TECHSAN WIND

Metrics Report

Texas Tech University (TTU) & South Plains College (SPC)

April 18, 2024

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**Abbreviations for listed fields of study:*
RE – Renewable Energy
CE – Civil Engineering

INTRODUCTION

The Connections sub-team of the Techsan Wind Team (TWT) went into this year's competition with several high-level goals. The first was to increase the gender and ethnic diversity of the team, and the second was to increase engagement with students aged 13-17. These goals were at the forefront of planning all the chosen activities.

RECRUITMENT OUTCOMES

Team Numbers

The TWT maintained an average of 20 members throughout the academic year with members joining and resigning throughout. At its peak, the team had 23 members. The most common reason for members resigning was scheduling conflicts. This team consisted of students from both Texas Tech University and South Plains College. The grade-wise distribution of our team is 31.3% first years, 6.3% second years, 31.3% third years, and 31.1% fourth years.

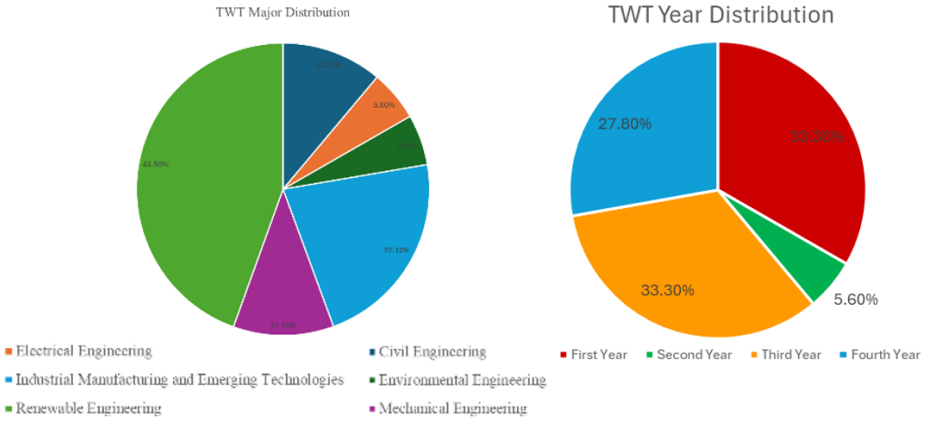


Figure 1. TWT grade distribution.

The TWT team had greater ethnic and gender diversity than the overall Texas Tech undergraduate[1] and South Plains College[2] student body demographics. The TWT is composed of 50% White, 35% Hispanic, 10% Black or African American, and 5% Asian students. 66.6% of members were male and 33.3% female. Currently, 21% of those employed in the wind energy field are women, a 44% improvement.[4] We are pleased to be above this number, but still aim to grow our female membership next year through increased outreach at events targeting women. Figure 1 and Figure 2 show the diversity of these two colleges' as well as the TWT's members.

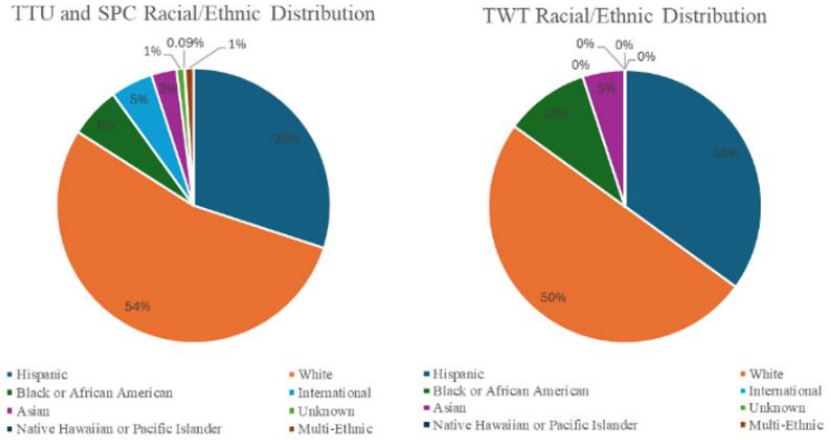


Figure 2. Racial/Ethnicity for comparison.

Reflection

The team's recruitment plans were focused on increasing the percentage of first and second-year students as well as female students. We succeeded in increasing the number of first-year participants going from 0% first-year last year to roughly 31% this year. We had 5 female students this year compared to 4 last year, however, we need to focus on improving female student participation.

SOCIAL MEDIA

Number of Followers

In the 2023-2024 social media journey, TWT used legacy accounts Instagram, X, Facebook, and created a new LinkedIn profile. We focused largely on Instagram and X to meet our goal of reaching a younger and more diverse audience, since these platforms have the highest percentage of relatively young and engaged users. However, other social networking sites were not overlooked and posts were modified to target specific audiences. As a result, we have different numbers of followers on each network. We began with 117 Instagram followers and have since grown to 197, surpassing the count of followers we have on Facebook or X. On X, we started with 95 followers and reached 114. Facebook increased its following from 53 to 69 while attracting a more experienced demographic. The percentage increase can be shown in Figure 3. Finally, despite being a new account, we are proud to have acquired 29 LinkedIn followers

Posts, Likes, and Growth

The number of posts and likes followed suit; on Instagram, we have 65 posts, 56 of them from this year. Each post varies in number of likes ranging between 15-30 likes with about 120 account interactions, the number of accounts reached. That said, ¼ of them are non-followers, indicating that we are introducing TWT to a new audience th

at was likely unaware of us before. Whereas our X profile has a total of 1.7k posts, including personal posts and reposts. Each of our posts ranges in number of likes from 5-10, however, our number of impressions is high. This is the number of how many times it was seen on X, which ranges between 50-130 times. On another note, Facebook has 22 new posts that include 70 photos with likes ranging between 5-10. Despite this, our profile has gotten approximately 300 interactions, of which 14.5% are from followers and 85.5% are from non-followers. Furthermore, our postings have attracted over 100 interactions, which includes number of clicks, shares, reactions, and responses to our posts. Finally, LinkedIn has 13 posts, including personal posts and reposts. Breaking down these posts, the number of impressions is 16, attracting an average of 25 profile visits. To summarize, we are extremely proud of our growth throughout the year; none of our platforms decreased in followings when compared to the start of the year. While our likes have remained consistent over the year, our postings have continued to grow each week, demonstrating our strong engagement and loyalty from our followers. Next year, we intend to post content that is tailored to the demographics of non-followers to convert into followers.

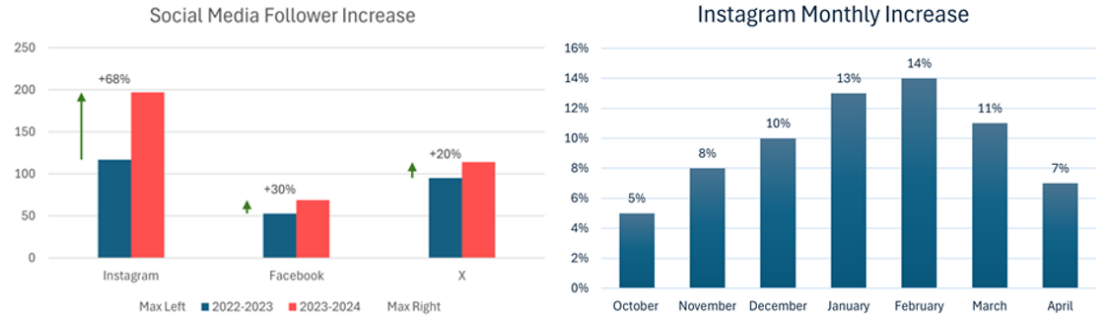


Figure 3. Social media followers increase.

Reflection

The Connection team's goal for the year was to connect with a variety of races, ethnicities, and ages. The team used social media to achieve this goal, giving our audience a chance to learn about our team and

stay updated on current events such as KidWind, research at the Reese Technology Center, STEM nights, etc. Consequently, this helped create a strong social media presence that established trust with our audience and continuously grew our following. Regarding our demographics, we were unable to get half of our followers to be between the ages of 13 and 17. However, we did succeed in attracting followers within that age bracket. We intend to publish more regularly and include more interesting content to get closer to our goal. As for our follower background, about half of our followers are from the U.S. and the rest are from a variety of countries, as shown in Figure 4. Given the wide range of content we provide on our platforms, we can state with confidence that our posts reached people of many racial and ethnic backgrounds.

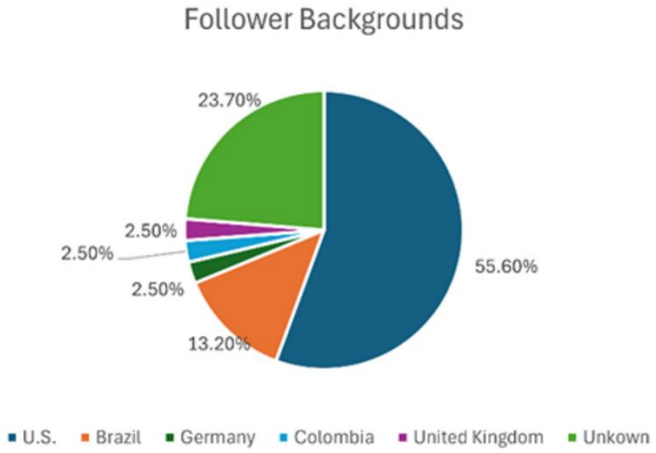


Figure 4. Follower Backgrounds.

CHOSEN ACTIVITIES

Industry Interviews

The Connection team's selected activities encompass Understanding the Wind Industry, Student and Local Community Engagement, and Communication Material. Our interviews featured Sarah Lindsey, Cooper McCauley, Susan Hock, and Christian Collins.

Sarah Lindsey, an alumna of Texas Tech University's Wind Energy Program, was the recipient of the Renewable Energy Program's Outstanding Young Alumni Award. She currently serves as an Early-Wind Project Manager at NextEra Energy, with over a year and a half of industry experience. Sarah's day-to-day life consists of using a wide variety of Geographical Information Systems to help plan future wind projects for development. Sarah eagerly looks forward to further engagement with the Collegiate Wind Competition (CWC), and with the TWT.

Cooper McCauley, is employed at White Rock Renewables and has six years of renewable energy experience. Cooper shared his experience with development to provide our team with strategies for report writing and data collection. Embracing the opportunity to contribute to the CWC, Cooper eagerly anticipates future endeavors in the field.

Dr. Susan Hock, a recognized WindPionneer by NAWEA, graciously shared insights garnered from her tenure as Executive Director of Strategic Planning at NREL, spanning nearly three decades. Her expertise in wind, solar, hydro, and battery storage underscores her commitment to fostering the next generation of talent. Dr. Hock is willing to participate in future CWC events.

Christian Collins, a Texas Tech graduate in Wind Energy, serves as a Wind Site Manager at NextEra Energy. His day-to-day life consists of managing wind technicians, ensuring quality repairs, and maintenance are done within company coherence. Christian's commitment to maintaining connections with the program and the CWC reflects his dedication to advancing the industry. He regularly visits TTU to recruit interns or employees.

Student and Local Community Engagement

For Student and Local Community Engagement, we focused on KidWind. Our objective of promoting TWT and connecting with a K-12 audience was accomplished by the student competition. The 1st Annual Regional KidWind event, March 22nd, was composed of 18 coaches from 16 schools. There were approximately 100 students in the age group of 11-17. In addition to the horizontal axis wind turbine performance test, the KidWind quick challenge was to build a vertical-axis wind turbine. Additionally, there was an unscored solar-battery circuitry challenge followed by turbine testing and judging. All the TWT members participated in the competition, which was organized by the Connection subteam. The planning process involved Zoom calls, catering, acquiring supplies, testing challenges, email communication, and community outreach. Our members were assigned tasks to oversee students testing of turbines, circuit building, and vertical axis wind turbine construction. This resulted in an agreement with KidWind to continue our partnership, inspire students to learn about renewable energy, and promote the team. With the help of our sponsors, RWE, RENEL Energy & Power Engineering, NREL, and Kidwind Project, Inc, it was made possible.

Another engagement opportunity we will be part of is the National Ranching Heritage Center's 55th Annual Ranch Day. This event will take place on April 20th and is considered "the most fun day of the year" by the community. TWT has the exciting opportunity to be reinvited to join in teaching the younger generation of kids about renewables. About 500 K-12 students will attend our booth, as projected by the previous year's numbers. They will learn about renewables and participate in the hands-on activity of making paper cup anemometers. With these two major outreach events, the Connection Team will have reached our goal of connecting with the younger generation.

Our team is also proud to have assisted the all-girl engineering capstone team from Yorkville High School in their creation of a bladeless turbine. TWT members participated in a Zoom call where members of Yorkville High School's capstone program asked questions about wind energy and turbine development. Team members answered questions about subjects such as the benefits of AC versus DC power and spaces where small turbines could best be integrated.

Communication Material

The Communication Material activity we chose was a social media campaign. This campaign is aimed at engaging ages 13-17 and sparking an interest in renewable energy. Materials presented in the campaign include "Fun Fact Friday" and "Wind Energy in Pop Culture" posts. Fun Fact Friday aims to share interesting information regarding wind and renewable energy to inspire viewers to learn more about them. Wind Energy in Pop Culture posts share summaries of different pop culture references that feature wind turbines. These references include movies, television shows, video games, and more. These both are posted on Instagram, X, and Facebook, although Instagram is the platform most popular with our target demographic. All posts feature both relevant and trending hashtags. 15 Fun Fact Friday and 7 Wind Energy in Pop Culture posts were made. These posts succeeded in increasing both the number of younger members on our team and the percentage of our followers aged 13 to 17. Three team members were responsible for making these posts and reached an average of 64 accounts and a maximum of 90 accounts.

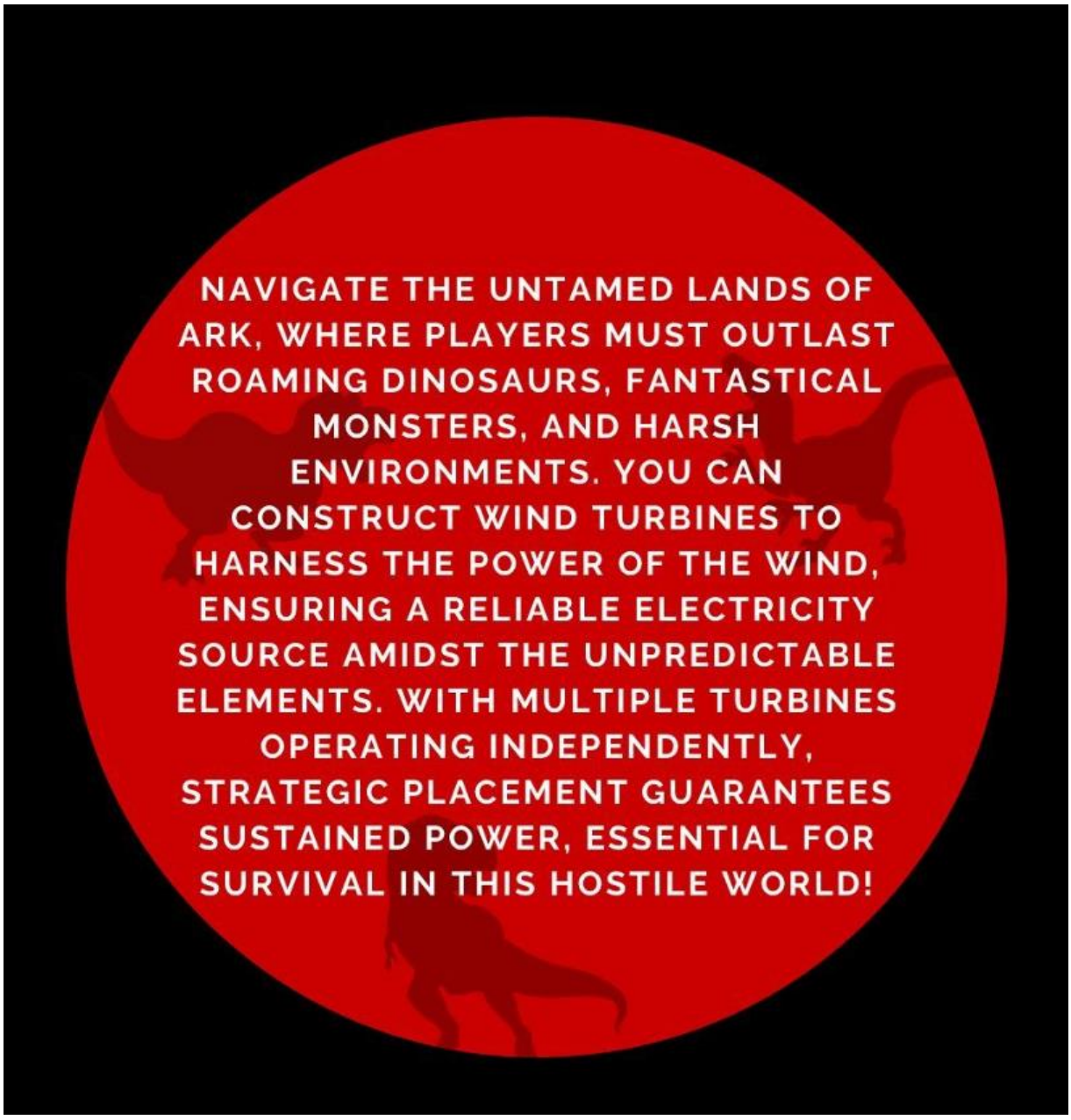
CONCLUSION

The Techsan Wind Team increased the gender and ethnic diversity of its members this year as well as become increasingly connected to students aged 13-17. We saw an increase in both female membership and ethnic diversity as compared to previous years. Social media accounts also expanded the number of followers aged 13-17. The achievement of these goals was largely due to the completion of our three chosen activities: holding industry interviews, hosting our 1st annual Regional KidWind event, and the social media campaign. Each of these activities uniquely expanded TWT's network and provided us with opportunities to share and receive information about the competition and renewable energy.

REFERENCES

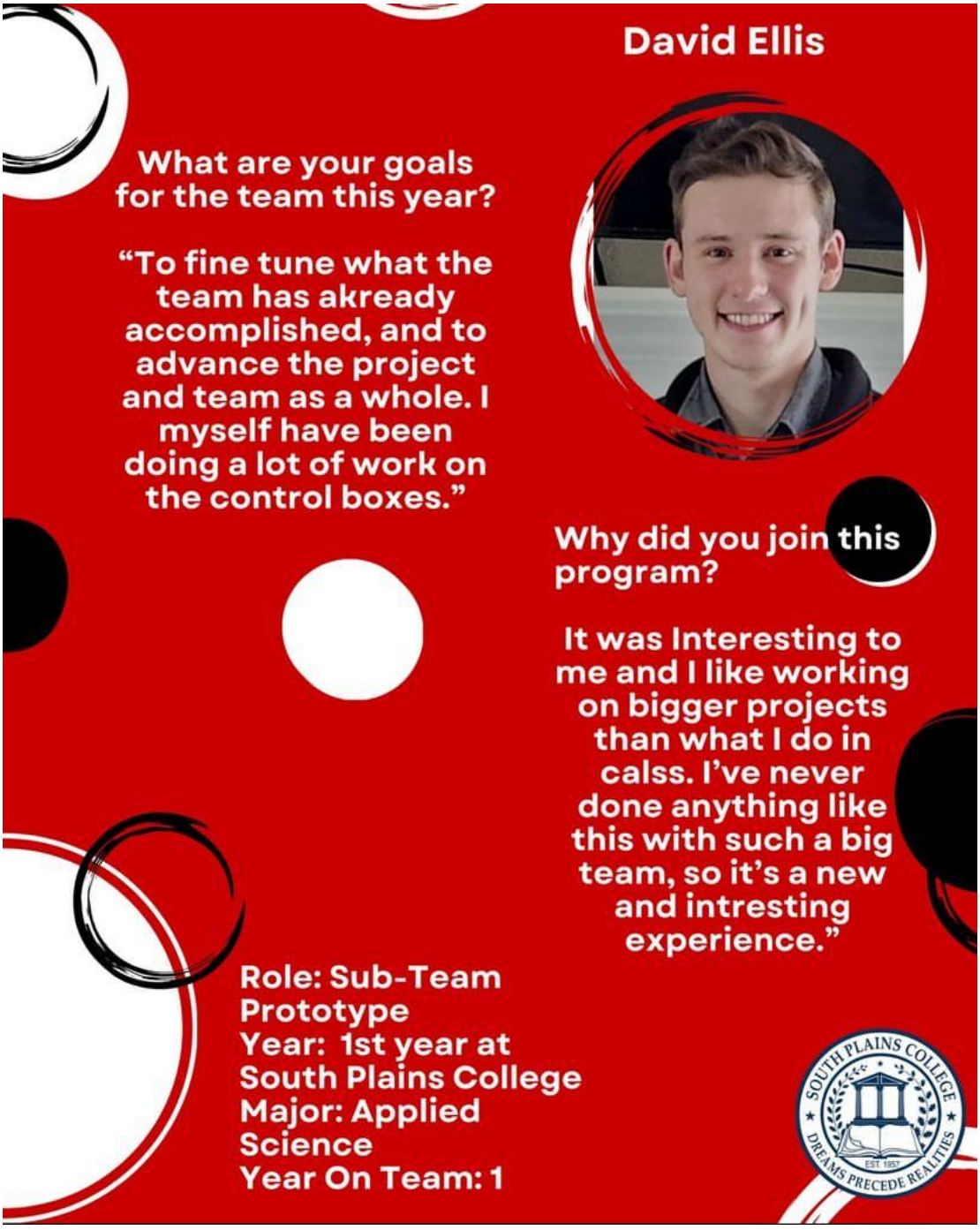
1. *Texas Tech University - Fact Book*. techdata.irs.ttu.edu/Factbook/Enrollment/ENRETHCLASS.aspx.
2. *South Plains College Diversity: Racial Demographics and Other Stats*. 22 Mar. 2023, www.collegefactual.com/colleges/south-plains-college/studentlife/diversity/#gender_ diversity.
3. *Texas Tech University Diversity: Racial demographics & other stats*. (2023, March 22). https://www.collegefactual.com/colleges/texas-tech-university/student-life/diversity/#age_diversity
4. *Renewable Energy a Gender Perspective*. 1 Jan. 2019, www.irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective.

Howling Wolves: 2nd Place, High School Division, 1st Annual Regional KidWind Competition. March 22, 2024.



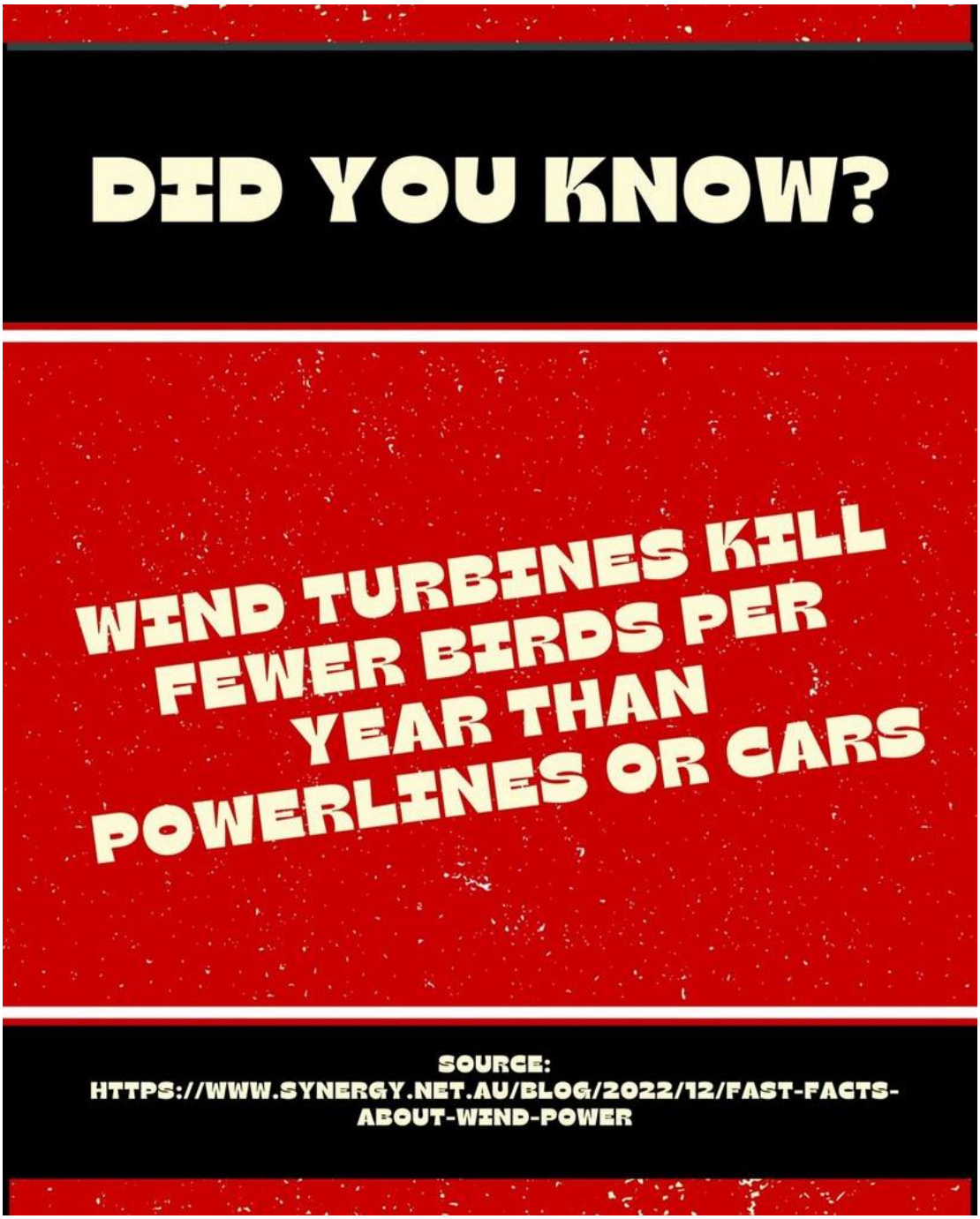
Wind Energy in Pop Culture Post. March 20, 2024.

TWT members preparing for KidWind competition. March 18, 2024.



Team Member Spotlight Post. March 4, 2024.

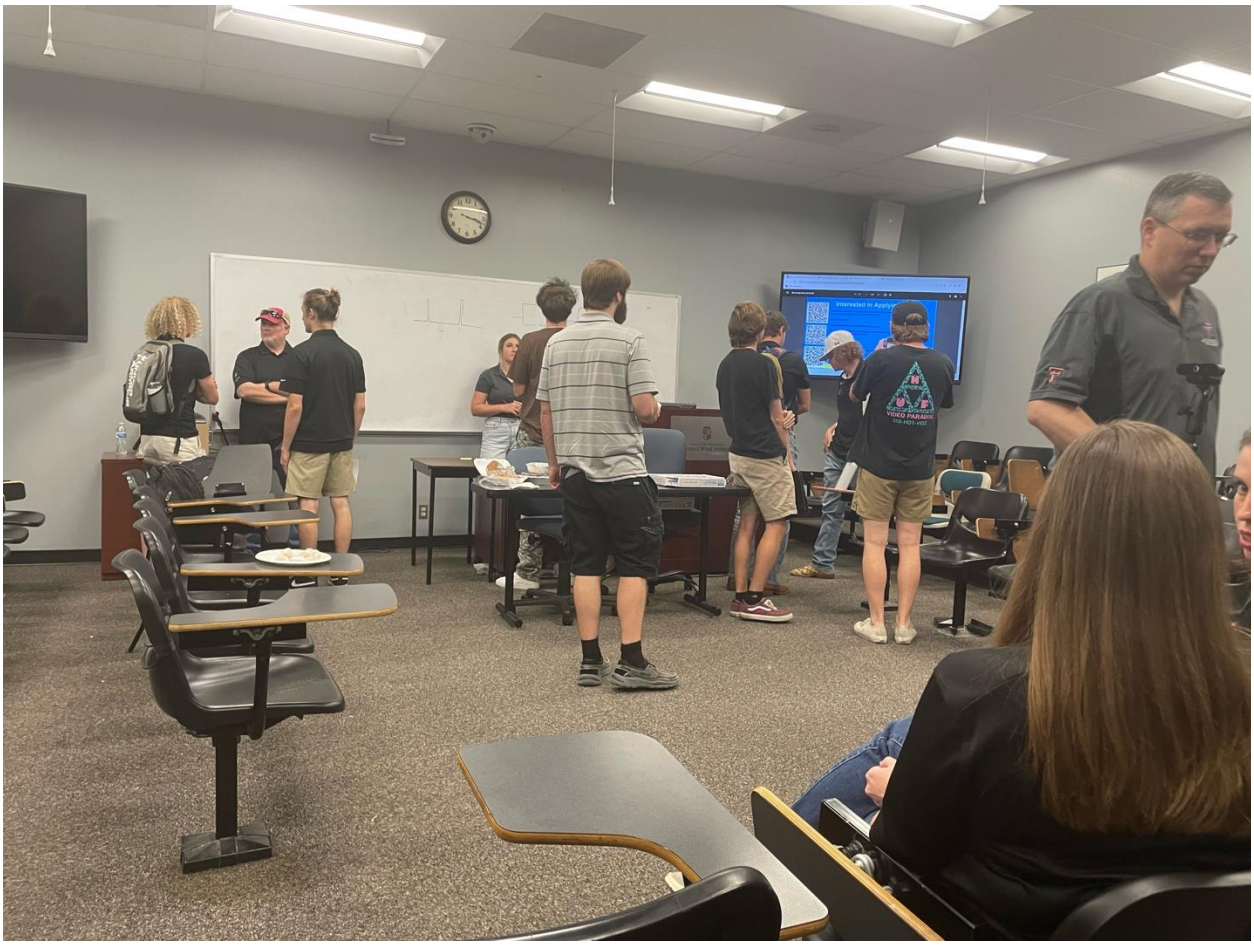
TWT building the turbine at Reese Technology Center. February 15, 2024.



Fun Fact Friday Post. March 12, 2024.

KidWind Teacher Workshop. January 16, 2024.

TWT Ramirez Elementary School STEM Night visit, building paper cup anemometers. January 26, 2024.

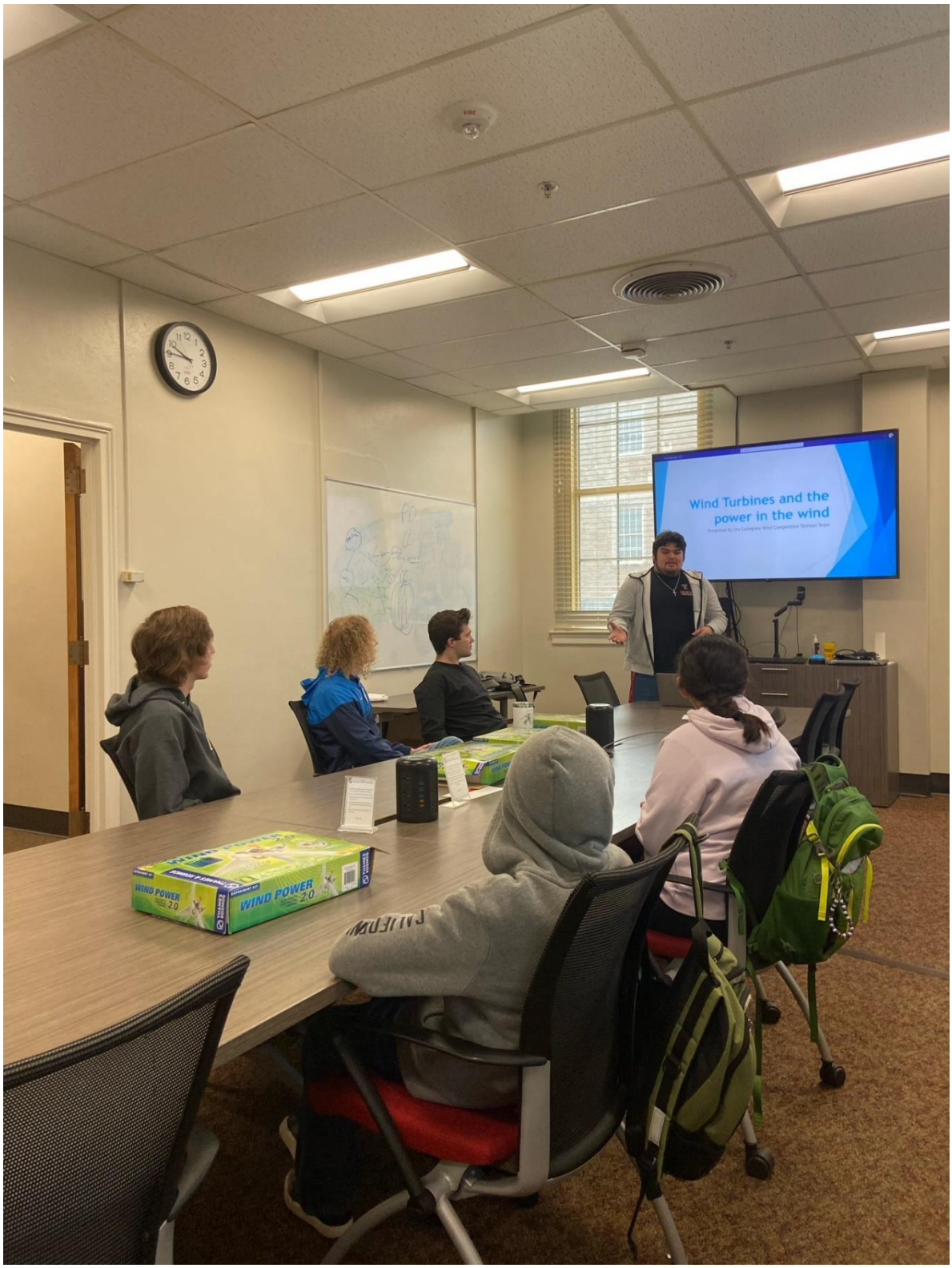


TWT/NextEra Energy Information Session. November 7, 2023.

TWT Pizza Monday meeting. March 11, 2024.

TWT participating in Tech Savvy. February 10, 2024.

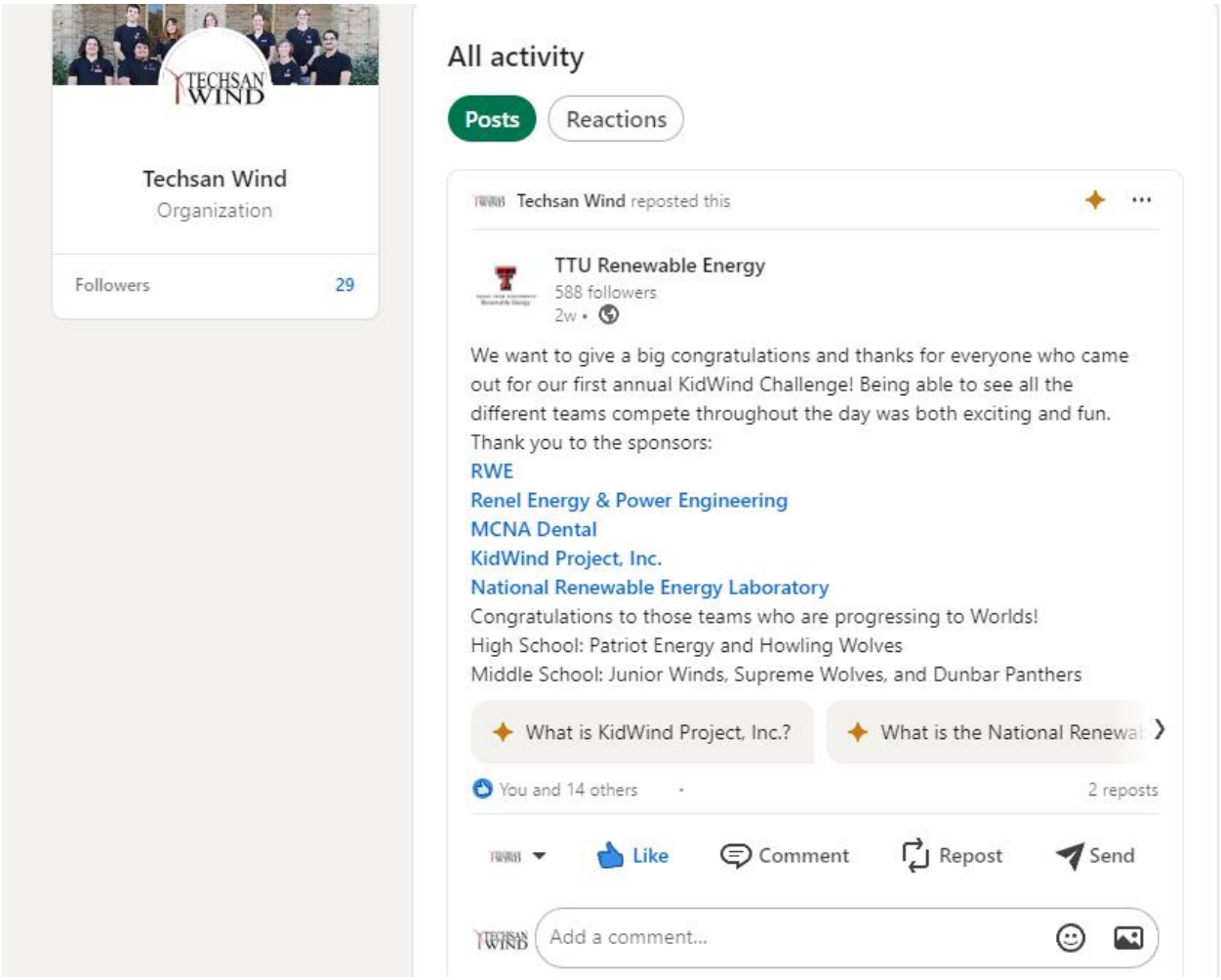
TWT research at Reese Technology Center. February 15, 2024.



TWT presenting at Tech Savvy. February 10, 2024.

Industry interview post. March 16, 2024.

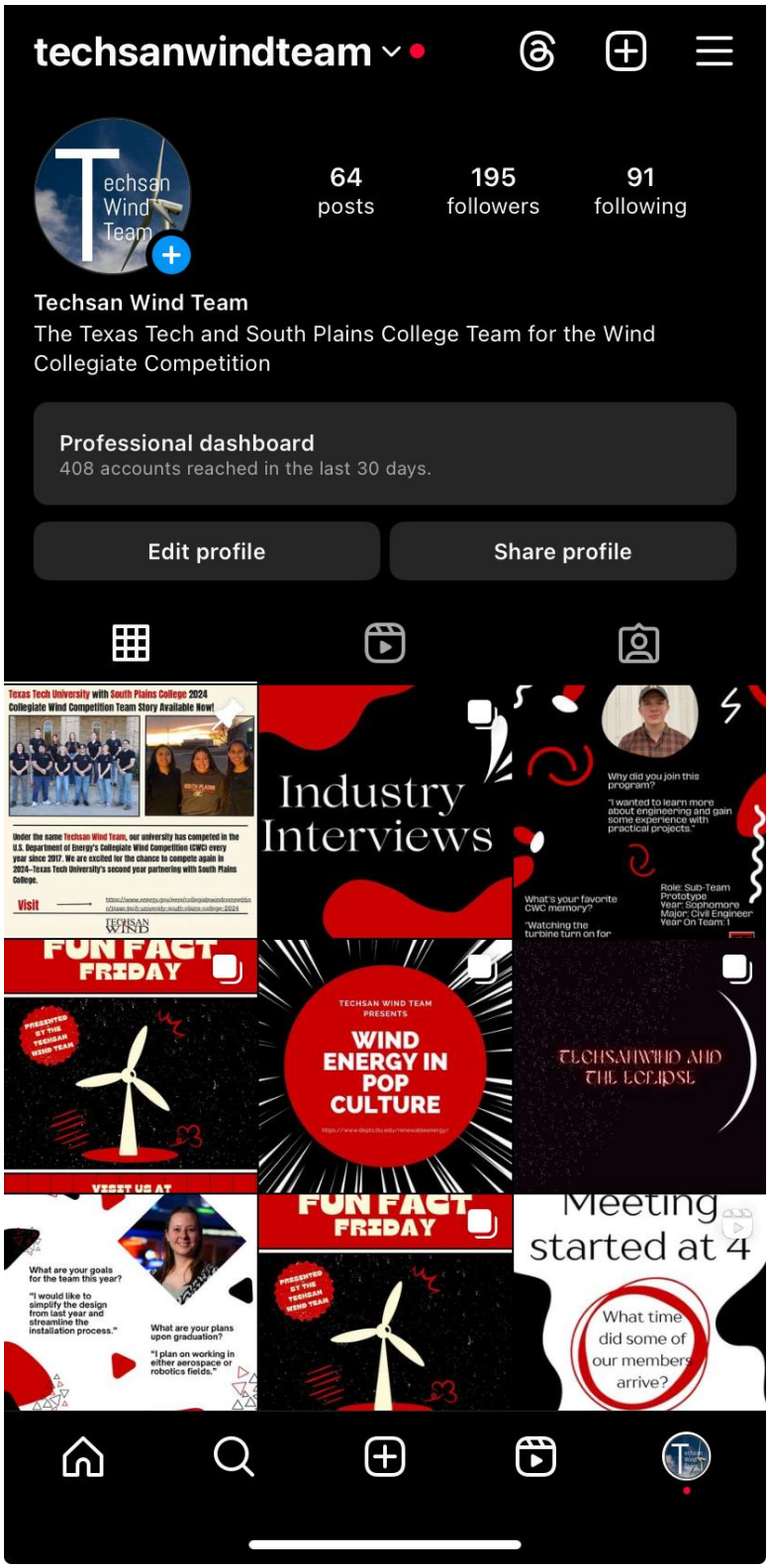
TWT team story announcement post. March 7, 2024.



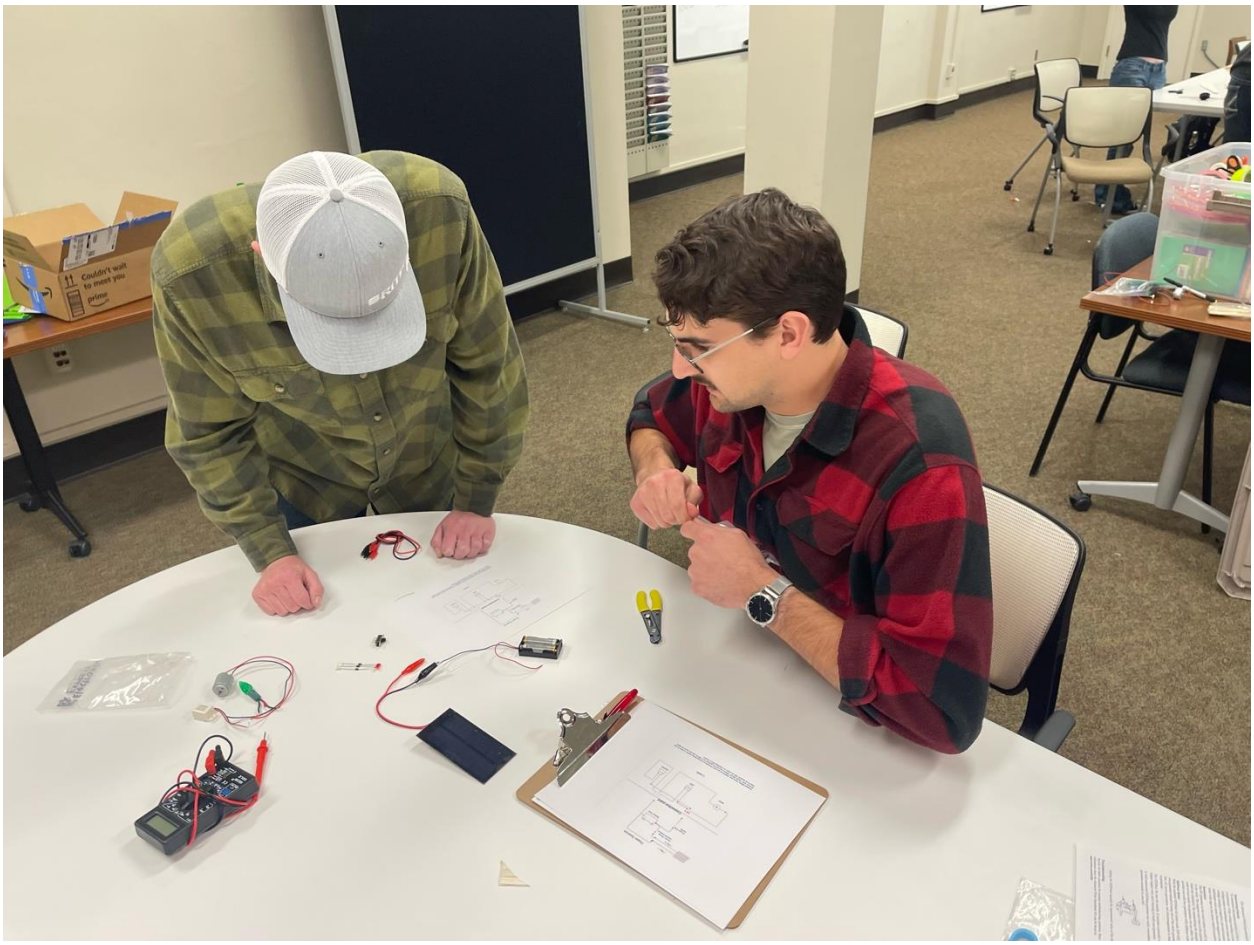
TWT LinkedIn page.

Group picture of KidWind participants. March 22, 2024.

TWT connecting with Renewable Energy Program alumni at alumni weekend tailgate. October 14, 2023.



TWT Instagram profile page.



TWT testing unscored circuitry challenge for KidWind. March 18, 2024.