



U.S. Department of Energy Collegiate Wind Competition

National Renewable Energy Laboratory
Collegiate Wind Competition
Organizing Team

Did You Know?

Wind is the way!



Wind energy is among **the largest sources** of renewable generating capacity in the country.¹

We're aiming high.



Recent studies suggest that wind energy could supply 20% of the nation's electricity needs by 2030 and 35% by 2035.¹

But we need more workers *in every field.*



To meet these goals, we need a **diverse, qualified workforce.**

We're investing in the next generation of talent...

The U.S. Department of Energy (DOE) Collegiate Wind Competition (CWC) inspires the next generation of creative and technical thinkers to build game-changing energy solutions.



As CWC competitors, students have the opportunity to:

Connect with industry.

The CWC presents a valuable networking opportunity for students and members of the wind energy industry.

Build experience.

CWC participants integrate academic coursework with hands-on learning and gain valuable wind energy experience.

Choose a path forward.

CWC partners help cultivate fresh talent for the wind energy and renewable energy industries while building relationships with the next generation of the wind energy workforce.

... through real-world experiences.

Undergraduate students gain experience and transferrable skills critical to a range of jobs in wind and other renewable energy industries.



**Turbine Prototype
Contest & Turbine
Testing Contest**



**Project
Development
Contest**



**Connection
Creation Contest**

Competition Impact



150+

students participate each year.



100s

of companies have partnered to provide:

- Mentorship
- Software
- Technical and financial support
- Interviews.



50+

U.S. colleges and universities have participated since 2014.

STRONG INDUSTRY SUPPORT AND JOB CREATION



75+

Wind industry professionals have judged CWC team submissions, representing companies like:



100+

Alumni have landed roles as engineers, analysts, project developers, and project managers at companies like:



Many alumni were hired by judges, fellow alumni, or through connections they made at CLEANPOWER.

HIGH PRAISE FROM JUDGES AND ALUMNI

I was impressed with the creative solutions the collegiate teams applied to their project development challenges. **CWC emulates real world wind farm development**, giving students an opportunity to learn in a hands-on way, and **uniquely prepares them for careers** in the wind industry.



Connor Kobeski

Judge, 2018 – 2020
Director, International Project Management, Invenergy LLC

The CWC gives you a chance to **narrow down what you're passionate about**, which will help you better define what roles you want to highlight when you start applying for jobs.



Jamie Mears

Participant, 2018–2020,
Project Developer,
Ørsted Onshore

Testimonials from Students, Faculty, and Partners

“I loved the *team-building aspect* of the competition.”

“Opportunities like CWC have allowed many of us to land our *dream jobs*.”

“The students from our institution were uniformly engaged and gained an experience that is *impossible to replicate* in a traditional classroom setting.”

“If it wasn't for this competition, our undergraduate programs wouldn't have such *meaningful projects* to work on related to wind energy.”

“This competition...has been *my favorite part of my undergraduate experience* and something I will reference for the rest of my career in developing me as an engineer.”



Timeline: The Competition Will Follow This Schedule

Each spring, CWC organizers begin accepting applications for the next year's competition. Interested schools fill out applications to participate in CWC during the upcoming school year.

Each summer, CWC organizers select the teams who will participate in the competition during the first half of the upcoming school year.

*** SELECTED TEAMS RECEIVE SEED FUNDING. ***

Each fall, teams prepare their first set of submissions.

Each winter, CWC organizers narrow the competition to the finalist teams, which will continue to participate during the second half of the school year.

*** SELECTED TEAMS RECEIVE FUNDING. ***

Each winter and spring, finalist teams prepare their final submissions, conduct final turbine testing, and present their work to a panel of wind energy experts at the final CWC event.



Turbine Prototype Contest & Turbine Testing Contest



Students design, build, and present a unique, wind-driven power system based on market research and test the system in an on-site wind tunnel.



What you'll do:

- Deliver final design report.
- Presentation to panel of industry judges.
- Host a Q&A session with industry judges.
- Produce power at specific wind speeds.
- Control rotor speed.
- Conduct emergency safety stops.
- Demonstrate durability in a simulated real-world wind regime.

What you'll get:

- The ability to apply and test what you've learned in class.
- The chance to meet with wind turbine design professionals.

Project Development Contest



Students research wind resource data, turbine technology, and environmental factors to create a site plan and financial analysis for a hypothetical wind farm.



What you'll do:

- Design a hypothetical utility-scale wind farm.
- Perform financial analyses for that wind farm.
- Produce a final design report.
- Present to a panel of industry judges.
- Host a Q&A session with industry judges.

What you'll get:

- Hands-on experience with industry software.
- Experience that makes you extremely marketable to hiring managers.

Connection Creation Contest



Students partner with wind industry professionals, raise awareness of wind energy in their local communities, and work with local media to promote their teams' accomplishments.



What you'll do:

- Develop and execute outreach, recruitment, and social media strategies.
- Tell your team's story.
- Engage in activities with the wind industry, your local communities, and other CWC teams.
- Submit a final metrics report.
- Present to a panel of industry judges and the public.
- Host a Q&A session with industry judges.

What you'll get:

- An understanding of the wind energy industry and engagement with professionals.
- Skills to share the purpose and impact of your work with your communities and potential employers.

Unique Opportunity to Compete and Connect at Industry Conferences

The CWC takes place at an industry conference or alternate venue.

The multiday live event will include many opportunities to meet with active members of the renewable energy industry.



Team Experience

CWC gives students the opportunity to:

- Be creative
- Explore interests in wind energy
- Get to know students outside of their major
- Gain leadership skills
- Apply classroom learning to hands-on projects
- Meet students at other schools
- Have fun!



Available Resources

The CWC offers resources, such as:

- Multiple all-team calls with competition organizers and leaders of each team.
- Help connecting with seasoned faculty advisors and industry professionals.
- A comprehensive curated suite of reference materials and webinars, including:
 - Previous design reports.
 - Contest overview webinars from previously winning teams.
 - Intro to project development video.
 - Wind energy basics video.
 - Links to key NREL reports.
- Industry-leading software, with:
 - Professional industry software licenses.
 - Technical support for software use.



Collegiate Wind Competition Resources [share a modification](#)

Teacher Contributed Material

5 stars 6+ hrs Moderate Free

About this Page

This page is a compendium of resources that will be useful for Collegiate Wind Competition teams, and any other students who are interested in learning more about wind turbine design and wind farm development. This collection was developed in collaboration with existing university wind energy programs and will be added to continuously, so check back in here.

Getting Started

- [Wind Energy Basics](#) from NREL's Lee Jay Fingersh.
- [2020 CWC Project Development Contest Kick-off](#)
- [2020 CWC Turbine Design Contest Kick-off](#)

More Excellent Videos:

- [Project Development and Finance Overview](#) Webinar with Invenery and RES
- [Electrical Wiring Best Practices](#) from NREL
- [Library of wind energy videos](#) from NREL's wind workforce team
 - Includes videos on wind flow modeling over complex terrain using Continuum, nacelle-mounted LiDAR for wind energy applications, and more.
- [Penn State videos](#) on YouTube
- [Cal Maritime videos](#) on Aerodynamics/Blade Design by Tom Nordenholtz



Project Development
RESOURCES



Turbine Design
RESOURCES



Connection Creation
RESOURCES

How to ask Questions and More Resources

On the HeroX platform, teams can:

- Find a detailed timeline for the current competition cycle.
- Access additional resources to help with their applications and projects.
- Ask questions about the competition in an open forum.
- Read updates from the competition organizers.
- Enter submissions for each phase of the competition.
- Explore [frequently asked questions](#) about the competition.
- Email collegiate.wind@nrel.gov, if you have questions specific to your team's application.



Who Can Apply?

Applications can be submitted by one student, multiple students, and/or a faculty advisor.

Teams do not have to be fully formed at the time of application but are typically comprised of:

- One or more student leads
- One or more faculty advisors
- 10 or more students (advised).

Teams must be led by undergraduate students from a single 4-year college or university in the United States. This lead institution may partner with:

- A 2-year institution in the United States, such as a community college
- Another 4-year institution in the United States
- An international institution.



Photo by Taylor Mankle, NREL

Preview of Application Topics and Tips

In your application, you should:

- Describe how you will recruit team members across multiple disciplines.
 - Successful teams often include students from multiple engineering disciplines, business, communications, and other fields.
 - It can be helpful to recruit students through a wind energy club or faculty advisors in multiple disciplines.
- Discuss why you want to compete in this competition and what it means for you.
 - Share your passion for wind energy with us!
- Explain if and how your team will be programmatically supported by your collegiate institution.
 - The competition activities require significant work. It's helpful if the team can get college credit for some of the work.
 - Examples include a capstone project, a student club, or an independent study.
- What your plan is for filling a possible funding gap?
 - Building the prototype wind turbine and traveling to the competition may exceed the amount of funding provided by the competition.
 - Clubs can provide access to school funding.
 - Industry members can be willing to sponsor!

How to Apply

Teams interested in applying to the CWC should visit:

www.americanmadechallenges.org/challenges/collegiate-wind-competition.

Click “Follow the Competition” to navigate to the current competition cycle’s HeroX site.

See the Official Rules under Challenge Resources for specific application requirements.



Thank you for watching this informational webinar!