

August 18, 2021

Robert Meagley, U.S. Department of Energy
Joe Simon, Sara Farrar, Travis Lowder, Jackie Petre,
National Renewable Energy Laboratory (NREL)
SOLAR DISTRICT CUP





"I met with industry professionals and learned that this is exactly what they do for a career. I was excited to hear how relevant our work for this competition was and how it can translate to the real world."

-Class of 2021 Student



Webinar Will Begin Shortly





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"I feel like I have a better grasp on how solar is applied in the real world, and all of the different skill sets that go into developing a successful project."

-Class of 2021 Student



Webinar Will Begin Shortly



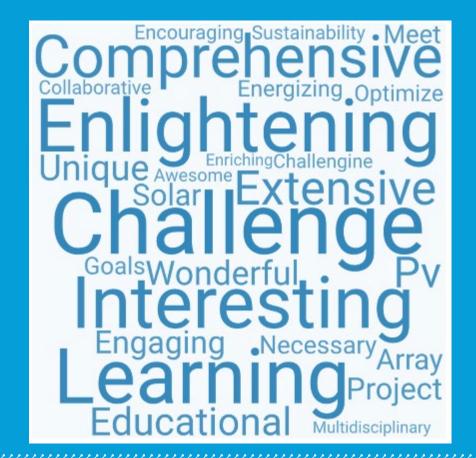


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What's one word to describe the Solar District Cup?



Webinar Will Begin Shortly





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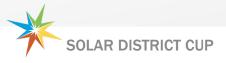


"Serving as a use case for the Solar District Cup was a great experience for UNL. The student teams presented very creative and professional work. The designs will be influential in future renewable energy projects as we work towards our sustainability goals. This is a wonderful program for everyone involved."

-Class of 2021 District Use Case Representative



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# **Webinar Housekeeping**

### Two Options for Audio (select audio mode):

- Listen through your computer:
   Click the 'up arrow' next to the "mute" button in the bottom left corner.
   Under "Select a Speaker," click "Same as System."
- 2. Listen by telephone:
  Click the 'up arrow' next to the "mute" button in the bottom left corner.
  Click "Switch to Phone Audio."

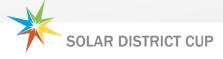
# Panelists – reminder to mute your audio device when not presenting. To Ask a Question:

Select the 'Q&A' button at the bottom of your screen and type in your question.

## Having Trouble with the Webinar?

Technical difficulties - contact Zoom Support at: 888-799-9666.

A video/audio recording of this webinar and the slide deck will be made available.





Robert Meagley, U.S. Department of Energy



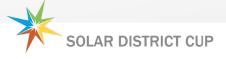


# Agenda

- 1 Introduction
- 2 About the Competition
- 3 Participation Expectations
- 4 Competition Rules
- 5 Divisions and District Use Cases
- 6 Training Provided
- 7 Timeline of Events
- 8 How to Register Your Team
- 9 What's Next
- 10 Closing Q&A



# Introduction



# Who We Are



**Dr. Robert Meagley**DOE



Joe Simon NREL



Sara Farrar NREL



Travis Lowder
NREL

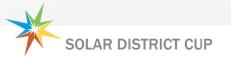


Dr. Aadil Latif

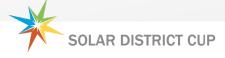


Jackie Petre NREL

The Solar District Cup Organizers



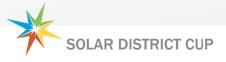
# **About the Competition**



# **Solar District Cup**

A MULTIDISCIPLINARY COLLEGIATE COMPETITION THAT
CHALLENGES STUDENT TEAMS TO **DESIGN** AND **MODEL DISTRIBUTED ENERGY SYSTEMS** FOR MULTIPLE
BUILDINGS ON A LOCAL ELECTRICAL DISTRIBUTION
NETWORK—ON A CAMPUS, ACROSS A DEVELOPMENT,
OR IN AN URBAN DISTRICT.





# **About the Competition**

- Cultivating cross-cutting skills to prepare the next generation for the distributed energy workforce.
- Multiple "divisions," each with a partner district use case of existing building energy data.
- Two-semester, upper-undergraduate project starting fall 2021 and culminating in a spring 2022 competition event,



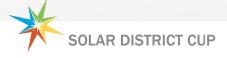








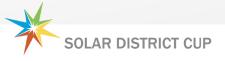




# **How to Stay in the Know:**



Go to <a href="www.herox.com/solardistrictcup">www.herox.com/solardistrictcup</a> and click "follow" if you're even remotely interested so you receive our updates & reminders about key deadlines.



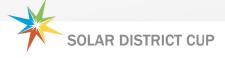
# **What We'll Cover Today**











# Who Evaluates You: Judges

Last year's judges. The Class of 2021-2022 will have new and returning judges.



Siddharth Temburni Summit Energy Group



Dana Clare Redden Solar Stewards



Bakary Coulibaly SolAmerica Energy



Dr. Qifeng Li University of Central Florida



Dr. Olga Lavrova New Mexico State University



Akshay Jain Virginia Tech



Kristen Fornes
ENGIE North
America



Ben Schneider Adapture Renewables



Rachel McLaughlin Forefront Power



Alex Parlato

Jniversity of Central

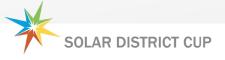
Florida



Dr. Linda Pickett
University of
Nebraska – Lincoln

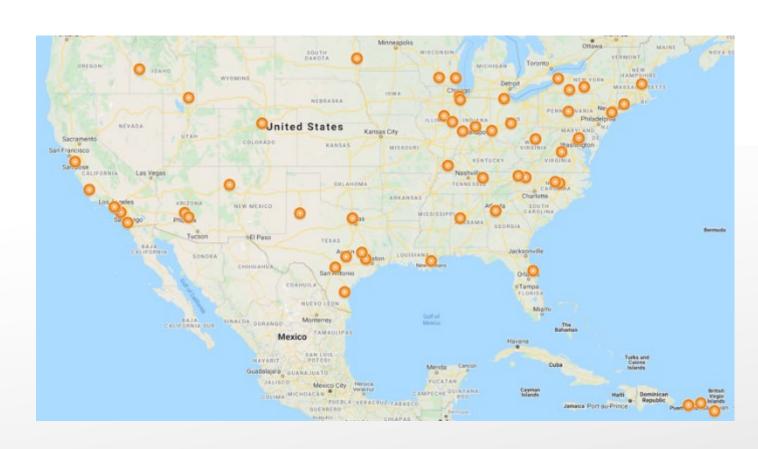


Chris Herr
Auraria Higher
Education Center



# **Who Participated Last Year**

- 59 participating teams
- 57 schools
- 21 returning schools from previous year
- 3 schools had multiple teams
- Many teams were multidisciplinary
- Many types of college students
- Many faculty advisors and industry mentors.



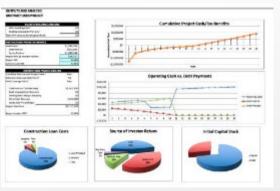


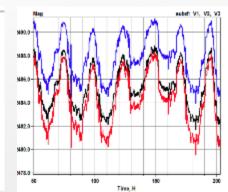
# What You'll Do

- Assume role of solar-plus-storage developer to create:
  - Project pitch
  - Conceptual system design
  - Distribution system impact analysis
  - Financial model
  - Development plan.







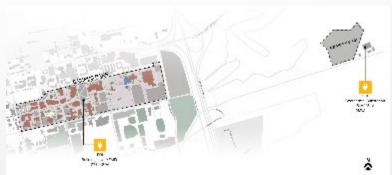




# Why We're Conducting the Competition

- Help address workforce gaps for professionals in the energy industry.
- Showcase innovative solutions for increased adoption of distributed solar energy generation at the campus or district scale.
- Inspire industry to think strategically about district energy systems.









# **How and What You Win**

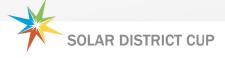
- Design a solar + storage system for an assigned campus or district that maximizes energy offset and customer financial savings.
- Gain valuable experience with real-life examples of innovative renewable energy design and engagement with industry.
- Win a trophy and national recognition!



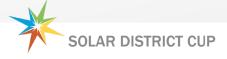
# Going for Gold: The Race for the Solar District Cup

Students from across the country competed in a new collegiate design competition that challenged teams to rethink real-world energy solutions while preparing to enter the solar workforce.





# **Participation Expectations**



# **About Participation**











# **Who You Are: Student Eligibility**

- A team composed of at least 3 students
- Enrolled student
  - Accredited U.S.-based collegiate institutions
  - At least one class and pursuing a degree
- Any level college student
  - Challenge aimed at upper-level undergraduate
- Multidisciplinary teams highly encouraged

Engineering Business or finance

Urban planning Construction management

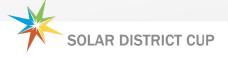
Communications Sustainability or environmental policy

Marketing Architecture

- Faculty advisor and/or mentor
  - Recommended (not required).







# **Why Participate**

- Build experience with innovative renewable energy design
- Develop real-world solutions that shape the future of solar energy
- Network with industry for career connections
- Enhance education and build resume
  - Senior design or capstone project
  - Elective or independent study course credit
  - Part of class curriculum or thesis
  - Seminar topic
  - Student interest club
  - Extracurricular activity.

















# Why Faculty Advise a Team

- Real data and use case for students
- Curriculum support and modeling tools
- Team-based design and analysis project
- Connections to industry.

"This competition gave [my class] much more structure, realism and excitement. This was truly a God-send. This was one of four projects in my senior capstone and I saw the skills from this competition that I wouldn't have focused on so much bleed into their other projects for their improvement."

—Class of 2020 Faculty

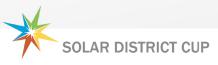
# Competition Rules Document

- Last year's Rules available for review on HeroX in "Resources" section.
- Class of 2021-2022 Rules to be published by August 31, 2021.









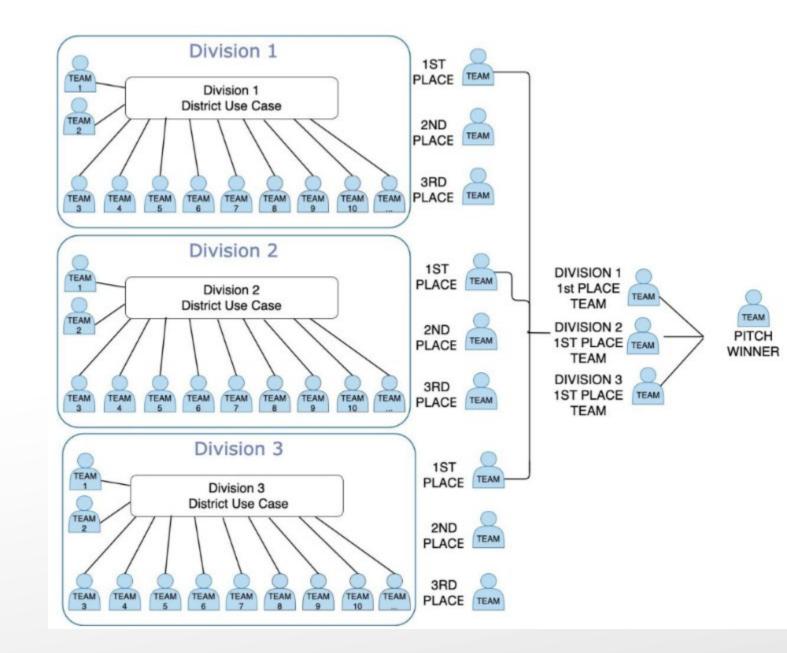
# **Divisions and District Use Cases**

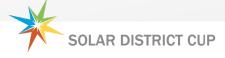
Assigned, real-world use cases with data, district master plans, and interest in your solutions.

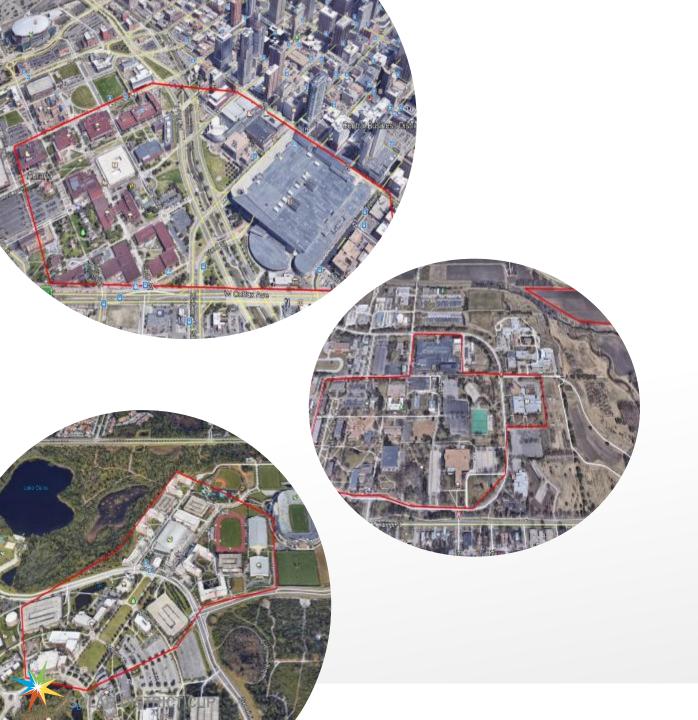


# **Divisions**

- 3 divisions
- Teams assigned to divisions by the competition organizers
- Winners of each division selected by industry judges
- Proposal pitch winner determined at final event.







# Expected 2021-2022 Division District Use Case Types

- National laboratory research campus
- University campus with critical hospital infrastructure
- Museum and park district campus.

# **Use Case Profile**

- Available in a secure online data room at when divisions assigned and teams announced
- Serves as the "challenge document," outlining each district use case and the parameters for student team projects
- Profile and data room contain several datasets to complete the challenge, including:
  - Annual interval energy usage for multiple buildings (.xlsx)
  - District Google Earth map with identifiers (.kmz)
  - Distribution system and substation information.



#### District Use Case: Ball State University

This document contains a description, data, and reference links for the Solar District Cup 2020 district use case of Ball State University. Data not available in this document can be found in the data packet on the following website:

Website: https://pfs.nrel.gov Username: ballstate-uc Password: VHOpmKb

#### 1. CAMPUS DESCRIPTION AND SUSTAINABILITY GOALS:

Ball State University (BSU) is a public research university with its main campus in Muncie, Indiana. The university was founded in 1918 with a bequest from the Ball brothers (of the Ball Corporation, famously the manufacturers of canning jars) and today hosts more than 21,800 students. The main BSU campus occupies more than 900 acres of land near the center of the city of Muncie



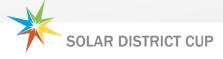
BSU was a 2006 founding signatory to the American College and University President's Climate Commitment, and in 2015 it signed the Climate Leadership Commitments, with a current goal of achieving climate neutrality by 2030. The university's statement on sustainability includes a commitment "...to protect and enhance the environment through our learning, research, service and administrative operations, [To] foster a community that sustains ecological systems and educates for environmental awareness, local action, and global thinking. [And] to incorporate environmental principles and environmentally responsible practices as fundamental and integrated components of all BSU operations and programs."



Version 1.0 2019-09-09

# **Training Provided**

Customized training, exclusive access, templates, and tools necessary for every team to succeed in the competition.



# **Customized Training on HeatSpring**

- Solar District Cup Specific Training Webinars
  - Introduction to Conceptual System Design
  - Distribution System Impact Analysis
  - How To Create a Financial Model
  - Development Planning Tips & Tricks
  - Pre/Post Knowledge Checks
  - And more!
- Free Access to "HeatSpring Solar Executive" MBA" content
- Live "Office Hours" with industry experts
- Class of 2021 competition team submissions and presentations.



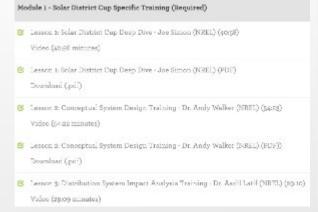


#### SOLAR DISTRICT CUP

8-MODULE ONLINE COURSE

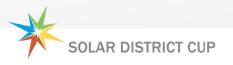
Lesson 1: Solar District Cup Deep Dive - Joe Simon (NREL) (40:58) (40:56 minutes)







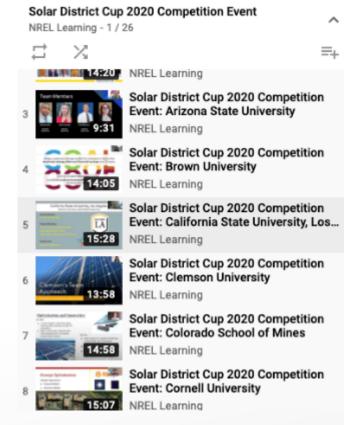
- \* Complete the course anytime

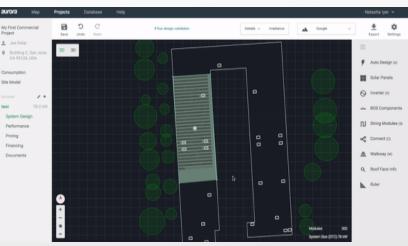


## **Additional Resources and Tools**

- Free access to industry-leading tools:
  - Aurora Solar for conceptual solar system design
  - Solar Executive MBA Financial Model
  - Energy Toolbase modeling solar + storage customer savings analysis
  - NREL's SAM and REopt Lite
- Free access to Solar Power International and regional Solar Power Events conferences.





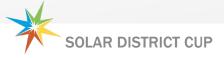




## **Timeline of Events**

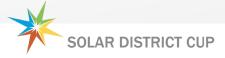
Designed to fit within the academic calendar

Participate as part of a course, senior design or capstone projects, or an extracurricular activity.



# **Solar District Cup Timeline**





# When to Engage: Summary Timeline 2021-2022

• August 18	Informational Webinar
August 31	Rules Published
<ul> <li>September 16</li> </ul>	Registration Deadline
<ul> <li>September 23</li> </ul>	Participating team announced, divisions assigned
<ul> <li>September 30</li> </ul>	Warm-Up Workshop (virtual)
<ul><li>November 18</li></ul>	Progress Deliverable Package Due
<ul> <li>December 16</li> </ul>	Finalist Teams Announced
<ul><li>April 14</li></ul>	Final Deliverable Package Due
<ul> <li>April 24-25</li> </ul>	Final Competition Event (virtual)
<ul><li>TBD (May)</li></ul>	Pitch Championship Presentations to Industry



# Intrigued?



Go to <a href="https://www.herox.com/solardistrictcup">www.herox.com/solardistrictcup</a> and click "Follow" so we keep you up to date!







- 1. Go to the Challenge page at www.herox.com/solardistrictcup
- 2. Choose "Solve this Challenge." This indicates your interest in competing; it is not a commitment (yet)
  - a. Sign-in or create a HeroX account if you don't already have one (and remember your password)
  - b. Agree to the Terms of Use
  - c. Confirm your email address
  - d. Accept the Challenge-Specific Agreement
  - e. Indicate "Would you like to compete as a team?"
    - i. Yes, I want to create my own team (with email addresses of invited team members)
    - ii. Yes, I want to join a team
    - iii. No, I want to compete individually (can create or join other teams later)
  - f. Form a team with one Team Captain.



#### **NREL Challenge**

**9** 5,002

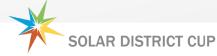
Share

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#### **Solar District Cup 2022**

Challenging multidisciplinary student teams to design and model optimized distributed energy systems for a campus or urban district.



# **How to Register a Team**

- 3. By the registration deadline, one person from each team must click "Begin Entry" and then submit a Register entry on HeroX to complete registration. This step is when you identify your collegiate institution and expected team. There is no cost to submit a Register entry.
- 4. Registration entries received by the deadline are deemed participating teams. All teams who successfully complete a Register entry and meet eligibility are accepted.
- 5. Divisions are assigned by the competition organizers following receipt of a complete Register entry and by the date on which participating teams are announced.
- 6. Multiple teams from a single school may submit a Register entry, but only one team may compete per division. Three divisions are expected.
- 7. Only one person per team may submit a Register entry. Other members join that registered team via HeroX. Team members may be added or removed from a team at any time. Once you have registered a team, you can invite additional members using HeroX.



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Share

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#### **Solar District Cup 2022**

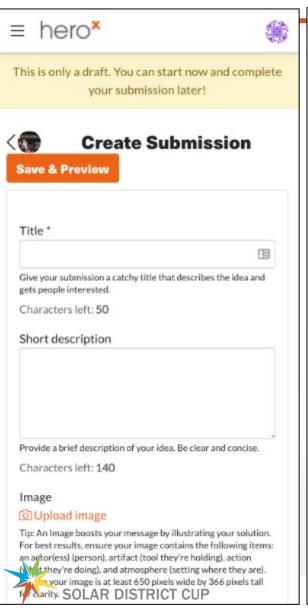
Challenging multidisciplinary student teams to design and model optimized distributed energy systems for a campus or urban district.

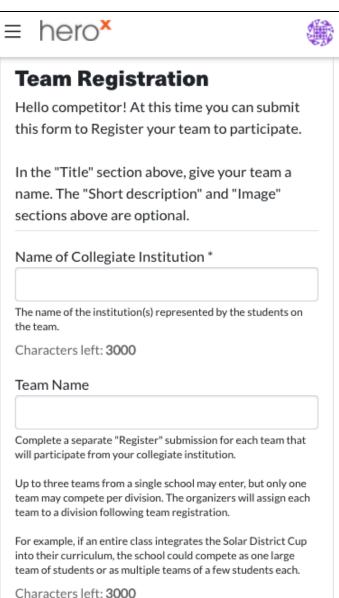
Register

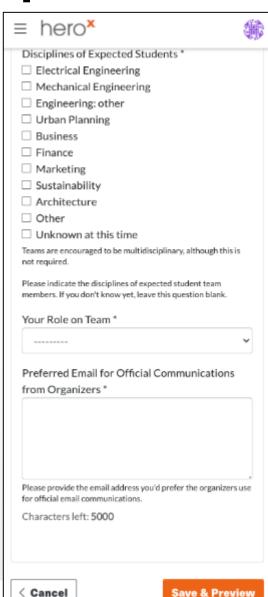
**BEGIN ENTRY** 

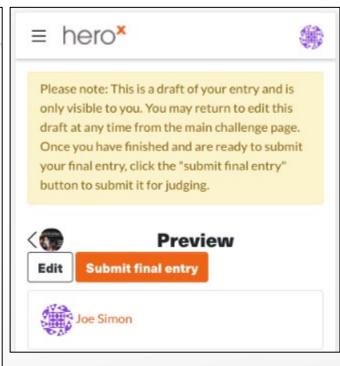


# **How to Register a Team: Prompts in HeroX**

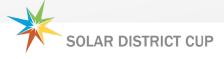








# **What's Next?**



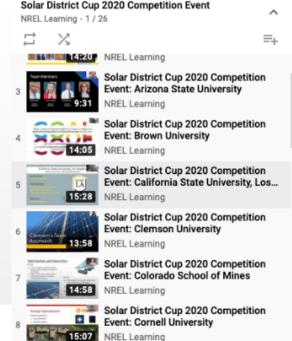
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<ul><li>December 16</li><li>April 14</li></ul>	Finalist Teams Announced Final Deliverable Package Due



# What To Do After Registration and Before Teams and Divisions Announced

- Read the Rules published on <u>HeroX Solar District Cup</u> Resources
- Watch recordings of the 15-minute project presentations of the Class of 2021 competing teams, available on NREL's Learning Channel in this <u>YouTube Playlist</u>
- Begin HeatSpring learning
  - Curriculum support
  - Available starting Aug. 31, 2021
- Build a team
  - Recruit multi-disciplinary team members
  - Identify faculty advisor
  - Find mentors.





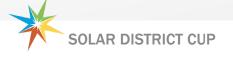






SOLAR DISTRICT CUP

8-MODULE ONLINE COURSE



# Warm-Up Workshop: September 30, 2021 (virtual)

Warm up your team with this workshop, featuring:

- Deep dive into the Rules
- District use case review
- Introduction to the Class of 2021-2022 participating teams
- Top 10 tips to take home glory
- Learning from the pros: guest speakers

Expect 3-hour video conference (with break time)

More details to come!

Also watch for announcement to attend the Solar Power International Virtual Tradeshow.

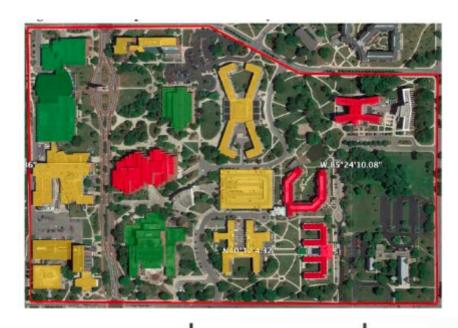
## What You'll Submit November

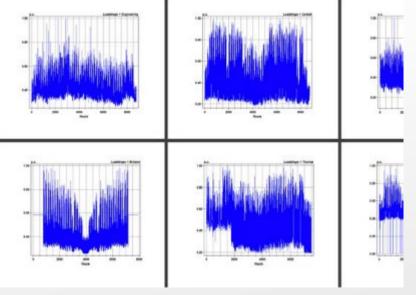
#### Progress Deliverable Package: Solar Systems

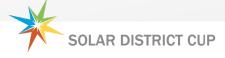
- Executive project summary
- Conceptual system design
- Distribution system impact analysis
- Financial analysis
- Development plan.

Due 5 p.m. ET on Thursday, November 18, 2021







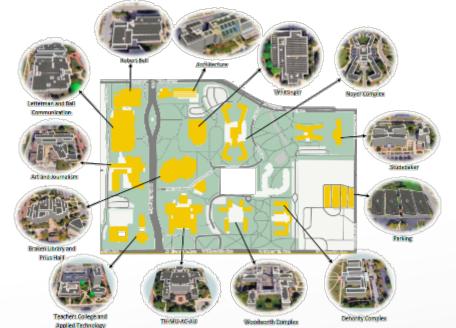


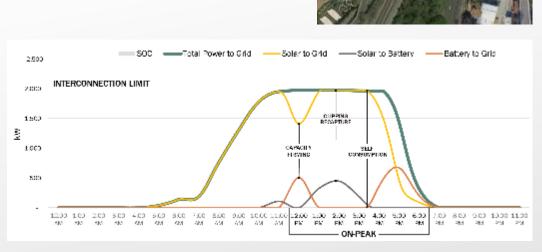
# What You'll Submit in April

### Final Deliverable Package: Solar-plusbattery energy storage systems

- Project proposal
- Conceptual system design
- Distribution system impact analysis
- Financial analysis
- Development plan.

Project proposal-pitch presentations







Fire Access Pathway

Para Top Sarar Amays

# Final Competition: April 24-25, 2022

- Present to division judges on Sunday, April 24
- Winners announced on Monday, April 25.
- Project Pitch Champion Presentations Schedule To Be Determined



"My favorite moment was being able to watch other teams present. Seeing what other teams came up with and the creativity that this project inspired was truly amazing." –Class of 2020 Student

SOLAR DISTRICT CUP 52

# Why Compete? No Risk, High Reward!

**NO COST** 

to enter

**TRAVEL** 

is not required

**TRAINING** 

is provided

CONNECTIONS

to industry



# **Next Steps: Recap**

Go to:

<u>www.herox.com/solardistrictcup</u> and choose "Follow" now!



#### RECRUIT

Team members, faculty advisor, and mentors



#### REGISTER

Your team on HeroX by September 16



#### **READ**

The Rules to plan your participation



#### **LEARN**

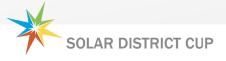
Using the resources provided by the Organizers



#### **DESIGN**

Your solutions!

Share the recording of this webinar with prospective team members. Recording link posted on HeroX on Aug. 19.

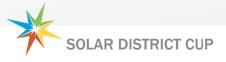


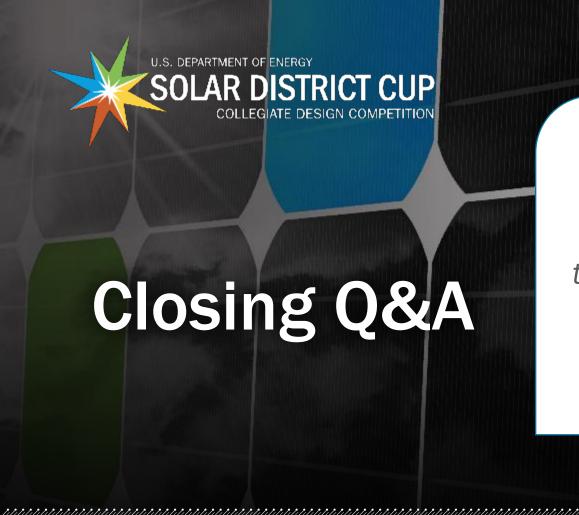
## **Thank You to Our Partners!**











"I met with industry professionals and learned that this is exactly what they do for a career. I was excited to hear how relevant our work for this competition was and how it can translate to the real world."

-Class of 2021 Student

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Office of ENERGY EFFICIENC & RENEWABLE ENERGY

Transforming ENERGY

Learn more, sign up for our newsletter, and register a team at:

www.herox.com/solardistrictcup

solardistrictcup@nrel.gov