Team Story

Washington State University-Everett with Everett Community College

JANUARY 9, 2020

School: Washington State University Everett and Everett Community College

Team name: Everett Wind Energy Team

Why are you participating in the Collegiate Wind Competition?

Washington State University (WSU) and Everett Community College (EvCC) students from different backgrounds and learning disciplines have banded together to form the Everett Wind Energy Team (EWET). Every WSU and EvCC student is welcome, whether their future lies within the civil engineering field, other avenues of engineering, or something totally different like business or communications. This cohesion is what makes EWET great. WSU mechanical engineering student, Isaiah Funston, has been an EWET member for two years. He said his favorite part of the program is the "team atmosphere."

The club was inspired by WSU mechanical engineering professor, Dr. Gordon Taub. He believes the best way to connect students with this growing industry is through club development. With this in mind, Dr. Taub decided to create EWET and prepare the team to compete in the Collegiate Wind Competition (CWC).

EWET students are eager to participate in the CWC. Many feel it provides invaluable know-how for resumes and interviews. Funston, the club's co-lead, said "[EWET students are] doing something unique with real-world application." Through this club, WSU and EvCC students have the potential to use advanced technology in the wind energy industry to gain hands-on experience. "Taking what I've learned in the classroom and applying it has been huge in my education," Funston said.

First year member, Alyssa Gorrell, said she looks forward to attending the CWC because her future career could be in sustainability. "This interaction will bring significant networking opportunities with industry professionals in the renewable energy field," she said. Gorrell also has faith in her teammates' experience competing last year, "the seniors understand what the judges are looking for and how robust our competitors are," she said.

EWET's leader in turbine design and co-lead is Sarah Hastings, a mechanical engineering senior at WSU. Hastings has been a member of the team for three years. She was originally intrigued by Dr. Taub's presentation of a vertical axis wind turbine (VAWT). "Our turbine design is really

unique; we're working on something that hasn't been done before," Hastings said of EWET's own VAWT design, "there aren't any designs that are really like this one."

EWET students also have the opportunity to operate industry tools like Geographic Information Systems, a mapping software the team uses to plan the perfect location for its wind farm. For Funston, this was his biggest reason for joining the team; his main focus is project development. He said, "this is the type of stuff you can't teach in classrooms."

Describe your project and your goals

EWET is designing a vertical access variable pitch wind turbine. The design uses a cam mechanism to pitch the blades back and forth as the turbine rotates. "VAWT blades experience cyclically-varying wind directions, which makes them prone to stalling and decreases power," said Sarah Hastings, EWET's co-lead. This cycloturbine design reduces blade stall and improves performance.

Research is currently being conducted to better understand how air flows around these kinds of turbines. Being on the cutting-edge of aerodynamics technology is what led many of EWET's members to the team. Unlike other variable pitch turbines with blades that require electricity, EWET's turbine uses a cam mechanism that determines the blades' pitch. "We pick the shape of the cam so that the blades move how we want and don't stall," said Hastings. "[The blades] don't need electricity to move since it's just a mechanism," she said. Her goal is to create a workable VWAT prototype to bring to the competition this year.

EWET is comprised of four sub-teams: mechanical, electrical, project development and communications. Isaiah Funston is the leader in project development. His goal for this year is to complete a full analysis while building a quality product. Communications team leader Alyssa Gorrell wants to focus on connecting the club with the community. "I also really enjoy community service, so hearing about the opportunity to work with the local youth was a huge bonus," she said. The communication team is eager to spread awareness of environmental sustainability options. EWET's ultimate goal is to design and build a functioning turbine for the WSU Everett campus.

What is your team's plan for achieving your goals?

Time management is key for EWET's success in this competition. Jackson Wagner shared his insight from last year's competition; he stressed the value of staying on top of deadlines. Isaiah Funston suggested starting early to complete tasks ahead of time. Sarah Hastings emphasized the importance of communication amongst teammates to ensure deadlines are met, something they hope to improve from last year.

The team has recruited a large communications sub-team to help achieve this goal. EWET's communications team focuses on recruitment through digital flyers and video clips online. They work to increase social media presence and network with wind industry professionals. Overall, the team is diligently working to enhance productivity and improve interdisciplinary communications.

Team strengths

EWET is composed of students from WSU and EvCC. “This creates diversity with students of different skill sets and backgrounds,” said Dr. Gordon Taub. Compared to teams from larger universities, EWET strives to accomplish cohesion which will ultimately lead the team to success in the competition.

Despite being in different fields, EWET members have formed a tight-knit community that promotes a healthy flow of information. EWET’s director of communications, Alyssa Gorrell, also hopes to further expand the team’s interdisciplinarity. “I want all majors to see the benefits of participating in STEM clubs,” she said. According to Gorrell, working with colleagues in different fields is fundamental for success in the world today.

EWET is one of the smallest teams competing this year. Small campus schools inspire better relationships between members, creating a more intimate team. Gorrell finds it encouraging to be part of an underdog team. “We have to work that much harder, this pushes our ambition to another level,” she said.

Team hurdles

Like many collegiate clubs, EWET has struggled to maintain involvement through these trying times. Washington state has maintained strict COVID prevention methods which hinder in-person interactions for team members and potential recruits. This lack of natural interactions means less involvement from students outside the schools’ engineering clubs.

Luckily, communications lead, Alyssa Gorrell, has a plan to get everyone involved. “Strategies will most likely include reaching out to personal contacts [from] high schools where team members have graduated,” she said, “because of the lack of accessibility to physically go to schools.” EWET also strives to maintain social distancing by conducting all meetings virtually.

Hurdles for EWET in particular include communication issues and scheduling conflicts because the team is composed of students from different colleges. Unanimously, the team admits that WSU’s semester system and EvCC’s quarter system create scheduling difficulties. EWET emphasizes flexible scheduling to account for EvCC’s start and end time to combat this challenge. For example, the communication sub-team sends out surveys to determine team members’ availability.

What do you hope to achieve in the competition this year?

Because the team has attended CWC before, EWET aims to use that experience to create not only a better functioning turbine design but a more cohesive team as well. “We did a great job last year of doing the research [and] building the turbine,” said Isaiah Funston, “then when it came to writing it out and actually presenting it, that’s where we really hit a snag.” EWET now has a robust communications sub-team to help bridge the gap between the engineering and the business side of this project.

This year, CWC requirements include community outreach. Alyssa Gorrell said, “the primary goal for the Spring semester will be integrating educational material with hands-on activities [to] easily distribute to over 100 local high school students.” EWET also hosts guest speakers to virtually teach the team about what it’s like working in the energy industry.

Ever striving for excellence, EWET aspires to improve from last year's accomplishment of third place. Electrical team lead Jackson Wagner said, "this year we have a foothold and the work is a reasonable project due to everything we [accomplished] over the years."

Social Media:

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YouTube: @EverettWindEnergyTeam

Twitter: @WindEverett, @WSUEverett, @EverettCC, @EvCClife

Facebook: @WSUEverettEngineeringClub, @WSUEverett

Instagram: @WSUEEC, @WSUEverett, @everettcommcollege @EvCClife, @EvCCseaclub

LinkedIn: Washington State University Everett Engineering Club, Washington State University, Everett Community College