

SCIENCE ADVISORY BOARD

NOAA Response to SAB

Fleet for the Future: Achieving a Net Zero Emissions (NZE) NOAA Fleet by 2050

Adena Leibman, Senior Advisor to the NOAA Administrator

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Outline

- Summary of SAB Charge
- NOAA Vision for a Fleet for the Future
- Challenges and Opportunities
- Current Activities
- The Path Forward



Summary of SAB Charge

- Outline for a Phase 1 Study
 - Requested propose, goals, potential partners, and a strategic plan
- Requests for specific information/analyses and SMART goals



NOAA Vision for a Fleet for the Future

- As the nation's lead agency in the application and operation of oceanographic, atmospheric, and climate sciences, NOAA has the responsibility to be a leader in mitigating the climate impact of its operations.
- Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad," and Executive Order 14057, "Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability," acknowledge that the climate crisis will require both significant short-term global reductions in greenhouse gas (GHG) emissions and net-zero global emissions by mid-century or before.



Six Guiding Principles

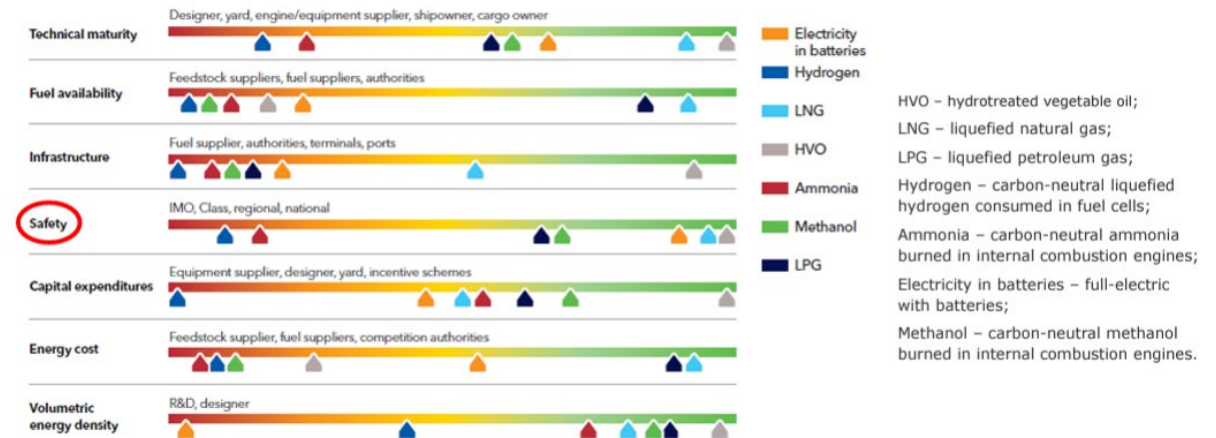
- Define “net-zero emissions” as accounting for ship-based greenhouse gas emissions, as well as shoreside facilities and activities, supply chain (e.g., fuel and supplies), logistics, and other opportunity areas for emissions reductions, such as increased telepresence and use of uncrewed systems. NOAA will prioritize direct emissions reductions over offsets.
- Capitalize on cross-agency collaboration and technical assistance opportunities (e.g., Department of Energy and Department of Transportation), as well as international efforts and examples from other governments, industry, and academic institutions, to achieve net-zero through a robust plan.
- Harness public-private partnerships to develop new technologies and designs nimbly and creatively, and to support the New Blue Economy.
- Share NOAA’s plans and findings as widely as possible to encourage uptake internationally and by the private sector.
- Use the effort to build a diverse workforce of the future both in the broader maritime community and within the NOAA Commissioned Officer Corps.
- Look for opportunities in its annual budget proposals to begin socializing the Fleet for the Future and request investments from Congress.



Challenges

1. Alternative Fuels
2. Fuel and Port Infrastructure
3. Vessel Improvements, Capacity, and Uniqueness
4. Workforce
5. Costs

The Alternative Fuel Barrier Dashboard –
indicative status of key barriers for selected alternative fuels in 2020





Opportunities

NOAA aims to harness the domestic and international momentum to build on its own 2050 decarbonization strategy, and to inspire others to join as collaborators and leaders in their own maritime efforts.

Additional capacity requirements will provide NOAA with a unique recruitment opportunity, pending available appropriations, to support not only particularly skilled wage mariners and NOAA Commissioned Officer Corps members, but also acquisition specialists, engineers, and program managers that can design and implement a robust Fleet for the Future program.



Current Activities

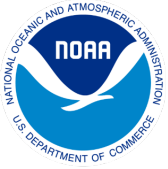
NOAA has begun the transition and is proactively taking actions to reduce emissions and increase efficiencies within the current and future fleet and associated shoreside infrastructure and operations. NOAA has identified three strategies that can mitigate the impact of its activities on GHG emissions and support the transition of the NOAA Fleet to net-zero emissions by 2050. These include:

- Avoiding future GHG emissions through smart design and climate-informed decision making.
- Reducing GHG emissions through greater efficiencies and reduced energy consumption, in fleet Shipboard Energy Efficiency Management Plans.
- Innovating through partnerships to capitalize on research and development and new technologies.



Current Activities

- Industry engagement
- Departmental collaboration
- Emissions reductions
- Operational and management strategies
- Technology integration
- Maintenance approaches



The Path Forward

Achieving a net zero-emissions fleet by 2050 will require:

- Knowledge transfer from other nations, U.S. Federal agencies, State experts, academia, and private sector leaders to merge rapidly into a NOAA plan.
- Phased procurement of new vessels (and retrofit, where possible) for all classes and missions of vessels incorporating fossil-fuel reduction and elimination technologies, as available appropriations allow.
- A cross-agency mission coordination and efficiency strategy to continue emissions reductions during the fleet rebuilding timeline.
- Workforce training/retraining, including within the NOAA Commissioned Officer Corps.
- Refreshed NOAA workforce and Corps recruitment materials and tactics.
- Consistent, committed, and multi-year funding to support the long-term *Fleet for the Future* strategy, including supporting a dedicated staff to drive the program forward.
- Robust, forward-looking requirements for the *Fleet for the Future* utilizing a net-zero-emissions fleet and autonomous and uncrewed systems.



The Path Forward

The *Fleet for the Future* will offer:

- Expanded NOAA leadership in fleet management and climate change mitigation.
- Additional ecological benefits beyond emissions reduction and climate change mitigation through additional quieting technologies and other advances in vessel design and construction.
- A new pathway to engage with potential staff and Corps officers who have a particular interest in clean energy technologies.
- Renewed investment in public-private partnerships.
- U.S. leadership as one of the world's largest fleets of net-zero-emissions research vessels.

Roadmap for a Net-Zero Emissions NOAA Fleet by 2050

- Determine the solution space for the transition to net-zero by 2050 (e.g., NOAA-wide, just the fleet)
- Establish net-zero targets and target boundary. Need to provide a common, science-based understanding of net-zero. Set intermediate and long-term targets based on technical, bureaucratic and economic factors impacting each emission source.
- Confirm mitigation tactics for achieving net-zero goal:
 - Avoid future GHG emissions through smart design and climate-informed decision-making
 - Reduce GHG emissions through greater efficiencies, reduced energy consumption and use of renewable energy
 - Innovate through partnerships to capitalize on research and development and new technology and develop platform-specific technical pathway
 - Invest in removing GHG from the value chain (i.e., offsets)
- Establish baseline. Knowing the GHG footprint is critical to being able to design and deliver effective solutions.
 - Determine quantification method
 - Define scope of emissions to be included
 - Audit GHG emissions by sources (platforms and activities) and quantities
- Design tracking system and metrics
- Estimate resources required to implement net-zero roadmap