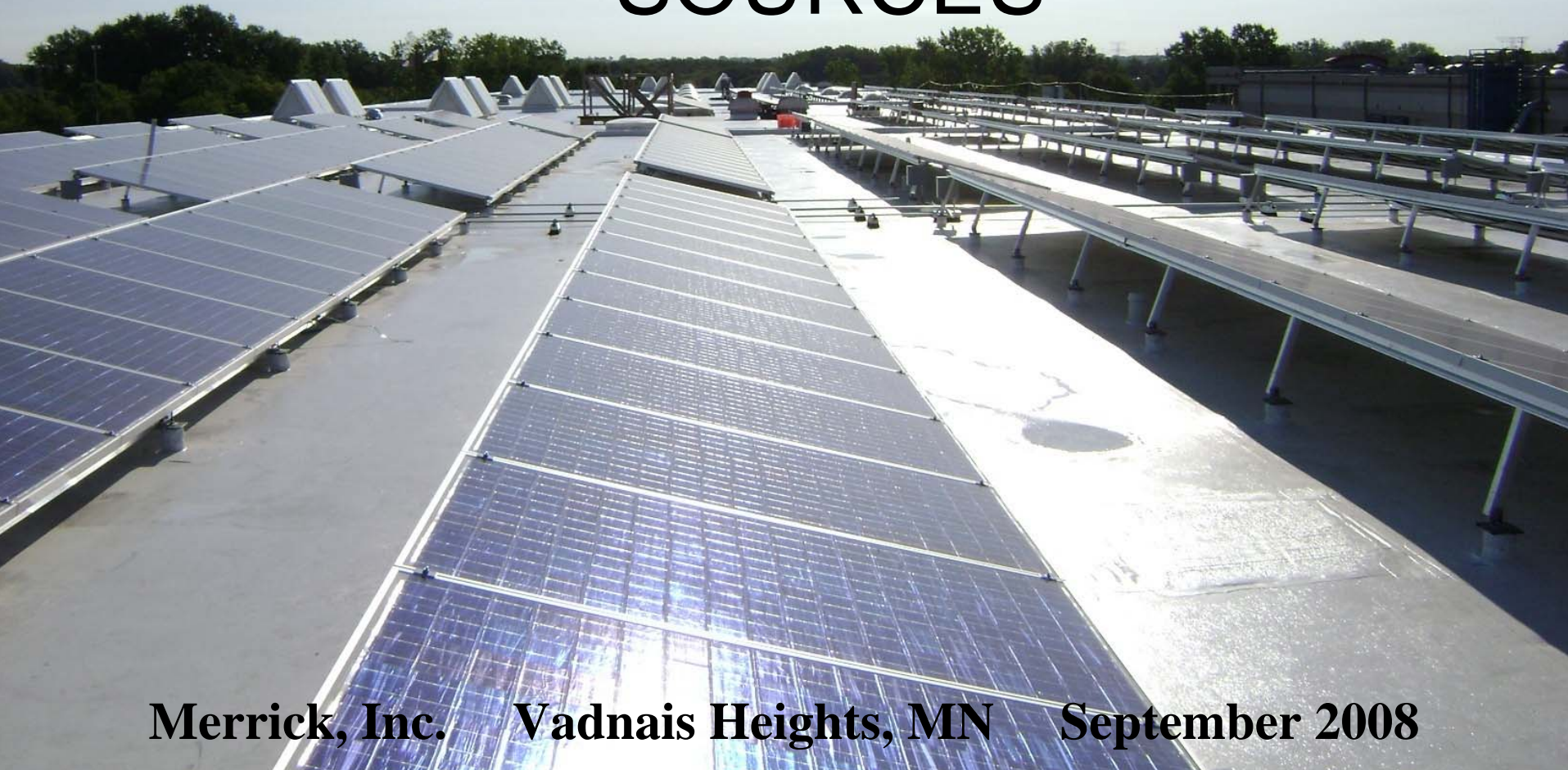


# A MARRIAGE OF HELIO AND GEO ENERGY SOURCES



**Merrick, Inc. Vadnais Heights, MN September 2008**

# Merrick, Inc.

- A nonprofit agency founded in 1964, working to meet the employment, personal development, and transportation needs of adults with developmental disabilities
- Licensed Day Training & Habilitation (DT&H), Supported Employment Services (SES), and Ticket to Work (TTW) provider
- We serve over 330 clients with a staff of 115 at our facility in Vadnais Heights and at over 80 businesses throughout the Twin Cities



# Merrick's Mission

*Our mission is to empower adults with disabilities through vocational and social opportunities, and guide them toward realizing their goals and dreams.*



# A Core Belief at Merrick *Civic Responsibility*

“Action for the common good”

## Green Initiatives

- Energy Use Reduction
- Renewable Energy



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- *Energy Use Reduction*
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# Energy Reduction— **R21 thermal envelope**





**Energy Reduction—  
16 Custom-built skylights**

A photograph of a skylight window in a dark, industrial-looking interior. The window is composed of several rectangular panes separated by metal frames. The view through the window is a bright blue sky with scattered white clouds. The surrounding structure is made of dark metal beams and supports, creating a grid-like pattern around the window.

See the sky from inside





Bathe the work areas with natural light



White  
“Durolast” roof  
\$263,000  
(will result in  
reduction in  
thermal load  
during summer)



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## Green Initiatives

- Energy Use Reduction
- *Renewable Energy*



# Geothermal System



- 110 ton system provides all heating and cooling needs for the 52,000 sq ft building
- 3 heat pumps circulate glycol through 108 vertical wells that go down 200 ft into the ground to capture heat in winter and shed heat in summer



- Glycol pumped to 21 heat exchangers which heat or cool the fresh air circulating throughout the building
- No natural gas consumption



- \$150,000 upgrade in 2003 to build over standard HVAC natural gas system
- Upgrade has paid for itself in less than 5 years



# Photovoltaic System

- 100 kW system is expected to provide 33% of all electrical needs of building
- 125,000 kWh per year, range of production
  - May-Jun-Jul : 13,750 kWh
  - Nov-Dec: 6,250 kWh
- Grid connected—no energy wasted





525 Evergreen  
190 W Panels,

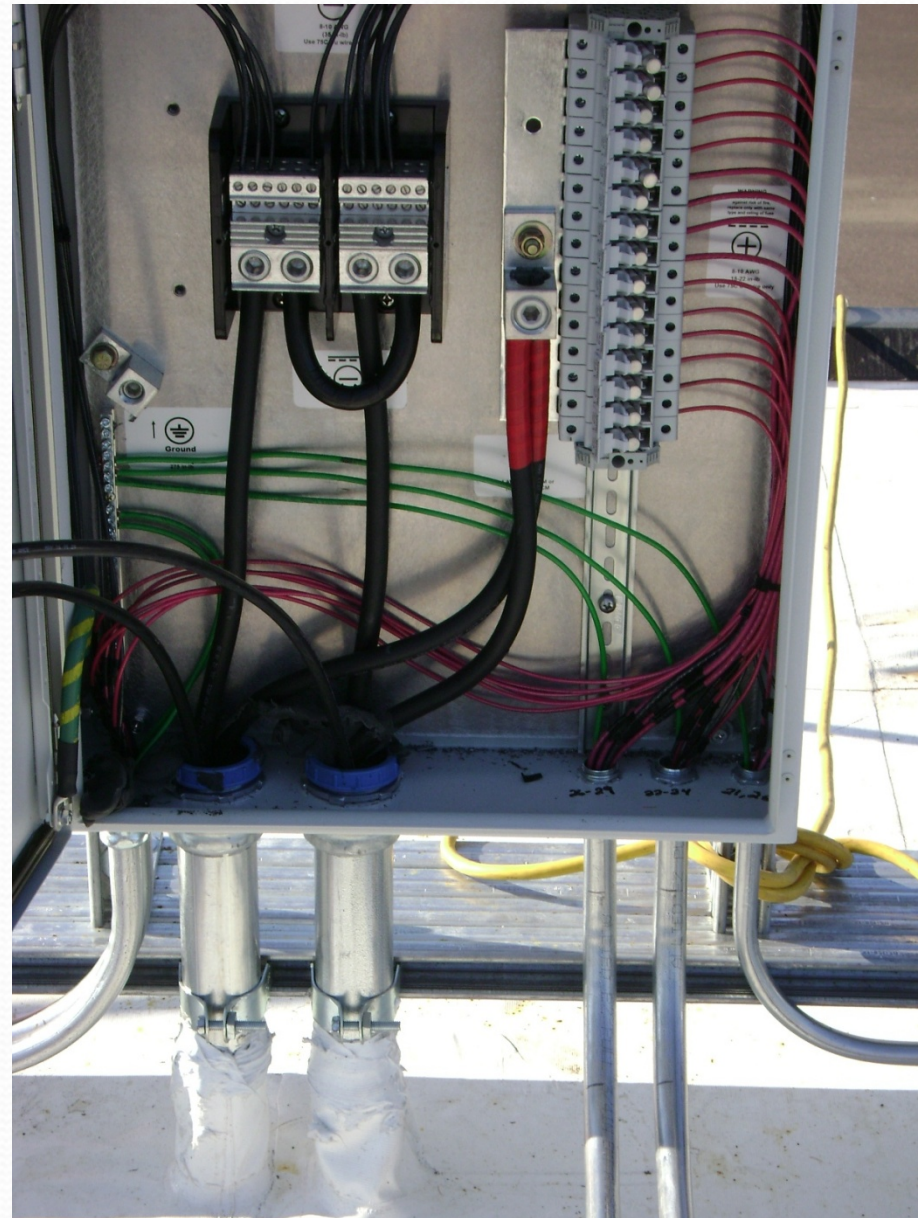




**South facing  
arrays  
13 degree slant  
(less than optimal  
because of snowload  
and wind shear issues)**



# Rooftop combiners





Inverter  
DC to AC  
Grid Connected  
(no lost energy  
even on sunniest  
days)



<b>PV Project Costs</b>	
Solar Modules	\$380,000
Inverter	\$50,000
Construction Materials - other	\$166,000
Solar Installation	\$175,000
Engineering & Permits	\$16,000
<b>Total Costs - prior to roof</b>	<b>\$787,000</b>
New white roof	\$263,000
<b>Total Cost with roof</b>	<b>\$1,050,000</b>
<b>RDF</b>	<b>\$735,000</b>
<b>Other Grant Funds</b>	<b>\$70,000</b>
<b>Merrick's Investment</b>	<b>\$245,000</b>



# Photovoltaic System

## Environmental savings over 25 years

By not burning coal to generate 1.8 MWh electricity, this system will eliminate from the air:

- 6,237,000 lbs of CO<sub>2</sub>;
  - equivalent to planting 312,000 trees
- 10,850 lbs of sulfur dioxide; and
- 18,100 lbs of nitrous oxide.



# Project Results

- Generated 14,080 kWh's in the first 49 days of operation.
- Participated in MN Solar tour and had approximately 50 people tour the solar array.
- Have had many groups and politicians, including Senator Klobuchar and MN Dept. of Commerce, tour the project.
- Have been highlighted in Star Tribune, White Bear Press, KARE 11's Earth KARE segment, and on Blue Print for Green TV show.
- Presented project to MN Waste Wise Annual Conference.

# A Marriage of Helio and Geo Energy Sources

*Thank you Xcel Energy*

*Project funding provided by customers of Xcel Energy through a  
grant from the Renewable Development Fund*

