Water Power Technologies Office (WPTO)
Marine and Hydrokinetic

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

WAVE ENERGY PRIZE
U.S. DEPARTMENT OF ENERGY

Demonstrations Session: Introduction and Overview

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Session Overview

Demonstrations:

The Program focuses on the demonstration of technologies that can be deployed in early-adopter markets in the near-term while supporting next generation technologies that have the potential to be cost competitive with large utility scale markets in the longer term. Gathering real-world deployment (IO&M) and performance data is critical to the success of the MHK industry, both in the near and long term.

The Challenge:

Close to full-scale demonstrations will help to obtain a comprehensive set of performance and cost data that will inform the Program's research and development portfolio planning. Such data will include annual energy production, availability, reliability, operation and maintenance costs and overall LCOE. The data will be used to validate design and cost model tools and identify deployment issues that can be addressed by the industry and through governmental action.

Gaining in-water experience will answer environmental and performance questions, reduce risk, and increase private investment in the industry.

Session Overview

2014 Peer review and response:

The 2014 Peer Reviewers determined that in-water demonstrations are one of the most valuable efforts that DOE could pursue for the broader MHK industry. Reviewer comments included:

- Maintain an emphasis on in-water demonstrations by industrial partners.
- Finish the mission on the nearest-to-market technology and secure successful deployment of that technology within the U.S. and globally. This will generate valuable cost reduction lessons for wave technologies on manufacturing, operations and maintenance, and supply chain development.
- Reconsider funding emphasis for wave technology development and instead offer parity funding to tidal and wave power technology.

The Program has since made significant investments in this area for the larger benefit of the MHK industry.

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

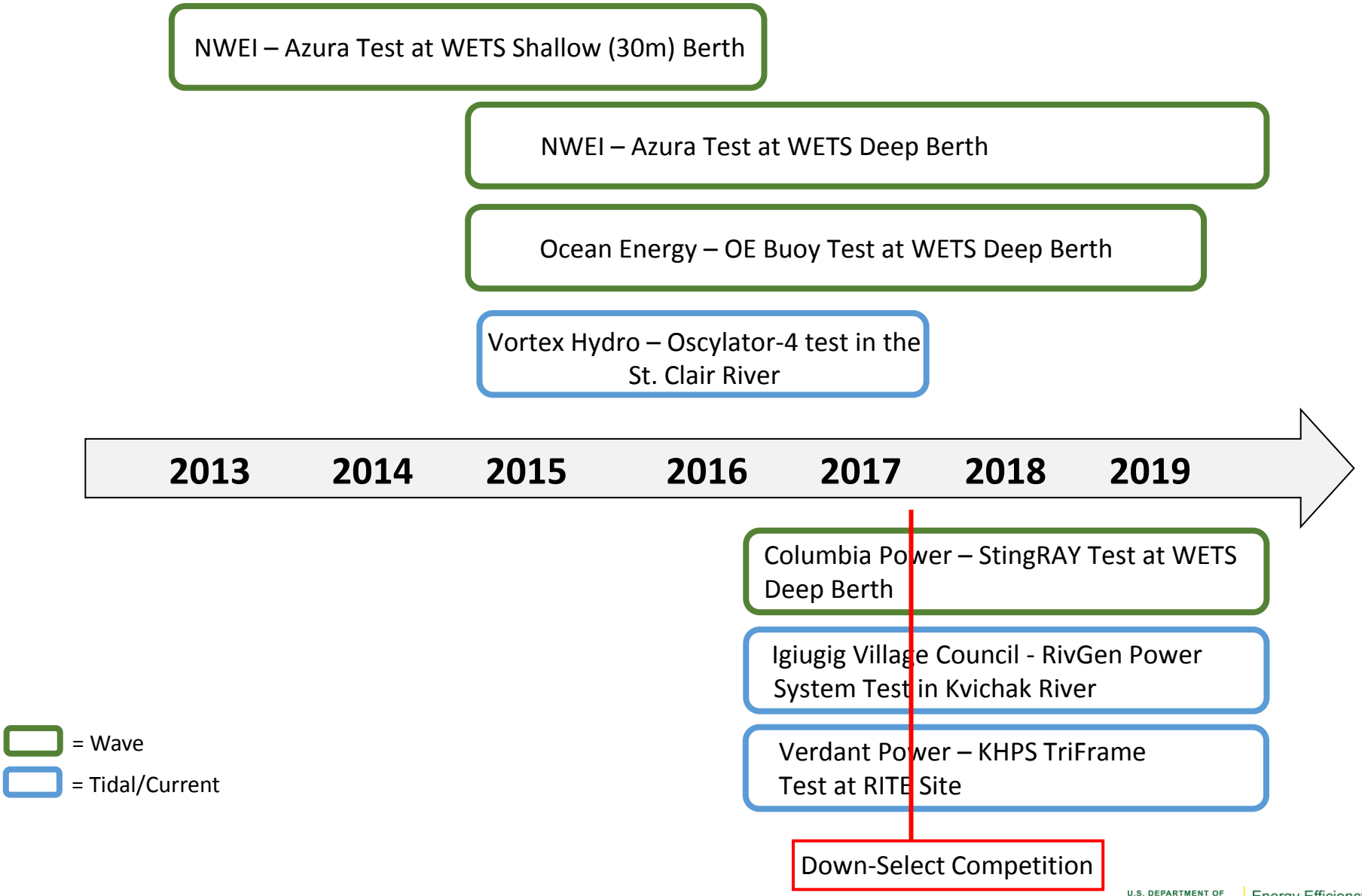
Market Development

- **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**

Timeline


NWEI – Azura Test at WETS Shallow (30m) Berth
NWEI – Azura Test at WETS Deep Berth
Ocean Energy – OE Buoy Test at WETS Deep Berth
Vortex Hydro – Oscylator-4 test in the St. Clair River
2013
2014
2015
2016
2017
2018
2019
Columbia Power – StingRAY Test at WETS Deep Berth
Igiugig Village Council - RivGen Power System Test in Kvichak River
Verdant Power – KHPS TriFrame Test at RITE Site
Down-Select Competition
= Wave
= Tidal/Current