



**MADISON**  
AREA | TECHNICAL  
**COLLEGE**



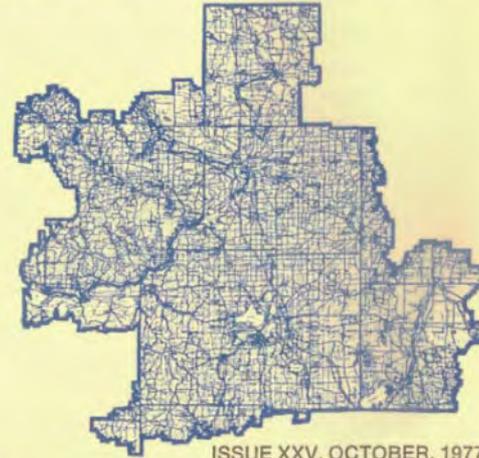
# Madison College Solar Installation Ken Walz and Adam Gusse



**A quick historical  
snapshot of pioneering  
clean energy efforts at  
Madison College..**

## THE SHUTTLE NEWSLETTER

for  
"better communications between  
high school and MATC personnel"



ISSUE XXV, OCTOBER, 1977

AREA VOCATIONAL, TECHNICAL & ADULT EDUCATION DISTRICT NO. 4

### MATC STUDENT HONORED **Solar Heat In Portage**



The Greater Madison Board of Realtors, Inc. honored Lem Eaton, a MATC student, at the April, 1977 GMBR Board Luncheon. Pictured is President Mike Franzen presenting the \$150.00 GMBR Scholarship to Mr. Eaton.

Mr. Eaton, the son of Mr. and Mrs. Nathaniel Eaton of Milwaukee, resides in Madison, Wisconsin.

The energy of the sun will provide an estimated 42 per cent of the annual heating needs of a new vocational education facility at Portage.

The Area Board of Vocational, Technical and Adult Education District No. 4, reviewed the results of an energy study and instructed architect Kenton Peters to include solar heating in the design of the new building.

Bert Johnson, vice-president of Mechanical Design, Inc., said the cost of the solar heating system would be \$62,000.

Johnson recommended electric heat be used to supplement the solar heat and said that arrangement would save about \$41,000 over 20 years.

"Most heating will be served electrically 20 years from now," Johnson predicted.

The electric heating system would be capable of carrying the entire heating load, he said, but is expected to be used only as a supplement to the solar system.

The structure will be one of the first educational buildings in the state to employ solar heating.

"I feel strongly we need to go this way even if we consider ourselves experimental," John Misfeldt, a board member from Fort Atkinson, said.

# ***MATC – Portage Solar Thermal System***



2,200 sq.ft. of collector surface area, producing  
an estimated 5,000 therms of energy annually

# Truax PV Systems (2002)

## 2.1 and 1.2 kW





**Building Integrated Photovoltaic Bus Shelter – 1.0 kW (2007)**

# MATC Photovoltaic Tracking System Storm Damage (July, 2008)



# Commercial Ave PV Training Lab. 9 kW total (2010)





# Solar Photovoltaic Roadmap

The Madison College Solar Roadmap was created through the College's participation in the Solar University Network funded by the U.S. Department of Energy SunShot Initiative. Over the course of several months in spring 2018, a team from Madison College participated in a course organized by the Midwest Renewable Energy Association to develop a campus solar roadmap. The course included teams from 14 colleges and universities across the country that worked together to explore and share best practices in solar planning and development. The course included subject matter expert instructors from the education, industry, and financial sectors. Numerous solar informational resources, research analyses, online tools, and case studies provided by government agencies, national laboratories, and other colleges were examined. The Madison College Solar Roadmap is a 60 page document that was produced as an outcome of that process, with the intention that it would be incorporated in the Madison College Facilities Master Plan, to guide solar projects to be completed over the next decade.

## **The Roadmap was authored by:**

Steven Ansonge, Madison College Student Senate President  
Tom Helbig, Madison College Electrician and Electrical Instructor  
Wes Marquardt, Madison College Facilities Manager  
Mark Thomas, Madison College Vice President and CFO  
Ken Walz, Madison College STEM Instructor & Director of the CREATE Energy Center

## Table of Contents

Overview and Executive Summary  
Section 1: Solar PV Stakeholders at Madison College  
Section 2: Solar PV Development Considerations  
Section 3: Campus Energy Analysis  
Section 4: Solar PV Site Prioritization  
Section 5: Solar PV Project Financial Modeling  
Section 6: Solar PV Contracting - Bid-Ready Solar Projects  
Section 7: Solar PV RFPs - Creation and Execution  
Section 8: Solar PV Forecast and Future Outlook  
Section 9: Solar PV Instruction at Madison College  
Section 10: Solar Grant Related Activities at Madison College  
Attachments and Figures

# Roadmap Completed in 2018

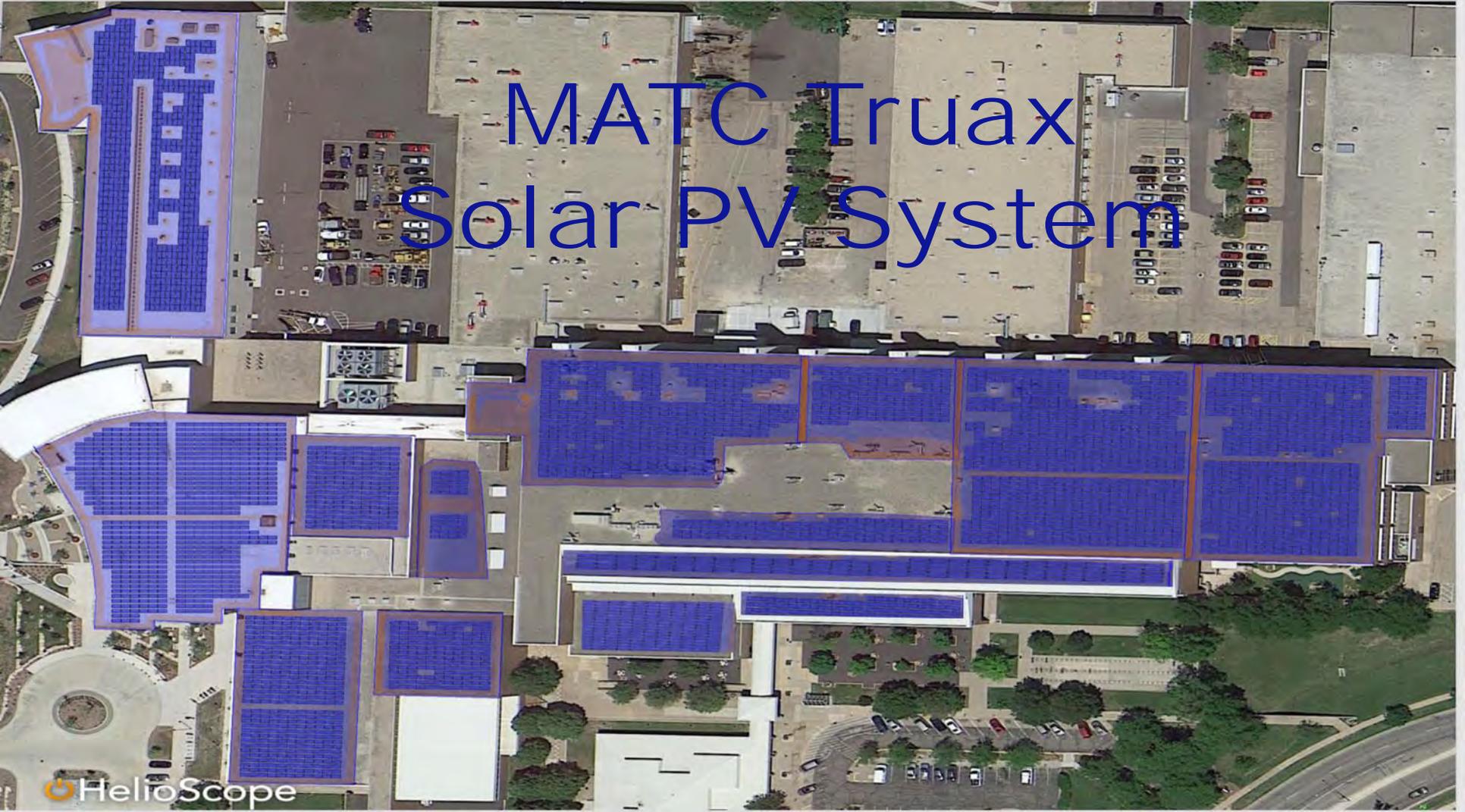
## Priorities Identified

1. Truax Main Campus
2. New South Campus
3. Health and Protective Services
4. Commercial Avenue (update instructional systems to include a ground mount array, energy storage and EV charging capacity)
5. Regional Campuses



# **Madison College Announces Large Rooftop Solar Project (2018)**

# MATC Truax Solar PV System



# Energy Impact for MC

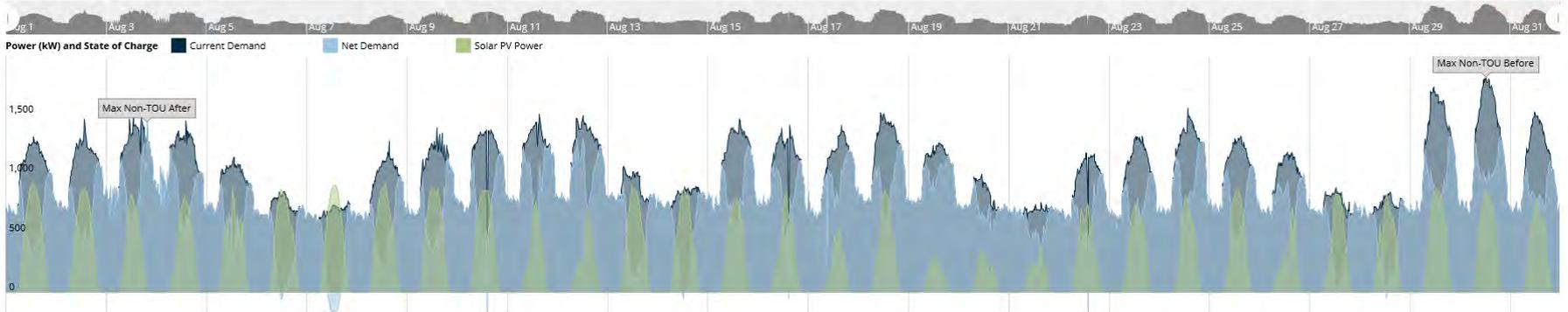
- On a good day: offset roughly 75-100% of Truax campus electric load
- Over a year: offset roughly 20-25% of consumption

Date Range for Chart

\* Select Date Range

Demand Profile And Costs Data

Zoom: 1 day 2 days 3 days 1 week **Full Range**

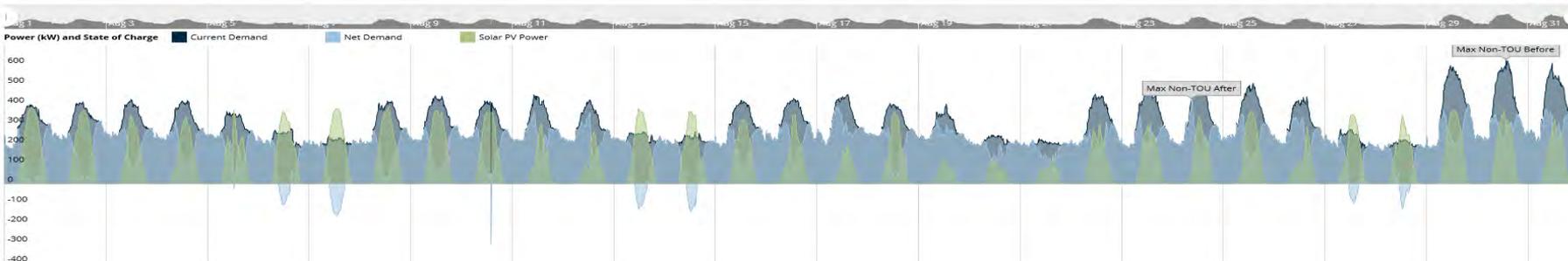


Date Range for Chart

\* Select Date Range

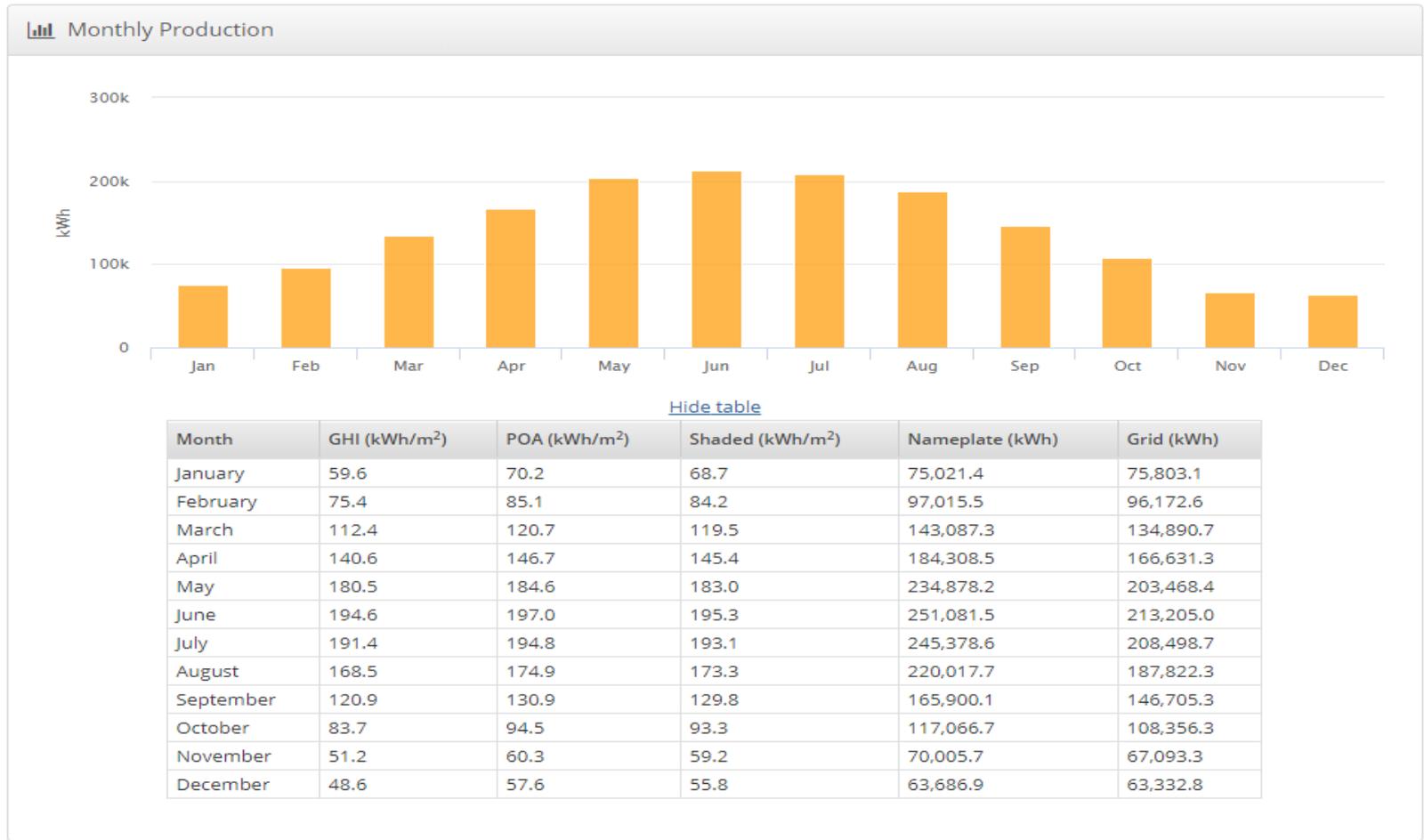
Demand Profile And Costs Data

Zoom: 1 day 2 days 3 days 1 week **Full Range**



# Estimated System Production

2,300,000 kWh average annual PV system production



# Ken's New Tool



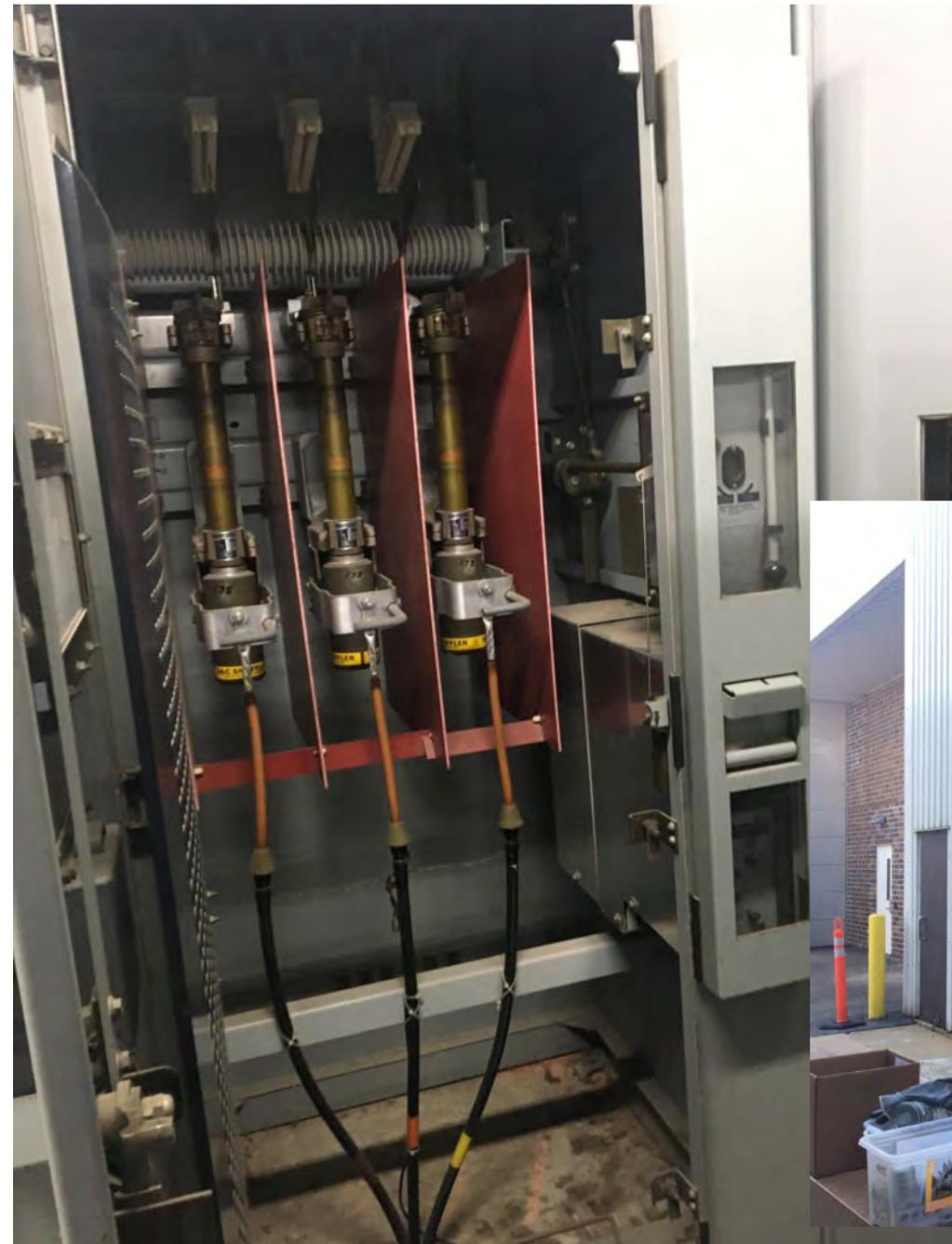
# System Design Overview

An aerial photograph of a large industrial facility with a flat roof covered in solar panels. The building is surrounded by parking lots filled with cars and trucks. The title 'System Design Overview' is overlaid in large yellow text at the top.

- 1.85 MW<sub>DC</sub> - (5,700) Yingli YL325P-35b modules
- 1.65 MW<sub>AC</sub> - SolarEdge 10 kW, SE66.6kW, & 100 kW Inverters with 730 W<sub>DC</sub> Optimizers
  - 277/480 VAC output for three phase interconnection
  - Fully UL listed, NEC 2017 Rapid shutdown compliant
  - Maximizes output at the module level
- Ecolibrium and Unirac Racking
  - Ballasted, non-penetrating
  - Ease-of-use, flexible design



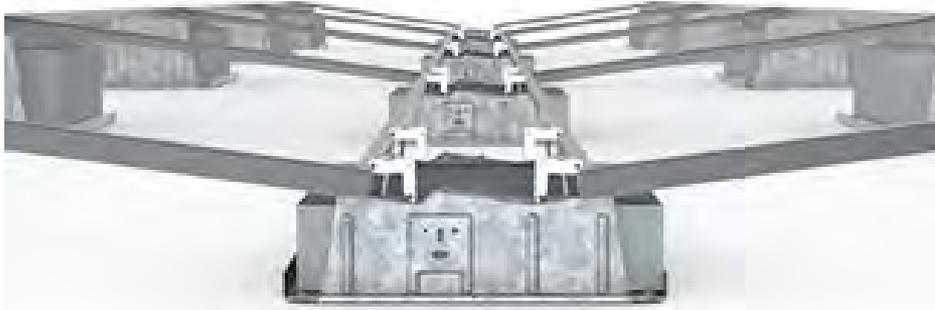
All for  
Solar☺



# Ecolibrium ballasted & EcoX Metal



# Unirac RMDT



- 8° tilt dual tilt (E-W) design to maximize power density due to existing roof penetrations and skylights



# SolarEdge New Synergy Inverters

- SE10KUS, SE66.6K, & SE100KUS inverters with integrated monitoring, 10 year warranty extendable to 12 years
- P730 optimizers – two modules per optimizer
  - Maximize power production using DC to DC conversion for MPPT
  - Monitoring to the optimizer level using powerline communication
- Israeli company founded in 2006; 2,500 MW shipped in 2017



Power Optimizer



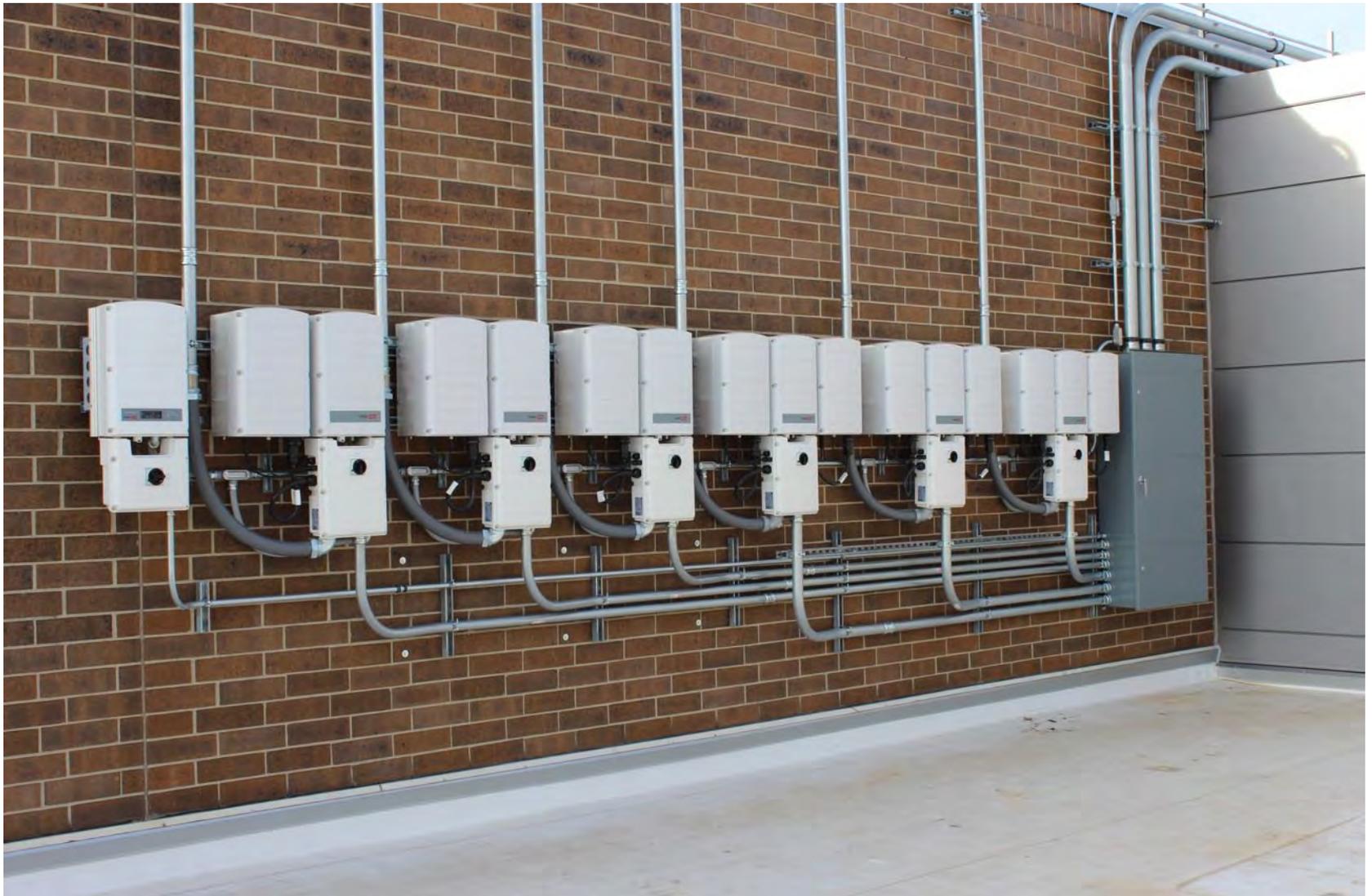
Inverter

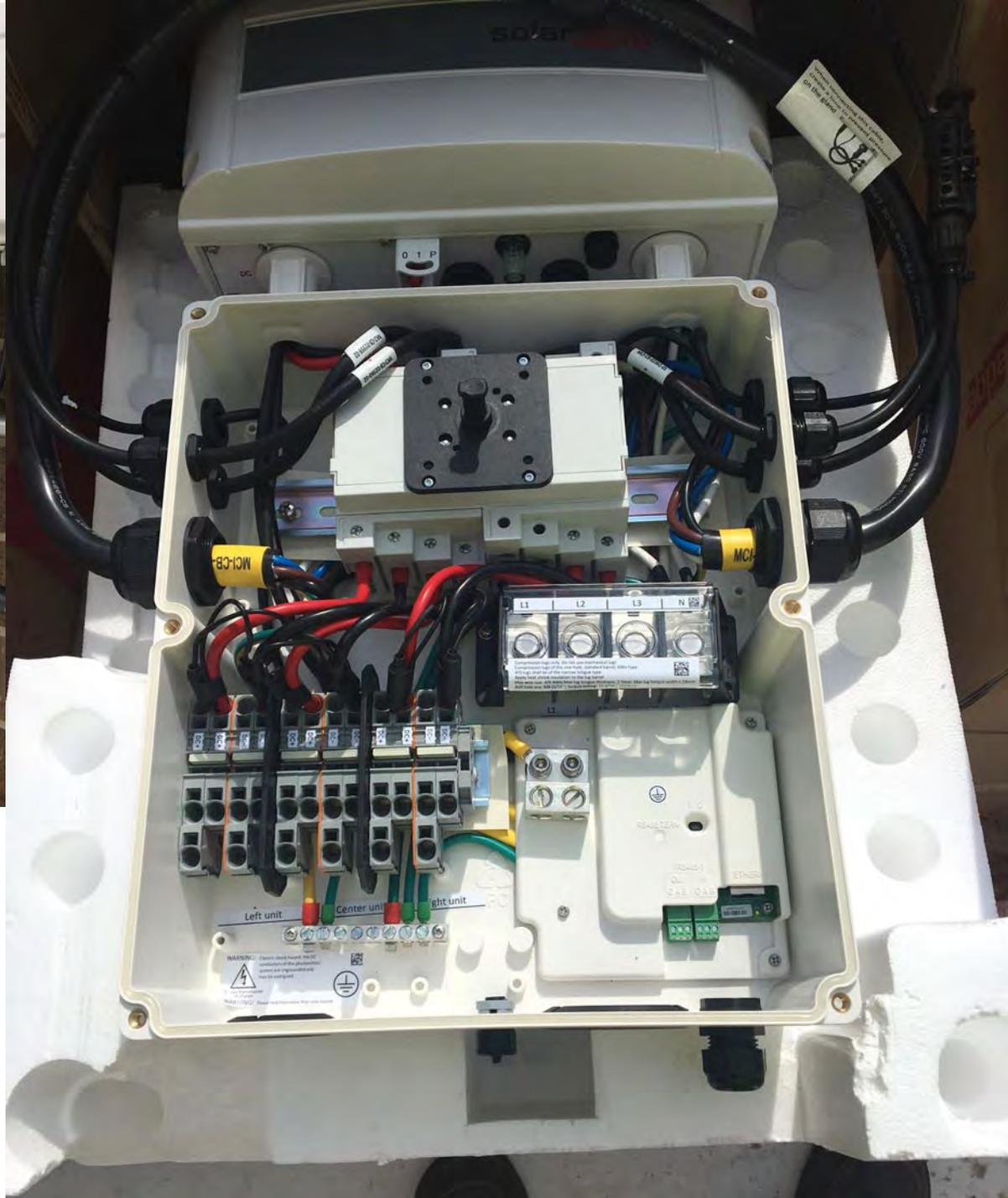


Monitoring



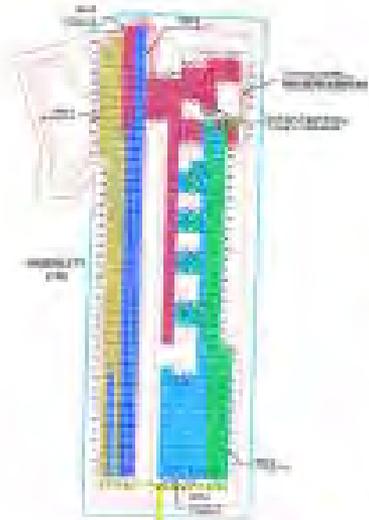
# SolarEdge Inverters





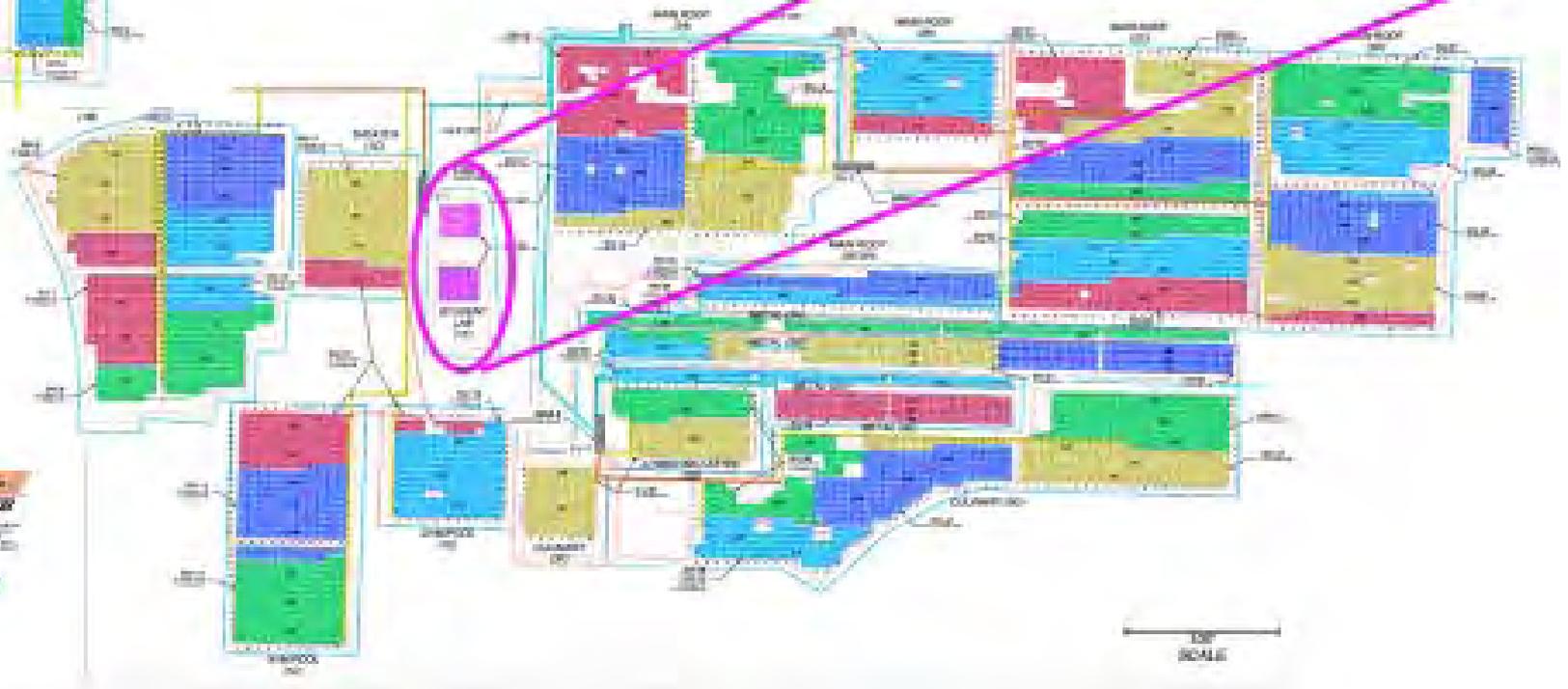
# SolarEdge Inverters

# Madison College 1.85 MW Solar System



**5700 panels**  
**119,300 sq ft**  
**Roughly two**  
**football fields**  
**worth of panels**

ADA Accessible Student Lab



# Thank you!

Adam Gusse

SunVest Solar, Inc.

[AdamG@sunvest.com](mailto:AdamG@sunvest.com)