

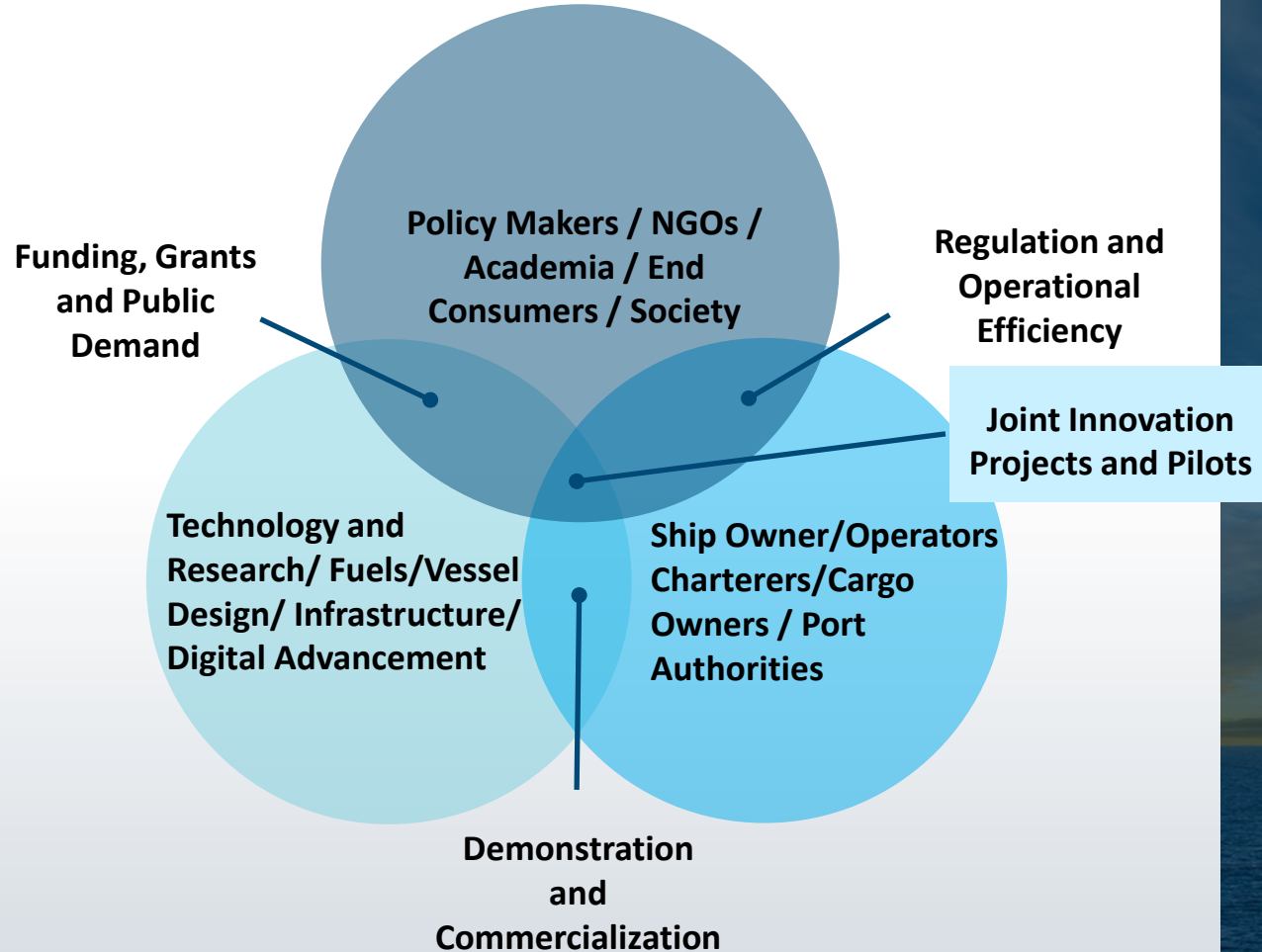


Roadmap to Maritime Net-Zero Greenhouse Gas Emissions

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Who is the Blue Sky Maritime Coalition?

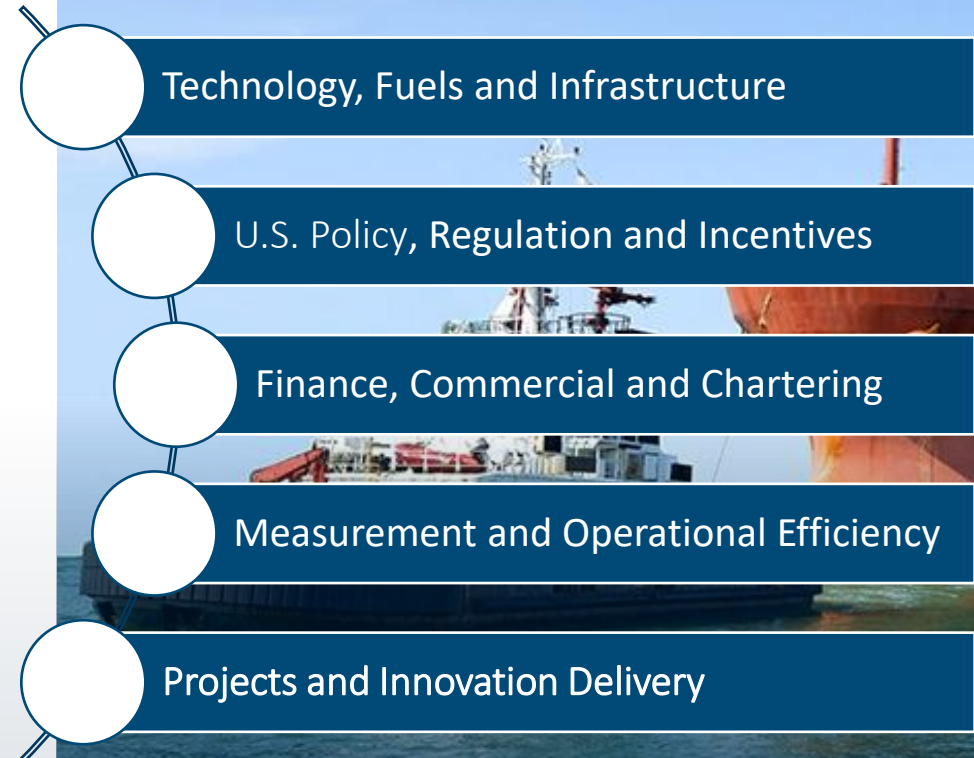


We are a non-profit group of like-minded companies, NGOs, public entities and individuals in North America coming together to:

- 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



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

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

Workforce shortages in traditional maritime sector, plus new experience needed

Innovation

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

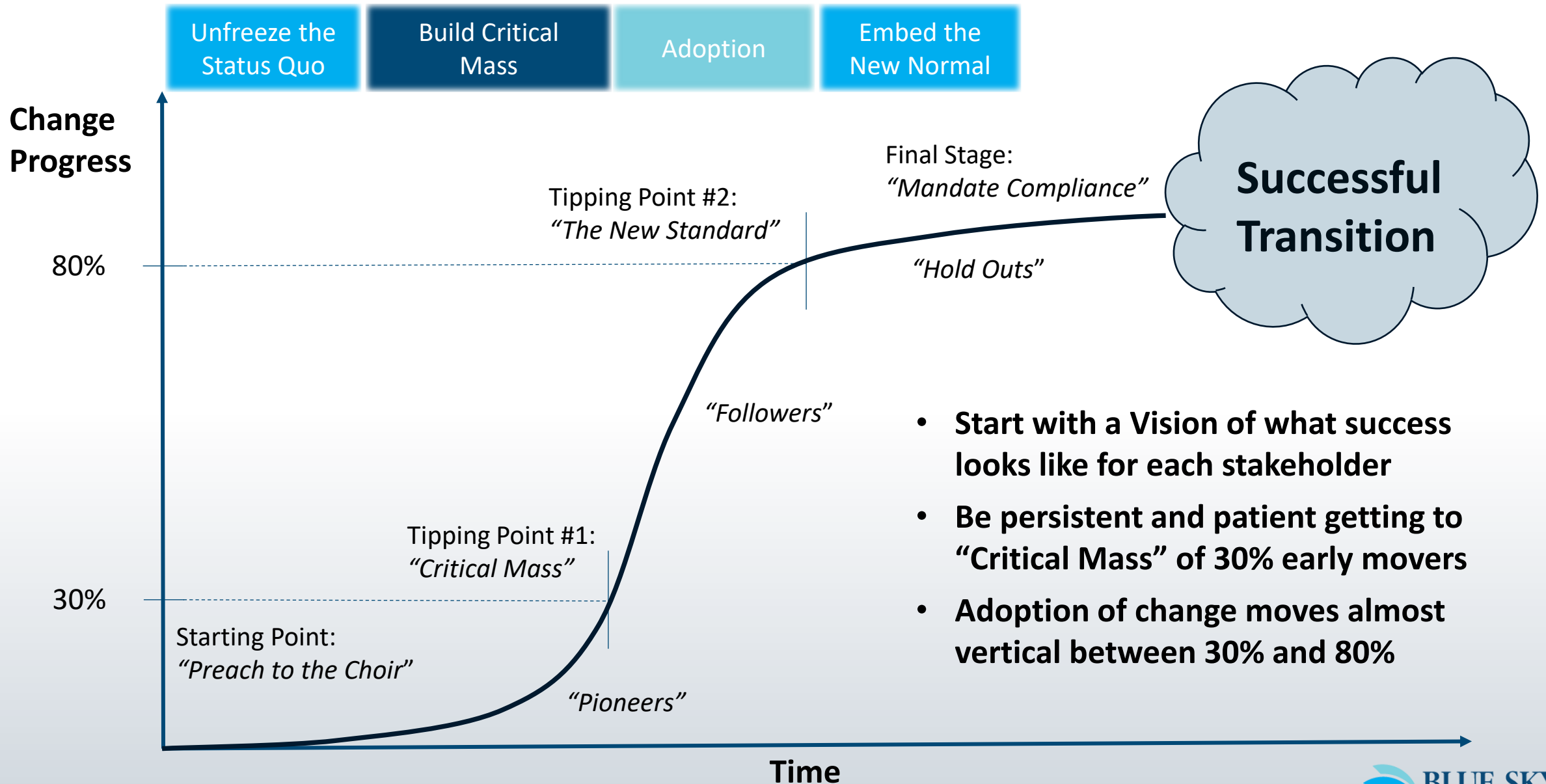
Systems Thinking

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

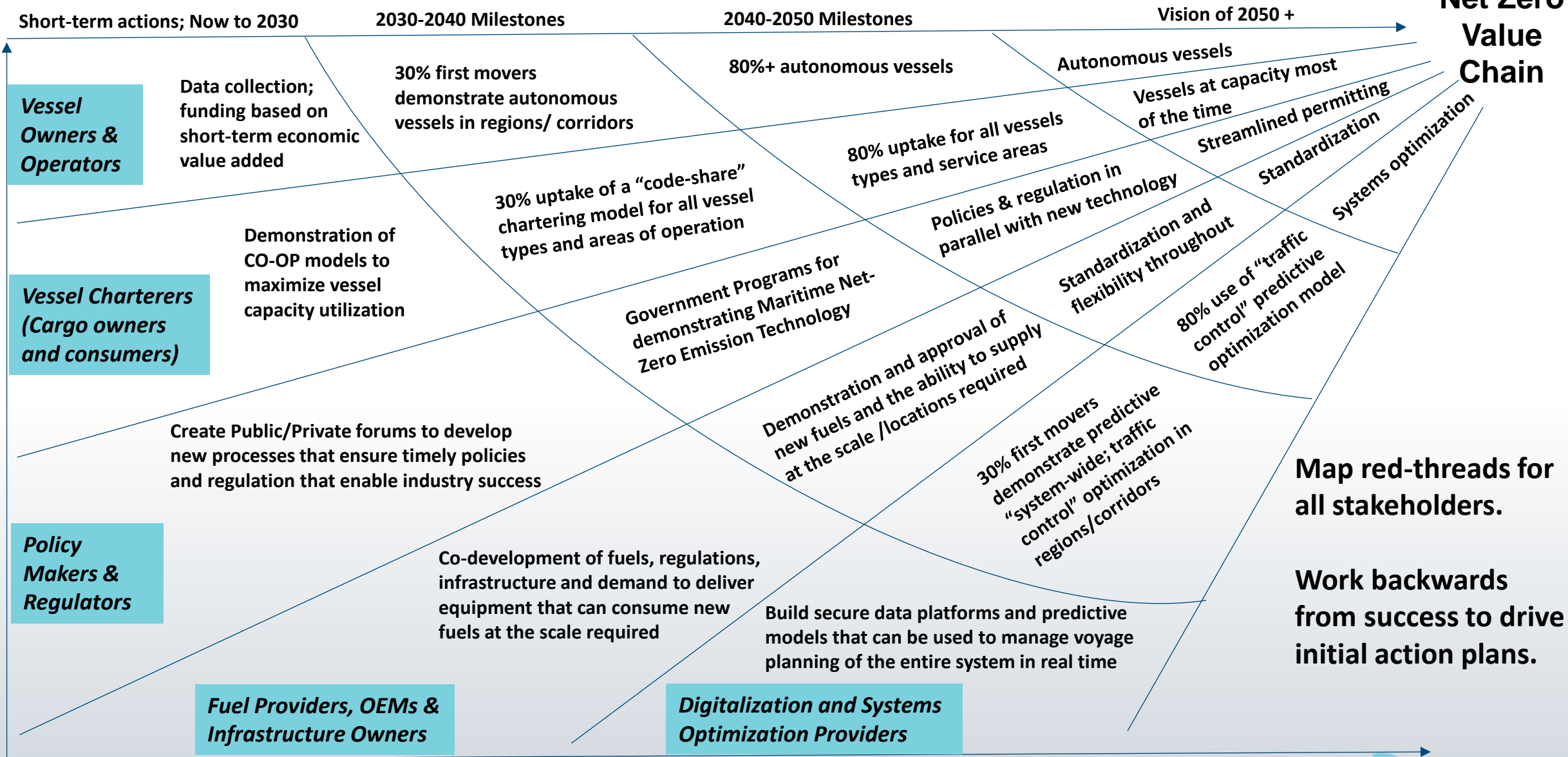
Transition Management

- 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 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

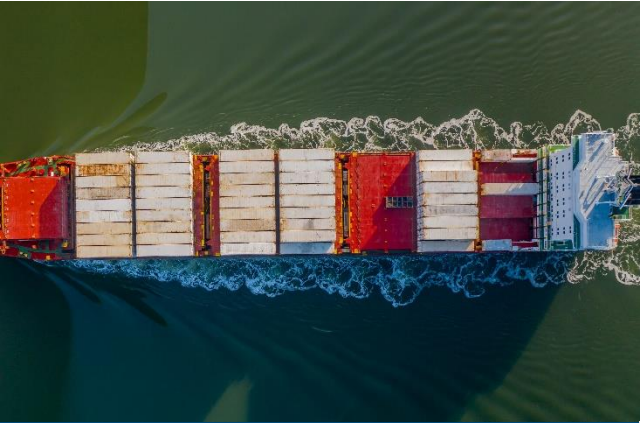
Customer Willingness to Pay

- 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

Q&A





Thank You

www.bluesky-maritime.org

