MECC 2024 Community Connection Final Report

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After Action Report

A. Overview

In this project, we carried out following actions to try to establish a strong connection with industrial professionals and local communities:

1) We solicited comments and real-world insights from industrial professionals possessing expertise or actively working in fields related to marine energy to gain a comprehensive understanding of the challenges, complexities, and impacts associated with marine energy harvesting and system operation. Their valuable contributions facilitated our comprehension of the intricate nuances inherent to this domain.

2) Team arranged a mid-year presentation in ME166 class and introduced MECC2024, marine energy background, design objectives and project plan with ME senior students. Team also exchanged ideas and thoughts on the technical design and implementation methods with other students.

3) We attended Fresno State 'Project Day' event on 5/1/2024 and presented a poster to showcase project design and the information of MECC2024. Thie event was hosted by the Lyles College of Engineering this year and has more than 100 projects showcased this year. K-12 students, organizations and companies throughout the California Central Valley are invited to come to enjoy the newly developed and forward-thinking projects at the event.

These actions and activities yielded invaluable benefits throughout the design process. They facilitated a deeper comprehension of the marine energy system, design, and related environmental impacts. Furthermore, these endeavors aided in identifying design priorities and potential impacts that necessitated addressal. Concurrently, they fortified our design approach to better accommodate the needs of the local community. Moreover, participation in the public event (Poster on Project Day) provided an educational opportunity for K-12 students, local companies, and other interested parties, fostering awareness and understanding of ocean energy harvesting systems and their associated benefits.

B. Challenges

Throughout the duration of this design project, we encountered numerous challenges across both the design and community outreach endeavors. The design-related challenges will be comprehensively detailed in our final design report. However, the challenges pertaining to community outreach activities are summarized as follows:

1) Establishing contact with relevant individuals and industrial professionals within the water and energy sector proved challenging. Despite employing various outreach methods, including email, LinkedIn messaging, and phone calls, our team received an underwhelming response to interview requests.

2) Time constraints and adherence to the project timeline posed significant pressures. Concurrently, we were required to complete project tasks while fulfilling various University course requirements, exacerbating the time-sensitive nature of our endeavors.

3) We encountered a diverse array of stakeholder interests, spanning from marine energy system operation and design. These divergent viewpoints occasionally culminated in misconceptions or concerns regarding design, implementation, and operation in the ocean.

To mitigate the challenges encountered during community outreach activities, we devised and implemented several strategies. For instance, we collaboratively selected and identified potential interviewees, subsequently distributing the contact tasks among team members to alleviate excessive workload on any individual. Furthermore, we concentrated our efforts on targets who might be directly and profoundly impacted by the available energy in the coastal region. Additionally, we developed a Gantt chart to monitor our progress and prioritize crucial outreach endeavors, ensuring efficient resource allocation and timely execution.

C. Reflection

Our team's community outreach endeavors, encompassing engagement with industry professionals, interviews with residents, and participation in a public poster event, yielded invaluable perspectives that fortified our technical ocean wave energy system design approach. Despite navigating challenges such as conflicting stakeholder interests and time constraints, we learned the critical importance of prioritizing outreach from the project's inception, leveraging strategic partnerships, sustaining engagement, and proactively addressing concerns through transparent communication. Furthermore, we gained the pivotal insight that cultivating strong connections with industry and community stakeholders is essential for developing successful marine energy projects that harmonize technical solutions with local priorities and needs.

Metrics Report

A. Industry Interviews

The team conducted a total of four interviews with professionals from various sectors within the marine energy industry. The interviews included representatives from the areas, including marine technical projects in the oil and gas industry, consulting for renewable energy technologies, wave energy monitoring and data analytics, and marine energy startups and entrepreneurship.

All team members had participated in the interview process, with each member responsible for trying to reach out & conduct at least one interview. These interviews were conducted either by phone or virtually online by Zoom, which provided valuable insights into water energy job roles, career paths, and advice for aspiring professionals in hydro-related fields. These interviews were attended by one interviewee with at least three student team members present for each interview session. The team also tried to invite other students to join (we saw active participation) and hosted a Q&A session at the end of each interview with an average of six to eight questions asked per session.

The details of successful interviews are listed as follows:

- Interviewee 01: Chirag Parmar

  Full Name: Chirag Parmar
  Company Affiliation: Chevron Shipping
  Email Address: chirag.parmar@chevron.com
  Origin of Relationship: Professional
  Sector: Marine Technical Projects in the Oil and Gas Industry
  Open to Future Participation: Yes

- Interviewee 02: Ramon Rodriguez

  Full Name: Ramon Rodriguez
  Company Affiliation: Roderick Consulting Inc.
  Email Address: ramon.rodriguez@roderickconsulting.com
  Origin of Relationship: Professional
  Sector: Consulting for Renewable Energy Technologies
  Open to Future Participation: Yes

- Interviewee 03: John W. Tauriac

  Full Name: John W. Tauriac
  Company Affiliation: Santa Cruz Waveworks
  Email Address: john.tauriac@waveworks.com
  Origin of Relationship: Professional
  Sector: Wave Energy Monitoring and Data Analytics

Open to Future Participation: Yes

The team was unable to obtain complete details for the remaining interview due to unforeseen circumstances and lack of responsiveness from the professional individual. All the interviewees expressed their willingness to participate in future Marine Energy Collegiate Competition (MECC) events, indicating their interest in supporting and engaging with the student community in the marine energy field.

B. Action Outcomes

We organized a mid-project presentation session on December 13, 2023, towards the conclusion of the Fall 2023 semester. This session was open to all senior students enrolled in the ME166 energy system design course. Our team delivered a concise presentation on the ocean wave energy system project, followed by a question-and-answer segment. Approximately thirty-five students attended this session, and more than eight inquiries were posed. The team attendance metrics were as follows: 1) All team members, including our faculty advisor, were present throughout the entirety of the session; 2) Each team member took turns presenting the project and responding to questions from attendees; 3) The technical presentation spanned approximately 15 minutes, followed by 20 to 30 minutes of meaningful interactions and in-depth discussions with attendees concerning the system design, operation, and its associated impacts.

Furthermore, we have attended the LCOE Project Day public event, scheduled to take place on May 1, 2024, at the Fresno State Recreation Center, during the end of the Spring 2024 semester (as shown in figure 1). This event will showcase more than 100 projects, with hundreds of K-12 students, local companies, and other interested parties in attendance. We are currently finalizing our poster and will bring both the poster and our small-scale wave energy system prototype to this event. Based on the total attendees of Project Day event, we get the following potential attendance metrics: 1) The poster presentation will experience a steady flow of attendees, with an estimated total of 40 to 60 visitors throughout the event (2pm-6pm); 2) At least six team members were present with the poster and our prototype at the event, and had recorded interactions with attendees from various schools and local communities.

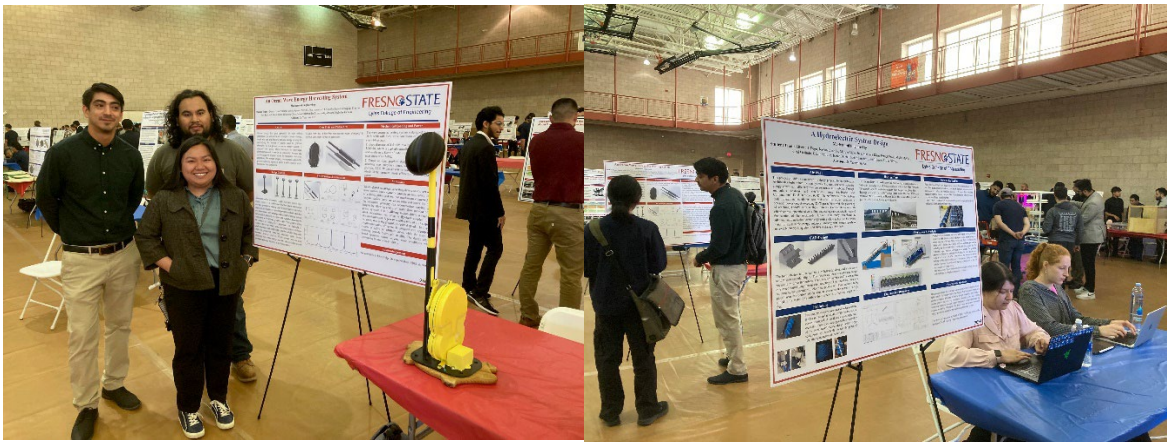

Figure 1 LCOE Project day poster and prototype

C. Outreach strategy outcomes

Our team's outreach endeavors have significantly contributed to the relevance and effectiveness of the team's design and implementation testing processes. By incorporating diverse perspectives and providing valuable communication and educational opportunities, these efforts have yielded the following outcomes: 1) An expanded professional network, facilitated by establishing connections with a broader range of hydropower professionals, thereby opening doors to potential internship opportunities, mentorship, and invaluable industry insights; 2) Increased industry knowledge and exposure through discussions, shared reports/reading materials, and technical webinar slides, which have enhanced our understanding of current trends, challenges, and emerging technologies within the marine energy sector; 3) Clear guidance for the

project, obtained through discussions and consultations with our college's industrial advisory board, who provided valuable feedback on the design and project planning aspects; 4) Collaborative opportunities with water energy companies, such as our industrial mentor Mr. Santos' company, which could provide access to additional resources, expertise, and real-world testing environments.

Summary

We reported the community outreach efforts undertaken by our team in this marine energy design project. The report details the various actions carried out to establish connections with industrial professionals and local communities, including soliciting insights from experts, conducting a mid-project presentation, and participating in a public event showcasing our project. We obtained invaluable benefits derived from these outreach activities, such as gaining a deeper understanding of marine energy systems, identifying design priorities and potential impacts, and fostering awareness and understanding within the local community. However, the team also encountered challenges during the outreach process. The team implemented strategies like collaborative task distribution and targeted outreach to mitigate these challenges. Overall, these community outreach efforts strengthened our technical design approach. We learned the critical importance of prioritizing outreach from the start, leveraging partnerships, and harmonizing technical solutions with local priorities and needs.

Acknowledgement

We gratefully acknowledge the support from MECC24 (NREL & DOE) on this project. Team also thanks our faculty advisor’s great support and help. We also acknowledge our industrial mentors’ valuable advice and discussion during the project.