U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

U.S. Department of Energy

Marine Energy to Hydrogen Working Meeting

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Water Power Technologies Office

Hydropower

Modernizing the Existing Fleet

Pumped Storage

New Low-Impact Projects

Marine Energy

Wave

Tidal, River and Ocean Current

Ocean Thermal (OTEC)

Outyear Priorities for WPTO

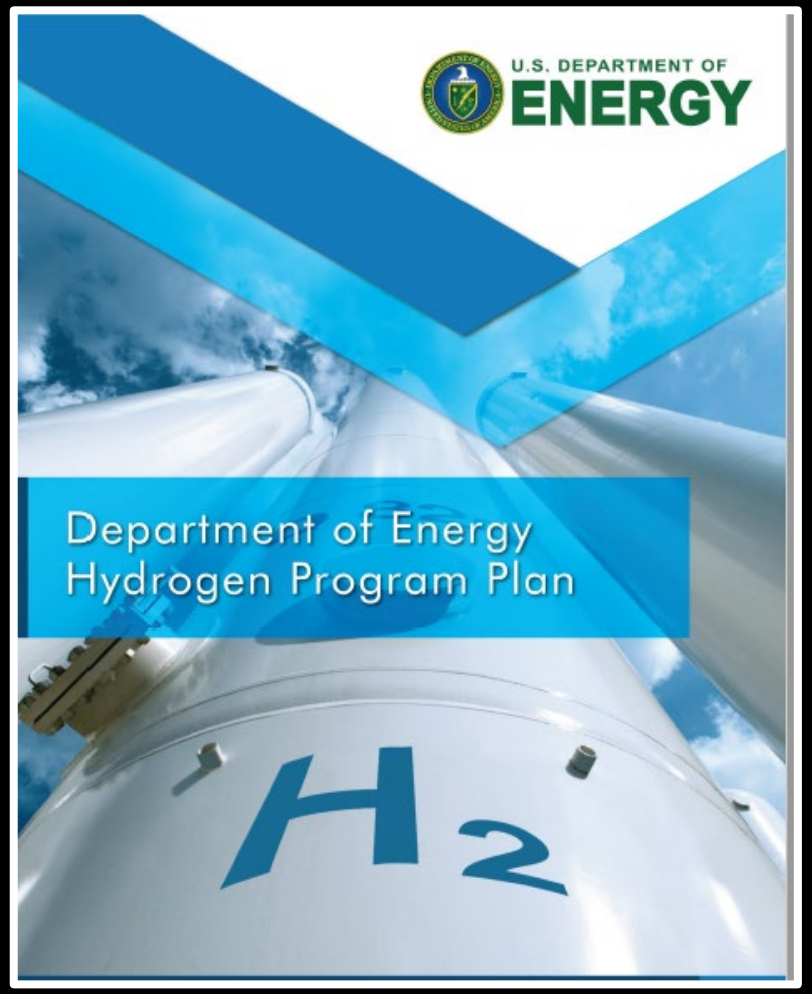
Top Priorities

1. Optimize U.S. hydropower and PSH to support renewables integration and a 100% clean energy grid.
2. Ensure 21st century hydropower is environmentally sustainable and fully resilient to climate change.
3. Reduce the costs of grid-scale marine renewable energy to enable a fully-renewable grid.
4. Deploy marine energy systems to catalyze and unlock new economic, climate resiliency, and scientific opportunities in the ocean.
5. Develop and advance water power and water systems to increase resiliency critical for remote communities and hard-to-decarbonize applications.

Oceans, Climate, and the Economy

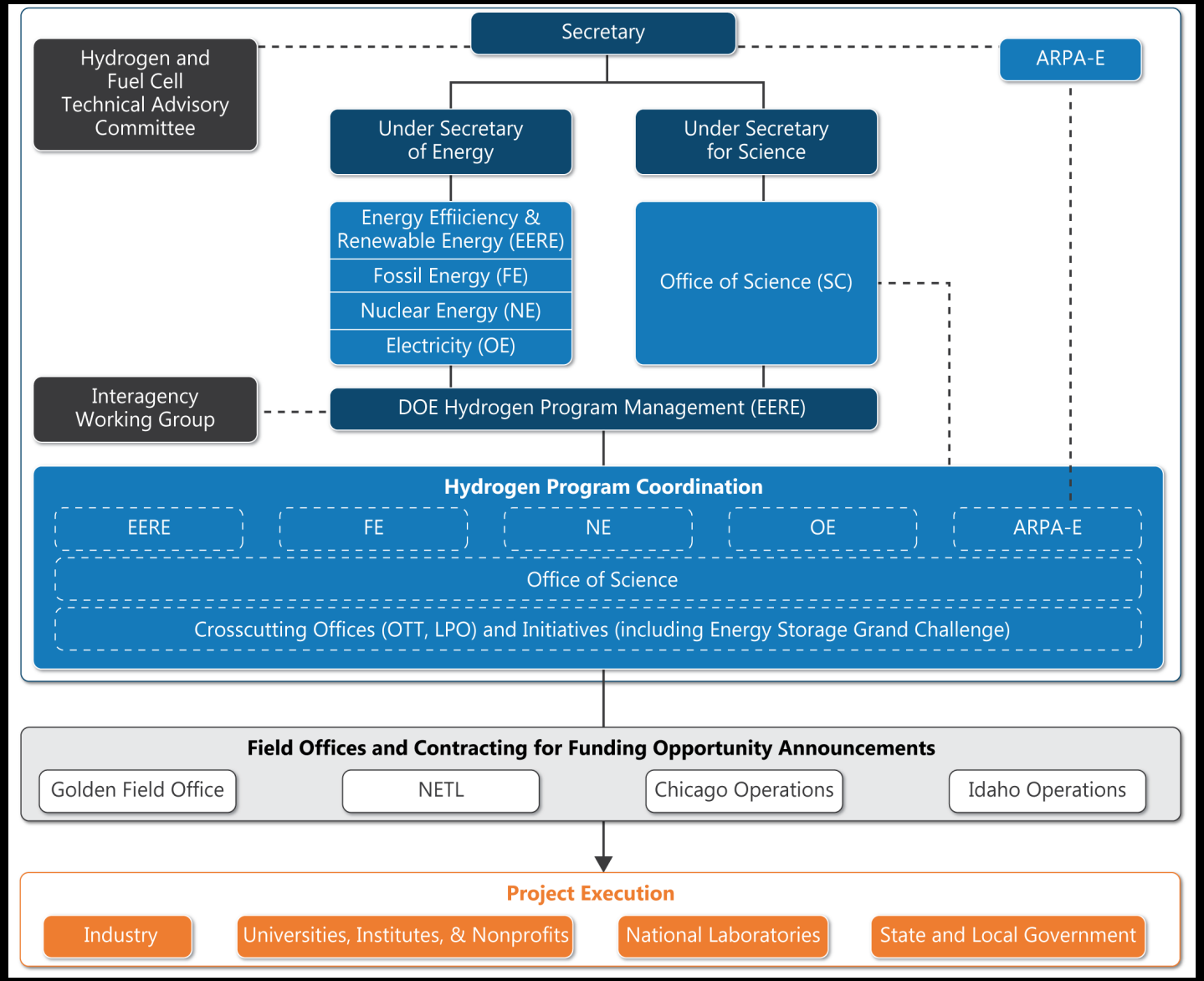
- **The ocean's contribution to emissions reductions, and a more equitable climate future, derive from four sectors:**
  - Ocean Energy
  - Maritime Decarbonization
  - Low Emission Seafood
  - Healthy Ecosystems and Carbon Storage
- **Underlying these four pillars are core values that tie together, constrain, and focus how we use the ocean to support climate change mitigation:**
  - Equitable energy transitions supporting coastal communities
  - Support sustainable growth in the blue economy
  - Improve energy system reliability and increase flexibility to achieve decarbonization goals
  - Leverage public private partnerships, and the full capacity of the federal R&D and science mission

DOE's Hydrogen Program, Led by the Hydrogen & Fuel Cell Technologies Office



www.hydrogen.energy.gov

A multi-office collaboration



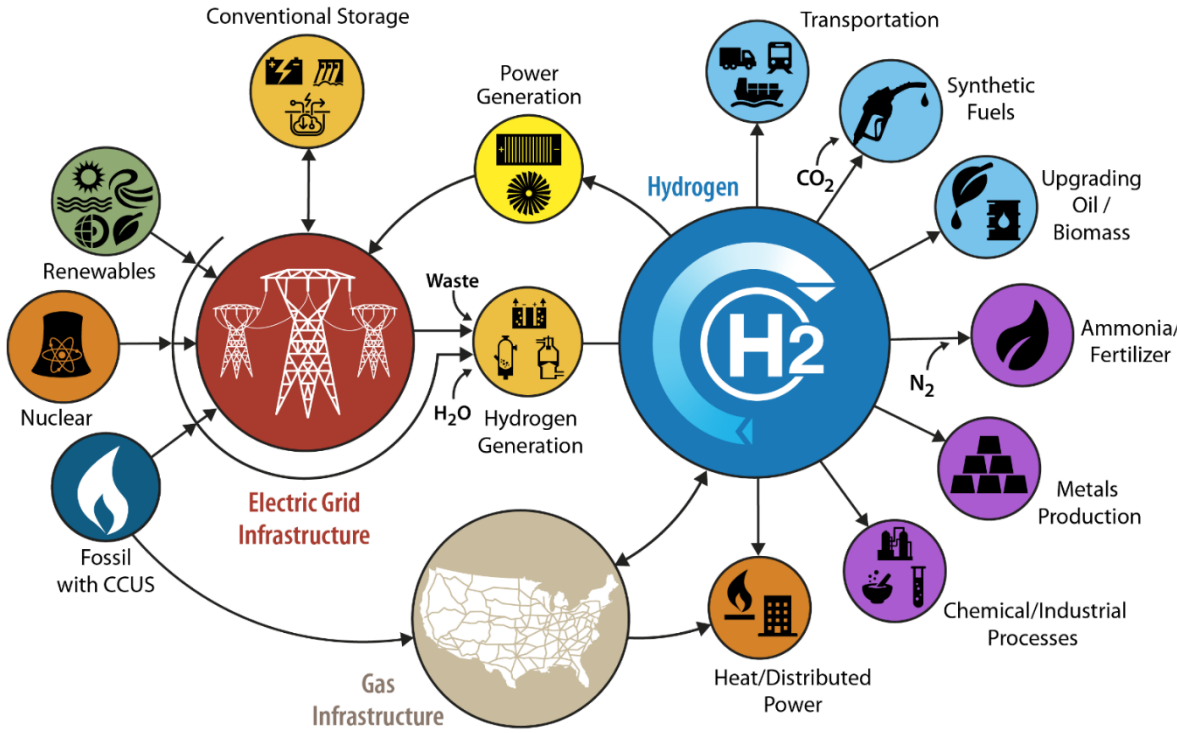
A Common Vision for Hydrogen Around the World

Addressing energy security, energy efficiency & resiliency, economic growth, innovation & technology leadership, as well as climate change & environmental justice

Global Action Agenda Aspirational Targets:
"10, 10, 10"
10M systems,
10K stations, 10 years

H2@Scale
U.S. Department of Energy

enabling affordable, reliable, clean, and secure energy across sectors



https://www.energy.gov/eere/fuelcells/h2scale

Today's Mission: Exploring Marine-to-H_2 Opportunities & Challenges

Opportunities

- New ways to leverage untapped marine energy resources *including vast coastal and deep-water resources*
- Renewable synthesis of clean H_2 and value-add co-products *supporting energy, transportation and industrial sectors*
- Exploiting inherent advantages of chemical energy transport
- Leveraging global advances in the H_2 energy revolution

Challenges

- Reducing costs in electrolyzer systems and balance of plant
- Advancing TRL of diverse marine energy technologies
- Optimizing coupling of marine resources with H_2 generation
- Mitigating effects of marine environments on integrated systems
- Reducing costs with innovations such as direct seawater splitting

Special Thanks to the Trailblazers!

Thank You

& Have a Great Meeting!

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