

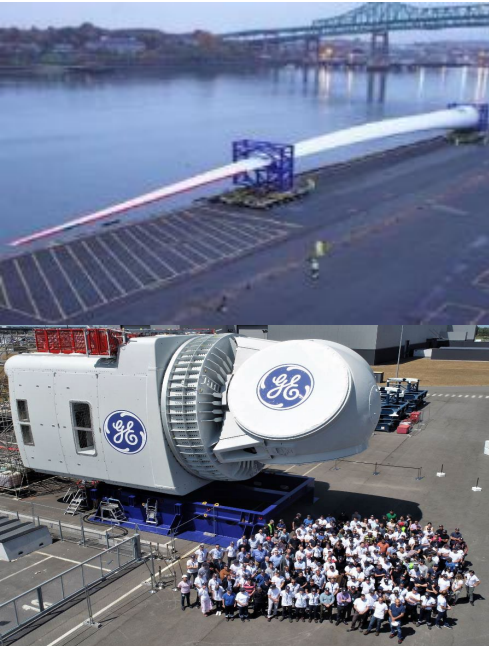
E21 – Collegiate Wind Competition

Mitigate Market Barriers – Stakeholder Engagement & Workforce Development

Elise DeGeorge

National Renewable Energy Laboratory (NREL)

August 2, 2021



FY21 Peer Review - Project Overview

Project Summary:

The U.S. Department of Energy (DOE) Collegiate Wind Competition (CWC or Competition) challenges interdisciplinary teams of undergraduate students from a variety of academic programs to offer unique solutions to complex interdisciplinary wind-energy challenges.
Key project partners: ACP and KidWind

Project Objective(s) 2019-2020:

It is estimated that the United States needs to grow the wind energy workforce to more than 350,000 employees by 2030. Based on research conducted by NREL, some of the most sought-after employees have advanced degrees or specific skills, leading employers to look outside of the United States to fill these positions. To help expand capabilities of existing and new wind-focused educational programs, NREL implements the Competition in parallel with other wind workforce flagship efforts. The CWC is a critical aspect to ensuring the availability of graduates with wind energy hands-on experience. A successful outcome is a growing wind industry workforce that is competitive in the global marketplace and that closely mirrors the wind industry, incorporating multiple engineering disciplines, business, marketing, and communications into strong diverse teams

Overall Project Objectives (life of project):

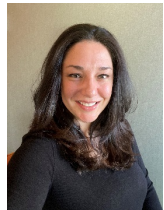
The objective of the U.S. Department of Energy (DOE) Collegiate Wind Competition (CWC or Competition) is to inspire and prepare students from multiple disciplines to enter the wind energy workforce by providing real-world technology and business plan development experience.

Project Start Year: FY2013; Merit Review FY2016
Expected Completion Year: FY2024
Total expected duration: Unknown years

FY19 - FY20 Budget: \$3,274,968

Key Project Personnel: Elise DeGeorge (PI), Lee Jay Fingersh, Christa Nixon, Jason Roadman, Heidi Tinneland, Jenny Wiegele, Tara McMurtry, Amy Howerton

Key DOE Personnel: Amber Frumkin, Jocelyn Brown-Saracino



Project Impact

- Typically, CWC impacts 12 university programs
- Includes a yearlong engagement of approximately 300 university students.
- Assists universities in the implementation of additional university curricula including lectures, capstone classes, and student clubs dedicated to wind energy that can persist following CWC engagement.
- Co-locates with National KidWind Challenge to allow for direct engagement with approximately 400 additional secondary students, which further introduces these younger students to STEM skills, higher education, and career options in wind.

What Impact have we had?

- Engaged institutions from Alaska to Puerto Rico
- Catalyzed wind energy programs that use CWC information in their educational material
- Grown core alumni group of advocates including administration, faculty, staff, students, etc.
- Fostered academic-industry connections and are continually broadening the industry network.
- Created connections with the K-12 educational community
- Created an inclusive environment



Photo by Werner Slocum

Program Performance – Scope, Schedule, Execution

	Carryover	Budget Authority	Total Budget	Planned Costs	Actual Costs
Total	\$1,674,968	\$1,600,000	\$3,274,968	\$1,769,048	\$1,504,987
2019	\$1,674,968	\$400,000	\$2,074,968	\$866,650	\$714,066
2020		\$1,200,000	\$1,200,000	\$902,398	\$790,921

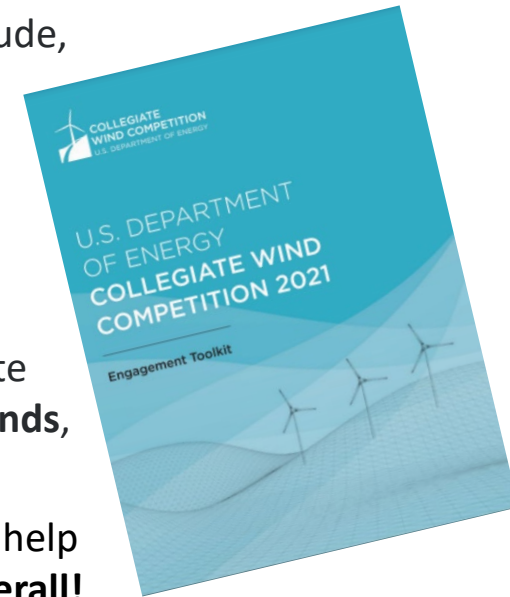
Task Name	Start	Finish	Q4	Q1	Q2	Q3	Q4
Inclusivity Activities							
HBCU	8/1/18	8/1/18					
NSBE	9/1/18	9/1/18					
SWE (Heidi)	10/1/18	10/1/18					
SACNAS (Heidi)	11/1/18	11/1/18					
FY19 CWC							
FY19 CWC - Notice of Intent							
Distribute notice of intent	7/2/18	Mon 7/2/18					
Deadline for Team Participation	10/31/18	10/31/18					
Contract modifications for team travel	11/1/18	4/9/19					
Investigate, Discuss with DOE and reserve event location	8/1/18	9/4/18					
FY19 CWC - Requirements Document Update							
Update Rules & Reqts Document	7/2/18	8/1/18					
DOE and Communications Review of Rules & Reqts Document	8/2/18	8/9/18					
Release Rules and Requirements Document to Competition Participants	8/15/18	8/15/18					
2019 Communications Activities							
Articles	Wed 10/3/18	Fri 5/17/19					
Social Media	3/10/19	5/17/19					
Print Materials	3/4/19	5/13/19					
Photography	5/14/19	5/16/19					
FY19 CWC - Website updates	9/3/18	6/30/19					
FY19 CWC - Wind Tunnel Upgrades							
Incorporate Updates to Wind Tunnel	3/4/19	5/13/19					
FY19 CWC - Pre-Event Activities							
Welcome conference call to all team participants	10/1/18	10/1/18					
Bimonthly Check-Ins - January (discuss lodging options)	1/21/19	1/21/19					
Bimonthly Check-Ins - March	3/25/19	3/25/19					

Portion of schedule for demonstrative purposes

Focus on Diversity and Inclusivity (D&I) and Industry Engagement

D&I OUTREACH:

- Continue to **expand outreach activities** targeted at increasing engagement of traditionally underserved academic institutions, both in terms of general team engagement and in STEM fields. Specific engagement activities could include, but are not limited, to:
- **Identifying minority advisors** to participate in the new CWC Alumni and Industry Advisory Boards to help us refine our approaches to expand the program into minority communities and subsequently support those we attract.
- Encourage Diversity in Team Development by asking teams to demonstrate how they will **cultivate a wind workforce comprised of diverse backgrounds**, skill sets, and educational training
- Maintaining an **inclusive culture** to keep diverse talent on your team and help them thrive. **Team makeup directly affects the future of wind energy overall!**



1. **Inspire** students to join the wind workforce and help connect them with jobs

2. Evolve and continually **improve** the contests

3. Broaden Reach and **sustainability**

Flowchart above represents the industry advisory board's areas of focus

Program Performance – Accomplishments & Progress

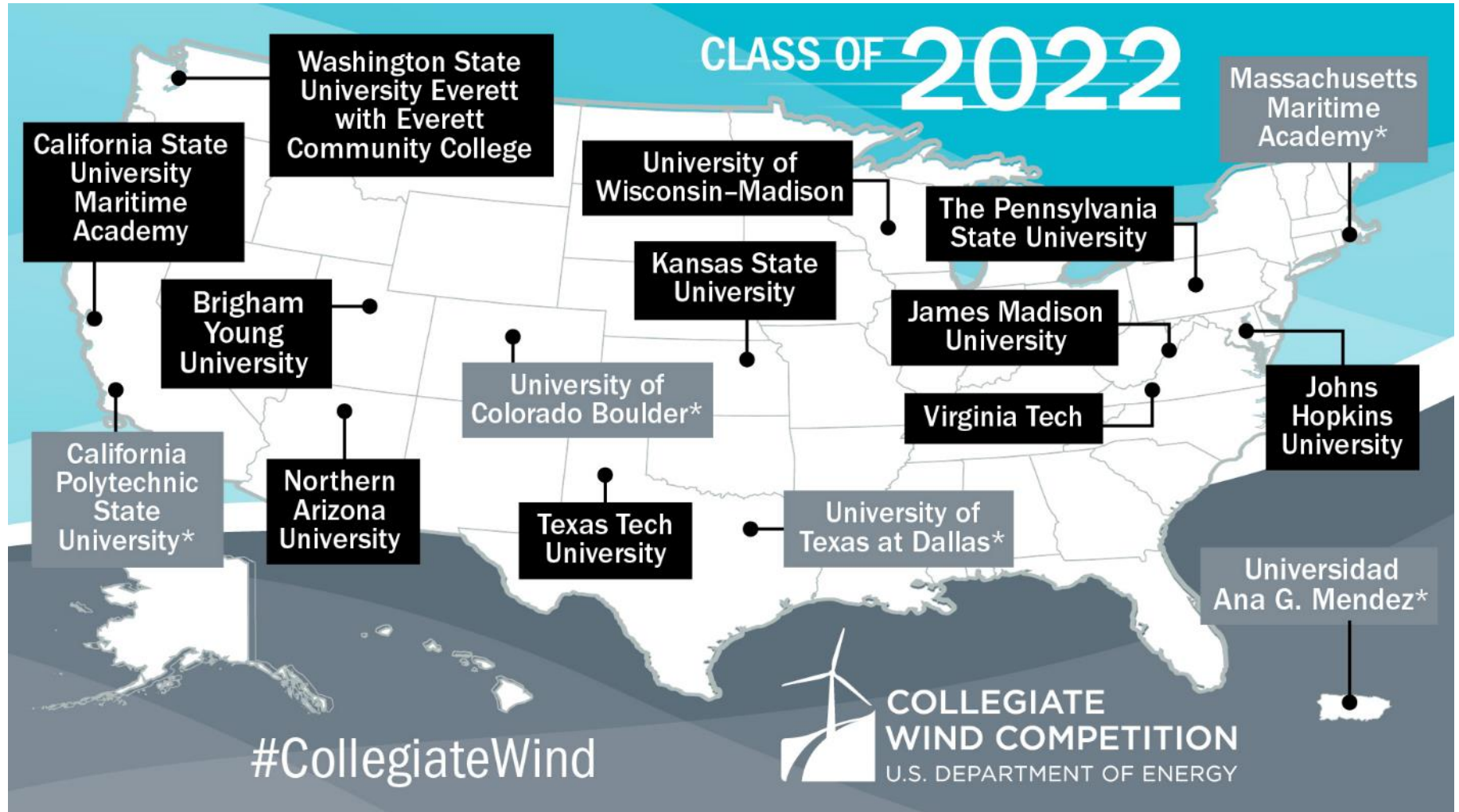
2018 Competition	2019 Competition	2020 Competition
12 universities; 4 new, 8 returning (the 3 rd biannual competition)	All 12 2018 teams returned	12 Universities; 3 new, 9 returning (the First ANNUAL Competition)
AWEA WINDPOWER in Chicago	NREL	VIRTUAL
Elements: <ul style="list-style-type: none"> • Turbine Testing (with new tunnel – increased wind speed) • Technical Design • Business Plan Siting Contest 	Elements: <ul style="list-style-type: none"> • Turbine Testing • Technical Design • Project Development Contest (1st year!) 	Elements: <ul style="list-style-type: none"> • Turbine Testing • Technical Design • Project Development Contest

These **industry engagement activities** were initiated:

- Facilitated **quarterly industry advisory board meetings** to increase competition impact and inform future activities.
- Created an **alumni group** to inspire students to enter the wind industry and networks
- Introducing activities throughout year to inspire students to join the workforce.
- Creating **job seeker best practice documents** for PIs and students.
- Developing a way to **consolidate internships**, entry-level job openings, and industry members willing to engage in interviews.
- Hosting a **student networking event** at CLEANPOWER
- Expanding **cross-educational programming** to build engagement between university and secondary-school students taking part in the co-located KidWind Challenge

Project Performance - Upcoming Activities

CWC22 BRINGS OFFSHORE WIND CHALLENGES!



Project Performance - Upcoming Activities

2021 Competition	2022 Competition
THEME: Being able to manage risk in uncertain times	THEME: OFFSHORE WIND (focus on platforms)
Location: Virtual alongside CLEANPOWER	Location: Cleanpower in San Antonio
Elements: <ul style="list-style-type: none"> • Turbine Testing • Technical Design • Project Development • Creating Connections Contest 	Elements: <ul style="list-style-type: none"> • Turbine Testing • Technical Design • Project Development • Creating Connections Contest

From an intense metrics gathering effort in partnership with BW Research, the CWC organizing team identified 5 areas where activities can be honed to further align with the CWC objectives:

- Aligning Educational Sessions to Support Career Development
- Fostering Industry and Alumni Engagement
- Ensuring Broader Reach and Equity
- Maintaining Real-World Applicability and Relevance
- Increase Alignment between CWC Programming and Educator Needs and Roles

Example Solution on Broadening Reach:

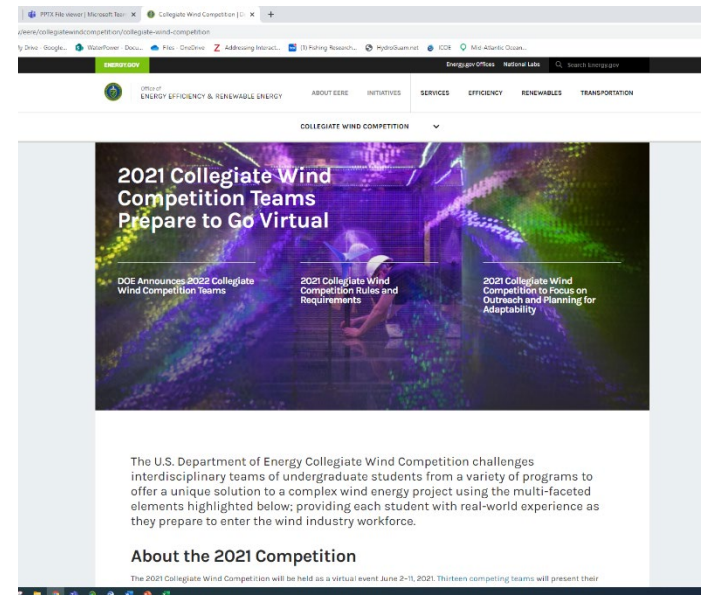
CWC22, organizers has invited 5 teams to participate as **“learn-along” schools** with the selected CWC teams

A decision will be made in March 2022 in consultation with WETO staff to invite all non-competitively selected teams to learn along, leading up to a December down-select for a set number of competitive slots to take part in the competition..

Note other growth opportunities in the summary document including inclusion of technical challenges and other unique ways to engage alumni and industry throughout the year.

Stakeholder Engagement & Information Sharing

- Continually improving CWC web interface (see screenshot)
- Close ties with ACPA to engage industry with CWC and share benefits of CWC
- Long-time partnership with KidWind integrating CWC with K-12 education.
- Sharing teams' stories
- Helping teams connect with industry mentors and alumni support
- Monthly blog or progress alert posted on Energy.gov, along with associated social media and stakeholder email content
- Leveraging NREL communications staff to support CWC efforts.



Key Takeaways and Closing Remarks

CWC helps college students prepare to enter the wind energy workforce through hands-on, real-world wind energy technology and project development experience and helps universities develop engaging, hands-on programs and activities that prepare the future workforce. Most importantly the CWC helps students and PIs have closer connections to the industry.

