

UCI SMART IAC Updates

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CalPlug Workshop

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**Industrial
Assessment
Center**
U.S. DEPARTMENT OF ENERGY

UCI SMART Industrial
Assessment Center

CSUN

CALIFORNIA
STATE UNIVERSITY
NORTHRIIDGE

Cypress  **College**

UCI SMART IAC

Sustainable Manufacturing Alliance for Research and Training
Industrial Assessment Center



UCI SMART IAC Energy Assessments

- Energy efficiency, waste reduction, and productivity enhancements
- Energy efficiency techniques: lighting, air compressors, motors, furnaces, ovens, boilers, HVAC, chillers, water treatment systems, renewables, and much more!
- Bringing SMART into our IAC: smart manufacturing, cybersecurity, life-cycle analysis, fuel switching, etc.

UCI SMART IAC Energy Assessments

- Tour
- Brainstorm
- Collect data
- Develop report
- Follow up

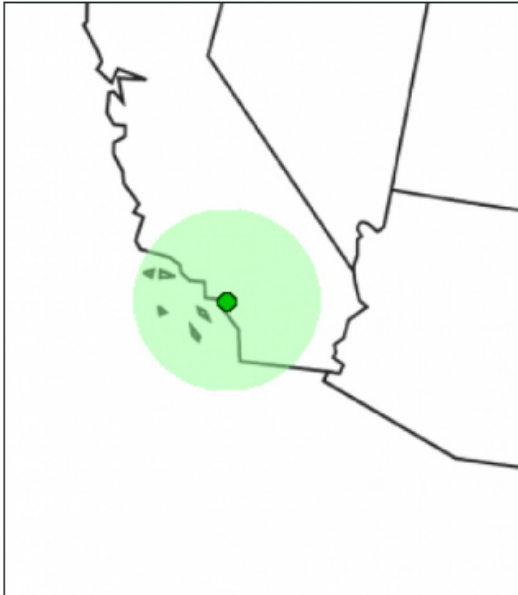
IAC Website Snapshot



University of California, Irvine

Student Research Award Winner: 2022

The University of California, Irvine Industrial Assessment Center (CI-IAC) provides **free energy, productivity, and waste assessments** to small and medium-sized industrial facilities through funding provided by the US Department of Energy.



16	Assessments
125	Recommendations
0.15	Tbtu Energy Saving*
\$2.75	million Cost Savings*
24	Students Trained

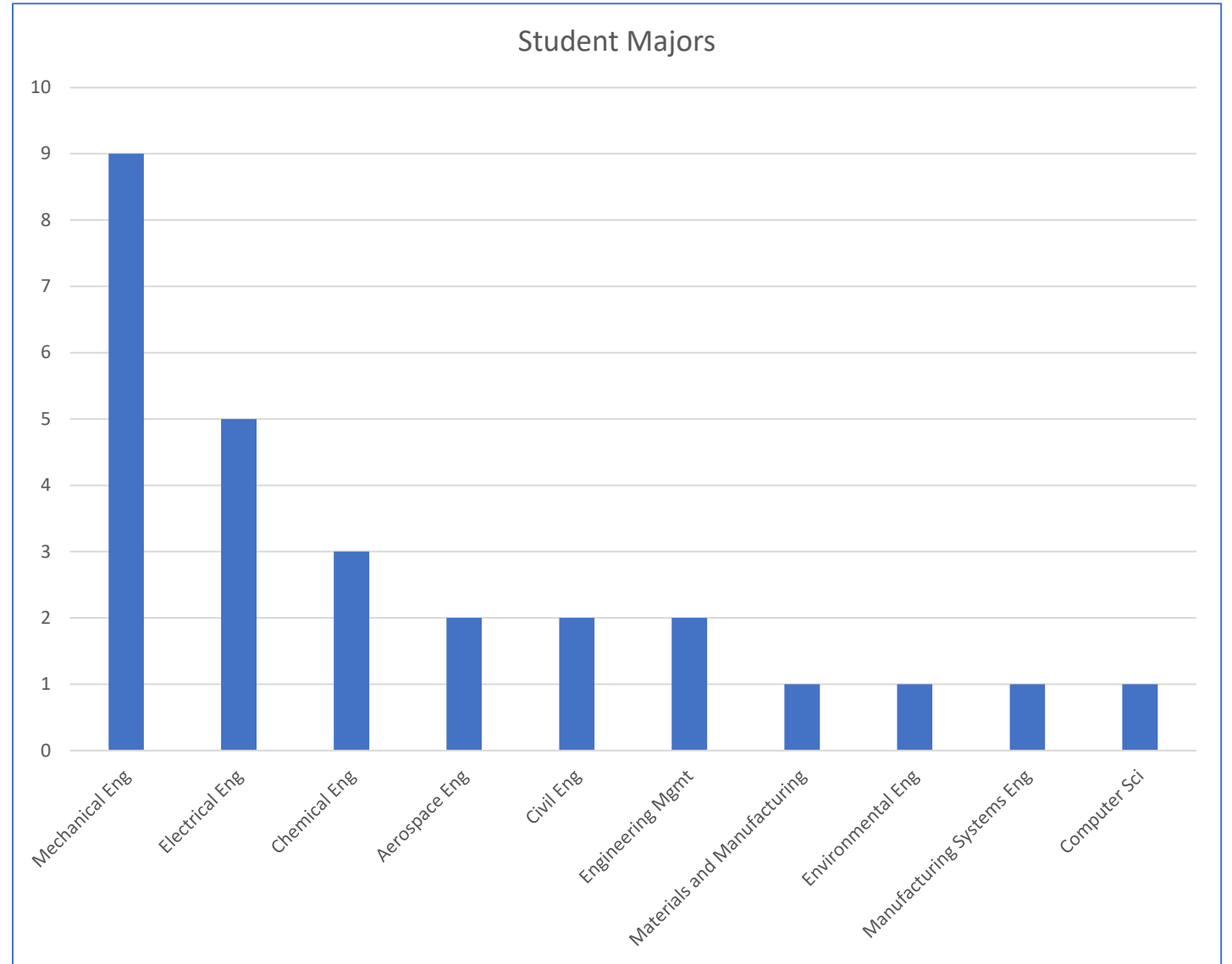
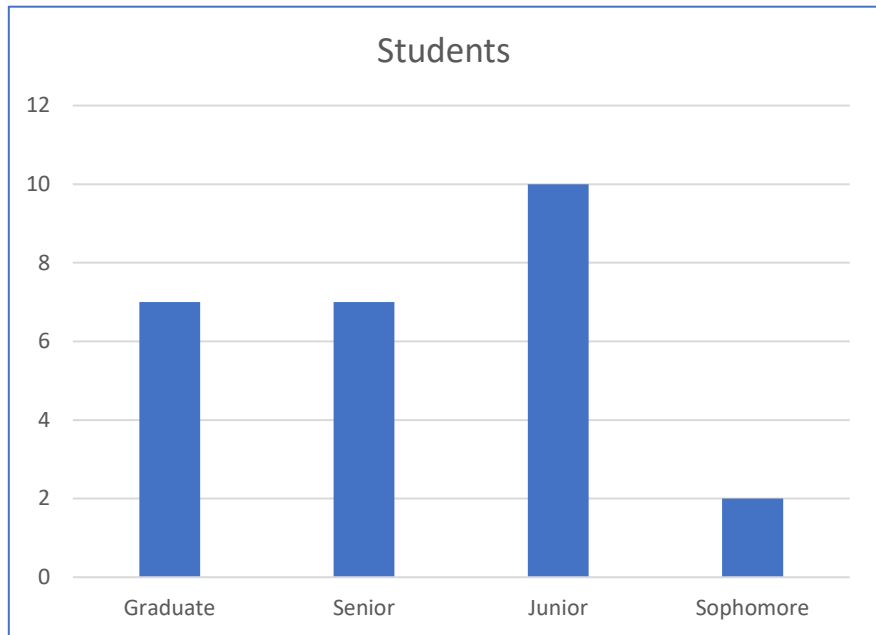
*Recommended Savings

← Assessment reports submitted to IAC database

<https://iac.university/center/CI>

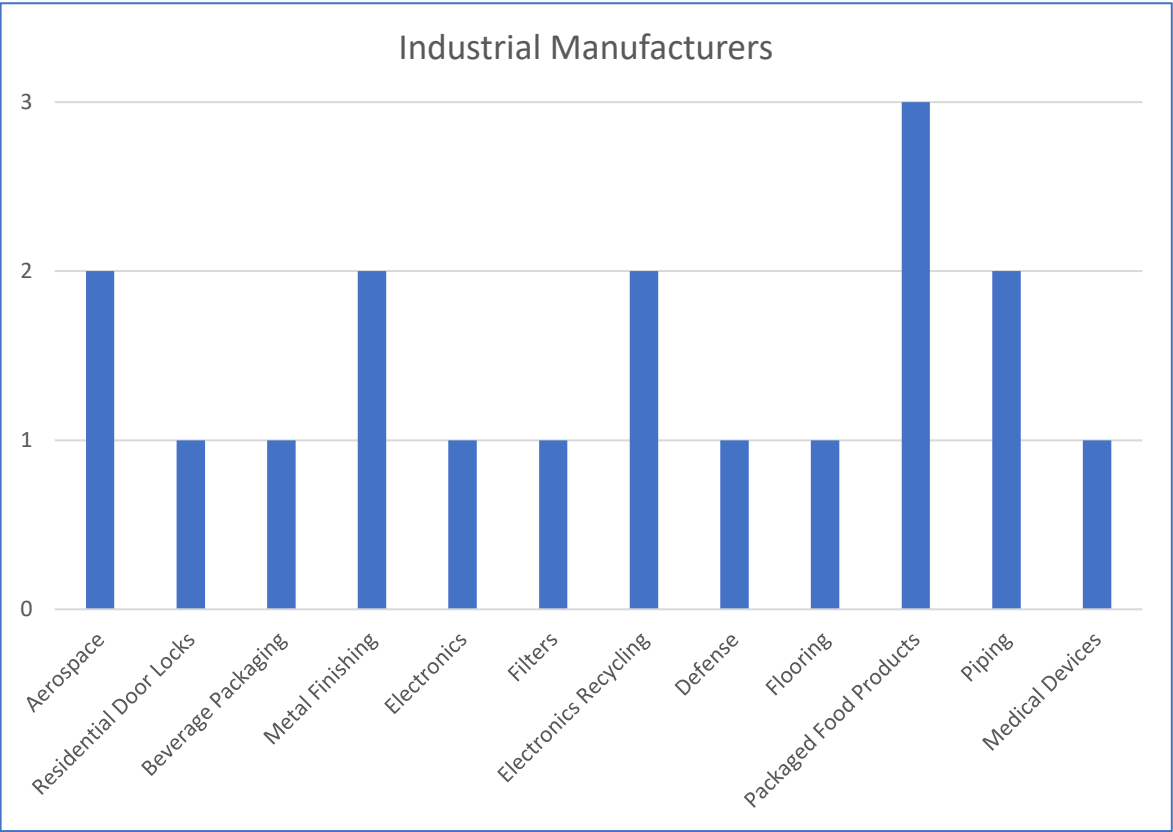
Student Team

- UCI: 23 Students
- CSUN: 3 Students
- Cypress: 1 Students

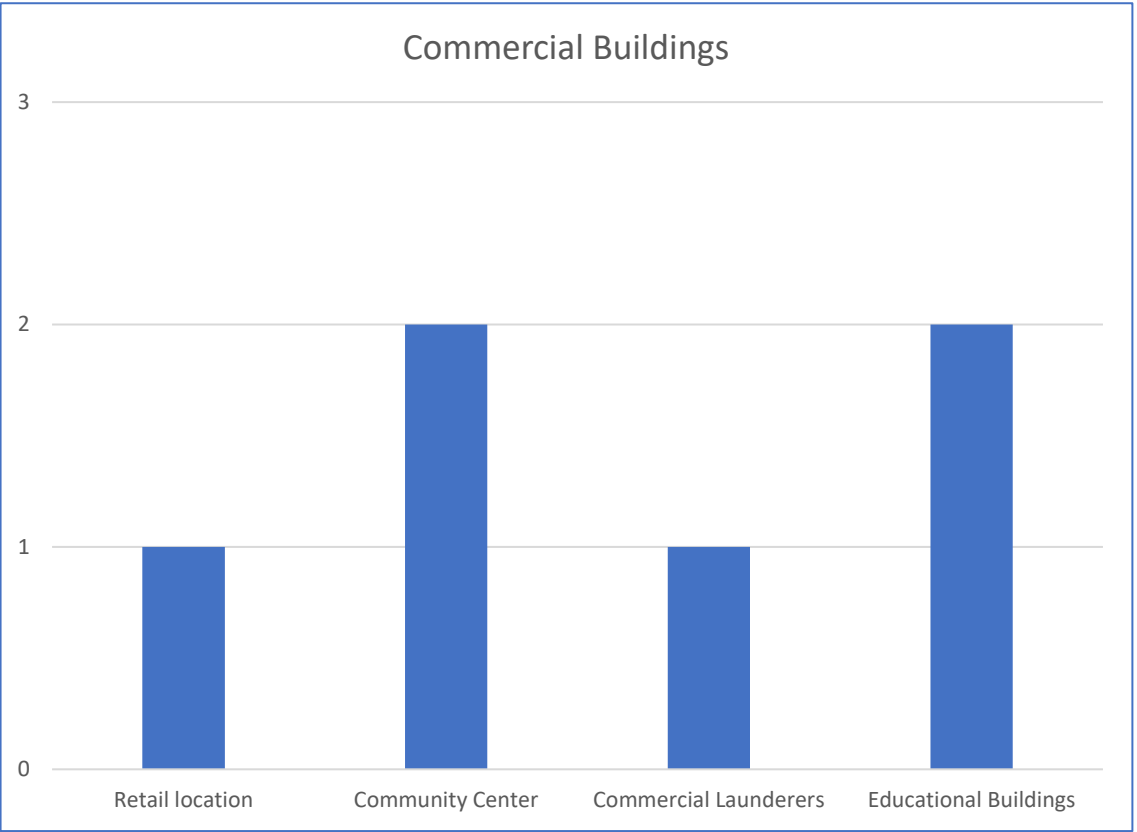


Energy Assessments Performed

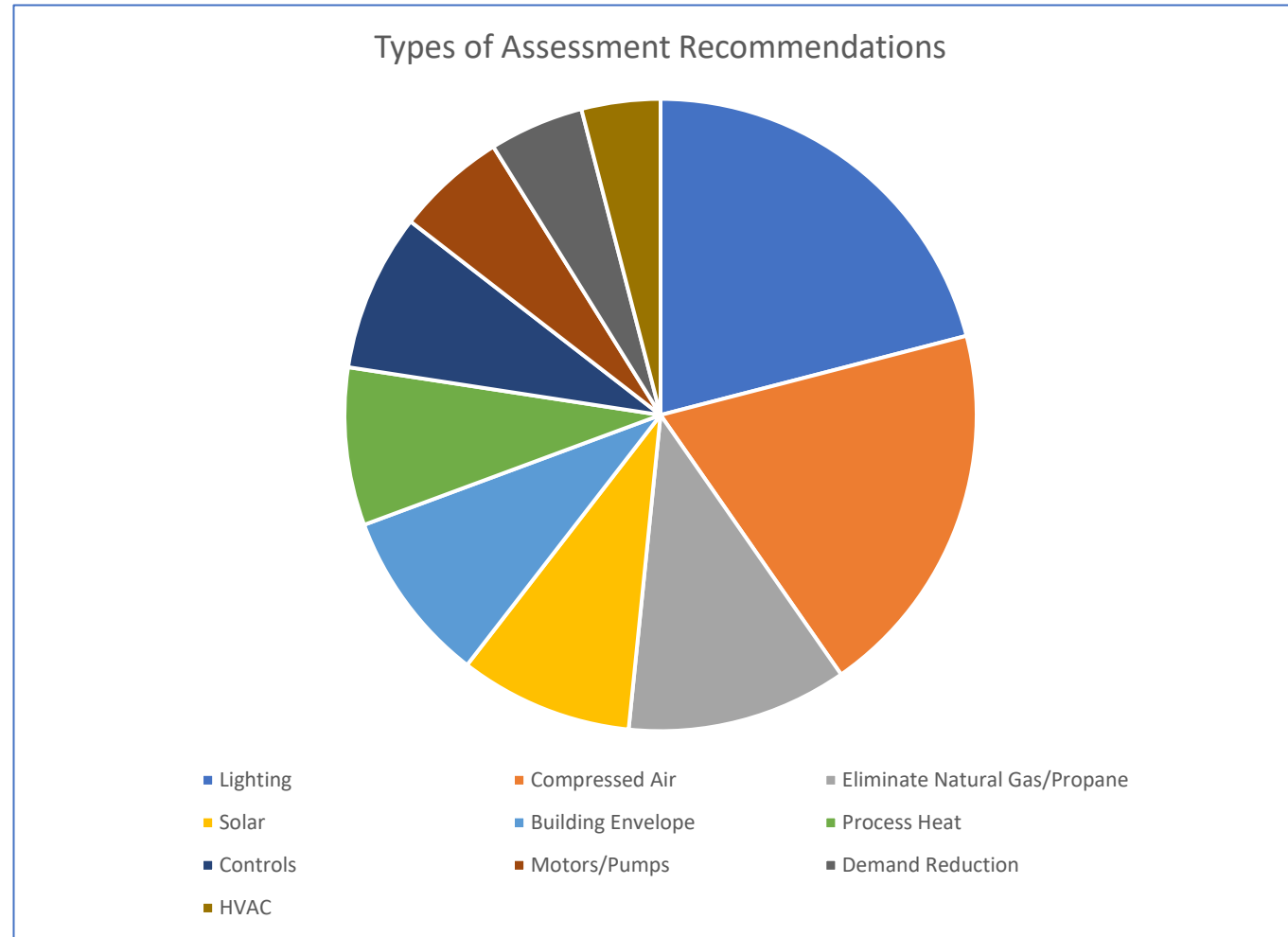
18 industrial energy assessments



6 commercial energy assessments

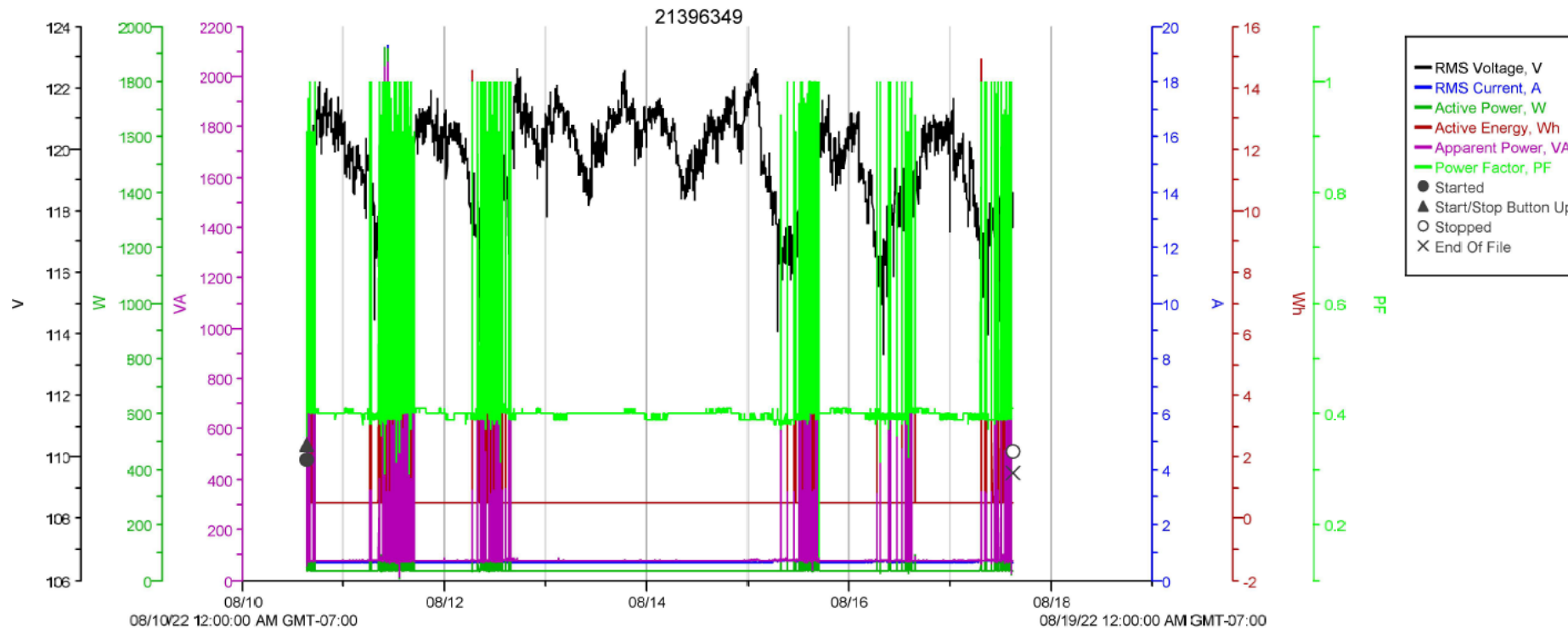


Assessment Recommendations

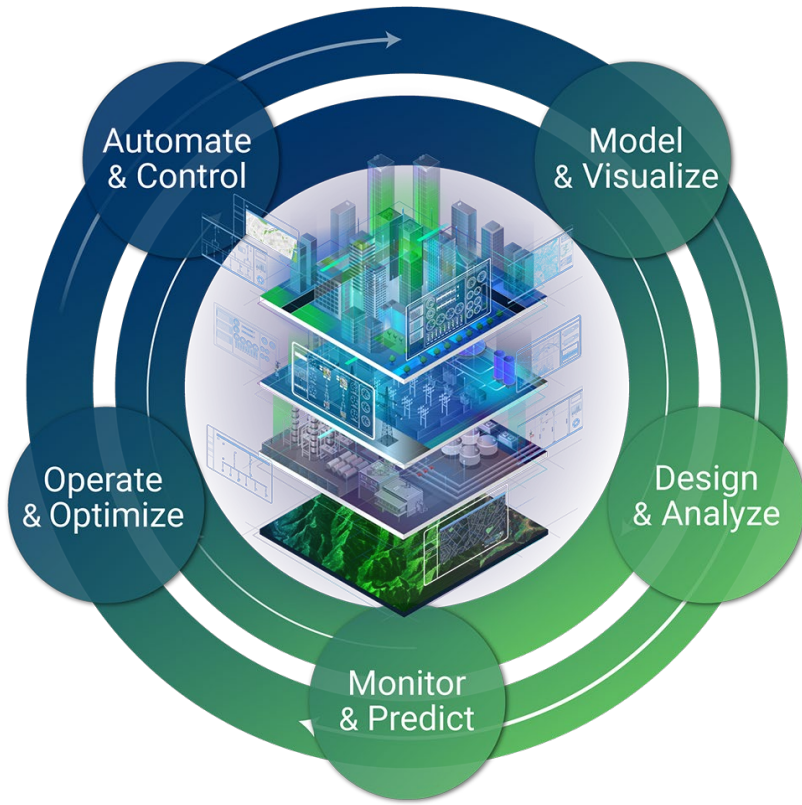


Unique Ideas – Dataloggers

- Equipment monitoring, controls and timers



Unique Ideas – Digital Twin Projects



- Real-time data for analysis by simulating models of systems in a virtual environment
- Analyze operating conditions and provide estimates of energy consumption
- AI-driven energy disaggregation modeling can lead to energy optimization and savings, alternate solutions to manufacturing processes, and increased productivity

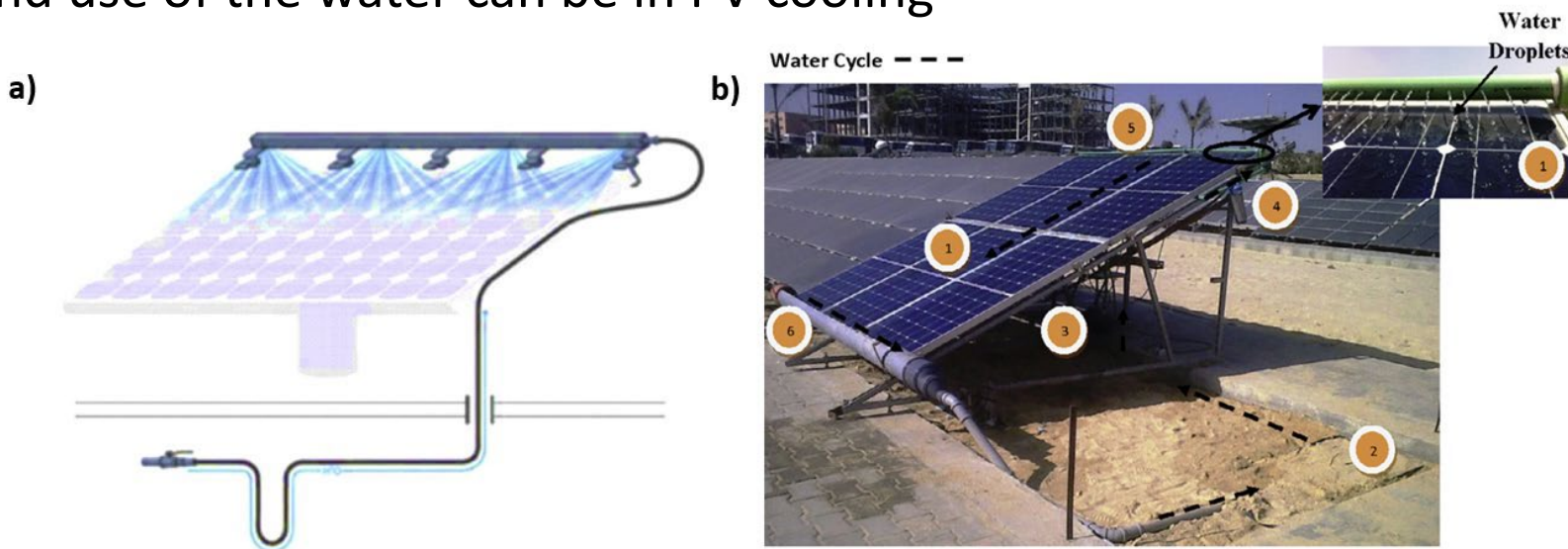
Unique Ideas – Smart Manufacturing Projects

- Cameras can automatically scan for preventative maintenance issues
- Cameras can be utilized for advanced training for operators
- Cameras can be used as occupancy sensors and connect to smart building energy management systems to control areas only when occupied



Unique Ideas – Cooling for Solar Systems

- Active cooling for solar systems – pumping water over the cells
- Temperature affects the performance of solar cells
 - Estimated that the power output of the system decreases $\sim 0.5\%$ per temperature degree
- Ideal when client already produces a lot of wastewater
 - Second use of the water can be in PV cooling



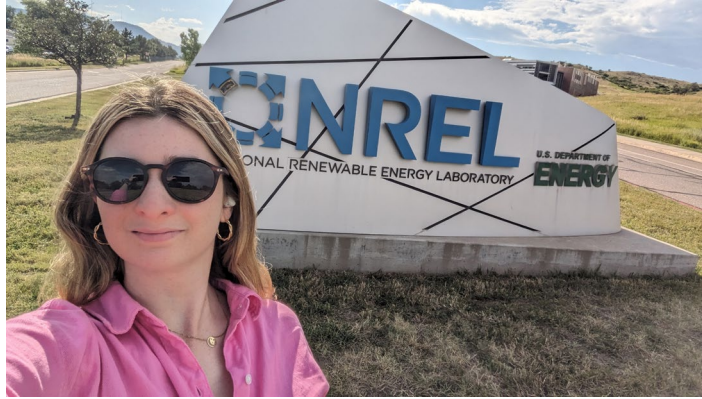
DOE Implementation Grants

- DOE is offering grants of up to \$300,000 with one-to-one matching from the client to help implement recommendations from IAC assessments
- Supporting projects that are meant to improve energy and material efficiency, enhance cybersecurity, increase productivity, deploy smart and advanced manufacturing technologies, and reduce waste and pollution at SMM facilities
- Encouraging our clients to apply, giving grant program updates to eligible clients, and **providing technical assistance** with application submissions

*To learn more about the IAC Implementation Grant program – including FAQs
– and to apply, visit: <https://www.energywerx.org/opportunities/iac-round-2>*

Student Experiences – Summer 2023

- Daniela Ruiz
 - PhD Student
 - Mechanical Engineering
 - NREL Internship



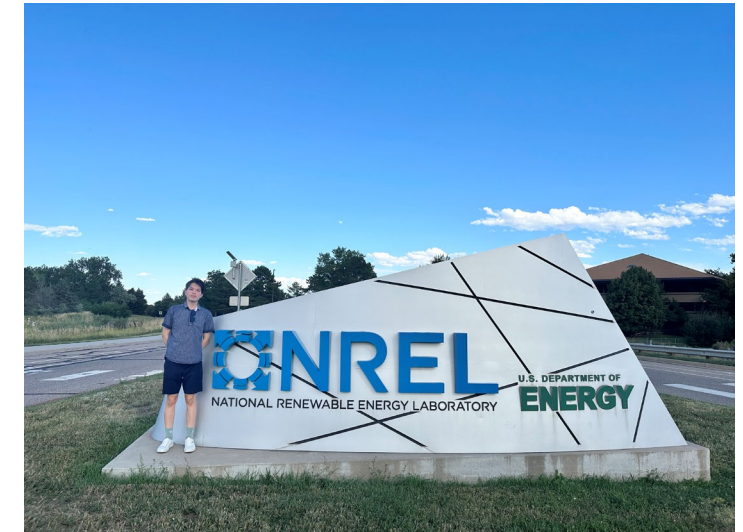
- Jiadong Zhao
 - Grad Student
 - Electrical Engineering
 - UCI SMART IAC and NREL Internship



- Huiting Qin
 - PhD Student
 - Materials and Manufacturing
 - IRWD Internship



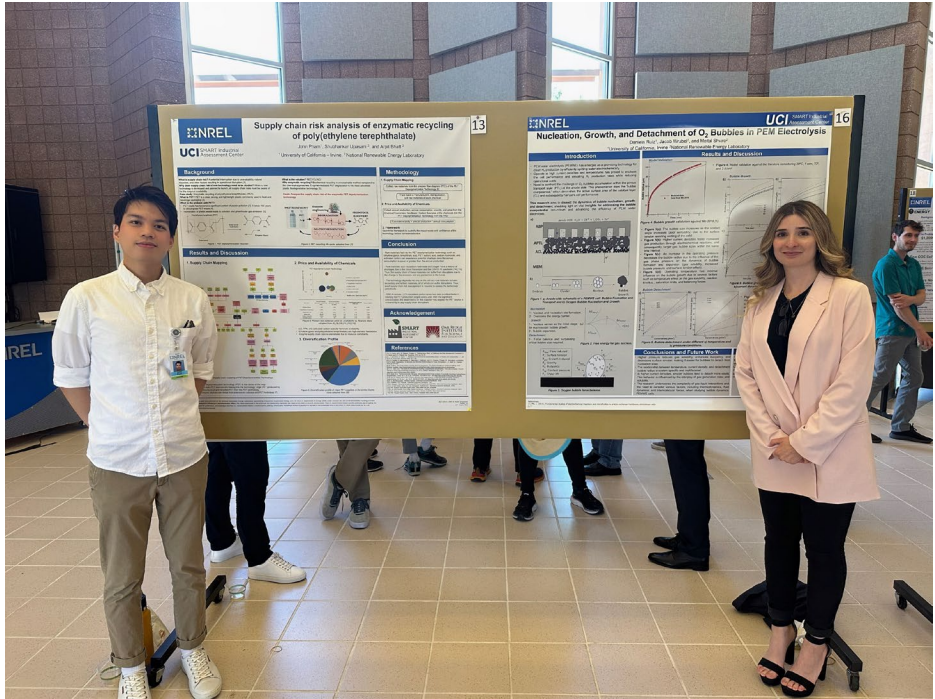
- John Pham
 - Senior
 - Chemical Engineering
 - NREL Internship



Student Testimonial

- Chris Ramirez
 - Senior
 - Mechanical Engineering
 - Student Lead





Questions?

