



The Water Security Grand Challenge

Interstate Council on Water Policy/National Water Supply Alliance
Washington DC Roundtable Meeting
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Today

- DOE's Energy-Water Nexus Activities: Background & History
- The Water Security Grand Challenge
- Next Steps



The Water Security Grand Challenge

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

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



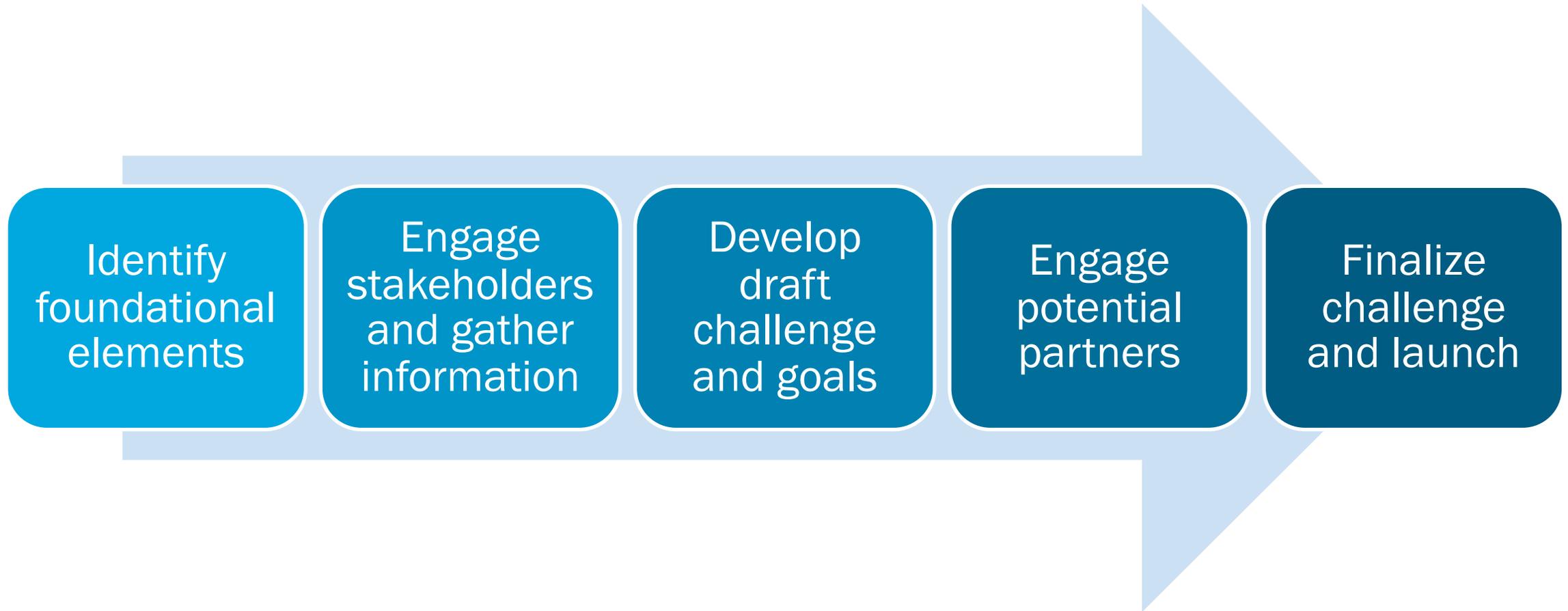
What is a Grand Challenge?

A Grand Challenge is a big, difficult problem that, if solved, would bring significant benefits to society. Grand Challenges often include the following important characteristics:

- They feature a measurable end-point that is highly ambitious but achievable
- Drive the need for collaboration between multiple disciplines, some of which do not normally interact
- Are too big to be undertaken by one or even a few organizations
- Capture the imagination of the public, thereby facilitating strong support for the resources required to achieve the goals



Water Security Grand Challenge Process





White House Roundtable & Stakeholder Engagement

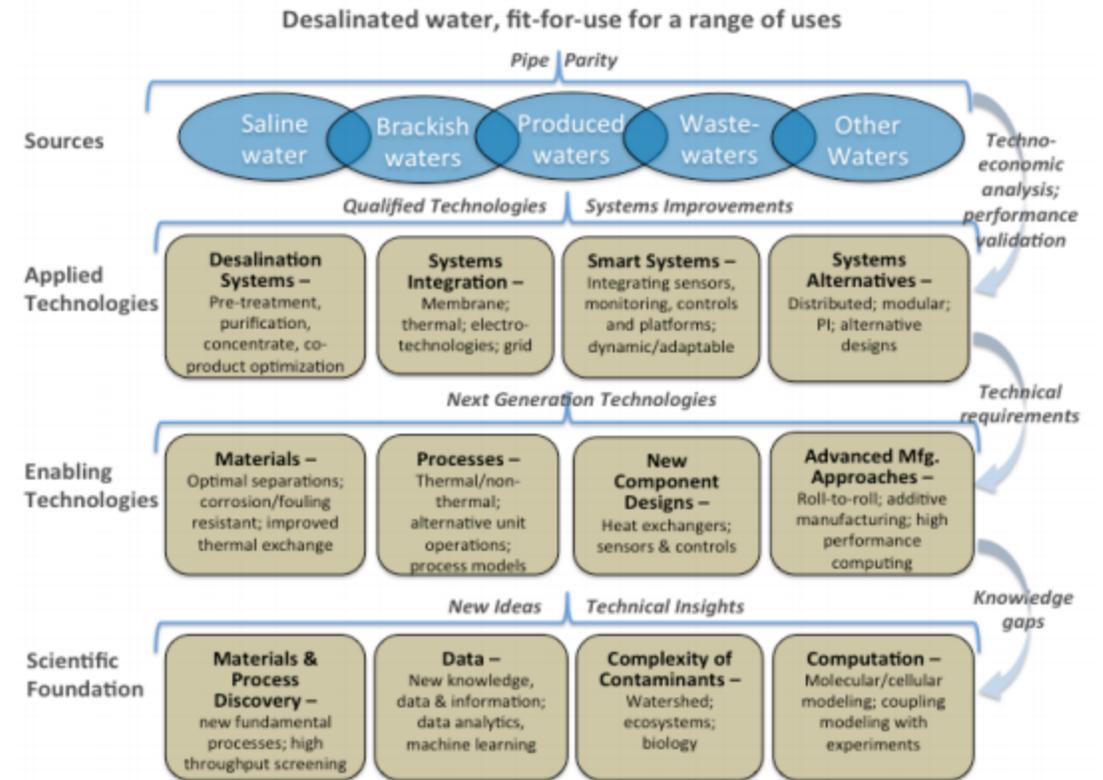


- Secretary Perry convened leading experts on water quality and prizes to inform the development of the Grand Challenge
- Formal Request for Information released the same day to gather broader views from the public



Select Activities: Energy-Water Desalination Hub

- DOE's \$100-million Energy-Water Desalination Hub will focus on early-stage R&D for energy-efficient and cost-competitive desalination technologies, including manufacturing challenges, and for treating non-traditional water sources for multiple end-use applications.
- DOE has organized the Hub into four technical topic areas:
 - Materials Research and Development
 - New Process Research and Development
 - Modeling and Simulation Tools
 - Integrated Data and Analysis



Illustrative example of the Energy-Water Desalination Hub Technical Opportunity Space



Select Activities: Waves to Water Prize

- Waves to Water Prize will provide \$2.5 million to advance small, modular desalination systems that use the power of ocean waves to provide potable water to remote and coastal communities.
- The prize seeks to accomplish three goals:
 1. Evaluate the economic basis for small-scale modular wave power desalination;
 2. Demonstrate desalination and marine renewable energy integration; and
 3. Validate technologies in a field test setting that meet quantifiable benchmarks for freshwater production, ease of installation, cost and reliability/survivability

Four-Staged Competition



Stage 1: Ideation contest



Stage 2: Detailed Technical Submission



Stage 3: Prototype Build



Stage 4: Demonstration Contest



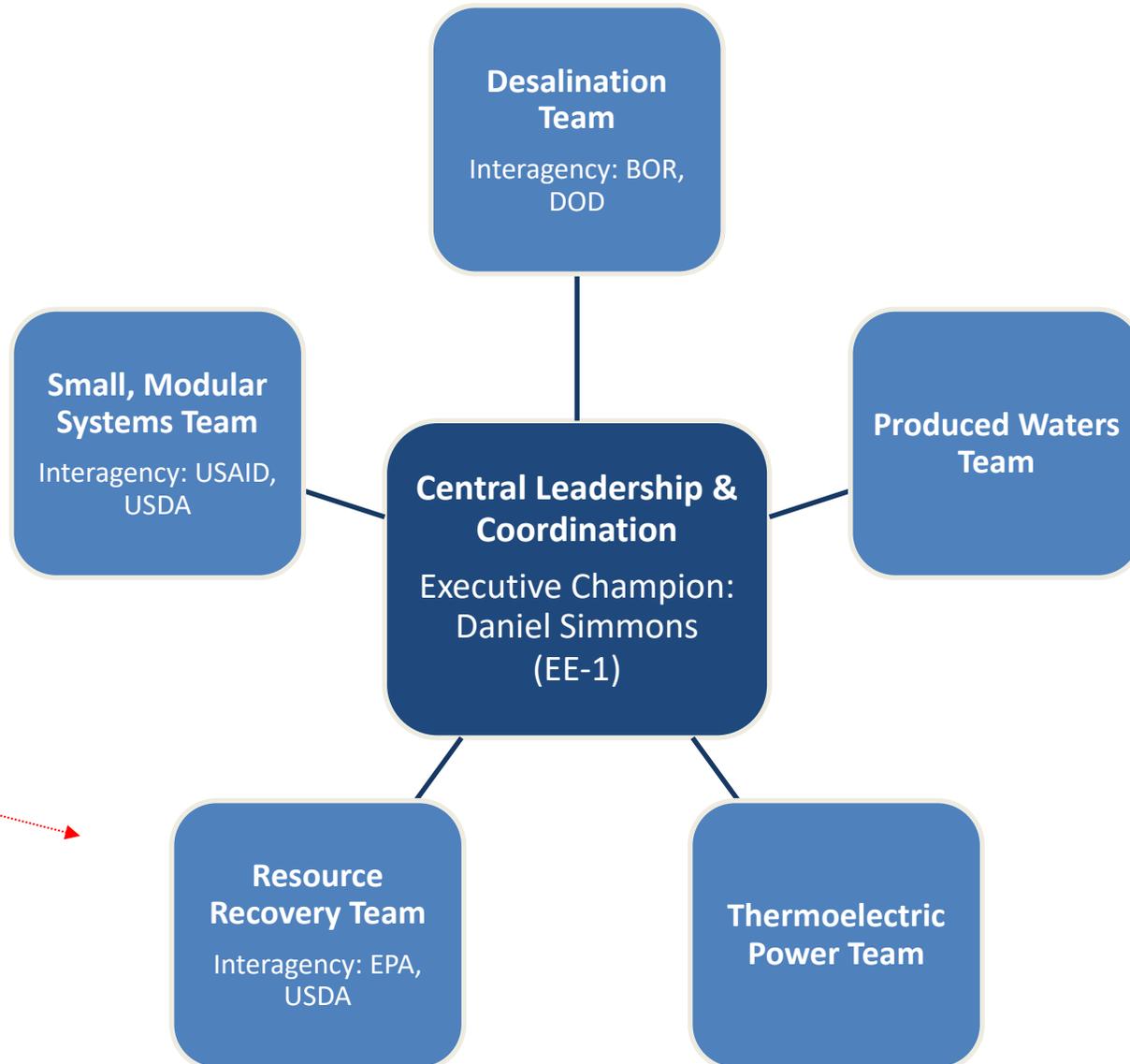
Building the Pipeline of New Solutions: Grand Challenge Workshop

- Held October 25, 2018 at DOE's National Renewable Energy Laboratory (same day as Grand Challenge launch)
- About 80 stakeholders from multiple sectors
- Split into breakout groups aligned with Grand Challenge goals
- Brainstormed prize ideas spanning technologies, business planning, regulatory frameworks, data visualization, software/apps, public awareness, student engagement





Building the Pipeline of New Solutions: Cross-Cutting Teams



Internal DOE prize experts advise teams on prize development; leverage GSA resources

Cross-cutting, interagency teams have been formed to:

- Develop new prize proposals
- Advance our understanding of key barriers and opportunities in each goal area
- Coordinate and inform future R&D and related activities
- Identify and pursue high-impact partnerships
- Track and coordinate communications opportunities



Leveraging Partnerships to Expand Impact

- In addition to its interagency partnerships, DOE is working with private and non-profit organizations to expand the reach and impact of the Water Security Grand Challenge. This includes formal agreements with:
 - Chevron Technology Ventures, which launched a contest seeking cost-effective solutions for managing produced water from oil and gas exploration;
 - The Water Council, which is developing a series of prizes to drive innovation on new water technologies, such as sensors to support intelligent water systems, advanced filtration and alternative disinfection
- DOE is also engaging less formally with a broad range of external organizations such as the Electric Power Research Institute, the Water Research Foundation, and the Water Environment Federation.



Next Steps

- Ongoing work across the five teams
- New prize proposals discussed in late April
- Continued coordination with interagency and external partners



Questions?

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