

Water Power Technologies Office (WPTO) Marine and Hydrokinetic

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy



Overview of Market and Industry
Development, Analysis,
and Data Dissemination

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Session Overview: The MHK industry is young and technologies diverse. The Water Power Technology Office, in order to drive progress, avoid repeating the same mistakes of other sectors, and within the sector, and track positive impact from investments in the sector has identified specific frameworks and implemented approaches for data collection. These efforts aim to improve the device development ecosystem and inform decision making in the MHK technology sector.

The Challenge: Regardless of device type or location, Marine and Hydrokinetic (MHK) companies today have substantial capital cost, long development timelines, and need to balance competing risks. Governments and other investors require information on the key cost reduction opportunities and risk areas to best direct funding to have the greatest benefit to the sector. Yet analyzing the current state of the technology, the risks, and the opportunities, to ensure greatest return on investment without data gathered for these specific purposes and ideally using a common framework across the sector, is a challenge.

Session Overview (Continued)

2014 Peer review feedback

Manufacturing and Supply Chain Needs Assessment

- Outreach to States and Manufacturing Extension Partnership, as well as trade groups is essential.
- DOE should encourage participation by Industry in the Manufacturing Needs Assessment.

Risk Management Framework

- “Risk Management is a well-established process with procedures that are documented in military and industrial standards. The case for developing a procedure specific to MHK has not been made.”
- “Risk management is applicable to all MHK projects. Results from this work will provide crucial information to MHK developers as well as potential investors.”

LCOE

- Long and high cost Reference Model project to identify cost reduction opportunity
- “The concept of developing reference models to look at the impact of various aspects of the design and how they contribute to LCOE makes sense and could be helpful in focusing areas where greatest cost improvements are possible. The idea of a standardized method for determining LCOE is also useful, provided it is not overly complex and can readily applied to multiple sites.”

Program Strategic Priorities

Technology Maturity

- Test and demonstrate prototypes
- Develop cost effective approaches for installation, grid integration, operations and maintenance
- Conduct R&D for Innovative MHK systems & components
- Develop tools to optimize device and array performance and reliability
- **Develop and apply quantitative metrics to advance MHK technologies**

Deployment Barriers

- Identify potential improvements to regulatory processes and requirements
- Support research focused on retiring or mitigating environmental risks and reducing costs
- **Build awareness of MHK technologies**
- Ensure MHK interests are considered in coastal and marine planning processes
- **Evaluate deployment infrastructure needs and possible approaches to bridge gaps**

Market Development

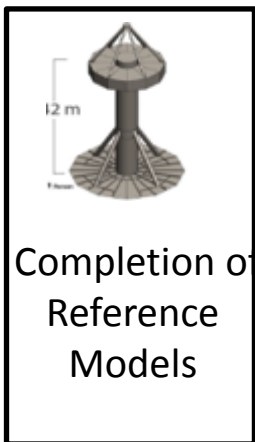
- Support project demonstrations to reduce risk and build investor confidence
- **Assess and communicate potential MHK market opportunities, including off-grid and non-electric**
- Inform incentives and policy measures
- Develop, maintain and communicate our national strategy
- Support development of standards
- Expand MHK technical and research community

Crosscutting Approaches

- Enable access to testing facilities that help accelerate the pace of technology development
- Improve resource characterization to optimize technologies, reduce deployment risks and identify promising markets
- **Exchange of data information and expertise**

Marine and Hydrokinetic – DOE Role

Timeline of Accomplishments



Completion of Reference Models

Published DOE MHK guidance for LCOE reporting

Guide awardees on LCOE reporting framework

Updated DOE MHK guidance for LCOE reporting

Communicate market opportunity, current cost of energy and DOE role in reducing cost to enter markets



Launch of MHK Data Repository

Launch of Instrumentation Database

Legend

Projects covered in this session

Related Program Initiatives

Relationship

Manufacturing and Supply Chain Needs Assessment

Publish Risk Management Framework

Evaluate Project Risk using Risk Management Framework

Compile LCOE from all projects starting in FY13

Gather data from all DOE funded projects on MHKDR

FOAs: SPA, Durability and Survivability, Energy Conversion Technology Advancement

2013

2014

2015

2016

2017