Acceleration, Incubation & Investment

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The maritime industry paid nearly $4.5 billion in wages in 2015 with average salaries of $65,300. In comparison, the state’s average wage in 2015 was $56,700 (does not include benefits).

Industry-wide, revenues have grown 2.4% per year from 2012 to 2015, with the largest growth rate in Maritime Logistics & Shipping at 5.2%.
The Blue Economy

“the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem.” – World Bank
The Blue Economy

“Will double to $3 Trillion by 2030 – but if, and only if, we are focused on innovation and sustainability.” – OECD
Washington State’s Strategy for the Blue Economy

Vision: Washington State will be home to a world-class, thriving, and sustainable maritime industry by 2050.
Growing Gateways

World-Class Cluster

Thriving, Low Carbon Industry

Global Innovation Hub

21st Century Workforce

Washington State’s Strategy for the Blue Economy

INDUSTRY, INNOVATION AND INFRASTRUCTURE

DECENT WORK AND ECONOMIC GROWTH

QUALITY EDUCATION

CLIMATE ACTION

PARTNERSHIPS FOR THE GOALS
Deep Decarbonization: Accelerate the transition of Washington’s maritime industry to a low-carbon future.

Thrusting, Low-carbon Industry
- Initiative 1: Low-carbon maritime technologies on board
- Initiative 2: Low-carbon shore side infrastructure
- Initiative 3: Strategies for emissions reductions

Global Innovation Hub
- Initiative 1: Digital transformation
- Initiative 2: Modernization of fishing and seafood industries
- Initiative 3: Collaborative R&D
- Initiative 4: Maritime Innovation Center

Working Waterfronts: Lead the nation in efficient, clean, and safe maritime practices across all sectors of the industry.

Growing Gateways
- Initiative 1: Smart Ports
- Initiative 2: Infrastructure & regulatory strategy
- Initiative 3: Green Gateway

21st Century Workforce: Next generation of an inclusive and diverse maritime workforce with technological expertise and access to clean, healthy, living wage jobs.

- Initiative 1: Career pipeline, pathways, & connections
- Initiative 2: Inclusivity, support, & outreach

Cluster Coordination: A formal cluster organization will drive implementation of Washington Maritime Blue to ensure a strong maritime industry founded on competitive companies and an attractive business environment.

World-Class Cluster
- Blue Focus: Communications & Marketing
- Blue Forum: Knowledge Sharing
- Blue Forward: JIP* & Business Services
- Blue Force: Training & Education
- Blue Finance: Funding & Investment

*Joint Industry Projects (JIP)
Innovation Clusters

Formal Ocean/Maritime Clusters have emerged as organizational entities that enhance competitiveness and collaboration.
A Strategic Alliance for Maritime Innovation and Sustainability

A partnership to implement Washington State’s Strategy for the Blue Economy - a thriving maritime economy, a healthy ocean & marine environment, equitable & resilient communities.
Scope of Work & Quadruple Helix

Industry & Business

Government & Public Sector

Academia & Research

Workforce & Community Org's

Blue Focus
Marketing & Communications

Blue Forum
Networking & Knowledge Sharing Events

Blue Forward
R&D, Joint Innovation Projects,

Blue Force
Career Connected Workforce Development

Blue Finance
Public & Private Funding, Access to Capital

Blue Facility
Innovation Center & Entrepreneurship
Blue Forward:
Washington State Ferry Electrification
Seattle Waterfront Decarbonization Strategy
JIP: Puget Sound Pilot Zero-emission Feasibility Study
JIP: ZF3: Zero-emission Foiling Fast Ferry
JIP: Green Hydrogen for Tacoma Maritime
Blue Forums
Uptown Tech Meets the Working Waterfront
R&D Pathways for Maritime Energy Solutions
Equity in a 21st Century Maritime Workforce
Investing in the Blue Economy
Coastal Community Economic Resilience
Blue Force
Youth Maritime Collaborative to develop inclusive and diverse youth pipeline Career-Connected learning + Equity Training for youth training providers and employers.
World-Class Cluster

Blue Focus
Growing membership and leadership
International recognition and speaking engagements
Cluster to Cluster relationships
Blue Facility / Blue Finance
Developing Maritime Innovation Center w/ Port of Seattle
Maritime Blue Innovation Accelerator
Capital Landscape Study for WA’s Blue Economy
Hub & Spoke Incubation around the State
Venture Capital is NOT seeking out Maritime.

There is a particular need for early-stage capital.

Government and philanthropic grants can help de-risk investments.

Clusters, incubators, & accelerators can create vetted and supported pipelines of new deals.
Maritime Blue Innovation Accelerator

Four-month program taking no equity.

Diverse stages and sectors.

Mentors from business development and maritime/ocean.

Attracting diverse funding and capital; public, debt, equity, VC, Impacts, grants, etc…
Funding and Investing in the Blue Economy

Global Market and Consumer Demand

Converging Ocean Sectors

Global Regulation from UN to Regional

Reducing Technology Costs

Cooperative Approach

Maritime & Shipping

Fishing & Seafood

 Restoration & Conservation

Ocean Tech & Marine Energy

Tourism & Recreation

Enabling Technology
May need to buy down risk for new technology

Many forms of private debt and equity

Look towards new ways to invest in public infrastructure

Growth in Impact Investing - individual and institutional
Global Enterprise for the Blue Economy
Joint Innovation Program (JIP)
Zero-emission Pilot Boat
A feasibility Study for Puget Sound Pilots

CHALLENGE
Puget Sound Pilots will need to replace or retrofit two existing Pilot boats operated from the Port Angeles Pilot Station. The goal is to evaluate options for a design that can operate with zero emission and minimize the environmental impact on marine life, while still fulfill the mission objectives, and ensure safe operation for crew and pilots.

SOLUTION
- Develop the relevant operational and mission profiles
- Establish a design basis and initial operation requirements
- Evaluate options for hull, machinery and propulsion, based on performance and operational criteria, as well as infrastructure
- Analyze the environmental, financial and social benefits; including noise
- Provide a concept specification for design/build phase

BENEFITS
An innovative and environmentally friendly Pilot Boat that aims to eliminate the GHG emissions, ocean discharges, reduce the underwater noise while exploring current, proven and innovative technology. The boat also need to perform its mission under the relevant environmental conditions and be operationally flexible and safe. The options concerning efficiency, economy, emissions, and community impact over the boat’s lifetime will be evaluated.

VALUE
The project will evaluate options to introduce a new safe, efficient and environmentally friendly Pilot boat for Puget Sound and Strait of Juan de Fuca. It is also expected that this concept might be relevant for other pilot boats and similar vessels, and hence facilitate WA companies to develop state of the art technology and competence.
Joint Innovation Program (JIP)

ZF³: Zero-emission Foiling Fast Ferry
Development of an innovative Hydrofoil craft

CHALLENGE
A zero-emission, clean transit concept for a high-speed hydrofoil craft using lightweight carbon fiber hull construction, to help relaunch the “Mosquito” fleet. A collaborative approach is needed to identify and solve the challenges related to technical, safety, operational risks and financial feasibility.

SCOPE
This Joint Innovation Program will be addressed in distinct phases or programs, including:
- Complete design using a Technology Qualification Design Process.
- Review of environmental benefits and impacts including acoustic impacts to marine mammals and strike avoidance.
- Terminal and Infrastructure needs with technology assessment
- Regulatory and permitting needs
- Materials and construction
- Routes and operations
- Hybrid funding model for first demonstration

BENEFITS
More efficient vessel, reduced emissions, improved commuter and transit options, WA innovation and economic development, quieting to reduce impacts on SRKW’s, platform for technology innovation.

VALUE
A zero-emission high speed waterborne transportation alternative in the Puget Sound that can offer a safe, reliable and cost-effective option, while minimizing the environmental impact on air and water quality as well as marine life. Washington companies to develop state of the art technology and competence to support our region as a center of excellence for maritime decarbonization.
Joint Innovation Project (JIP) - DRAFT
Zero-Carbon Maritime Hydrogen Ecosystem through Formic Acid Storage Pathways

**CHALLENGE**
Alternative fuels and energy are needed to reduce emissions from transportation and port operations. Hydrogen shows great promise, if it can be generated at scale in our region from renewable energy, as well as stored and transported in a safe manner. Tacoma Power has excess clean hydropower generation that can be utilized to make Green Hydrogen. They also need to provide energy for cold-ironing services to berthed vessels, which have large variances in power demand and timing.

**SOLUTION**
- Build and scale a Maritime hydrogen ecosystem through a project at the Port of Tacoma that demonstrates the concept of a port-based hydrogen (H2) solution utilizing Formic Acid for lower cost and safer storage and movement.
- This demonstration features a system that creates a liquid H2 carrier, formic acid, directly from green renewable electricity, water and recycled CO₂. This unique technology is provided by two of the partners: OCO Inc., whose electrolyzer technology creates the formic acid as a liquid H2 carrier and the Pacific Northwest National Laboratory, that provides a reformer technology to decompose and release the H2 from formic acid when needed.
- A local utility will provide the green electricity, which comes primarily from hydroelectricity and is 97% carbon free. They will also be the end user of the H2, to generate energy on demand for cold-ironing services to berthed vessels.
- DNV GL will provide techno-economic modeling so that this demo can be used to provide the anchor application for scaling-out hydrogen use in other maritime applications like hydrogen fueling for trucks, trains, vessels and a wide variety of cargo handling applications.

**VISION**
Regional collaboration to make Tacoma, WA the production and distribution nerve center for scaling up the use of clean hydrogen for port and maritime applications.

**BENEFITS**
This approach provides a large-scale local production and use for Hydrogen in maritime ports that can be stored as a liquid carrier in the form of Formic Acid, overcoming some of the key storage and movement challenges. This demonstration has the potential to show ports, utilities, and numerous maritime end-users what can be achieved when H2 is used at scale.