



ENVIRONMENTAL COMPLIANCE COST ASSESSMENT (ECCA) PROJECT

"Progressing from Environmental Compliance Process and Cost Assessment to Developing and Implementing Strategies and Actions to Realize Benefits"

PROJECT OVERVIEW

The nascent marine and hydrokinetic (MHK) energy industry today faces significant challenges in getting projects permitted and deployed. This project aims to understand and develop strategies for overcoming these challenges associated with the environmental permitting and compliance process. Since the project began in October 2016, the Sandia National Laboratories (SNL)-led team has, and continues to, conduct discussions with project developers to collect detailed, quantitative environmental compliance (EC) cost information (direct costs, time, and resources) associated with permitting/licensing, and monitoring and compliance of MHK projects. Deep dives with MHK developers and regulatory agencies elicited their perspectives on the permitting process, and combined with the EC cost analysis, helped identify opportunities to improve the permitting process. The project team also reviewed other more mature energy and marine industries (offshore oil and gas, offshore and onshore wind, onshore solar, and subsea power and data cables) to obtain perspectives on permitting and regulatory lessons learned.

HIGH-LEVEL OBSERVATIONS

- There is a lack of cohesive knowledge of existing science and MHK project experiences on environmental effects to inform permitting and licensing. Best available science from other locations or projects is not known or poorly understood.

- Information gaps make it difficult for regulators to evaluate MHK projects in the permitting/licensing process with more certainty. Focused research on collecting useful and relevant information can help fill these gaps and informs the permitting and licensing process.
- There is a consensus among regulators and developers that investment in industry-wide knowledge is key to advancing the MHK industry at national and project levels.

Findings were shared with regulators and developers through workshops and webinars to explore costs, experiences, and recommendations, leading to 6 strategies and 24 actions on national and project-levels to increase the efficiency and effectiveness of the permitting and compliance processes. Continued collaboration enables the project team to refine these strategies and actions to maximize their potential effect. The project's next phase focuses on implementing actions prioritized through stakeholder feedback.

PROJECT OBJECTIVES

- Create efficiencies in MHK environmental permitting
 - » Identify research and process innovations to create efficiencies for both industry and regulatory agencies in MHK environmental permitting.
- Get the technology to market
 - » Help reduce time and costs to achieve environmental compliance with federal, state, and local regulations.
- Encourage development of MHK projects
 - » Increase understanding and predictability of environmental compliance costs to, in turn, increase stakeholder and regulator confidence and lower the risk for MHK project deployments.

Determine Permitting and Compliance Cost

Oct 2016 – Sep 2017

1

Identify Cost Reduction Pathways

May – Sep 2018

2

Develop Cost Reduction Strategies

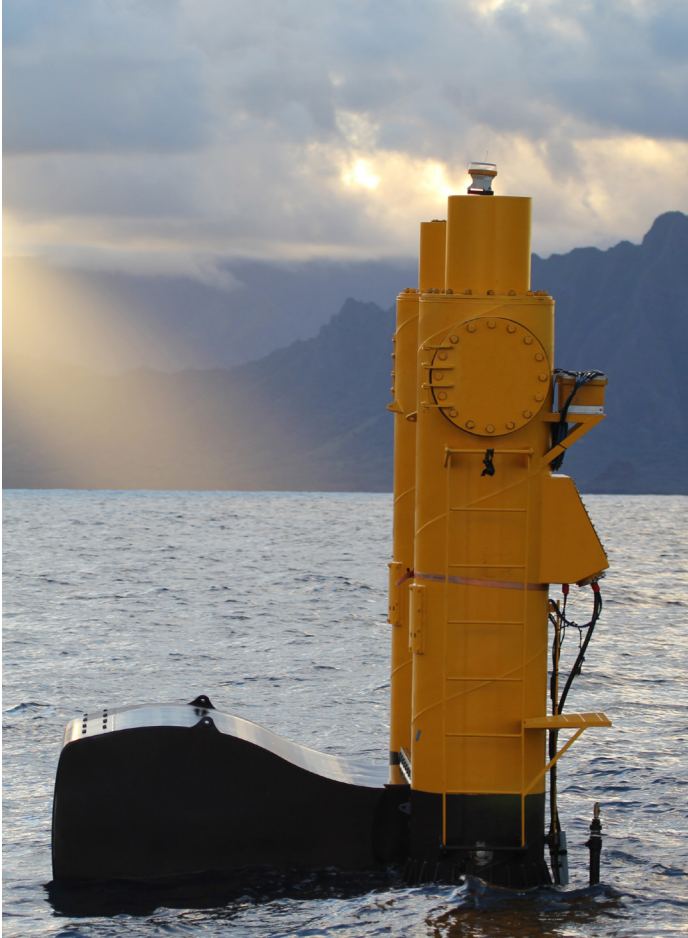
Fall 2018 – Summer 2019

3

Implementing Cost Reduction Strategies

Fall 2019 – Summer 2020

4



Azura Wave Energy Converter deployed at the Wave Energy Test Site, Hawaii. Image courtesy of Northwest Energy Innovations.

STRATEGIES AND ACTIONS

The national strategies and actions developed focus on opportunities for federal agencies such as the U.S. Department of Energy (DOE) and the Bureau of Ocean Energy Management (BOEM) to further the industry by 1) establishing frameworks for sharing and distributing MHK information; 2) encouraging collaborative industry development, 3) improving and advancing the permitting process, and; 4) furthering scientific knowledge and technical capabilities. Actions include developing a national MHK collaborative, predictive models, and advancing technologies for site characterization. Project-level strategies and actions focus on best practices for project developers and regulators, such as developing relationships with local academics, collaborating early and often with regulators, seeking efficiencies in monitoring and pre-deployment testing, using adaptive management to phase project development into an array deployment, and conducting device level testing to understand cumulative impacts.

The national and project-level strategies and actions are interconnected, building off one another, and reflect feedback and consensus from developers and regulators as actionable pathways to further the MHK industry nationally and at a project scale.

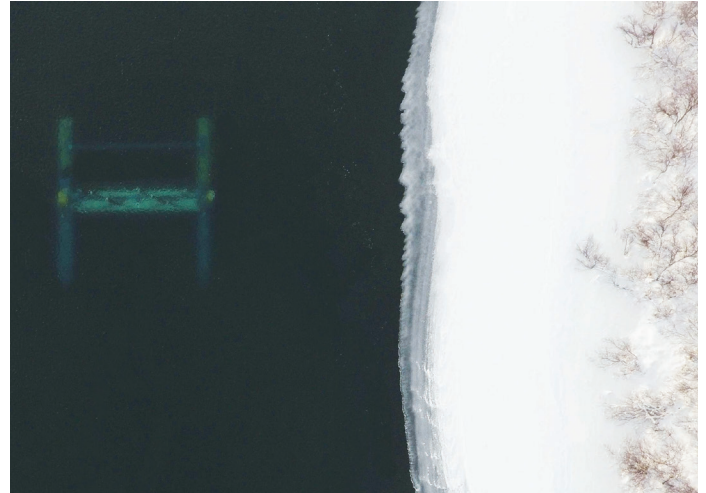


Image of Ocean Renewable Power Company's RivGen® Power System deployed in the Kvichak River, Igiugig, Alaska. Image courtesy of Village of Igiugig and taken January, 2020.

ACTION 4.2. TARGETED RESEARCH IDENTIFICATION USING A WORK GROUP APPROACH

To maintain the momentum and collaboration among developers and regulators and implement actions, the project team is convening work groups to advance, Targeted Research that received the highest percentage of strong agreement among regulators and developers for the top 10 actions. The project team will convene work groups of diverse stakeholders on acoustic characterization and benthic habitat to identify critical research needs related to these environmental topics. This information will be published and provided to federal and state agencies and others to better inform funding decisions related to the environmental topics.

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