

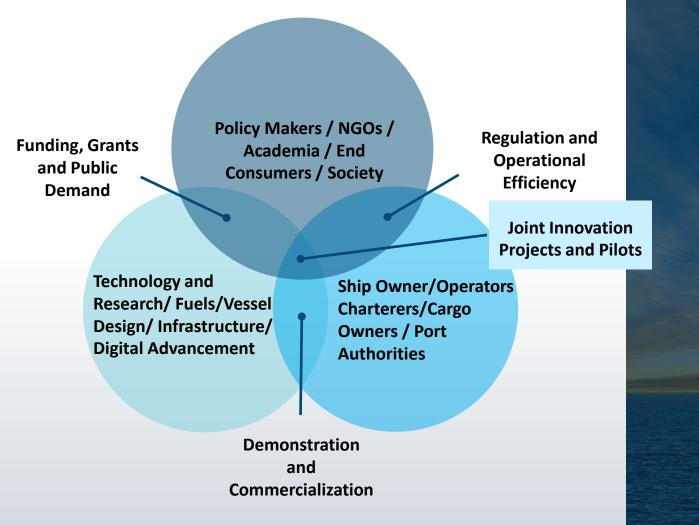
Roadmap to Maritime Net-Zero Greenhouse Gas Emissions

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Upper Mississippi River Conference; Western IL University Moline, IL | 16 & 17 October 2024

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Who is the Blue Sky Maritime Coalition?



We are a non-profit group of like-minded companies, NGOs, public entities and individuals in North America coming together to:

- Collaborate among stakeholders on how to achieve net zero emissions through various workstreams
- Evaluate, encourage and engage -through varying pathways and projects -innovation that reduces emissions
- Accelerate the North American maritime value chain's pathway to net zero emissions



Value Chain Approach

• Direct Organizations

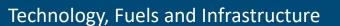
- Ship Owner/Operators
- Charterers/Cargo Owners
- Fuel Manufacturers
- Shipbuilders and Design Engineers

Indirect Organizations

- Classification Societies
- OEMs
- Port Authorities
- Other Transportation Sectors

Supporting Organizations

- Financiers and Insurance
- Legal/Service Providers
- NGOs and Academia
- Infrastructure
- Community Organizations
- Society and End Consumers



U.S. Policy, Regulation and Incentives

Finance, Commercial and Chartering

Measurement and Operational Efficiency

Projects and Innovation Delivery

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Innovation, Systems Thinking and Transition Management

Vessels that will operate in 2050 are being built now, Jones Act vessels up to 50-60 year lifespans Energy density and bespoke vessels: There is no "one-size fits all" fuel solution



Innovation

- Disruptive; challenge the status quo
- Thrive on creativity, dissent and friction
- "Use" focus on problems / solutions
- Learn by doing; be the future

Systems Thinking

- Solve system optimization first
- Eliminate "Tragedy of the Commons"
- Incremental AND vision-led milestones
- Preach to the choir to reach critical mass

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Long lead time in clean energy technology supply chain and infrastructure development



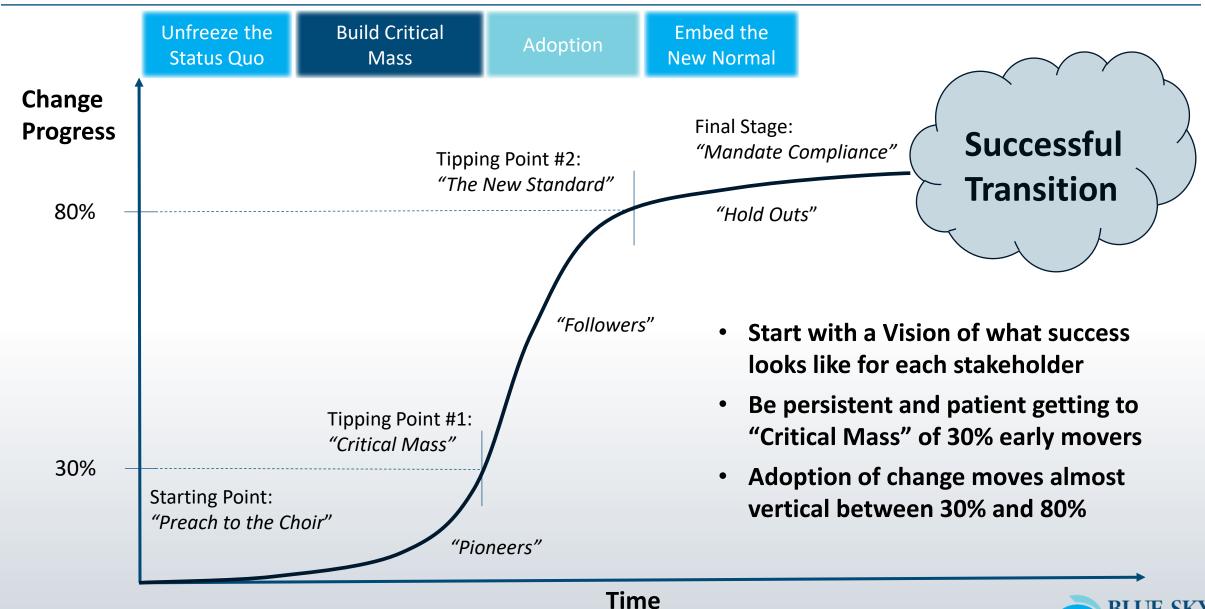
plus new experience needed

Transition Management

- Change management fundamentals
- Low hanging fruit; early wins; economical
- Innovative technology, fuels and infrastructure
- Policy enablers; Regulatory clarity
- Innovative commercial / financial constructs
 - Financing and market measures
 - Chartering and owner/operator models
- Digital Innovation; machine learning predictive algorithms
- Collaborative action; green shipping corridors
 - Primary focus on GHG emissions vs. fuels
 - Pragmatic/profitable; fuel flexibility and efficiency
 - Connectivity with multiple value chains



Principles of Change (or Transition)



Transition Roadmap (vision-based action planning)

Short-term actions; Now to 2030	2030-2040 Milestones	2040-2050 Milestones	Vision of 2050 +	
Vessel Owners & OperatorsData collection; funding based on short-term economic value addedVessel Charterers (Cargo owners and consumers)Demonstratic co-OP model maximize ves capacity utilized	30% uptake of a " chartering model types and areas sel	of operation Poincing Maritime Net- pemonstrating Maritime Net- pemonstration and approval of pemonstration and approval of pemonstration and approval of pemonstration and approval of pemonstration and approval of pemonstration and approval of pemonstration and approval of pemonstratic	Standardizatic oughos Standardizatic predictive flexibility throughouse of "traffic flexibility throughouse of "traffic flexibility throughouse of "traffic flexibility throughouse of "traffic standardization model control" predictive optimization model	B B SOPTIMITATION
Create Public/Private new processes that en and regulation that en	sure timely policies	In he se	onstra Map re	ed-threads for ceholders.
Policy Makers & Regulators	Co-development of fuel infrastructure and dema equipment that can con fuels at the scale require	s, regulations, and to deliver sume new Build secure data platforms and	d predictive from subscription of the second	backwards uccess to drive action plans.
Fuel Providers, Infrastructure (Digitalization and Systems Optimization Providers		

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Short-term Challenges and Actions

Built in Maritime System Inefficiencies and Siloed Approaches

- Enable Optimization Through Digitalization
- Accelerate Green Shipping Corridor Initiatives
- Monetize Value Chain Approach

Lack of Trusted, Accurate & Verifiable GHG Emission Inventories for NAWT

- GHG Emissions Study for North American Waterborne Transportation
- Emissions Data Collection System
- Establish Common Emission Methodologies

There Is No "One-size Fits All" Solution for Vessels

- Support Development of Pilot/ Demonstration Projects
- Develop Condition-based Approaches for Retrofits

Fuel and Energy Infrastructure Lacking Demand to Reach Scale

- Green Shipping Corridors Fuel Clusters
- Fuel Production & Utilization Mapping
- Multimodal Aggregated Fuel Demand
- Port/ Utility/ Maritime Collaboratives

Patchwork of Policy and Regulations

- Develop Approval Roadmap for Regulatory Processes
- Design Inclusion Pathway for Domestic Maritime in National Action Plans
- Develop Incentives for Uptake of Emission Reduction
 Technology Solutions for Maritime

Customer Willingness to Pay

- Develop Innovative Commercial/ Financial Constructs
- Grow Maritime Participation in Carbon Credit Markets
- Develop Consistent Carbon Intensity Values



Initial Action Themes

• **Systems Efficiency**: Work with the same vision binationally, and (eventually) globally, to drive systems changes and efficiencies.

- **Collaborative Innovation:** Embrace innovation and disruptive change. Enable optimization through collaboration.
- Transformational Technologies: Drop in fuels (economic challenges) and innovations like Carbon Capture, Utilization and Storage (CCUS)

- Use data collection for predictive algorithms that drive fuel efficiencies ("air traffic control" and "code share partnerships")
- Build anonymous data files for eventual autonomy (somewhat similar to aviation)
- Compatibility and not standardization
- Develop an approval process for regulation
- NOT "Business as usual with a different fuel"
- Work with other transportation sectors on drop in fuels (renewable Diesel for maritime)
- Multimodal aggregated fuel demands
- CCUS onboard maritime vessels











Thank You

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