



Solar at Work Phillips Eco-Enterprise Center



The Phillips Eco-Enterprise Center (PEEC), a 70,000 square foot commercial/light industrial building in south Minneapolis developed by Green Institute, added to its already extensive green features by installing a 34 kilowatt solar electric system in 2004. The system features solar electric, or photovoltaic (PV), panels mounted by racks on the roof and walls. Some quick facts about the system:

- There are 700 modules on the roof facing southeast, and 92 modules on the side building wall facing southwest.
- The type of cells are called “thin-film amorphous silicon,” less expensive to manufacture but also less efficient than the average PV cell; on average however, it costs about the same per watt as a typical solar cell, but takes more roof space for the same output.
- Generates enough electricity (40,000 kWh/yr) to offset approximately 25 percent of the annual power needs of the office tenants.
- During weekends when the building is not in high use, the system will create a surplus of energy that will be sold back to Xcel Energy through a grid inter-tie connection. Through net-metering, the energy will sell at the same rate Xcel charges the building for power.
- In the event of a power outage, the system also includes battery back up that could cover the emergency energy needs of the building.
- Based on the system design, the payback for the \$195,000 cost (approximately \$5.73 per watt) was a projected 40 to 50 years.

How much pollution is offset by the solar power system?

- 30 tons CO₂ per year
- 180 lbs Nox per year
- 164 lbs SO₂ per year
- Plus several lbs. of mercury

Community Involvement

A project of this scale does not happen without a lot of help. Over the course of the project, over 1000 volunteer hours (many during the Minnesota winter) were given to help install racks and mount panels. BP Solar donated the panels for the project, while Xcel Energy and city and state government officials assisted in negotiations and funding assistance. The state solar electric rebate, offering \$2,000 per kW and administered by the MN Department of Commerce, was also instrumental in making the project cost-effective.

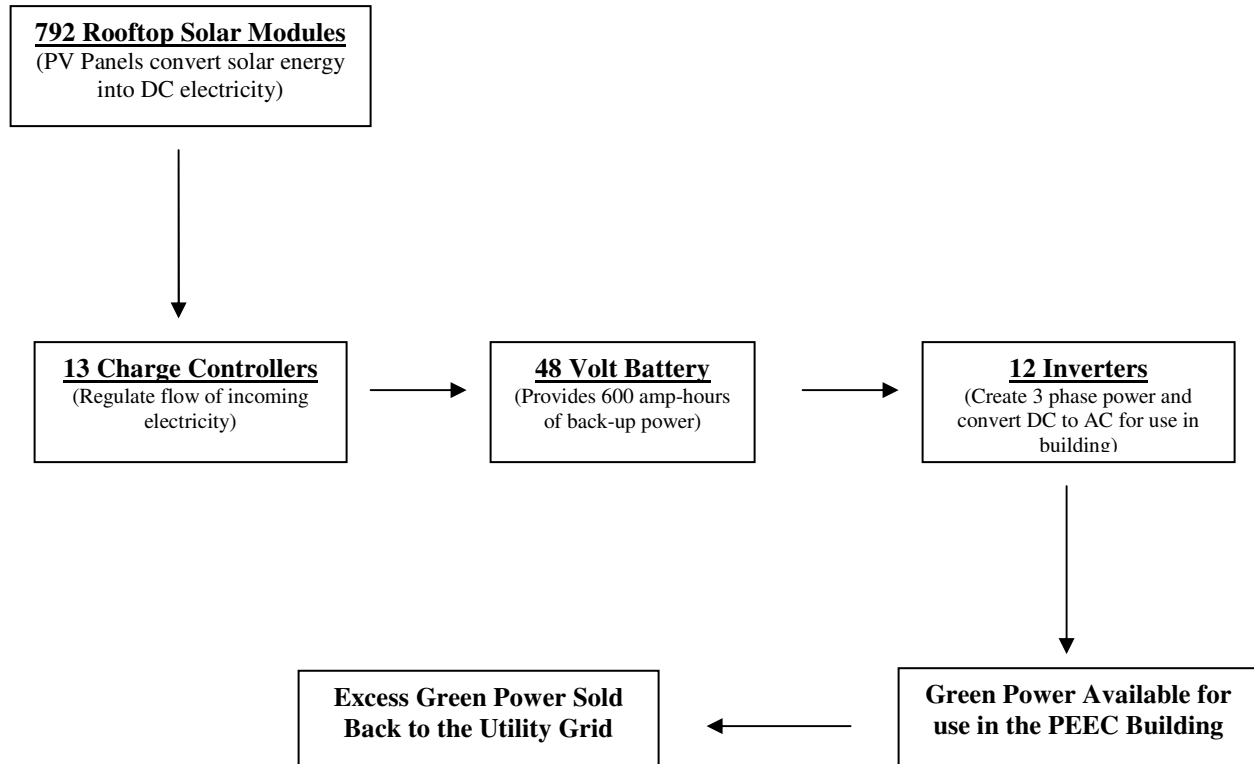
Motivations for Choosing PV

In addition to the environmental benefits associated with decreasing Minnesota’s dependence on coal and other fossil fuels, The Green Institute’s motivations for developing its PV system included:

- Planning an installation that was highly visible to the community, from the ground and by commuters on the Hiawatha Light Rail Transit line.
- Connecting renewable energy projects with local community revitalization opportunities.
- Demonstrating how local businesses can utilize renewable energy.
- Diverting the need for new power stations to cover peak demand periods by selling excess PV electricity back to the utility.
- Having a system that Minnesota utility companies and state policy makers can use as a successful business model for planning future projects.
- Jumpstarting the marketing of Green Power to rate payers and invested industries.

Phillips Eco-Enterprise Center Solar Array General System Components

The PV array and balance of systems at the PEEC is one of the largest installations in Minnesota. Although there is a sophisticated wiring system, the key components serve simple functions in creating power for the PEEC. The system is divided up by several circuit breakers and disconnects to protect service technicians during system monitoring and maintenance. The installation and oversight of the project were conducted by Innovative Power Systems.



For More Information...

For more information, ,
contact Agatha Vaaler at 612-278-7142
avaaler@greeninstitute.org
www.greeninstitute.org

Additional Resources

Minnesota Solar Rebate/Funding Opportunities: <http://www.solarminnesota.org/funding/funding.asp>
Minnesota Renewable Energy Society: www.mres-solar.org
Solar Minnesota (Million Solar Roofs Initiative): www.solarminnesota.org
Updated grants/programs/incentives for PV: www.dsireusa.org