



# NHA's 2021 Waterpower Innovation Council Forum

January 28, 2021

Jose Zayas, Eagle Creek RE, WIC Chair  
Steve Wenke, Avista, Inc., WIC Vice Chair (2020)  
Luciana Ciocchi, NHA Staff Liaison

# Agenda Topics

- Opening Remarks and Introduction
- Live Demo of NHA's Waterpower Research Portal (WaRP)
- DOE Hydropower Program Update
- Preview of February 2nd "Digital Twins: A Tool for Modern Hydropower" Webinar
- What Does Innovation Mean to You? (Panel Discussion & Roundtable)
- "Open Mic" Session – Highlighting DOE's Water Power National Labs
- Closing Remarks

# What is the National Hydropower Association?

- The National Hydropower Association (NHA) is a nonprofit national association dedicated to promoting the growth of clean, affordable U.S. hydropower. It seeks to secure hydropower's place as a climate-friendly, renewable and reliable energy source that serves national environmental, energy, and economic policy objectives.

## NHA's Water Innovation Council (WIC)

- NHA's Water Innovation Council (WIC) is comprised of NHA members who share a passion in seeing a robust and fruitful R&D program dedicated to enhancing all elements of the Waterpower resource spectrum including Marine Hydrokinetic, Pumped Storage, Small Hydro and Conventional Hydro.
- The Council is responsible for identifying R&D priorities that will serve to strengthen the Waterpower Industry through technology, environmental and policy-based research and support the industry in its efforts to secure funding for these important initiatives. The Council also works with other NHA Councils and Committees to advocate for a robust Waterpower Program within the DOE and other agencies.

**NHA represents more than 200 companies in the North American hydropower industry, from Fortune 500 corporations to family-owned small businesses.**

# 2020 Highlights

- **Spring 2020:** WIC Discussion Board
- **Summer 2020:** NHA Files Response - DOE Hydropower Program Research and Development Strategy and HydroWIRES Research Roadmap Request for Information
- **Monthly:** WIC & DOE Hydropower R&D Highlights Webinar Series - held the 4<sup>th</sup> Wednesday of the month at 2:00 pm ET (NHA member service)
- **October 2020:** Technology chapter for Uncommon Dialogue
- **January 2021:** Waterpower Research Portal (WaRP)

# New Leadership for 2021

- *WIC 2021 Leadership & Staff Liaison*
  - Megan Nesbitt, GE Renewable Energy, WIC Chair
  - Boualem (Bo) Hadjerioua, Mesa Associates, Inc., WIC Vice Chair
  - Luciana Ciocchi, NHA Staff Liaison
- *Thank you to Steve Wenke, Avista*

# *Introducing NHA's Waterpower Research Portal (WaRP v1.0)*

WaRP is a **living** database of research within the hydropower, pumped storage and marine energy sectors, conducted by industry, government, NGO and educational entities.

- Fully Open sourced on NHA website
- Comprehensive database (industry, agencies, academia, trades, national labs and more)
  - Over 240 active projects (Conv. Hydro, MHK, PSH, Small hydro, and physical and cyber security)!
- User friendly

Bonneville  
POWER ADMINISTRATION



EPRI



NHA'S WATERPOWER RESEARCH PORTAL



Thank you to Steve Wenke, Avista  
& Sarah Kulpa, HDR

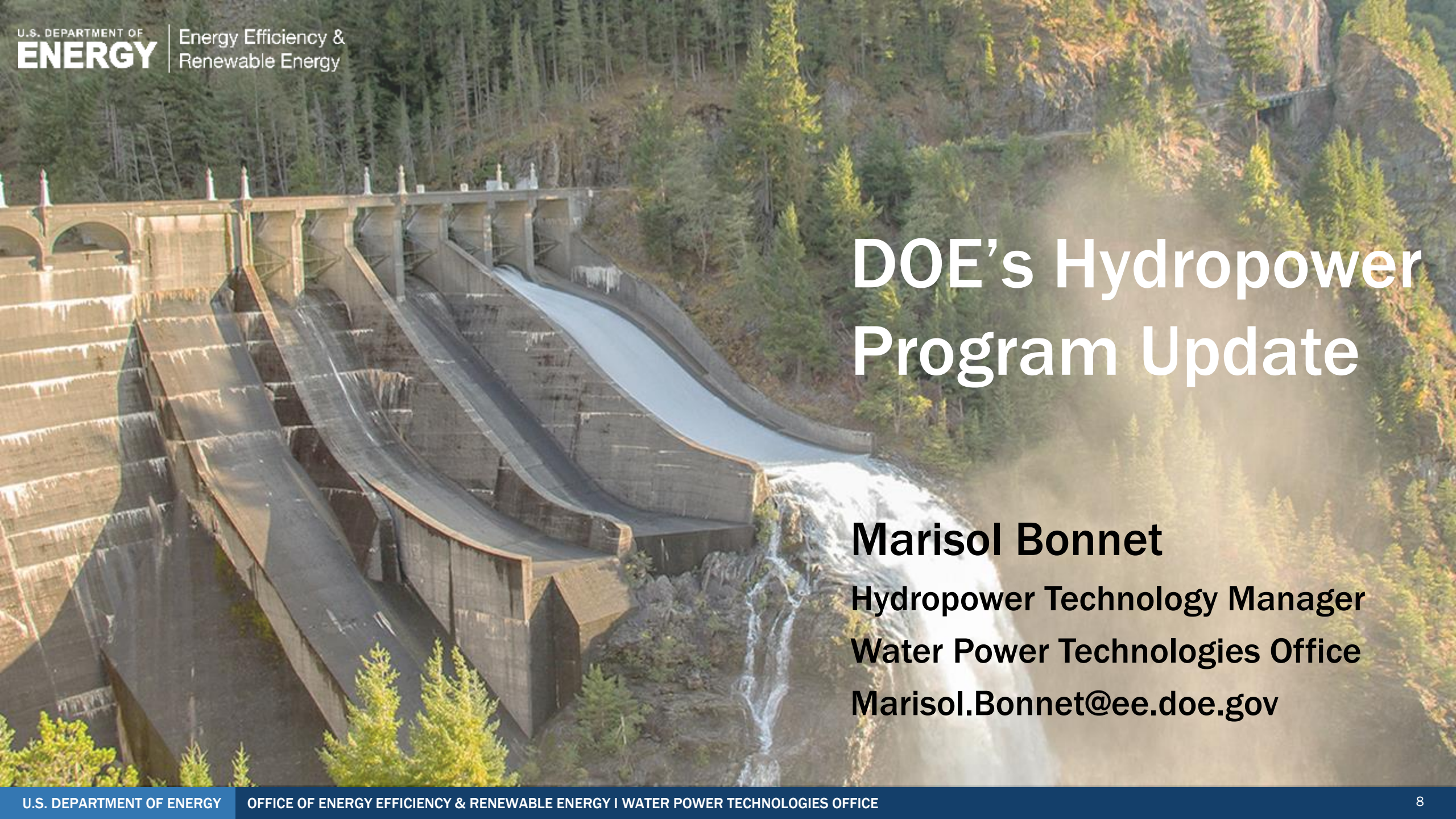


**WaRP is our database. Help us keep it going, relevant and updated!**

# Live Demo of WaRP







# DOE's Hydropower Program Update

**Marisol Bonnet**

**Hydropower Technology Manager  
Water Power Technologies Office  
[Marisol.Bonnet@ee.doe.gov](mailto:Marisol.Bonnet@ee.doe.gov)**



# About the Water Power Technologies Office (WPTO)

WPTO enables research, development, and testing of emerging technologies to advance **marine energy** and **next-generation hydropower** and **pumped storage systems** for a flexible, reliable grid.



Accelerate development of innovative water power technologies, while ensuring that long-term sustainability and environmental issues are addressed.

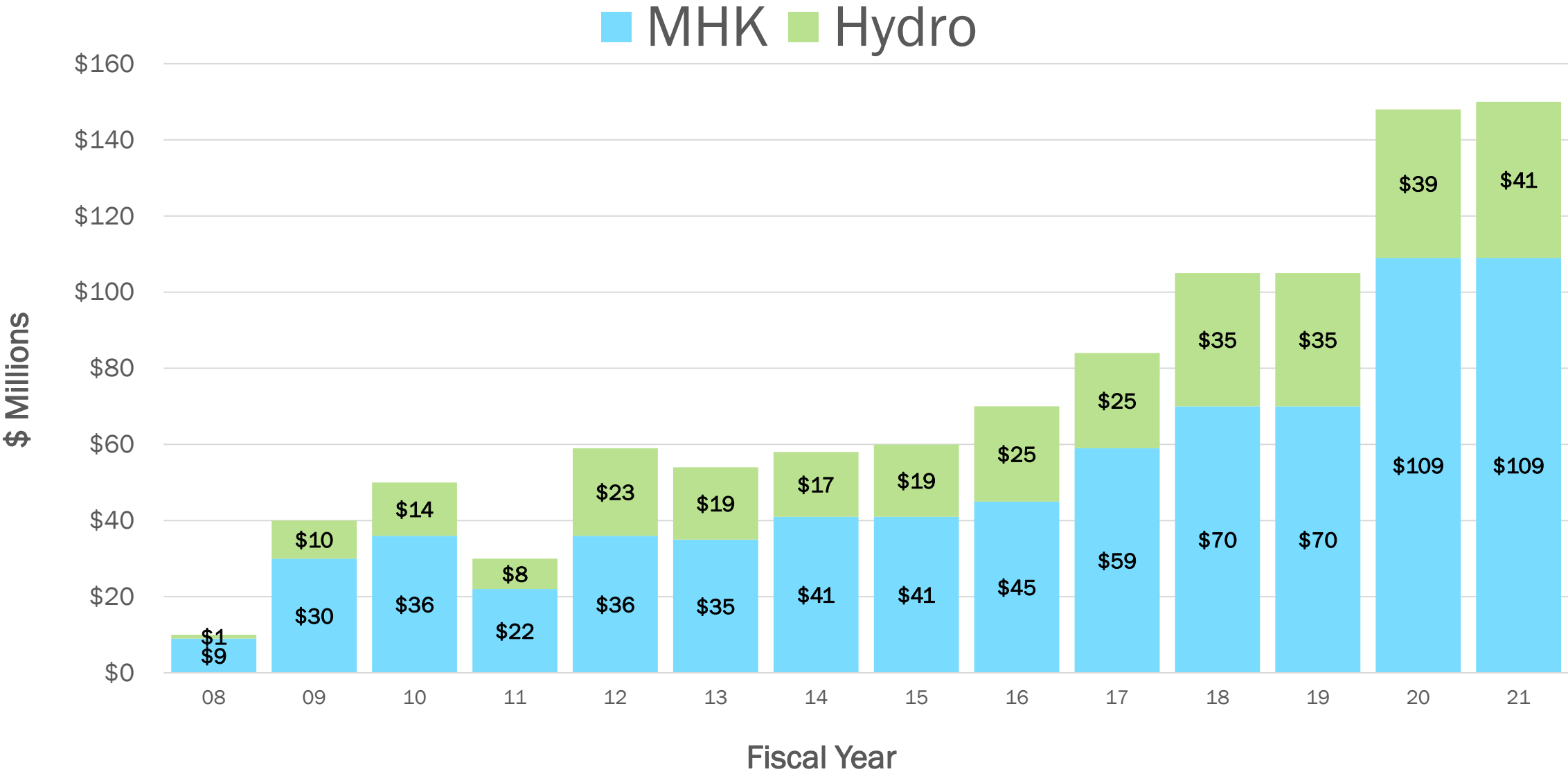


Develop and increase accessibility to necessary testing infrastructure to validate performance and grid reliability for new technologies.



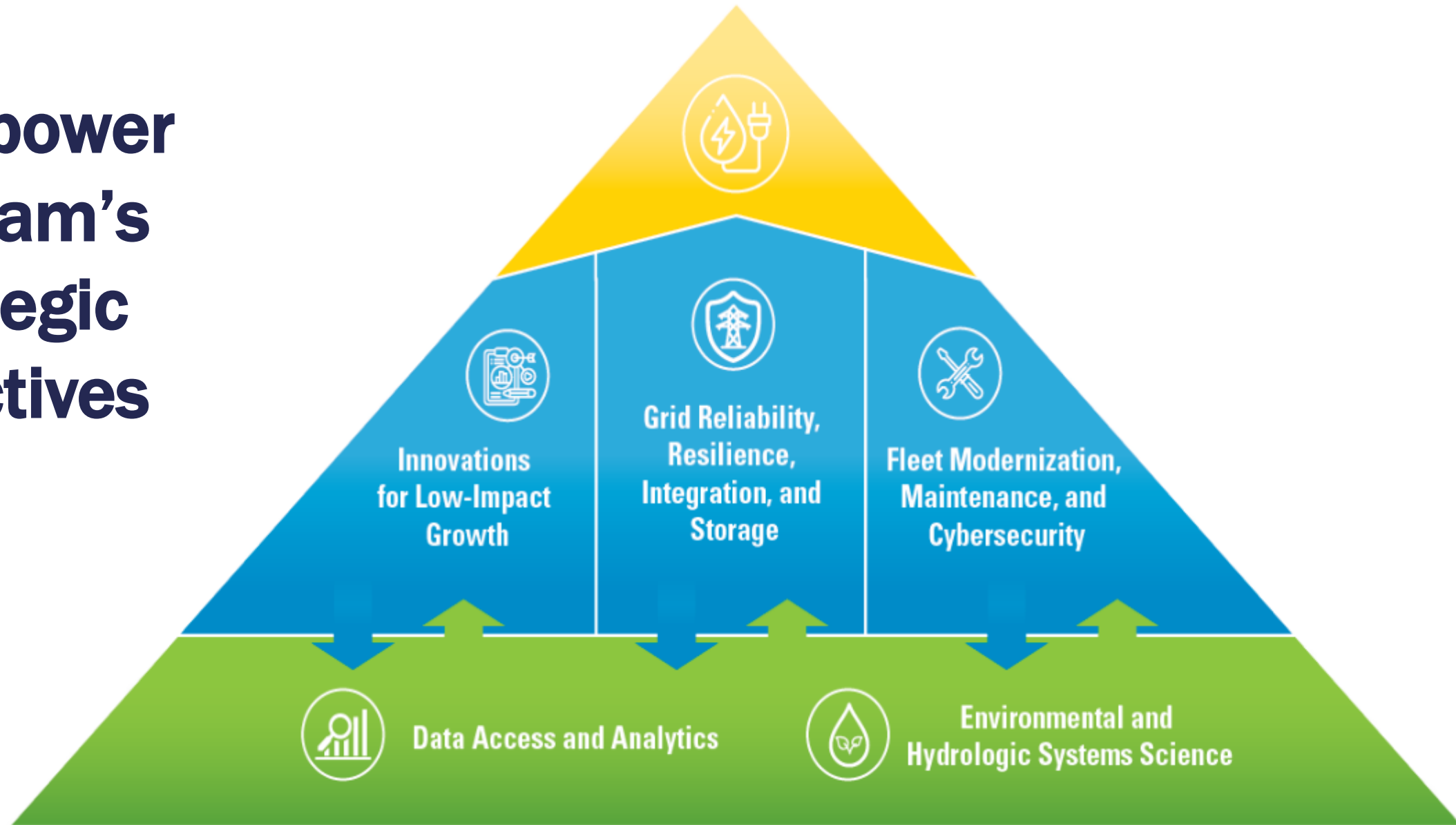
Aggregate, analyze, and disseminate relevant, objective, and technical information on water power technologies and related issues.

# WPTO Budget Over Time

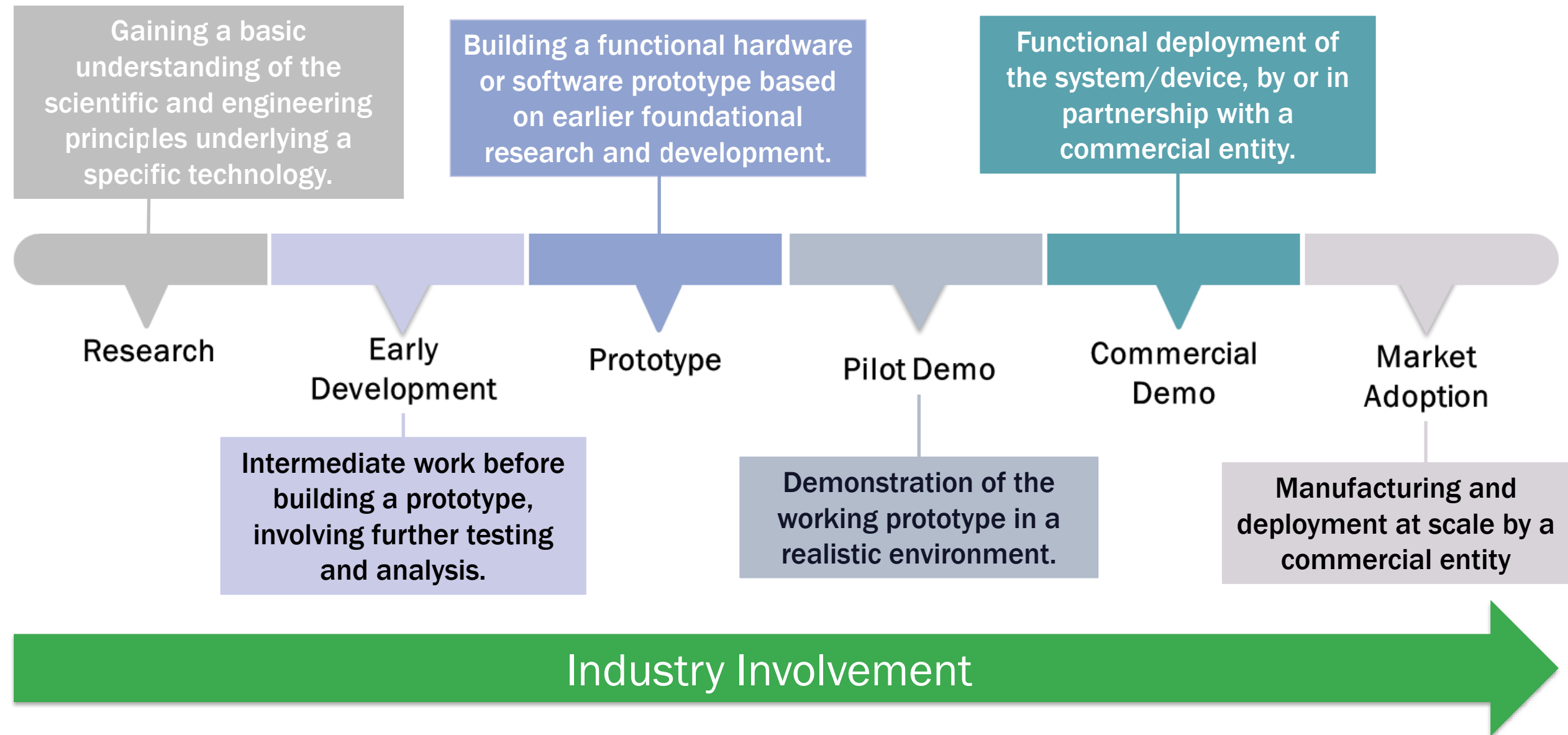


**More sustainable, cost-effective, and flexible hydropower  
and pumped storage to support a rapidly evolving grid**

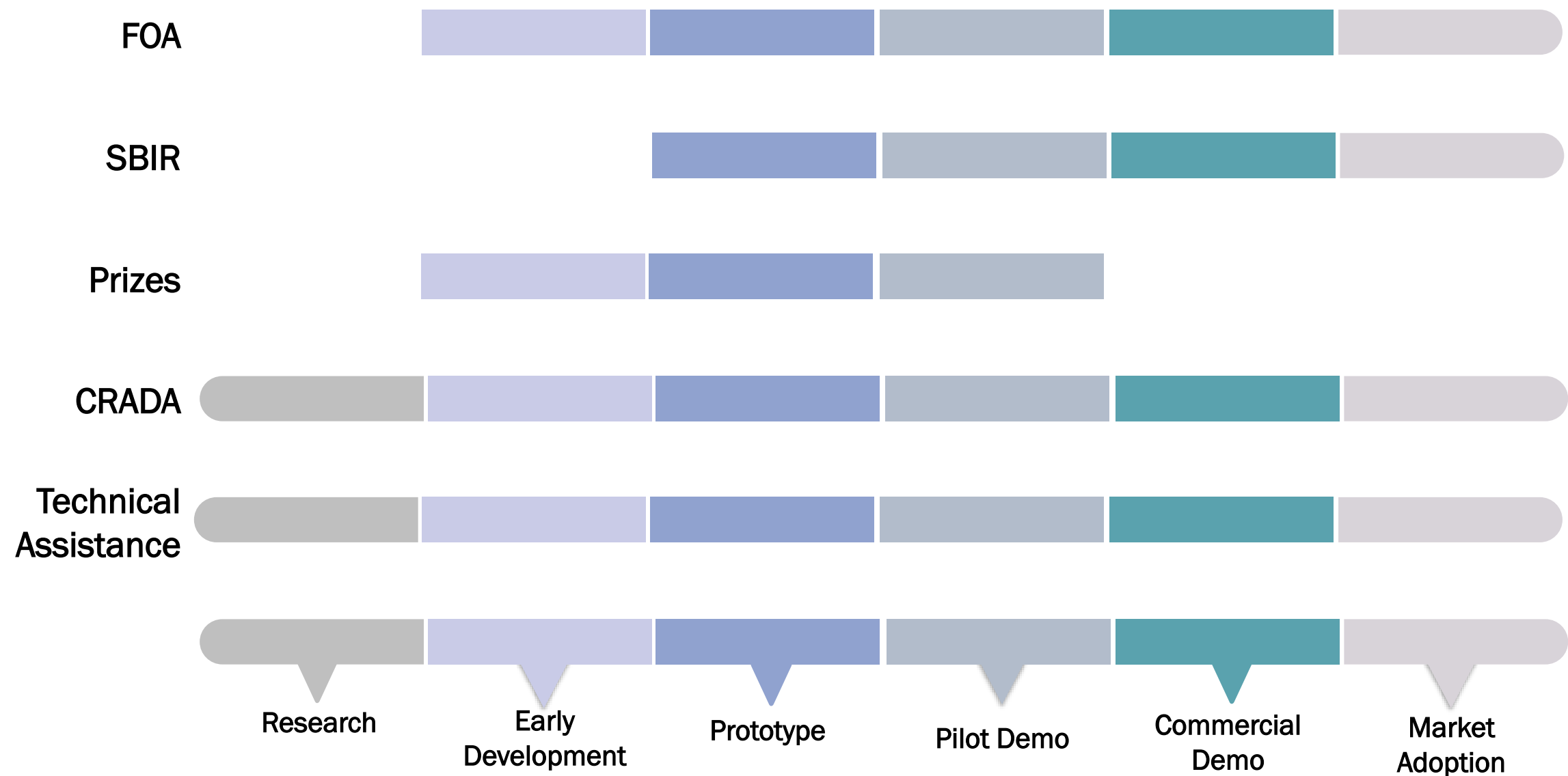
# Hydropower Program's Strategic Objectives



# Range of Activities



# Funding Mechanisms





# Funding Mechanisms

Industry Led

FOA

SBIR

Prizes

CRADA

Technical Assistance

Research

Early Development

Prototype

Pilot Demo

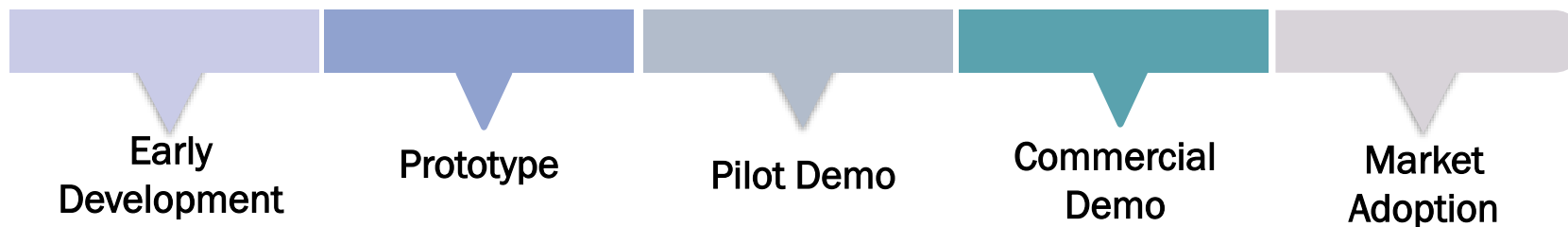
Commercial Demo

Market Adoption

# Industry-Led Mechanisms

## Funding Opportunity Announcement (FOA)

- **Goals:** Long term projects, substantial federal employee involvement, stretch R&D goals, infrastructure building
- **Duration:** 18-45 months
- **Funding:** \$1,000,000 - \$100,000,000
- **Cost Share:** Yes, with limited exceptions. 20% or 50%
- **Type of Recipient:** Academia, Industry, Small Businesses



# FOA Example

## FY19 FOA: Modular Technologies for Low-Head Hydropower Applications

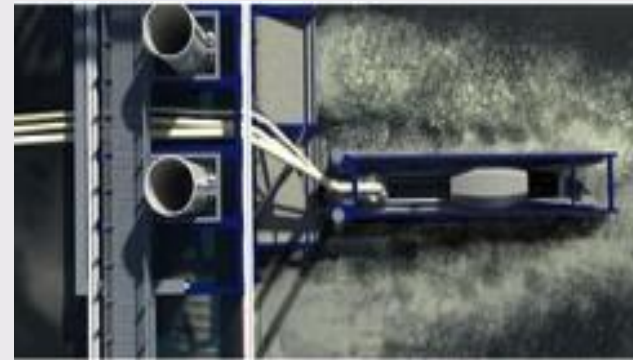
**Funding:** \$1M per award

**Duration:** 24 months

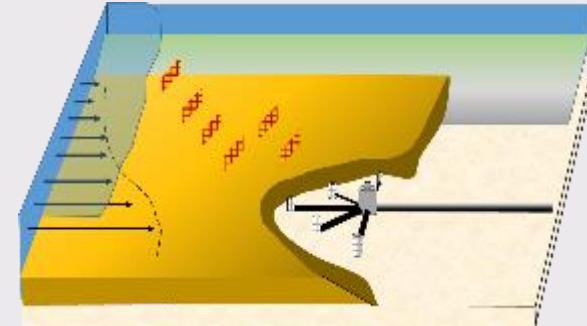
### Objectives:

- Develop transformative modular hydropower technologies that balance performance, economics, and environmental sustainability.
- Leverage advanced manufacturing techniques to lower the cost, increase performance, and/or facilitate rapid deployment of these technologies.

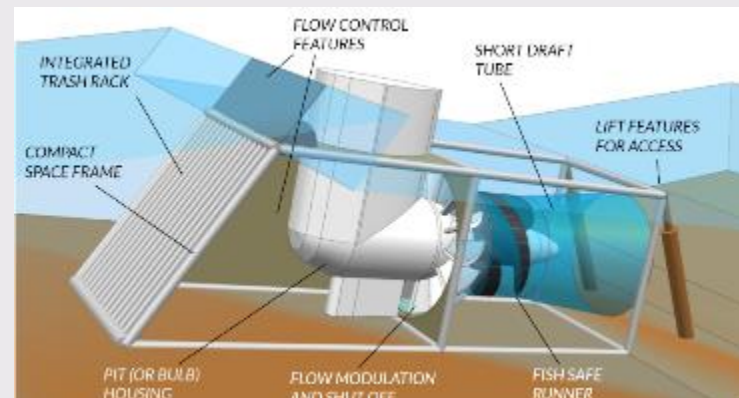
*Littoral Power Systems*



*University of Minnesota*



*Natel Energy*



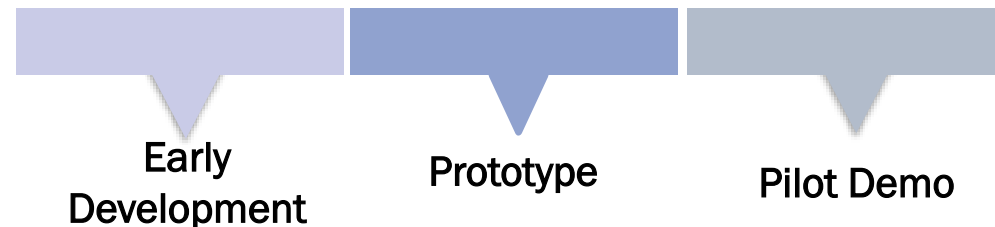
*Percheron Power*



# Industry-Led Mechanisms

## Prizes

- **Goals:** Incentivize the achievement of scientific and technological innovation by offering monetary and nonmonetary benefits (including recognition) to competition participants.
- **Duration:** 9 - 36 months
- **Funding:** \$15,000 - \$5,000,000
- **Cost Share:** None
- **Type of Recipient:** Academia, Industry, Small Businesses, Individuals



# WPTO Hydropower Prizes



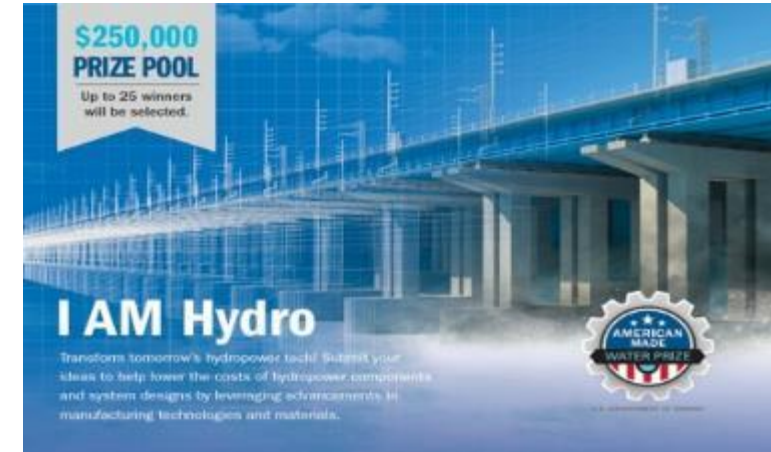
## Fish Protection Prize

- Catalyzing new solutions, designs, and strategies to prevent fish from swimming into water infrastructure.
- \$700,000 of combined cash prizes and voucher support for 9 finalists got to work with PNNL to develop solutions.
- Three winners were selected.



## FAST Commissioning for Pumped-Storage Hydropower Prize

- Next-generation pumped-storage hydropower development and the encouragement of exploration for new use cases of PSH.
- \$550k of combined cash prizes & voucher support
- 9 finalists, 4 grand prize winners.



## I AM Hydro Prize

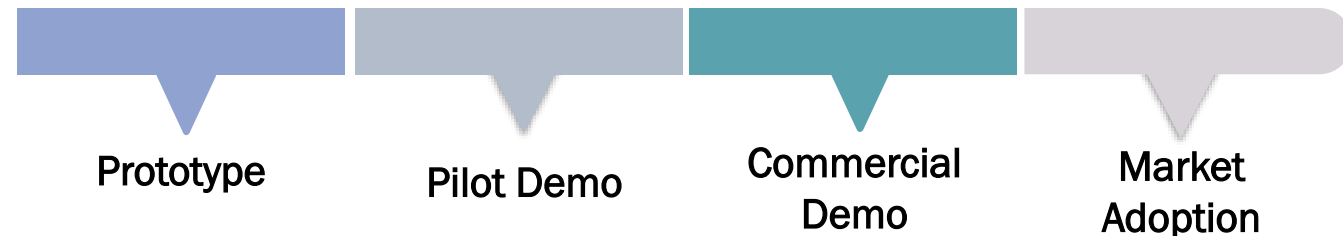
- Lower the costs of hydropower components and facilities by leveraging advanced manufacturing technologies
- The competition distributed up to \$175,000 in cash prizes to 11 winners.



# Industry-Led Mechanisms

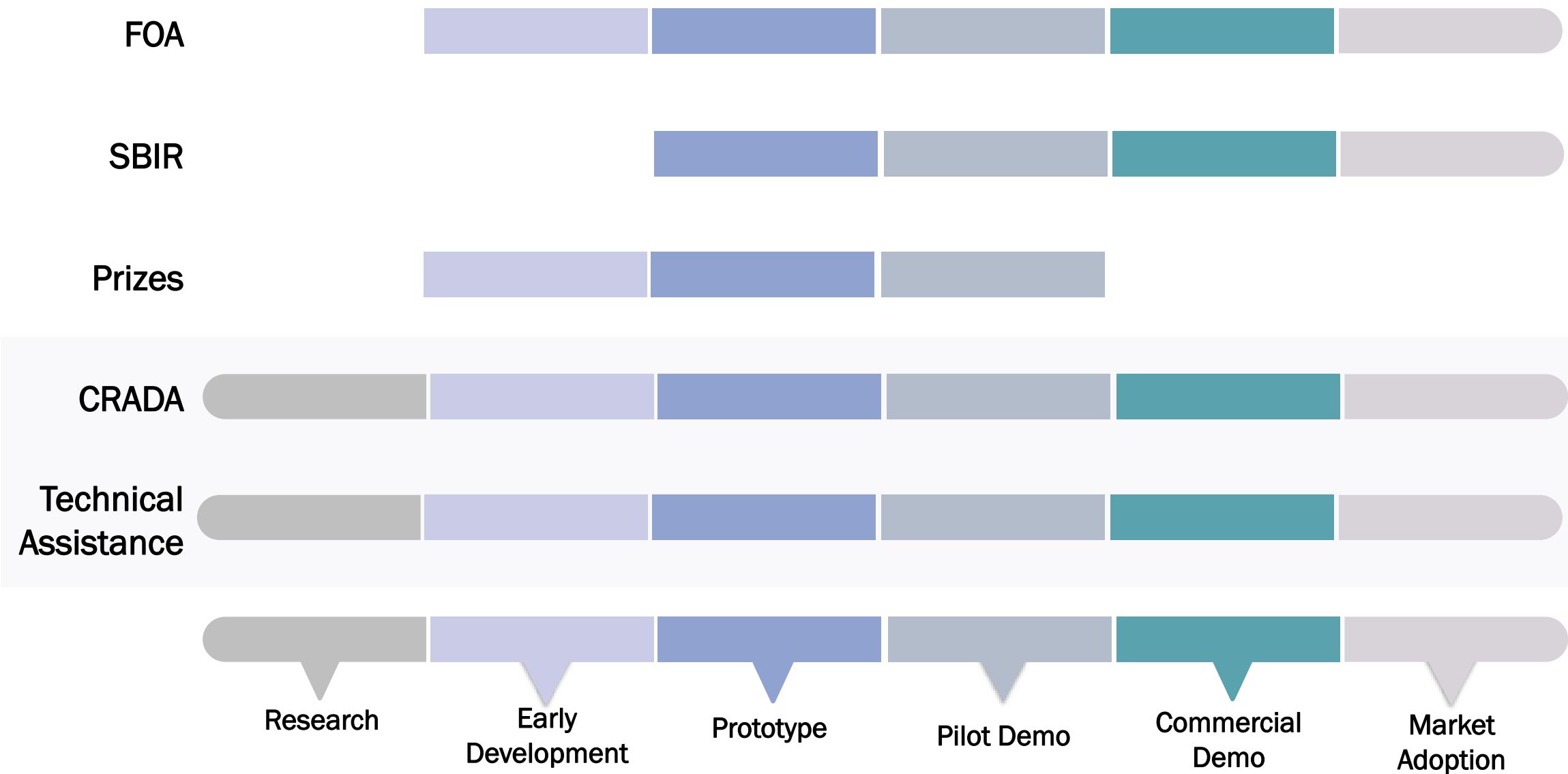
## Small Business Innovation Research (SBIR)

- **Goals:** Use small businesses to meet federal R&D needs and increase private-sector commercialization.
- **Duration:** 12 – 30 months
- **Funding:** \$150,000 - \$1,200,000
- **Cost Share:** None
- **Type of Recipient:** Small Businesses



# Funding Mechanisms

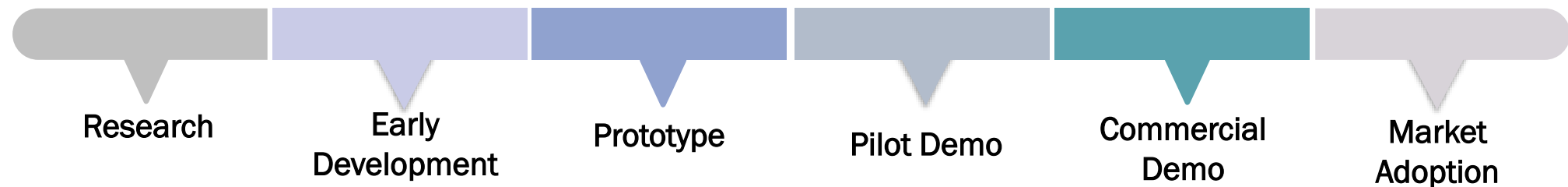
Lab Led



# Industry-Led Mechanisms

## Cooperative Research and Development Agreement (CRADA)

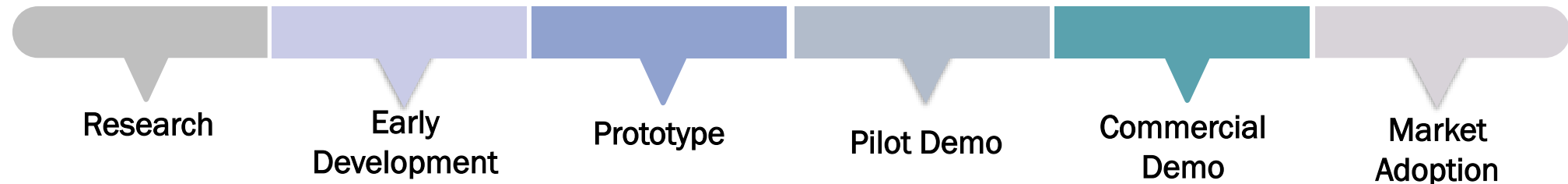
- **Goals:** Collaborative agreement for national laboratories and non-federal partners to optimize their resources, share technical expertise in a protected environment, and commercialize federally-funded technologies.
- **Duration:** 12 – 30 months
- **Funding:** No funding; only technical support
- **Cost Share:** Cash or in-kind
- **Type of Recipient:** Academia, Industry, Small Businesses, Individuals



# Industry-Led Mechanisms

## Notice of Opportunity for Technical Assistance (NOTA)

- **Goals:** Competitively provide non-federal partners access to national lab capabilities, services, facilities, and equipment.
- **Duration:** 12 – 30 months
- **Funding:** No funding; only technical support
- **Cost Share:** Cash or in-kind
- **Type of Recipient:** Academia, Industry, Small Businesses, Individuals



# Other ways to get involved

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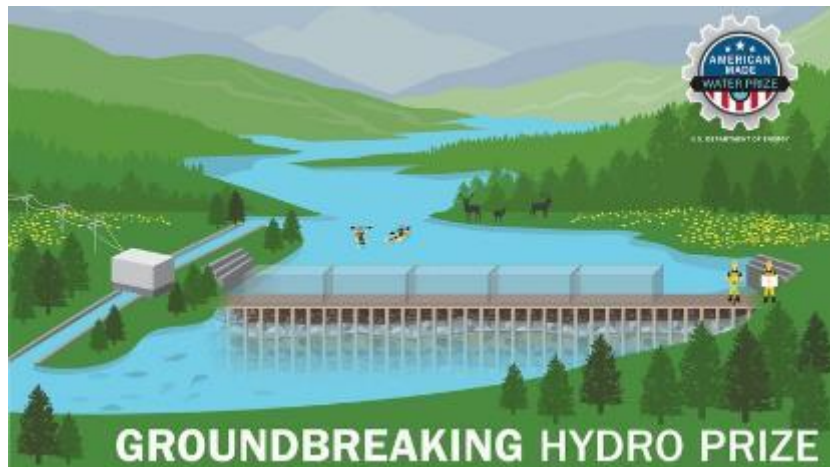
- ✓ Share ideas, challenges, concerns
- ✓ Participate in webinars
- ✓ Serve as a technical advisor
- ✓ Be a reviewer!



# Open Solicitations

## Groundbreaking Hydro Prize

- Up to **\$300,000** in cash prizes!
- Seeks to encourage the development of new ideas to **cut the costs, timelines, and risks** associated with development of geotechnical foundations.
- Deadline is **January 31!**



## NOTA: Improving Hydropower's Value through Informed Decision-Making

- Valued at **\$1.75M!**
- Provides hydropower decision-makers with **National Lab expertise and capabilities** to address challenges and capture opportunities for their systems.
- Up to **6 recipients** will be selected.
- Concept papers due **February 17.**



# How to stay in touch?

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Subscribe to the [Water Wire](#) for funding opportunities, events, publications, and news sent directly to your inbox.



Learn more about WPTO at [energy.gov/eere/water](https://energy.gov/eere/water).



# Questions

- How many people knew about the NOTA and the prize?
- How do you find out when we release funding/technical assistance opportunities? Is anything in this presentation surprising?
- What funding amount is attractive? How low is too low (i.e., I AM Hydro)?
- What motivates you to apply, or keeps you from applying?
- How much time do you need to get approval from your leadership?
- Is technical assistance on its own attractive?

# Digital Twins: A Tool for Modern Hydropower – Virtual Seminar

*Organized by Department of Energy (DOE); Hosted by NHA's Hydraulic Power Committee*

Tuesday, February 2, 1 – 2 pm (eastern)

Free to attend - visit [www.hydro.org/events/](http://www.hydro.org/events/) to register

## Why Participate?

- ✓ Hear experts from DOE, National Laboratories, General Electric, and Chelan County Public Utility District discuss hydropower Digital Twin developments – both benefits and challenges
- ✓ Gain insight on the efforts to create an industry-focused Digital Twin Framework
- ✓ Give feedback for use in shaping the Digital Twin tool.

# Digital Twins: A Tool for Modern Hydropower – Virtual Seminar

*Moderator:* Dr. Mark Christian, Technology Manager, Hydropower Fleet Modernization, Maintenance and Cybersecurity, Department of Energy, Water Power Technologies Office

*Featured Speakers:*

- Alejandro Moreno, Water Power Technologies Office Director, Department of Energy
- Dr. Hong Wang, Senior Distinguished R&D Staff, Oak Ridge National Laboratory
- Dr. Osman Ahmed, Principal Technical Advisor for Advanced Controls, Pacific Northwest National Laboratory
- Achalesh Pandey, Research Director for Industrial Artificial Intelligence, General Electric
- Kirk Hudson, Managing Director of Generation & Transmission, Chelan County Public Utility District



# What Does Innovation Mean to You?

- Panel Discussion
  - Deb Mursch, GE Renewable Energy
  - Gia Schneider, Natel Energy, Inc.
  - Vincent Bryan III, Whooshh Innovations
  - Paul Gay, SMI, Inc.
- Live Q&A



# “Open Mic” Session – Get to Know DOE’s National Labs

## Share your thoughts!

- National Lab Water Power POC’s
  - Vladimir Koritarov (koritarov@anl.gov)
  - Thomas Mosier (thomas.mosier@inl.gov)
  - Al LiVecchi (Al.LiVecchi@nrel.gov)
  - Brennan Smith (smithbt@ornl.gov)
  - Brian Bellgraph (brian.bellgraph@pnnl.gov)



# Industry Events

- Water Power Week
  - April 27 – 29, 2021
  - Virtual Event



- International Conference on Ocean Energy (ICOE)
  - April 28 – 30, 2021
  - Virtual Event



- Clean Currents – Atlanta
  - October 20 – 22, 2021





NHA'S WATERPOWER RESEARCH PORTAL

Consider joining WIC &  
Please visit WaRP

<https://www.hydro.org/resources/warp/>