnesota Statute 116J.4372. In addition to the Plan's proposed legislative initiatives, education and workforce training strategies are also proposed. The plan reports several strategies and findings. It can be downloaded from the [Green Jobs Task Force website](#).

The plan includes a formal definition of "green jobs" and includes four industry sectors: green products, renewable energy, green services, and environmental conservation. The plan reports that "The Renewable Energy sector is the strongest area of economic opportunity for Minnesota"  
- GSP Consulting Corp.

### Information on Careers and Jobs in Energy Efficiency and Renewable Energy

The U.S. Department of Energy Office of Energy Efficiency and Renewable Energy (EERE) is beginning to partner with federal and state programs as well as clean energy companies to help build a talented and knowledgeable workforce. There is a dramatic need for skilled workers to bring about change and solidify U.S. leadership in energy efficiency and renewable energy, and in times of extraordinary economic challenge, the Office of EERE is taking the opportunity to invest in both U.S. workers and green technologies.

On the [EERE website](#), you can learn about workforce development and education efforts, information about energy-related careers, and job listings in renewable energy and energy efficiency.

## Rent Solar Cart



Rent portable solar power

## Rent Solar PathFinder



Solar PathFinder - No cost loan to MRES members!

## Rent Solar Trailer

[IPS Solar](#) and MRES have joined efforts to build the most versatile power supply in the state. The Solar Power Trailer is both an educational tool and a fully functioning power source that can provide quiet, clean, renewable solar power to any site. Use it for remote power at family reunions, picnics, church, or school events. [Minnesota MPCA](#) donated the PV panels to upgrade the Solar Trailer to 1.664 Kw, and [Mario Monesterio of Westwood Renewables](#) donated the labor to install the recent upgrade with the new PV panels.

Examples of What the Trailer Can Power:

- A concert for 5,000 people
- A small carnival
- Up to 25 trade show booths
- Temporary telecom sites
- About 5 concession stands
- About 200 laptop computers

Trailer Specifications:

- PV array rating 1664 watts (newly upgraded)
- 2 Trace SW4024 inverters (4 Kw at 48 volts)
- Battery bank rating 440 amp-hours = 21,120 Kwh
- 40 amp max at 110 vAC capacity
- Usable total battery capacity: 16,896 Kwh
- 10-volt 30-amp circuit breaker for larger concert equipment
- Approximate trailer weight: 3,000 pounds



MRES Solar Trailer

To [rent the solar trailer](#), solar cart, or solar pathfinder - contact David Boyce at (651) 324-1642 or [DavidB@mnRenewables.org](mailto:DavidB@mnRenewables.org)

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