

# U.S. DOT Maritime Administration

US Navy Decarbonization Research Consortium  
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META – Decarbonization and Related Projects

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**META = Maritime Environmental and Technical Assistance program**

## **Our Charge/Mission:**

*The Secretary of Transportation, acting through the Maritime Administrator, shall engage in or support the study, research, development, assessment, and deployment of emerging marine technologies and practices related to the maritime transportation system through eligible entities.*

Established in 2010

- Annual Budget of \$7.5M/Expecting \$10M in FY2025
- Main Areas of Focus
  - Port/Vessel Air Emissions/GHG/Decarbonization
  - Aquatic Nuisance Species (BW/Hull Fouling)
  - Vessel-generated Underwater Noise
  - Safety

- **Historic lack of Federal investment in R&D compared to other transportation modes**
- **Ultimate goal is to get data on “what works” for maritime applications in support of a:**
  - Safe, competitive, efficient US Maritime Transportation System
- **Additional benefit of “de-risking” emerging technologies**
- **NOT classified a DOT R&D program**

- **Collaboration w/other government agencies, industry stakeholders, NGOs, academia**
  - **U.S. Federal partners include: DOE, USCG, EPA, Navy, NOAA, National Labs, DOT Modes**
- **Focus areas related to decarbonization: criteria pollutant and GHG emissions reductions, alternative and renewable fuels, energy efficiency applications, green technologies (fuel cells, batteries), multimodal modeling**
- **Results: peer-reviewed articles, white papers, industry guidance**
  - **Informs regulatory/policy actions**
  - **Informs industry on “what works”**
- **Inform industry and USG policy**
- **<https://www.maritime.dot.gov/innovation/meta/maritime-environmental-and-technical-assistance-meta-program>**

## Maritime Decarbonization

- **Microgrid Demonstration at Port of LA**
  - Demonstrating solar and windwall technology for terminal operations
- **Liquid hydrogen tank design study**
  - Investigate new tank designs
- **Ship Alternative Fuel and Emissions Toolkit (SAFE-T)**
  - GHG calculator and other information
  - [www.safet.io](http://www.safet.io)
- **Global Routing Energy and Emission Network for Transportation (GREEN-T)**
  - Multimodal origin/destination optimization tool
- **Vessel Carbon Capture and Storage Feasibility Study and Technoeconomic Analysis**
  - Feasibility study publicly available
- **Vessel Carbon Capture Demonstration**
  - Partnering with Carbon Ridge and Crowley
- **Hybrid/Battery Electric Vessel Demonstrations**
- **Vessel Emissions Inventory Database**
  - More accurate idea of what US vessels are contributing for GHGs
  - Linking in vessel generated underwater noise

- **Low Carbon Fuel/Tech Vessel Demonstration**
  - META advertises subject-specific RFPs, annually
  - Recently funded demonstration of hybrid dredge spread and shore side megawatt charging system
- **Vessel Energy Efficiency and Decarbonization Guide**
- **Battery Electric Workboat Techno-economic Analysis**
  - Completed Oct 2023
- **Blue Carbon Study**
  - Focused on submerged aquatic vegetation carbon sequestration at Port of San Diego
  - Completed Oct 2023
- **Future Energy Options Studies (deep dive into what feasible for regions)**
  - Great Lakes
  - California
  - Gulf of Mexico
- **Lifecycle Emissions Analysis**
  - ICE vs Battery Electric
- **Low Carbon Fuel Engine Testing**
  - Methanol and ammonia for Category II engines

- **Further FC demonstration for maritime applications**
  - Discussions w/Navy and DOE
- **Renewable Methanol for a 2-Stroke Compression Ignition Engine in a Dual-Fuel Mode**
  - Ongoing testing at ORNL/ANL
- **U.S. Fleet Decarbonization Economic Analysis**
- **Additional regional future fuel studies (i.e. East Coast)**
- **Computational Fluid Dynamics (CFD) Modeling the Design of Vent Masts for Hydrogen Vessels**

- **Mandated from FY23 NDAA**
- **Resides under the META Program**
- **NOFO expected to be released in April 2024**
- **Expected to pick/award “Secretariat” in Summer 2024**
- **Mechanism is a cooperative agreement**
- **Secretariat will work with MARAD to bring members into the Center**
- **Center members will be comprised of industry, government agencies, NGOs, and academia**



## Our Charge:

- facilitating the development and use of clean energy and necessary infrastructure to support the deployment of clean energy on vessels of the United States;
- monitoring and assessing, on an ongoing basis, the current state of knowledge regarding emerging marine technologies in the United States;
- identifying any significant gaps in emerging marine technologies research specific to the United States maritime industry, and seek to fill those gaps;
- conducting research, development, testing, and evaluation for equipment, technologies, and techniques related to marine environmental protection;
- providing guidance on best available technologies;
- conducting technical analysis; assisting with understanding complex regulatory requirements; and documenting best practices in the maritime industry, including training and informational webinars on solutions for the maritime industry; and
- working with academic and private sector response training centers and Domestic Maritime Workforce Training and Education Centers of Excellence to develop maritime strategies applicable to various segments of the United States maritime industry, including the inland, deep water, and coastal fleets.

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**Webpage with links to reports**

**<https://www.maritime.dot.gov/innovation/meta/maritime-environmental-and-technical-assistance-meta-program>**