

U.S. Department of Energy
Advanced Manufacturing Office
Energy-Water Nexus Activities

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- AMO Mission statement
 - Catalyze research, development and adoption of energy-related advanced manufacturing technologies and practices to drive U.S. economic competitiveness and energy productivity.
- AMO Strategic Goals
 - Improve the productivity and energy efficiency of U.S. manufacturing
 - Reduce lifecycle energy and resource impacts of manufactured goods
 - Leverage diverse domestic energy resources in U.S. manufacturing, while strengthening environmental stewardship
 - Transition DOE supported innovative technologies and practices into U.S. manufacturing capabilities
 - Strengthen and advance the U.S. manufacturing workforce



Figure 1.1 Diagram Showing Connections between the Fourteen Advanced Manufacturing Technology Areas (which coincide with the 2015 QTR Manufacturing Technology Assessment Topics), Energy Systems Influenced by Manufacturing, and Emerging and Crosscutting Areas.

Advance transformational technology and innovation to meet the global need for safe, secure, and affordable water. By 2030:

- Launch desalination technologies that deliver cost-competitive clean water.
- Transform the energy sector's produced water from a waste to a resource.
- Achieve near-zero water impact for new thermoelectric power plants, and significantly lower freshwater use intensity within the existing fleet.
- Double resource recovery from municipal wastewater.
- Develop small, modular energy-water systems for urban, rural, tribal, national security, and disaster response settings.





- 5-Year, \$100M+ “early-stage applied research” program (TRL 2-4) from DOE’s Advanced Manufacturing Office (EERE)
- Critical cost share commitments from CA-DWR and SWRCB
- **Goal: Secure a Resilient 21st Century Water Supply through Distributed Desalination and Reuse**



NAWI Alliance

180+ U.S. organizations

- Large Companies
- Small Companies
- Universities
- National Labs
- Federal Agencies
- State Agencies
- Water Utilities
- Non-Profit Orgs

NAWI Research Consortium

3+ Nat Labs
15+ Universities
10+ Industry Partners

The most critical role that the Alliance plays is in helping the RC identify the right PROBLEMS to focus on...



Autonomous operation

Sensors and adaptive process control for efficient, resilient, and secure systems



Precision separations

Targeted removal of trace solutes for enhanced water recovery, resource valorization, and regulatory compliance



Resilient treatment and transport

Reliable treatment and distribution systems that adapt to variable water quality and are robust to corrosive conditions



Intensified brine management

Systems optimization to maximize brine reuse, process innovations to displace thermal distillation, and materials research for cost savings



Modular membrane systems

Materials, manufacturing, and operational innovations to extend membrane systems into new applications



Electrified treatment processes

Electrifying water treatment processes and facilitating clean grid integration

Alliance Members

Industry stakeholders

Researchers

Policy stakeholder

Utilities

End-users

Source
Water
Roadmap
Team

**Lead
Cartographer**

10–20 participants per map

3 month research

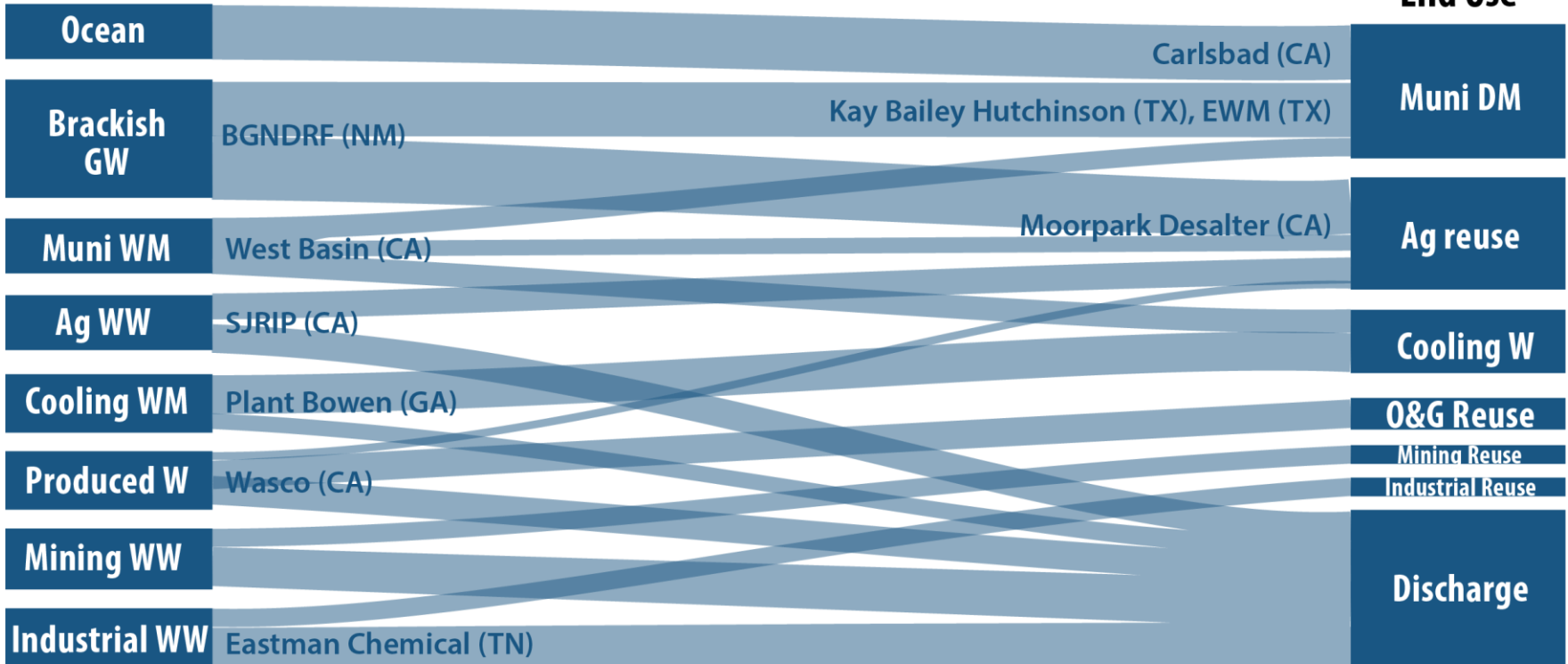
3 month synthesis/review

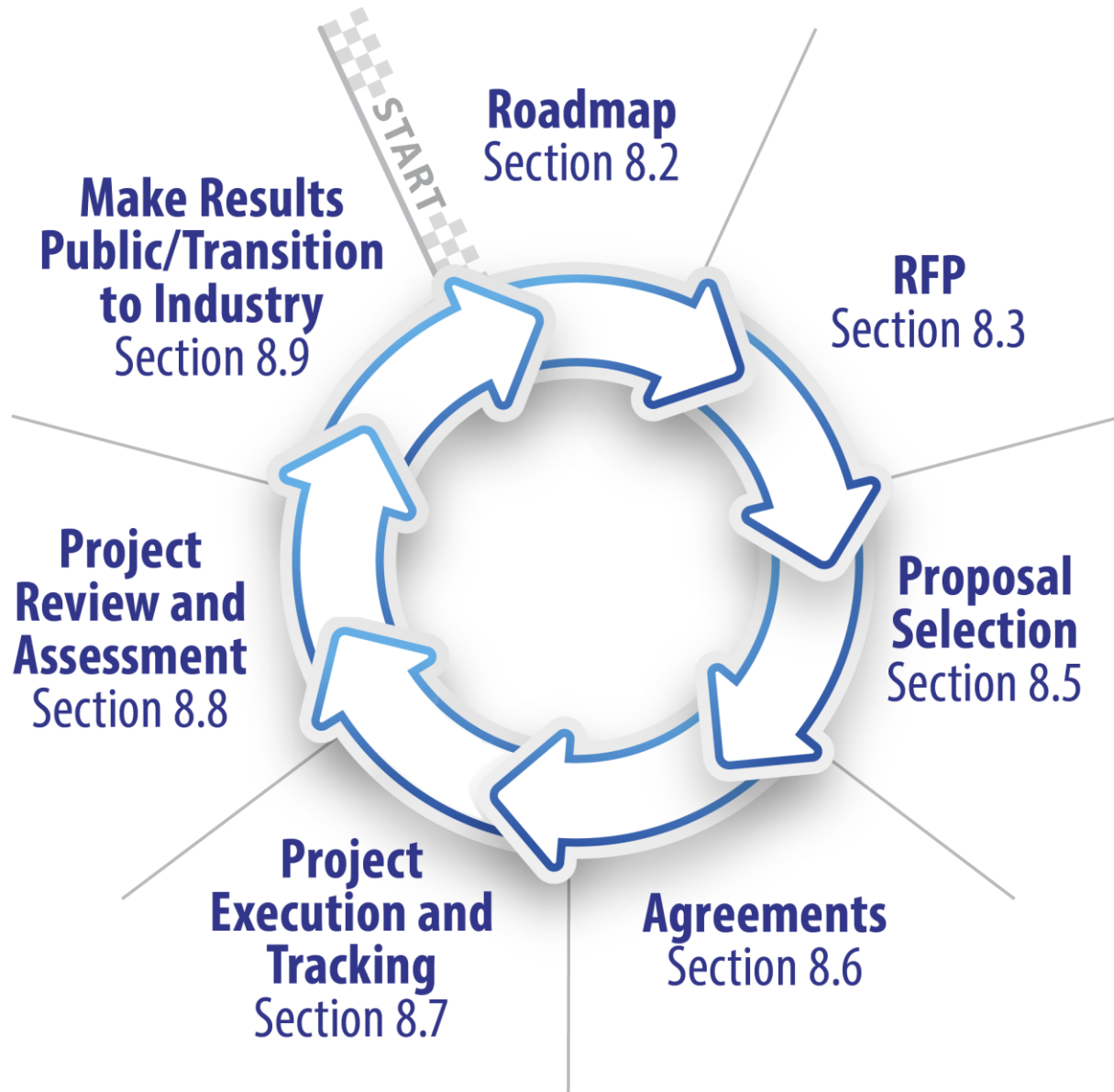
Outcome:

- Industry-reviewed roadmap
- Peer-reviewed publication

Non-traditional Water Source

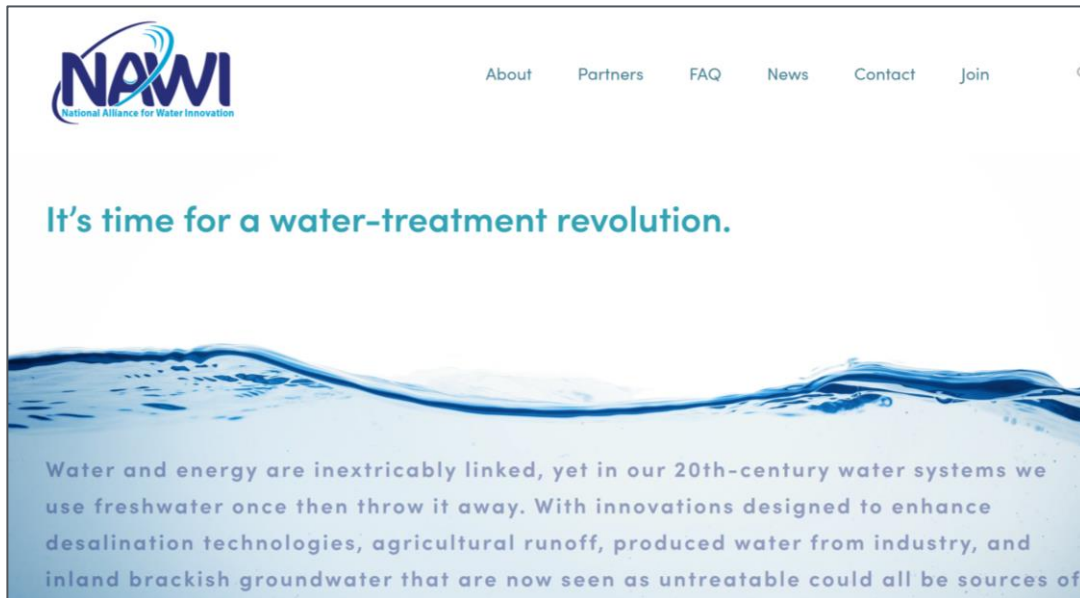
End Use





- Register your interest in joining a roadmap team by filling out this form:
<https://www.surveymonkey.com/r/RT6KSQG>
- Talk to NAWI leadership at upcoming meetings
 - Imagine H2O Water Innovation Week – March 24-26, San Francisco, CA
 - NAMS – May 16-20, Tempe, AZ

For more information: go to the nawihub.org website and direct others to register to receive updates (extensive FAQ is there...)



www.nawihub.org/partners

- \$100m in Energy-Water Desalination Hub (just started)
- \$20m in a Water Security Grand Challenge FOA (FY20, Spring)
 - Water/Wastewater topic based on congressional language
- Partnership /TA activity (ongoing)
 - Water accelerator and water tools for better plants program
 - IACs look at water efficiency
 - \$1m Water Resource Recovery Prize (Water Security Grand Challenge)
 - Upto \$4m in technical assistance for water/waste water facilities
- FY20 Small Business Innovation Project R&D topic (ongoing)
 - Energy Recover Device topic for small, modular desalination systems
 - Slightly related, ocean plastics topic
- Strategic Analysis (ongoing)
 - Industrial waste water analysis paper under development by LBNL, NREL, etc.
 - Other analysis ongoing and will be coordinated with NAWI and WSGC activities

- Key 2020 Activities related to water
 - Jan: Water Resource Recovery Prize Launch
 - Feb: WSGC RFI on water-efficient cooling
 - Feb: EPA WRAP released
 - March: SETO Solar Desalination Prize Launch
 - April-June: NAWI workshops for developing R&D roadmaps
 - April: FY20 FOA for Water/Waste Water R&D
 - Late Summer: NAWI releases 1st RFP