



Minnesota Renewable Energy Society

connecting minnesotans with renewable energy resources

The Solar Flare

e-Bulletin from the Minnesota Renewable Energy Society
December 2008

December 2008 Highlights - (See details below)

- Annual Meeting & 30th Anniversary celebration! - December 11, 2008
- Introduction to Renewable Energy Options & Opportunities - February 7, 2009
- Dunwoody Offers Building Science Short Course - Residential Energy Auditor
- CERTs 2009: Harnessing Resources & Teamwork for Minnesota's Energy Future - Feb. 10-11th
- Energy Design Conference, Duluth - March 9-11, 2009
- Solar Energy: Everything You Always Wanted to Know About Photovoltaics - April 4, 2009
- Solar Energy: Everything You Always Wanted to Know About Solar Water Heating - April 18, 2009

Upcoming Events

Annual Meeting & 30th Anniversary celebration!

Thursday, December 11, 2008

Location: Concordia University, Library Technology Center,
Room LTC 214-215, St. Paul, MN

Map: [Concordia University Campus Map](#) (Building 23)

Parking: Lots A, B, and E shown on the map



Meeting program and celebration:

6:00 p.m. – Refreshments & Entertainment by [Michael Monroe](#)

Listen to Michael Monroe's solar-powered musical recordings at: myspace/michaelmonroemusic

6:20 p.m. – Annual Report by David Boyce, Board Chair

6:45 p.m. – *Saving the Planet through Sustainable Architecture: An architect's panel on solar and sustainable architecture*; Moderated by MRES Board member, Loren Abraham, AIA, of Abraham & Associates – Panelists: Douglas D. Pierce, AIA, LEED AP, Senior Associate, Perkins+Will; Paul C. N. Mellblom, Meyer Scherer & Rockcastle, Ltd.; and Tim Jordan, M.A., Architect

8:00 p.m. – Board member elections

Members must be current with their dues to vote in the elections. If you haven't paid your annual membership dues, or you would like to join the Minnesota Renewable Energy Society, you can [join or renew](#) your membership or [update your contact information](#) on the MRES website.

8:30 p.m. – 9:15 p.m. – More entertainment by Michael Monroe

If you plan to attend, **please RSVP** by sending us an [email](#) or call us at: (612) 308-4757

Introduction to Renewable Energy Options & Opportunities

Saturday, February 7, 2008, 8:30 AM to 5:00 PM

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.

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



- 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).

Dunwoody Offers Building Science Short Course

Partnering with the US Dept. of Energy and the Minnesota Department of Commerce, Dunwoody Custom Training is now offering a week long energy auditing short course.

The class provides a building science foundation for beginners interested in getting into the field as well as for more seasoned workers preparing to challenge the certification test. Students will learn to do basic blower door and furnace tests and apply the results to develop a practical action plan for lowering residential heating and electric bills. Future auditors will also learn to screen for comfort and safety problems and educate householders on low and no cost ways to trim bills.



The class does not teach any auditing software, but covers how to manually do heat load, transmission loss, and air leakage calculations for a better understanding of the auditing process. Dunwoody hopes over time to recruit practicing people in the field to teach workshops on special subjects to add depth to the basic course.

People interested in challenging the test, taking the course which will be offered monthly, or teaching a workshop can call Kris Caldwell at 612-381-3098 or email at kcaldwell@dunwoody.edu for more information. More information is available on the Dunwoody website under Custom Training and [Residential Energy Auditor](#).

CERTs 2009: Harnessing Resources & Teamwork for Minnesota's Energy Future

Third Clean Energy Resource Teams (CERTs) Conference, February 10-11, 2009

CERTs 2009 will bring together over 500 Minnesotans who are blazing the paths to a clean energy future by working on energy efficiency and clean energy projects in their communities, thus accelerating our learning process together.

This conference could not come at a more important time. Our economy is hurting, energy prices are on the rise, and the impacts of global warming are becoming increasingly clear. Minnesotans of all stripes want to know what they can do. It just so happens that many of the solutions to our global climate crisis are also the ones that are going to help our economy and our communities thrive.

You can be a part of Minnesota's clean energy future, and you can get energy efficiency and clean energy projects on the ground in your community!

Whether you're a farmer, utility representative, school staff, local official, student, business owner—or member of any community—there is a role for you to play. Learn what people are doing across the state, connect, and share resources.

Participant, sponsor, and exhibitor registration is now available!

To learn more and register, visit: www.CleanEnergyResourceTeams.org

Submit a digital short for a chance to win fabulous cash and clean energy prizes! Make a 30 second to 3 minute video on your clean energy project, and enter it to win!

Videos must be received by **January 9th**. There will have a two-week public voting period in January, and finalists will be screened at the 2009 CERTs Conference Reception on the evening of February 10th.



The Clean Energy Resource Teams present:

Clean + Green

Video Shorts Contest and Film Festival

Submit a digital short for a chance to win fabulous cash and clean energy prizes! Finalists will be screened at the 2009 CERTs Conference Reception on February 10th!

Submissions should promote community energy efficiency or clean energy projects and CERTs, and be between 30 seconds and 3 minutes long. Videos must be received by January 9, 2009. For more information and complete contest rules, visit: www.CleanEnergyResourceTeams.org/Events/CleanGreenFilmFest



More Info: <http://www.cleanenergyresourceteams.org/events/cleangreenfilmfest>



Solar Energy: Everything You Always Wanted to Know About Photovoltaics

Saturday: April, 4 2009

Course Location:

Century College

3300 Century Avenue N.

White Bear Lake, MN

Phone: (651) 779-3341

9 a.m. to 3:45 p.m.

Room: Century East Campus 2313



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 photovoltaic (PV) system for residential applications.

The essentials of creating electricity from sun light are covered. You will learn to evaluate solar site resource, when solar PV is the right solution, the economics and incentives for solar PV, and system design principles. System components, system sizing, PV panels, inverters, grid connected vs. non-grid connected systems, electrical connections, will be all explored.

Mario Monesterio, a 20+ year veteran of solar system installations, is the instructor in this course. Mario is a RE designer, industrial energy engineer, solar installer, Energy 10 instructor, certified Industrial/commercial energy auditor, and consultant. He is active in national efforts to set standards in the renewable energy industry and owner of [Best Power Intl. LLC](#).

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

Course ID: 001826

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



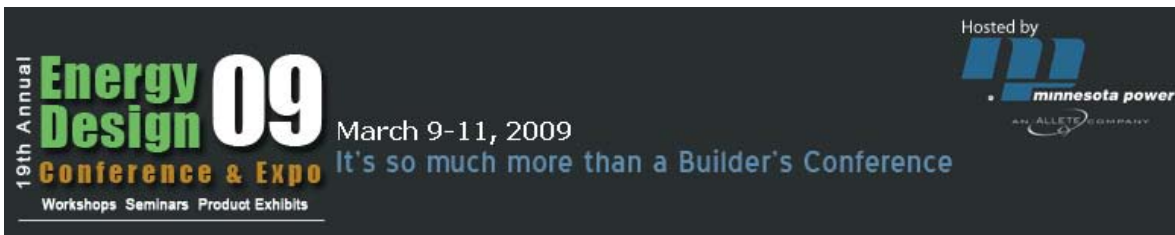
Century College and the Minnesota Renewable Energy Society have co-developed, this one-day introductory course for homeowners and people interested in learning the basics of how to design a solar hot water heating system for residential applications.

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 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



The annual Energy Design Conference and Expo started nearly twenty years ago as a one-day builder's conference with just 45 attendees. It has grown to become a regionally recognized event that attracts over 1,300 people and more than 75 exhibitors.

This event delivers a diverse selection of quality seminars and workshops to a variety of building, housing, and environmental professionals along with educators, students, homeowners, and others.

Attendees enjoy a unique opportunity to meet and network with individuals, companies, and organizations while learning more about the wise use of energy and resources.

For more information go to: www.duluthenergydesign.com

SMALL FOOTPRINT LIVING FAIR

Grand Marais, Minnesota

Fri., June 5, & Sat., June 6, 2009

9:00 a.m. – 5:00 p.m.



Individuals or businesses interested in exhibiting products or services relating to Sustainability and Green Living issues are invited to apply for exhibit space in the Small Footprint Living Fair.

All exhibitors must work directly with issues relating to "Small Footprint Living." Any crafts or goods sold should be made by the exhibitor from raw materials.

The 2009 Fair will emphasize (but is not limited to) four main areas: Green Business Practices, Alternative Energy, Green Building Construction, and Sustainable Foods. Product and service information and expertise is in any or all aspects of sustainability, or "living green."

Join the second Small Footprint Living Fair in Grand Marais:

Contact: Diane at the Cook County Extension Office: phone (218) 387-3015,

Cook County Extension, 317 W. 5th Street,
Grand Marais, MN 55604

E-mail: diane.booth@co.cook.mn.us



Minnesota Renewable Energy Society

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Growing Solar – and Solar Jobs – in Minnesota

Minneapolis – (Nov. 19, 2008) – The solar industry is poised to continue its stunning growth, nationally and internationally, at rates exceeding 40% per year. It will expand by several multiples in the next decade. A temporary window of opportunity exists for Minnesota to take a national leadership position in both the manufacturing and installation of solar technologies — and in associated industry and commerce.

An analysis by the American Solar Energy Society of state programs and their effectiveness in producing a solar market — and creating jobs — lists these three keys to success:

- Creation of a robust solar incentive program. Transitioning to a performance-based incentive program based on market forces to attain energy goals will reward high quality installations and encourage private investment.
- Establishment and promotion of a suite of incentives for businesses. In order to compete with other states nationwide, an attractive economic development package for renewable energy manufacturers, including solar, should be available to businesses.
- Political leadership. State government solar champions can include either legislators or governors — or both.

The Renewable Energy (RE) and Energy Efficiency (EE) industries are growing rapidly; solar is leading the way, growing faster than all other energy sectors – and it has the potential to become the largest. Evidence of the growth and opportunity includes:

- The global solar industry's revenue has grown by 40% per year since 2000.
- Minnesota's solar related industries are growing rapidly, some at 40% per year or more, and several new solar businesses have emerged statewide in 2008.
- Solar rebate applications in Minnesota have outpaced the Minnesota Solar Electric Rebate Program, reserving all funds in the first 3 months of Fiscal Year 2009.
- The U.S. Department of Energy forecasts that solar photovoltaic power will reach grid parity with conventional electricity by 2015; industry analysts and many solar manufacturers predict this may happen sooner, depending on incentives for solar.
- Minnesota's solar resource is superior to Germany's, which has one fourth the U.S. population but more RE jobs, and as the world leader in solar industries, Germany now has more solar jobs than the German auto industry. The success of the German solar industry is largely due to government leadership and incentives.

“As a Minnesota manufacturer of solar thermal collectors sold nationwide, we've seen some solar markets take off, while others have yet to get off the ground. States that wisely complement federal incentives set themselves up for explosive growth.”

– Randy Hagen, Co-Owner, Solar Skies Manufacturing

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While Minnesota is a recognized leader in renewable energy development, it is behind other states in the competition to attract solar jobs. Elsewhere:

- In the past 6 months, 27 new solar manufacturing plants or expansions have been announced in 14 states, expected to result in 11,000 jobs to start.
- Many states have solar incentives superior to Minnesota's, resulting in the accelerated adoption of solar technologies, including solar electric and solar thermal. Currently, many of Minnesota's solar industry manufacturers maintain that most of their business activity is out of state in markets that have stronger solar policies.

Successful strategies to grow solar elsewhere have included:

- A feed-in tariff, also known as a distributed advanced renewable tariff or standard offer program (47 countries including Germany, Spain, Australia; Ontario; California. Several Midwest states are considering as well.)
- A solar carveout within an RES/RPS; can include solar thermal (OH, CO, MO + 12 other states and DC)
- An income tax credit (14 states)
- A net metering limit of at least 1 megawatt (17 states + DC)

Business incentives include:

- Property tax relief
- Tax increment financing
- Attractive leases
- Relocation assistance
- Corporate tax incentives

"Minnesota's energy challenges are not going away; this is an exciting time of endless possibilities, but we need to invest now if we want to be a player."

– Tracy Anderson, Director, 3M Renewable Energy Division

Colorado, an Example of Solar Success in Progress:

Lawmakers have created a sunny business environment for RE businesses to locate in Colorado. It doubled the RES to 20% by 2015 with the electorate voting in favor of a 4% solar set-aside. The state recently adopted a 2 megawatt net metering law for its investor owned utilities.

Results: 500 jobs at AVA Solar; 300 workers at Ascent Solar Technologies; the SolarTAC 74-acre head-quarters on the new 1,762 acres Campus for Renewable Energy; 2500 new jobs at Vestas; and Conoco-Phillips plans 7,000 new jobs in its international learning and alternative energy/advanced research center.

With the right policies, Minnesota — like Colorado — can expand its current solar industry and attract additional high quality sustainable-jobs to the state. In doing so, Minnesota will facilitate the mainstream adoption of solar and tackle two of the state's most pressing goals: addressing climate change, and creating high skilled, high quality jobs.

The window available for taking a leadership role is brief. Under the new administration in Washington, activity in every segment of the RE and EE industries can be expected to ramp up extraordinarily quickly – in every corner of the nation. The time for Minnesota to act is now.

About the Minnesota Renewable Energy Society

The Minnesota Renewable Energy Society (MRES) is a member-run, 501(c)(3) non-profit organization founded in Minneapolis in 1978 to promote the use of and advocacy for renewable energies in Minnesota through education and demonstration of practical applications, with a particular emphasis on solar energy technologies. For more information, go to www.mnRenewables.org.

More of the Story for: *Growing Solar – and Solar Jobs – in Minnesota*

On behalf of the Minnesota Renewable Energy Society ([MRES](#)) and the [Solar Minnesota](#) group, the preceding two-page “news” story (on pages 6-7), “[Growing Solar – and Solar Jobs – in Minnesota](#)” was submitted to the [Green Jobs Task Force](#) Co-Chairs, Minnesota [Senator Ellen Anderson](#) and [Representative Jeremy Kalin](#), originally on Nov. 19, 2008.

The Intention of MRES is to enthusiastically recommend development of solar jobs and the solar industry in Minnesota. MRES did not necessarily intend to recommend any particular incentive but rather only that the State of Minnesota support and invest in the growth of the solar industry through the most appropriate incentives on which most stakeholders can agree.

MRES believes that State investments in solar jobs and the solar industry would be prudent and an excellent growth opportunity for the whole State from economic, environmental, and social justice perspectives. State solar industry and job growth incentives would be an important investment component, now effectively missing from the mix of our State renewable energy incentives, and should be added quickly before we miss an important green job growth opportunity, which other states could capture before us.

If you too support solar incentives by the State of Minnesota, please contact the offices of Senator Ellen Anderson, Representative Jeremy Kalin, your State Senator, or your State Representative. They all need to know that you support Growing Solar – and Solar Jobs – in Minnesota. Sending a letter or email is an effective way to show your support.

Minnesota Senate member information found here: <http://www.senate.leg.state.mn.us/>
Minnesota House of Representatives member information here: <http://www.house.leg.state.mn.us/>

The next Green Jobs Task Force (GJTF) meeting is schedule for January 5, 2009 (9 am to 3 pm) at the [Wilder Foundation](#), more information is on the GJTF website: <http://www.mngreenjobs.com/>

Please feel free to ask how MRES can support your efforts to bring more green jobs to Minnesota, and solar jobs in particular.

Youth Energy Summit

Monday, November 10, 2008
2101 15th Avenue NW Willmar, Minn.

YES! Community Event youth teams for Music, Message & Inspiration, Engage in the conversation to envision their community’s energy future. The Minnesota Renewable Energy Society had a tabletop display and make a presentation at the event. 80+ students attended from 13 High Schools in west- central Minnesota.



Doug Shoemaker “on duty”

Xcel Energy Stores Wind Power

As the nation's number one wind power provider, Xcel Energy wants to harness renewable energy to the greatest extent possible. With that focus, Xcel has launched a groundbreaking project to test cutting-edge technology for storing wind energy in batteries. The project marks the first use of direct wind energy storage technology in the United States.

Energy storage is key to expanding the use of renewable energy, integrating variable wind and solar energy production to the needs of the power grid is an ongoing issue for the utility industry and will become even more important as the penetration of both of these renewable resources increases. The technology Xcel is testing has the potential to reduce the impact caused by the variability and limited predictability of wind and solar generation.



Xcel Energy is testing emerging technologies and energy storage devices as part of our overall Smart Grid strategy, which aims to modernize and upgrade the grid to allow for easier integration of renewable energy sources. For more information, read more about the [Wind-to-Battery project](#).

Minnesota Public Radio also covered the story: "[Xcel using bus-sized batteries to store wind energy](#)," on the radio, November 18, 2008.

E3 2008: The Midwest's Premier Energy, Economic and Environmental Conference November 18, 2008 at the St. Paul RiverCenter

[E3 2008](#) focused on the intersection among innovative technologies, visionary policies, environmental benefits, and emerging market opportunities as they relate to developments in renewable energy.

Renewable energy and environmental researchers, students, government officials, nonprofit and business/industry leaders joined together to share knowledge and discoveries through keynote addresses, breakout sessions, research posters and exhibitor booths. The Minnesota Renewable Energy Society had a tabletop display. 750+ attendance.



Doug Shoemaker doin' what he does at E3

An Energy Activist Couple's Solar Success Story: 99.7% first-year solar PV performance on St. Paul's West Side

by Christopher Childs

My wife, Elizabeth Dickinson, and I have been energy and climate activists for some time. My own involvement began as a volunteer with the Appalachian Mountain Club in New England in the early 1980s; in those days, acid rain, snow, and fog – largely the byproduct of coalburning midwestern power plants – bathed the Northeast. Fish disappeared from some 200 lakes in New York State; in New Hampshire's White Mountains, only the skeletons remained of red spruce and fir, their root hairs clogged by aluminum ions released as the forest floor acidified. The threat called for a nationwide shift – and part of it, at least, was accomplished through something we "Appies" worked hard for: federal sulfur dioxide cap-and-trade legislation that reduced SO₂ from utilities and industry.

Elizabeth's involvement in energy issues came when we moved to St. Paul in 1998 and saw the stack of the antiquated High Bridge power plant out our front window. Seizing an opportunity to influence Xcel Energy's proposal for a Metro Emissions Reduction Project, she helped mobilize hundreds of citizens to press for an aggressive cleanup; the old High Bridge plant and its signature stack are now history, replaced by a far cleaner, natural-gas burning unit. Riverside in Minneapolis will shortly follow suit, and the larger, baseload A.S. King plant near Stillwater, though it still burns coal, has been retrofitted with state-of-the-art pollution controls.

At our own home, however – a 1911, 1750-square-foot "urban cottage" – the questions remained: Could we clean up our own act? What would it cost us to seriously reduce our carbon footprint and our responsibility for other pollutants, from mercury to SO₂ to oxides of nitrogen and other less-publicized nasties? We had a south-facing roof; could we afford to "go solar"? For that matter, as energy and climate-change activists, could we really afford not to?

I'd worked for Greenpeace on energy issues in the late '80s and '90s, even traveled with a 16-wheeler that carried a solar array around the U.S. My personal investment in solar, though, had been modest: we lived in California for several years; while there, I bought a single Solarex photovoltaic panel, pole-mounted it on our canyon side, and wired it to charge my laptop. In St. Paul – paired with a tiny, cheap 70-watt inverter to power a radio or an LED rope light – it became a home demo unit to explain PV to friends. We'd also contributed a few dollars to a community effort, the Sunnyside Project, that put PV on a local cafe. Outfitting our home with an array, however – one big enough to meet our average daily usage – was a challenge.

But in the fall of 2006, we began discussions with our West Side neighbor Mario Monesterio, founder of Best Power. We'd calculated that after basic conservation, a 3-kilowatt PV system might be enough to match our power consumption. Amazingly, Mario said, "I know where we might get 3 kilowatts of used panels." (These days, finding used PV panels is like finding teeth on a frog.) One fresh mortgage and two bids later, we inherited – from an insurance company – 36 Solarex 83-watt panels with the checkered history of having been stolen from a public building, replaced, and then recovered by the police. Mario and friends installed them in the spring of 2007, along with a German-made Fronius 4000 inverter... oversized, to allow more panels later to power a plug-in hybrid or all-electric car. With the addition of Xcel's required digital meter on June 12, our system was off and running.

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I monitored it obsessively all that summer, wondering how much electricity we'd really generate above our 9 kWh/day average use. (We have no battery storage, so we sell excess power to Xcel at the "net-metered" retail rate; we buy "green power" when it's dark, or cloudy, via Xcel's Windsource program.) I was a little less obsessive in the fall, as a 165-kWh "cushion" we'd built up through September gradually gave way to negative numbers in winter. But by April, daily production again outstripped use – and through May, I held my breath to see what the first-year totals would be.

Almost incredibly, when June 12 rolled around again, we'd produced power 99.7% equivalent to our consumption for the year.

The summer – and fall – of 2008 have been even more remarkable for solar production, and as I write this year's "cushion" stands at an astounding 360-plus kWh, more than twice as big as 2007's (it's gone even higher now than when we made our second appearance on the ASES/MRES Solar Tour in early October). A relatively cool, dry, and sunny summer – with very little need for air conditioning or dehumidifying, two huge energy drawdowns – set us up to do better than 100% in our system's second year. And to date, we've avoided some five tons of carbon dioxide emissions. For us – while saving the cost of some 5000 kWh of electricity is no small matter – that CO2 emissions cut, and the accompanying reduction in other pollutants, may be the biggest "payback" of all.



Best Power installation crew at Childs-Dickinson Residence

[Writer/activist Christopher Childs is an MRES boardmember, and chairs the MRES Advocacy Committee; he's the former national lecturer for the U.S. branch of Greenpeace. For technical and financial details of the Childs-Dickinson PV system, check out the Solar Tour site at: <<http://www.mnrenewables.org/events/solartour/2008/index.php>>; click on the link for tour stop #2.]

Renewable Energy Careers



Roland Mann is an interim and executive search firm with a developed practice in renewable energy.

Their retained practice works with both growing U.S. firms, and established global energy companies and investors, wanting to start alternative energy operations in America.

The firm specializes in conducting national searches and providing hard to find executives that will fit with the corporate culture: sales and marketing, business development, and general management.

Roland Mann launched their www.WindEnergyCareers.com site to reflect the work they were doing in wind and other alternative energy fields. They offer companies a chance to post jobs for free at our site without retaining us for that specific assignment.

Roland Mann
AND ASSOCIATES, INC.

The Best People Proven For The Job.

Roland Mann encourages members of The Minnesota Renewable Energy Society and affiliated companies to promote their jobs for free on its website as a service to the efforts of The State of Minnesota and the Green Jobs Task Force.



Solar, renewable energy, energy efficiency, and related fields employers, if you want to list your renewable energy job opening in the Solar Flare, please send inquiries to: info@mnRenewables.org

Rent Solar PathFinder



Rent Solar Cart



Rent Solar Trailer

IPS Solar and the 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 power to any site. Use it for remote power at family reunions, picnics, church, or school events. Best Power donated the labor for the recent upgrade of the PV panels to 1.664 Kw.

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



To rent the solar trailer, solar cart, or solar pathfinder by contact David Boyce (651) 324-1642.

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