

California State University – Maritime Academy Wind Team



2024 Collegiate Wind Competition Final Metrics Report

Faculty Advisor – *Dr. Thomas Nordenholz*

Connection Creation Lead – *Vonne Ng-Bader*

Turbine Design Lead – *Jasen Nicolas*

Project Development Lead – *Matthew Rizzi*

A Very Special Thanks To:

Ms. JoEllen Myslik | Ms. Josie Alexander | President Dumont and his Staff |
Mr. Tyler Pederson | Our Many Cal Maritime Cadet Volunteers

Ms. Sarah McDonald | Mr. Bart Goedhard | Mr. James Sun | Mr. Joel Southall | Ocergy

Many Thanks To Our Sponsors:



COLLEGIATE
WIND COMPETITION
U.S. DEPARTMENT OF ENERGY

Team's Recruitment Strategy Outcomes

Students were recruited for the Turbine Design team via the mechanical engineering senior design capstone, thus resulting in nine seniors on the team. Due to the reputation of the program's quality, we recruited nine junior mechanical engineering students to take over the team for next year. Additionally, other engineering students took notice and wanted to join the team, although it was not mandatory for them. Project Development participation is based on interest in renewable energy and gaining professional experience, and the university club rush. These students opt to attend weekly meetings and help with research. A core group of four students on the Project Development team consisted of two graduating seniors, one junior, and one sophomore. This totals a team of 13 members (nine from Turbine Design and four from Project Development). For next year, a team lead has been identified and recruitment will be generated from tabling an informational booth at the university's annual club rush. The recruitment plan was successful for this year because we had a full team and have another full team ready to take over for next year. We will continue to recruit through the mechanical engineering department and the club rush.

Team demographics are mostly reflective of the university itself. Due to the specialized nature of our university and other demographic trends, our enrollment is currently low (715 students), heavily male (81.5%), and heavily white (48.1%). Out of the entire mechanical engineering senior class, there are only two females and the CWC team has one of them. The Cal Maritime CWC team is 54% non-white, which is slightly more diverse than the campus as a whole. While diversity continues to be a challenge for the CWC team, we highly value it and strive to improve it. For example, our meetings are open to everyone and we always welcome new members from every major and background. Diversity across academic backgrounds is a strength of our team; out of seven majors offered at Cal Maritime, the CWC team has students from four of them. Those majors include Mechanical Engineering, Marine Engineering Technology, International Business & Logistics, and International Strategy and Security.

Social Media Strategy Outcomes

Our main social media presence is on our Instagram, @calmaritimewindteam. Since the mid-year report, 1,655 accounts have viewed our content, 571 accounts have visited our profile (up 110% from last semester), and we have gained 44 followers. We now have 359 followers. We have left 9,028 impressions (amount of time our content was viewed) from January to April, which is up 247% compared to last semester (where we had 2,601 impressions). Overall, our interactions have increased, and our content has gained more popularity. On our Instagram, we published 21 posts on our feed and 34 posts on our story with an average of 69.6 likes per post. Posts on our story can be viewed for a day, while posts on our feed can be viewed indefinitely. In comparison, the 2022-2023 competition team had 12 feed posts and five posts on their story with an average of 48.9 likes. We posted about twice as many posts on Instagram and six times as many posts on our Instagram story.

From the frequency of posting on social media, we tripled the number of media shared, and engagement was at an all-time high. Also, the quality of our activities and our team's progress has increased viewer engagement with our account. Our numbers also grew throughout the year as we gained more partnerships. We became involved with the Community Engagement and Learning Center (CELC) on campus and posted collaborative posts with them. We spread our message of renewable energy with the rest of campus which created a collaborative effort between the two accounts. Additionally, we collaborated with the official university account, @calmaritime, to post several announcements together. From these collaborations, we were able to spread our message to our follower base and theirs. Additionally, an alum of our university works for the NASA Ames Research Center. We had the opportunity to take a tour of the facility and learn about their commercial wind tunnels. The graduate posted us on her Instagram, which further expanded our network into NASA and alumni space. The social media plan was successful because the metrics on our Instagram were boosted, and we continued to have high engagement. For next year, the plan will be similar, and we will prioritize our Instagram as the main source of social media presence.

Chosen Contest Activities

The chosen activities had the purpose of connecting with people with the collective goal to develop California's future in offshore wind. A third of the estimated offshore wind development that the United States is targeting is estimated to occur in California. As the California team that has participated in CWC the longest, we wanted to educate more people about the industry to further expand interest in our home state.

Host an Industry, Alumni, or Interteam Activity

The most anticipated event of the year was our California Collegiate Offshore Wind Conference (CCOWC). We connected with the two other CWC California teams: Cal Poly – San Luis Obispo and UCLA (University of California, Los Angeles). This event served as a dynamic incubator, bringing together college students and professionals from the offshore wind sector. The event occurred on February 16-18, 2024, and was hosted on the Cal Maritime campus. It was organized by the Cal Maritime Connection Creation team, with help from Cal Poly – SLO and UCLA. Cal Maritime's CWC team was fortunately able to raise six thousand dollars from our generous sponsors – Hornblower and Crowley - to fund the event. This money paid for housing for the visiting students, catering for each day of the event, and other necessary expenses. Our team also organized the rental spaces, found speakers for the industry panel, and publicized the event.

Day 1: The Cal Maritime CWC team welcomed the teams as they moved in. From there, students participated in a dinner where teams made connections. Teams were encouraged to talk about the progress made on their projects and what to expect for the rest of the weekend, as well as looking forward to the competition in May. After we finished the social portion of the day, each team practiced the presentations they expected to present the next day.

Day 2: On the second day of the conference, we hosted a professional industry day. The day began with breakfast, where we introduced our guests to the Collegiate Wind Competition and explained why we are hosting the CCOWC. Next, each team presented their Turbine Design and Project Development to the crowd. After each presentation, we had a networking break where the guests could speak to us individually and get any questions answered. From there, a student-led industry panel was commenced. On the panel, we had Dr. Kevin Jackson (President of Pacificos Energy, Inc.), Cole Van Gundy (VP of Construction & Engineering at Crowley Wind Services), and Nancy Krishner-Rodriguez (Western Director of the Oceanic Network). Dr. Jackson has a career in renewable energy that brings over thirty-five years of experience in design, testing, and operations of utility-scale electric power systems. Mr. Van Gundy has more than 15 years of experience and has played an integral role in advancing Crowley's growing engineering and design services in maritime and offshore wind services. Ms. Krishner-Rodriguez is an experienced government relations and policy strategist, who has expanded her organization's presence in western states and on federal legislative priorities. These three speakers were able to answer a wide range of questions that the students from the three teams asked and provided great insight on the expansion and development of offshore wind in California. After the panel, there was a short lunch break followed by industry presentations. This is when our industry guests presented their companies and what opportunities there are for students looking to enter the renewable energy space. Companies that presented were Pacificos Energy, Inc., Crowley Wind Services, the Oceanic Network, and AECOM. After the conclusion of the panel and the industry events, we tested our turbines in the Cal Maritime wind tunnel to prepare for the third day of the conference.

Day 3: On the third day of the conference, the students from the three teams met up to have a more intimate look at each of the team's projects. We did an in-depth exploration of each turbine. After each team explained their turbine and showed the mid-year deliverable video, each team was able to test their turbine. A handful of alumni from Cal Maritime's expansive alumni network also visited and gave tips to each team. Students were eager to see how each turbine performed against each other. After a long day of testing, the students were given a tour of the campus and the Training Ship Golden Bear.

The weekend was full of collaboration and learning more about the wind industry. All guests became great partners for the teams and were thrilled to meet future leaders in California offshore wind. Among the three teams, industry partners, and alumni, the total attendance for the weekend was 57 people. All three teams have expressed interest in holding the event again next year (making it an annual conference), and the Cal Maritime team has tried to include the event's expenses in future year budgets.

Student and Local Community Engagement

For this event, we hosted the 4th Annual NorCal KidWind Challenge on February 3rd, 2024. This year, we renamed the challenge to the Evan Fishel KidWind Challenge in remembrance of Evan Fishel, who ran the event last year and sadly passed away shortly after the challenge. He was also the Connection Creation student lead and had a passion for serving the community.

This year, we had eighty students and educators participate in the challenge, 18 members of the Cal Maritime CWC team, and 16 volunteers for 114 people! This was nearly triple the number of people who participated last year and put us at maximum capacity. There were ten teams competing, with four in the middle school division and six in the high school division. The top two teams for the middle and high school divisions were invited to the KidWind National Challenge, and all four of the teams selected are planning to attend. The purpose of hosting the KidWind Challenge is to develop a KidWind presence in the San Francisco Bay Area, which did not exist prior to Cal Maritime's inaugural KidWind event in 2018. We are the only challenge in Northern California, making us a crucial developer of offshore wind students in California.

During the event, we had each team sign-up for testing slots in the Cal Maritime Wind Tunnel when their turbines were ready. Integrated into the day was a pre-determined schedule of a panel of judges (consisting of four Cal Maritime CWC members) inspecting each team's Turbine Design. Students needed to be able to explain the theory and impact of each design as they presented to the judges. Winners were chosen with a combination of the judges' scores and the top power produced by the teams. This event increased knowledge of wind energy and encouraged participation from students of all backgrounds.

Understanding the Wind Energy Industry

For our final event, we conducted four interviews with professionals from four different sectors of the Wind Industry. During these interviews, we learned about careers in offshore wind and how each of the industry professionals and their companies are advancing the development of offshore wind. Our high-level goal was achieved as we focused discussions on the development of offshore wind in California. All interviewees would be open to participating in future CWC events.

Interview I: During the interview, Sarah McDonald, Vice President for Vessel Construction and Repair at The Hornblower Group, discussed the aspect of crewing the vessels that support offshore wind farms and supply. We learned how crucial it was for the maritime industry to conform to regulations in California because there are very few companies that can legally bring crew and supplies to and from the farms. This is especially important because it gives another career path for the students who attend the academy. When students visit our campus, we stress the importance of getting a degree from Cal Maritime because you can support the wind industry in an alternate way. 9/13 of our team members attended.

Interview II: During the interview, Bart Goedhard, Director of West Coast Business Development for Floating Offshore Wind Solutions at Crowley Wind Services, discussed the directorial duties and how to manage offshore wind development. Mr. Goedhard gave us information that we could pass on to young students on the importance of how a developer mind works. We were able to observe how it is to be successful in this market that one must think creatively. 11/13 of our team members attended.

Interview III: During the interview, James Sun, Development Director for RWE's Offshore Wind Project, and Joel Southall, Director of Sustainability and Environment at RWE, discussed the impacts of offshore wind on the environment and project development. This was especially crucial because we were able to

teach young students about the environmental effects of offshore wind and how it benefits the community. 11/13 of our team members attended.

Interview IV: During the interview, eight members of the engineering team, project development team, and project management team at Ocergy – Sustainable Offshore Solutions discussed how they develop and design offshore wind turbine foundations. This is a local company that consists of naval architects, mechanical engineers, and project managers. They provided insight on the designing portion and insight of regulations of building turbines off the coast of California. 8/13 of our team members attended.

Interviewee - relationship
Sarah McDonald - alumni
Bart Goedhard - professional
James Sun - sponsor
Joel Southall - sponsor
Ocergy - professional

Additional Events and Sponsorships

Over the past 10 years of Cal Maritime competing in the CWC, our university has built up a large association of CWC alumni who maintain passion and engagement with the competition. Our team leverages this network by hosting an annual alumni dinner where our former members are invited to connect and give feedback to the current team. This year we also invited various industry connections that we have made throughout the year. The event was hosted on March 22, 2024. Through this event we formed a tighter bond with the alumni creating connections into various industries, internal and external to the wind industry. Furthermore, we were able to gain feedback and learn about challenges they overcame in their year, allowing us to reflect on and refine our designs both on the project development and the turbine design teams.

The Cal Maritime CWC team was invited to present to the NorCal Society of Naval Architects and Marine Engineers (SNAME) at their SNAME Student Paper Night. We presented it to the members and explained what we are contributing to the offshore wind industry. SNAME advances the art, science, and proactivity of naval architecture and marine engineering. They are a valuable partnership to our team because of the important insight they provide on the construction and development of offshore wind. They lent advice and were able to give insight into the realistic expectations of offshore wind.

This year, we have expanded our sponsorship network. The Hornblower Group and Crowley Maritime Corporation have been longstanding sponsors of our team. They sponsor events, such as our alumni dinner and the CCOWC. In addition, RWE offered a grant opportunity through the CWC which we applied for and were selected to receive the grant award. To further strengthen this partnership, we hosted a member of the RWE team at our alumni dinner and interviewed them.

As our reputation has grown, more companies have taken note of the strides that we are making as a team and our potential contribution to the offshore wind industry. We have identified additional new sponsors and partners for next year. Thanks to all our sponsors' generous donations, we were able to host events, buy new equipment, and pay to bring members of the 2024-2025 team to the competition with us.



The majority of the students who participated in the Evan Fishel KidWind Challenge on the waterfront of Cal Maritime.



Students learn how to operate the Cal Maritime Wind Tunnel during tunnel testing at the Evan Fishel KidWind Challenge.



Students finish assembly of their KidWind wind turbine at the Evan Fishel KidWind Challenge.



Educators and students look on as their turbine is tested in the Cal Maritime Wind Tunnel at the Evan Fishel KidWind Challenge.



The CWC teams from Cal Maritime, Cal Poly – San Luis Obispo, and UCLA during the California Collegiate Offshore Wind Conference hosted at Cal Maritime.



Students from Cal Maritime, Cal Poly – San Luis Obispo, and UCLA collaborating as they test a turbine in the Cal Maritime Wind Tunnel.



Industry representatives and political dignitaries watch the students as they present their progress made on their wind turbines at the CCOWC.



Panel of industry representatives answer questions asked by students from the three California CWC teams.



The Cal Maritime Wind Team at the NASA Ames Research Center inside the largest wind tunnel in the world (the National Full-Scale Aerodynamics Complex, NFAC).



Example of an interview for the *Understanding the Wind Energy Industry* event (this interview was with Ms. Sarah McDonald, Hornblower)



Members of the Cal Maritime CWC team alumni network at the alumni dinner after watching the presentations by the current CWC team.



Turbine Demonstration by the Turbine Design team to the alumni network at the alumni dinner.



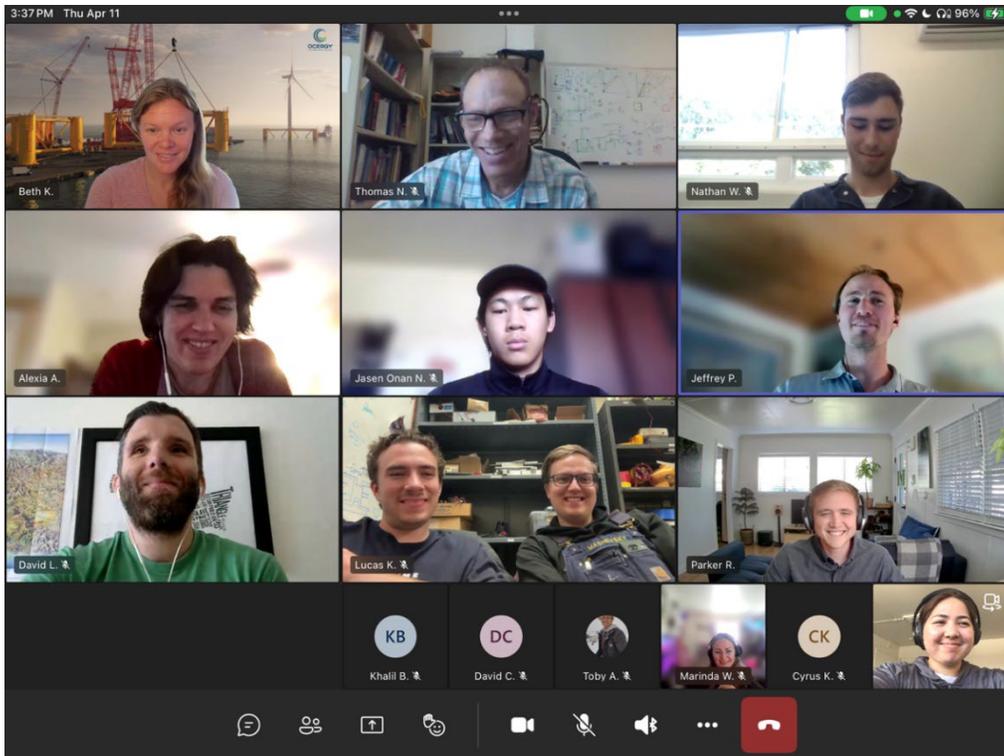
Members of the Turbine Design Team presenting the NorCal chapter of SNAME.



Members of the CWC team with Cal Maritime's President, President Michael Dumont, who invited them to the annual Scholarship and Award Gala. Members (L to R): Gavin Murray, Matt Rizzi, Nikhil Hunter, President Dumont, Vonne Ng-Bader, Cyrus Khaleeli, and Jasen Nicolas.



Example of what our Instagram profile looks like; it highlights our events, progress in Turbine Design, our Connection Creation Contest Activities, and updates on the team.



Meeting with multiple members of Ocergy to see the number of members it takes to run a company for the *Understanding the Wind Energy Industry* event.



Taking a tour of the historic Nasa Unitary Plan Wind Tunnels.



Taking a tour of the Fluid Mechanics Laboratory at NASA Ames Research Center.



Members of the Cal Maritime CWC team teaching students about the fundamentals of wind turbines at the Evan Fishel KidWind Challenge.



Updated team photo. From L to R:
Back row: Nikhil Hunter, Gavin Murray, Vonne Ng-Bader, Madalyn Reynolds, Jasen Nicolas, Brennan White, Kent Suzuki, Cyrus Khaleeli, and Matthew Rizzi.
Middle row: Nathan Witte, Lucas Kennedy, Tobias Afdahl, Matthew Ferguson, Victor Mashevsky
Front: Dayton Huffaker