
2026 SUSTAINABLE MARITIME FUELS SUMMIT

Workshop Summary

Table of Contents

Executive Summary	3
Background	5
Key Themes	7
Barriers, Gaps, and Opportunities	9
Calls to Action	14
Conclusion	23
Appendix A	25
Organizations Represented at the Summit	26
Appendix B	27
Sustainable Maritime Fuels Summit Agenda	27
Appendix C	33
Summit Working Session Photos	33

Executive Summary

The Port of Seattle hosted a Sustainable Maritime Fuels Summit (Summit) March 17-18, 2026, to achieve the following objectives:

- Showcase the Port of Seattle's commitment to advancing sustainable maritime fuel (SMF) supply chains by sharing work underway, completed studies, and reinforcing the Port's ongoing commitment of sustainable maritime fuel adoption in Washington state and the broader West Coast region.
- Create a forum that encourages attendees to discuss their organizations' near- and long-term interests and plans for supporting the transition to sustainable maritime fuels.
- Convene key stakeholders and experts to identify and discuss the specific challenges and enabling conditions to accelerate sustainable maritime fuels adoption in both Washington state and the broader West Coast region.
- Distinguish priority needs and generate buy-in with the Port of Seattle that will lead to action on specific, near-term strategies.

Throughout the two-day Summit participants engaged in a range of facilitated and open discussion across SMF topic areas. Attendees also heard from and engaged with experts during facilitated panel sessions. Throughout these discussions and panels, some key themes emerged:

- **Policy Streamlining and Alignment** – There is an opportunity to streamline and align SMF supportive policies, such as clean fuel standards, life cycle assessments, permitting, and siting at the state and regional level.
- **A regional value proposition for SMF is critical** – While the Pacific Northwest (PNW) has significant potential to help advance SMFs, realizing that opportunity will require a concerted focus on where the region can lead, rather than attempting to compete across every element of the SMF value chain.
- **Knowledge sharing is powerful** – Finding complementarity and preventing duplication across regional efforts already underway is essential to advancing solutions in a cohesive and strategic way.
- **Public engagement is essential** – Discussions throughout the Summit highlighted a history of mistrust between residents, industry, and governments on a range of environmental and social issues which should be directly addressed in any effort to advance SMFs in this region.
- **Demonstration projects are badly needed** – There was significant discussion around the value of learning by doing, and the importance of moving from feasibility

analysis to practical applications as the critical next phase in advancing the discussion around SMFs.

- **Opportunity for constructive dormancy** – While the current federal regulatory environment is not supporting SMFs, important work can continue at the regional level to lay the groundwork for future processes.

During the facilitated working sessions of the Summit, attendees and their working groups were asked to identify barriers, gaps, and opportunities within the following topic areas:

- Community engagement
- Incentives, investment, and financing
- Regional economic and policy frameworks
- Safety and emergency response
- Streamlining regulatory processes: Permitting, siting, and zoning
- Workforce and economic development

Working groups were asked to choose one priority topic to focus on and power map an action that could help address one of the previously identified barriers, gaps, or opportunities. The power mapping outcomes highlight where the Port of Seattle, partners, and SMF stakeholders can focus their support. The working groups proposed and mapped these priority actions:

- Utilize Innovative Community Engagement Approaches
- Demonstrate SMF on Local Route
- Assess Feasibility of closing SMF cost premium with Contracts for Difference
- Harmonize Life Cycle Assessment (LCA) Standard Across Pacific Coast
- Establish a West Coast Clean Fuel Standard (CFS)
- Identify SMF Storage Infrastructure Opportunities
- Develop Emergency and Safety Protocols for Alternative Fuels
- Expand Existing Maritime Training Programs to include SMF

Next steps will involve incorporating action items into the Port of Seattle's work plans where feasible. The Port of Seattle will conduct external outreach with partners and stakeholders to share the Summit findings. The Port of Seattle will also coordinate with external partners and stakeholders to further prioritize these actions, identify appropriate organizations that can lead action items, and organize support for advancing these activities across a wide-range of stakeholders.

BACKGROUND



Background

The Port of Seattle hosted a Sustainable Maritime Fuels Summit March 17-18, 2026, at the Bell Harbor International Conference Center. Motivated by the Port of Seattle's commitment to advance sustainable maritime fuel (SMF) supply chains, the Summit strived to meet multiple objectives determined collaboratively amongst Port of Seattle leadership:

- Showcase the Port of Seattle's commitment to advancing sustainable maritime fuel (SMF) supply chains by sharing work underway, completed studies, and reinforcing the Port's ongoing commitment of sustainable maritime fuel adoption in Washington state and the broader West Coast region.
- Create a forum that encourages attendees to discuss their organizations' near- and long-term interests and plans for supporting the transition to sustainable maritime fuels.
- Convene key stakeholders and experts to identify and discuss the specific challenges and enabling conditions to accelerate sustainable maritime fuels adoption in both Washington state and the broader West Coast region.
- Distinguish priority needs and generate buy-in with the Port of Seattle that will lead to action on specific, near-term strategies.

The Summit outcomes are intended to help align the Port of Seattle's maritime fuel-related work plans, as well as the roadmaps of other organizations and initiatives, such as the Sustainable Maritime Fuels Collaborative (SMF Collaborative), the Northwest Seaport Alliance, West Coast ports, state and local policymakers, and industry. The Port of Seattle will continue to work with these and other partners to continue to support the advancement of a supportive ecosystem for SMF.

As an invite-only event, the Summit created an environment for key stakeholders along the fuel maritime fuel supply chain to engage in open dialogue, relationship building, and interactive brainstorming. The Summit has about 100 attendees representing sectors that included:

- Academic and research institutes
- Cargo owners
- Fuel distributors
- Fuel producers
- Industry organizations
- NGOs
- Ports, including ports from Washington and California
- State government

- Vessel owners and operators

Local Tribal and City of Seattle representatives were invited to the Summit but unable to attend. Outcomes of the Summit will be shared with those representatives as well as the Summit attendees.

The Summit agenda (see Appendix B for full agenda) reflected the overall objectives by balancing providing information to attendees with receiving information and ideas from attendees. Each day featured a panel or presentation in the morning, followed by a half day of facilitated interactive breakout sessions. The breakout sessions were designed to spark discussion and collect feedback on SMF challenges, gaps, and opportunities, as well as to outline immediate, near-term, and medium-term actions that can be taken by both the Port of Seattle and/or other stakeholders with direct and indirect influence over maritime fuels.

Facilitation of the Summit was conducted by representatives from the Aspen Institute¹. The Aspen Institute also contributed to the development of the Summit agenda, assisted with identification of organizations to invite, and contributed their industry expertise to help ensure an impactful event. Breakout sessions were facilitated by a combination of Aspen Institute and Port of Seattle staff.

Key Themes

Throughout the two-day Summit participants engaged in a range of facilitated and open discussion across SMF topic areas. Attendees also heard from and engaged with experts during facilitated panel sessions. Key themes in these discussions and panels included:

- **Policy Streamlining and Alignment** – There is an opportunity to streamline and align SMF supportive policies at the state and regional level. There is a need to streamline Washington state policies, through clarification of existing policies² and simplifying permitting and zoning processes, to help reduce real and perceived risks among developers. Educational programs targeted at industry can also help to clarify existing state policies. Additionally, participants frequently pointed to the need for regional coordination on standardizing policies amongst states in the region, such as Clean Fuel Standards, in the absence of federal and international policies. This is already occurring to some degree through Washington’s exploration of linking its Climate Commitment Act with the joint California-Quebec market.

¹ For more information on the Aspen Institute please visit <https://www.aspeninstitute.org/>.

² Attendees specifically mentioned a need for clarification and education around the Clean Fuels Standard (<https://ecology.wa.gov/air-climate/reducing-greenhouse-gas-emissions/clean-fuel-standard>) and the Climate Commitment Act (<https://ecology.wa.gov/air-climate/climate-commitment-act>).

More opportunities may exist to harmonize California, Oregon, Washington, and British Columbia policies in the region.

- **A regional value proposition for SMF is critical** – While the Pacific Northwest (PNW) has significant potential to help advance SMFs, realizing that opportunity will require a concerted focus on where the region can lead, rather than attempting to compete across every element of the SMF value chain. Defining a clear regional value proposition will require identifying segments, fuel types, and fuel pathways where the PNW has the strongest comparative advantage while recognizing that some aspects of the value chain may be particularly costly to scale in this region. This prioritization will be particularly important given structural hurdles in the region, including a restrictive permitting environment, competition from other leading ports, and competition across sectors for scarce feedstocks and renewable electricity needed to produce SMFs.
- **Knowledge sharing is powerful** – There are already many activities and collaborations currently taking place within the PNW to explore the viability of SMF in the region. Finding complementarity and preventing duplication across efforts already underway is essential to advancing solutions in a cohesive and strategic way. Through the Summit, participants were able to effectively learn about activities, work, and regulations specific to the PNW. The panels and lightning round presentations of the Summit helped educate participants about current activities and new programs and collaborations in the region, and clarified state regulations that participants can bring back to their home organizations and respective work in the SMF space.
- **Public engagement is essential** – Discussions throughout the Summit highlighted a history of mistrust between residents, Tribes, industry, and governments on a range of environmental and social issues which should be directly addressed in any effort to advance SMFs in this region. Proactive education to the public about different fuel types, what scaling these fuels requires, and the associated benefits, opportunities, and risks is critical. Any public engagement must also be consistent, transparent, and approached through a lens of partnership, rather than simply informing.
- **Demonstration projects are badly needed** – There was significant discussion around the value of learning by doing, and the importance of moving from feasibility analysis to practical applications as the critical next phase in advancing the discussion around SMFs. There was some tension around the concept of “analysis paralysis” and an appetite to accelerate pilot and demonstration projects in the years ahead.

- **Opportunity for constructive dormancy** – While the current federal regulatory environment is not supporting SMFs, important work can continue at the regional level to lay the groundwork for future processes. In the face of federal policy headwinds and the rollback of incentives and funding, there are near-term opportunities to advance strategically and selectively. A focus on relationship-building, planning, coordination and market preparation can sustain momentum which could be accelerated when conditions become more favorable.

Barriers, Gaps, and Opportunities

During the facilitated working sessions of the Summit, attendees and their working groups were asked to identify barriers, gaps, and opportunities within the following topic areas:

- Community engagement
- Incentives, investment, and financing
- Regional economic and policy frameworks
- Safety and emergency response
- Streamlining regulatory processes: Permitting, siting, and zoning
- Workforce and economic development

Facilitators guided attendees through discussion and captured notes on the discussion. The information received from attendees during these sessions is summarized in the tables below.

Community Engagement		
Barriers	Gaps	Opportunities
• Low public awareness; perceived vs. actual risk • Safety concerns; mistrust of government/developers • No common definition of “sustainable fuels” • Competing community priorities; engagement fatigue • Misalignment between commerce and community	• Limited understanding of community benefits • Outdated engagement methods; lack of a convening leader • Need for local education programs • Limited understanding of fuel transport impacts	• Emphasize health benefits • Community benefit agreements • Modernize engagement with different tools: tours, frameworks, trusted messengers, modern communication tools • Workforce programs for near-port communities • Leverage port forums, NGOs, and IMO participation

Incentives, Investment, and Financing		
Barriers	Gaps	Opportunities
• Cost gap (2–3×); first-mover penalties • High WA business costs; unclear “who pays” • Permitting delays; vessel build timelines • Lack of timely market information	• Maritime excluded from LCFS; unclear demand • Need for demand aggregation • Limited transparency for credit revenue • Supporting infrastructure gaps (storage, bunkering, pipelines, rail)	• Include maritime in RFS/LCFS • Port collaborations to de-risk projects • Contracts-for-difference, price floors, government backstops • Green banks, incubators, prize programs

Regional Economic and Policy Frameworks		
Barriers	Gaps	Opportunities
• Fragmented U.S. policy; rules shift frequently • State authority ends 3 nautical miles offshore • Unclear bunkering approval process • Feedstock certification burdens • Cargo market competition from EU/ETS and East Coast • State gift-of-public-funds restrictions create barriers for financial incentives	• No clear regional governance body • Need uniform CI and SMF definitions • Need targeted and flexible policy tools • Fuel certification gaps present a significant opportunity to standardize certification for emerging fuels	• West Coast regional coordination; Inclusion in the Pacific NorthWest Economic Region (PNWER) strategy • Uniform LCFS approach; leverage WA CCA linkage model • Programmatic EIS, industrial zoning, unified state-local policies, streamlined permitting • Dockage incentives; regional offtake backstops

Safety and Emergency Response		
Barriers	Gaps	Opportunities
• First responders & crews lack training • Rapidly evolving technologies • Fuel property risks (flashpoint, vapor pressure, toxicity) • Insurance and warranty concerns	• Need minimum standards and harmonization • Training frameworks for fire departments, WSDOT, response orgs • Improved stakeholder safety messaging	• Develop unified standards (ASTM, Coast Guard, IMO) • Centralize and share safety information • Conduct pilots; proactive risk assessments • Community and Tribal outreach on safety

Streamlining Regulatory Processes		
Barriers	Gaps	Opportunities
• Local opposition; fragmented regulatory oversight • Uncertain permitting and interconnection timelines • Slow fuel certification	• Unclear state leadership on SMF permitting • Uncertainty in maritime LCFS eligibility • No spill response standards for nonoil fuels	• Permit flowcharts/guides/support for development projects; improved transparency • West Coast Clean Fuel collaboration • Demonstration projects, PPPs, grant partnerships • Standardized definitions across agencies

Economic Development		
Barriers	Gaps	Opportunities
• Capital access; Jones Act complications • Inconsistent Seattle infrastructure and transportation chokeholds • Business case for SMFs in WA is not clear • Lack of “business-friendly” environment in state (hard to permit, hard to build)	• Lack of a statewide industry “champion” • Prioritization of projects that can advance SMF • Understand where existing infrastructure has capacity for renewables	• Develop in state-assets: Refining at Cherry Point, LNG bunkering in Tacoma • Expand U.S. shipbuilding • Assess capacity of existing infrastructure (e.g., harbor island, existing refineries)

Workforce Development		
Barriers	Gaps	Opportunities
• Maritime labor shortages; aging workforce • Legacy industry inertia; small and medium sized business resource limitations	• Need data on economic/workforce opportunities • Limited value-chain benchmarking • Understanding additional training needed	• Expand SMF-specific training • Build regional training centers; integrate alt fuels into curricula • LA Workforce Development Center as a model • Support small and medium-sized businesses • Project labor agreements • Messaging via community/labor orgs

CALLS TO ACTION



Calls to Action

Attendees were asked to focus on one specific topic and develop an action that could help address one of the previously identified barriers, gaps, or opportunities. Attendees were then guided through a power mapping exercise to identify the primary formal and informal authorities³, as well as immediate, near- and medium-term actions. The power mapping outcomes highlight where the Port of Seattle, partners, and SMF stakeholders can focus their support. Organizations identified as formal authorities should consider prioritizing those actions and incorporating activities to support those actions into their internal work plans. Where organizations are identified as informal authorities, those organizations should assess where and how they can influence change.

Near-term and medium-term actions identified during the summit should not be considered comprehensive and are intended to identify possible actions and timelines that support activity implementation. Additional robust plan development involving both expert and stakeholder input is needed for each call to action.

The Port of Seattle will evaluate the incorporation of activities into internal work plans where the Port of Seattle is identified as a formal authority. Where the Port of Seattle is not identified as a formal authority, it will coordinate with and encourage the identified external partners to lead actions.

³ For the purposes of the working session, formal authority was defined as those who have power to make something happen, who can approve, deny, fund, regulate, or set binding standards. Informal authority was defined as those with influence, that may not be actors who sign permits and laws, but can shape outcomes through pressure, demand signals, norms, financing, public opinion, or coordination/coalition-building.

Action	Utilize Innovative Community Engagement Approaches
Description	Attendees identified the need for new and innovative approaches to community engagement that differ from historical methods to encourage broader and more impactful bi-directional communication with communities. Innovative approaches may include intentional outreach that meets communities where they are and creates a reliable and ongoing dialogue, rather than one-off engagement opportunities. Successful engagement with communities on sustainable maritime fuels can help improve knowledge of future fuels, create community buy-in and reduce pushback, and help identify opportunities like job creation and community economic development.
Formal Authorities	Community groups, ports, local governments, Harbor Safety Committee
Informal Authorities	Advocacy groups, trusted community leaders
Immediate Activity	Identify community engagement topic areas
Near-Term Activity (1-2 years)	- Hold standing, reoccurring meetings with communities to discuss multiple topics, including but not limited to fuels - Educate communities on SMFs, the various fuel types and pathways, safety issues and concerns, and health and environmental benefits. - Alignment with Port of Tacoma and NWSA, and coordination with the SMF Collaborative, Cascadia, Puget Sound Clean Air Agency, Ecology, and others.
Medium-Term Activity (3-5 years)	- Incorporate engagement feedback and community concerns into SMF strategy, policy, planning, and implementation - Expand upon reoccurring meetings as needed - Continue to evaluate effectiveness of meetings and revise as needed - Expand beyond port-adjacent communities

Action	Demonstration of SMF on Local Route
Description	Attendees identified the need for a small-scale local route (e.g., an intrastate route) demonstration project that would help identify needs and support incremental scale-up for larger green corridor projects. Similar in practice to a green corridor, but on a localized, shorter route, this action can help identify and address challenges in scaling-up SMF use. The benefits of demonstrating a localized route are that it is easier to coordinate, less capital intensive since it is a shorter route, and can help improve local and regional SMF infrastructure and readiness.
Formal Authorities	Vessel owners and operators, state and local governments, WA Department of Transportation, ports, fuel producers, bunker providers

Informal Authorities	Public, local maritime companies, advocacy groups
Immediate Activity	- Identify potential vessel segments and routes - Assess best practices from other green corridor projects (US-Korea green corridor, PNW2AK green corridor)
Near-Term Activity (1-2 years)	- Get buy-in of project partners and public agencies - Identify funding and incentive mechanisms that can close the narrow the cost gap
Medium-Term Activity (3-5 years)	- Obtain capital - Cargo owners - Vessel owners and operators - WA CCA - Permitting - Bunkering infrastructure

Action	Assess Feasibility of SMF Contracts for Difference
Description	Investigate the legal and practical feasibility of implementing government issued SMF contracts for difference for fuel offtakers in WA. Sustainable fuel contracts for difference are long-term, government-backed financial mechanisms designed to accelerate the production and adoption of sustainable fuels by bridging the cost gap between these emerging technologies and conventional fossil fuels. They operate by establishing a guaranteed "strike price" for the producer. If the market price for the fuel is lower than this strike price, the designated agency pays the producer the difference, protecting them from market volatility. Several programs that include contracts for difference or similar financial mechanisms for sustainable maritime fuels have been implemented, including in Canada and the United Kingdom.
Formal Authorities	State government agencies, ports, WA Supreme Court, State legislatures, USDA, Governors, Commodity credit corporation
Informal Authorities	Community, fuel producers, industry groups, consumers/cargo owners, Tribes, NGOs, feedstock providers, SMF Collaborative
Immediate Activity	- Engage with USDA. USDA utilizes contracts for difference in the agricultural sector and may have lessons learned to share. - Outreach to UK/Canada on their programs
Near-Term Activity (1-2 years)	- Outreach to commodity credit core to do legal analysis of constitutionality - Hold West Coast ports meeting with USDA to discuss program and possibilities - Outreach to Tribes - Go/no-go decision to move forward with action or policy revisions - Finalize funding source including a possible clean fuel standard income to ports

Medium-Term Activity (3-5 years)	If contracts for difference are deemed a feasible mechanism, then the following actions would be recommended to help implement a program: • Add to state legislative agendas • Engage federal government for funding • Implement and engage the mechanism
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Action	Harmonize Life Cycle Assessment (LCA) Standards Across Pacific Coast and Advocate in IMO LCA Discussions
Description	The International Maritime Organization (IMO) defines the LCA of sustainable marine fuels as a holistic methodology to calculate greenhouse gas (GHG) emissions from "Well-to-Wake". It ensures fuels reduce emissions throughout their entire production, delivery, and combustion cycle rather than just shifting them to other sectors. Currently, there are multiple methodologies for life cycle assessment standards for quantifying fuel greenhouse gas emissions. This results in restricting comparability, increasing compliance costs, and causing regional inconsistencies in measuring environmental attributes.
Formal Authorities	WA Department of Ecology, California Air Resources Board (CARB), Oregon Department of Environmental Quality, British Columbia Energy Regulator (BCER), State/Province governors/Premier
Informal Authorities	Ports, feedstock providers, lobby groups, industry associations, community, NGOs, industry groups, agriculture, consumers/cargo owners, Tribes, fuel producers, vessel owners
Immediate Activity	• Continue Pacific Coast (CA, OR, WA, BC) discussions • Gather data from stakeholders and partners on different LCA models ◦ Educate on different LCA models and inputs/data needs • Pull-in stakeholders who have influence into IMO LCA Guidelines (i.e., MMM) ◦ Identify gaps and differences between optimal model and IMO
Near-Term Activity (1-2 years)	• Discuss LCA and treatment of different maritime fuels with other states ◦ Discuss how to leverage state LCFS to incorporate maritime fuels ◦ More formal regional agreements may require legislative action • Pilot fuel pathway with industry (e.g. for an advanced biofuel) • Activate regional trade associations to include this issue in agendas to help support alignment
Medium-Term Activity (3-5 years)	• Additional fuel pathways go through LCA process ◦ Need industry partner(s)

	• Demonstrate consistency across WA, CA, OR, BC • Use the regional LCA as a case study to influence/inform IMO discussions on LCA guidelines ○ ID gaps/differences between IMO and West Coast LCA ○ ID IMO partners with influence ▪ Member States ▪ Observer organizations
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Action	Establish a West Coast Clean Fuel Standard (CFS)
Description	A Clean Fuel Standard (also known as a Low Carbon Fuel Standard) is a market-based, performance-driven policy that requires fuel suppliers to gradually reduce the greenhouse gas emissions associated with transportation fuels. Currently, California, Oregon, Washington and British Columbia each have a separate CFS that differ significantly in their structure and carbon intensity reduction targets. The differences in the CFS across states complicates logistics, administrative costs, and fuel supply chains. Developing and adopting a uniform clean fuel standard across the West Coast (California, Oregon, Washington, British Columbia) would create a consistent market for SMFs, reduce regulatory burdens for suppliers and offtakers operating in multiple states, and support economic development.
Formal Authorities	WA Department of Ecology, California Air Resources Board (CARB), Oregon Department of Environmental Quality, British Columbia Energy Regulator (BCER), State/Province governors/Premier
Informal Authorities	Ports, feedstock providers, lobby groups, community, NGOs, industry groups, agriculture, consumers/cargo owners, Tribes, fuel producers, vessel owners
Immediate Activity	• Engage states ○ Determine timing: act now or wait for IMO • Form a West Coast fuel standard coalition ○ Engage state and federal leaders • Develop government relations strategy to add maritime to federal LCFS • Understand where LCA methodology is different across states • Advocate Dept of Ecology and other regulatory bodies to coordinate
Near-Term Activity (1-2 years)	• Engage informal authorities/influencers • Develop government relations strategy to add maritime to federal RFS • Align on unified standard and framework definition • Ports to implement and execute LCFS
Medium-Term Activity (3-5 years)	• Policy design • Enact a unified CFS

Action	Identify SMF Infrastructure Opportunities
Description	Both attendees and panelists at the Summit identified the need for SMF infrastructure, including refineries, pipelines, and storage. For many SMF fuel types, existing infrastructure can be used as-is or retrofitted to store SMFs. Attendees highlighted the need to identify existing infrastructure, especially for fuel storage and fuel transportation, and assess where there is capacity for expansion of existing infrastructure that could support low- and zero-emission fuel development
Formal Authorities	Policy leaders, fuel producers and distributors
Informal Authorities	Ports, vessel owners and operators, environmental advocates, cargo owners
Immediate Activity	• Catalog existing Washington fuel storage infrastructure • Assess current and forecasted demand for SMFs • Identify SMF fuel storage infrastructure needs • Identify fuel storage infrastructure that can be retrofitted/upgraded to meet SMF storage requirements.
Near-Term Activity (1-2 years)	• Share existing infrastructure retrofit opportunities with industry • Identify specific permitting process issues that act as a barrier to infrastructure development • State policy makers lead coalition conversations to understand statutory changes that would support SMF infrastructure development • Conduct community outreach to educate public on risks and benefits of developing SMF infrastructure
Medium-Term Activity (3-5 years)	• Implement changes to policy to facilitate SMF infrastructure development • Work with property owners and industry to develop SMF fuel storage

Action	Develop Emergency and Safety Protocols for Alternative Fuels
Description	There is an additional industry need for established emergency and safety protocols for spills, fire, exposure, and response plans. Several SMF types have properties that require different protocols, such as spill and fire response. Protocols are needed for the production, storage, transport, and maritime use of methanol, ammonia, and hydrogen. In some cases, protocols can be adopted from the chemical industry, while in other instances new protocols will need to be developed.
Formal Authorities	State regulators, local fire departments and emergency response, IMO, U.S. Coast Guard, vessel classification societies, flag states, state and federal governments
Informal Authorities	Ports, insurance, vessel owners and operators, labor and workforce associations, public opinion

Immediate Activity	- Assess existing standards and ongoing work - Ulsan, Busan, Singapore - Safety and emergency standards from chemical industry where applicable - Methanol bunkering risk assessment (Port of Seattle) - Update existing guidelines for alternative fuels based on best practices, research, and industry input
Near-Term Activity (1-2 years)	Work with port authorities, state agencies, U.S. Coast Guard, and other organizations to develop protocols based on IMO guidelines for safety management systems and inspections.
Medium-Term Activity (3-5 years)	International - IMO implements training programs for seafarers Federal - U.S. Coast Guard enforces safety and emergency standards State - Legislative changes to extend Washington Department of Ecology's rulemaking - Draft bill and request legislation process - Cultivate state legislative champion on alternative fuels and safety - State legislature authorizes Ecology to regulate alternative fuels (fuel over water)

Action	Expand Existing Maritime Training Programs to include SMF
Description	Attendees recommend prioritizing the expansion of existing training programs for seafarers and emergency response organizations for sustainable maritime fuels. The unique properties of some SMF types require different storage, transportation, and fueling procedures. To help ensure that current and future workforces are prepared, training programs should be expanded to include these procedures.
Formal Authorities	Department of Labor and Industries, vessel owner operators, labor, training institutes, maritime academies, U.S.C.G., OSHA, IMO, college/university programs
Informal Authorities	Blue Sky Maritime, SMF Collaborative, ports, fuel organizations (i.e., Methanol Institute)
Immediate Activity	Convene those using/bunkering LNG to share lessons learned and best ways to train LNG response training gaps at local level Aggregate owner/operator best practices
Near-Term Activity (1-2 years)	Share information with existing associations Industry-informed needs shared with workforce development practitioners and engage educational partnerships (We Work the Waterways, NAMEPA, International Transportation Learning Center, Seattle Maritime Academy, etc.) Elevate alternative fuel training gaps to transportation research board
Medium-Term Activity (3-5 years)	Create and facilitate a culture of pride for jobs in this space Private sector led Internal company-wide education about SMF related programs State approved funding to support alternative fuel training Federal funding for workforce training for LNG and alternative fuels

CONCLUSION



Conclusion

The Port of Seattle Sustainable Maritime Fuels Summit convened key stakeholders and experts to discuss the specific challenges and enabling conditions to accelerate SMF scale-up in both Washington state and the broader West Coast region. The combination of information sharing and interactive agenda activities helped move the conversation from challenges and gaps to opportunities to advance SMF in the region. Several key themes emerged over the two-day Summit, including the need for policy streamlining and alignment, leveraging the unique advantages and assets in the region, increasing collaborative knowledge sharing, expanding public engagement and education, supporting near-term demonstration projects, and opportunities for regional action and alignment without a supportive federal regulatory environment.

The challenges and opportunities identified during the Summit and the calls to action will be shared with Port of Seattle leadership and staff, Port of Seattle partners, and regional SMF stakeholders. Where feasible, based on available resources and capacity, the Port of Seattle will incorporate action items into its work plans to help lead or support those activities. The Port of Seattle will also continue to engage with external partners and stakeholders to share findings and encourage leadership on actions that fall within their areas of influence and responsibility. The next steps for the Summit focus on sharing outcomes so that organizations and coalitions working in the region can develop more informed, aligned, impactful roadmaps for collective action to expand SMF production and deployment.

APPENDIX



Appendix A

Organizations Represented at the Summit

- American Seafood
- Aspen Institute
- American Waterway Operators
- Blue Sky Maritime Coalition
- British Consulate General San Francisco
- British Embassy Washington
- Burnham
- C40 Cities
- Carnival Corporation
- Clean & Prosperous Institute
- Climate Solutions
- CMA CGM
- Crowley
- Cruise Lines International Association (CLIA)
- Divert Inc
- Earth Finance
- EFSEC Washington
- Freezer Longline Coalition
- Friends of the San Juans
- Greater Victoria Harbour Authority
- Highly Innovative Fuels
- Holland America
- Maritime Blue
- Matson
- Methanol Institute
- Microsoft Cloud Supply Chain Global Operations
- Midori Energy
- Mitsui O.S.K. Lines
- Montana Renewables
- National Laboratory of the Rockies
- Northwest Seaport Alliance
- Norwegian Cruise Line Holdings, Ltd.
- Ocean Network Express
- Pacific Environment
- Pacific Northwest National Laboratory
- PNWH2
- Port of Bellingham
- Port of Hueneme
- Port of Long Beach
- Port of Los Angeles
- Port of Oakland
- Port of San Diego
- Port of Seattle
- Port of Tacoma
- PTL Marine (Maxum Petroleum)
- RMI
- RNG Coalition
- Royal Caribbean Group
- Seaspan/TransMontaigne
- Starcrest Consulting Group, LLC
- Stoel Rives LLP
- Sustainable Energy Ventures LLC
- Swire Shipping
- Vancouver Maritime Centre for Climate
- Washington Public Ports Association
- Washington State Department of Commerce
- Washington State Department of Ecology
- Washington State House of Representatives
- Washington State University

Appendix B

Sustainable Maritime Fuels Summit Agenda

Day One | Tuesday, March 17, 2026

Item	Timing
Check-in / Registration Breakfast and coffee served.	8:00 – 9:00 am
Kickoff & Housekeeping Selena Elmer, Aspen Institute	9:00 – 9:20 am
A Conversation with Port Leadership Ryan Calkins, Commissioner, Port of Seattle Steve Metruck, Executive Director, Port of Seattle Session Description: Port of Seattle Commissioner Ryan Calkins and Executive Director Steve Metruck will open the workshop with a conversation on why the moment is right to scale sustainable maritime fuels in the Pacific Northwest, highlighting the Port of Seattle’s vision, the regional ecosystem, and the role of state leadership in driving progress.	9:20 – 9:50 am
Panel: Demystifying the Washington Regulatory Environment Session Description: Washington State government leaders will explore how Washington’s existing and evolving policy framework can accelerate a scalable transition to sustainable maritime fuels. The conversation will highlight how existing laws, incentives, and public engagement processes can unlock opportunity, address barriers, and align regulatory action with long-term decarbonization goals. Speakers: - Casey Sixkiller, Director of Department of Ecology, WA State - Ami Hafkemeyer, Director of Siting & Compliance, EFSEC - Stephanie Celt, Senior Energy Policy Specialist, WA Dept. of Commerce Moderator: Carly Michiels, Senior Director of Environmental Policy, WPPA	9:50 – 10:45 am
BREAK	10:45 – 11:00 am
Lightning Round: Understanding the PNW Ecosystem	11:00 – 12:30 pm

Session Description: This fast-paced, interactive lightning round spotlights the projects, partnerships, and policy efforts shaping the Pacific Northwest’s sustainable maritime fuels ecosystem. Through rotating conversations with regional leaders, participants will gain shared situational awareness of what’s underway, what’s coming next, and where collaboration is needed to turn momentum into lasting impact beyond the Summit. Speakers: • Sustainable Maritime Fuels Collaborative ◦ Joshua Berger, President & CEO, Maritime Blue • EPA Clean Port Grant Activities ◦ Sarah McKearnan, Program Manager, Port of Seattle • Green Corridor Projects in the Pacific Northwest ◦ Ryann Child, Senior Environmental Program Manager, Port of Seattle; Rose Arsers, Environmental Project Manager, Northwest Seaport Alliance • Carnival Biofuels Bunkering Pilot ◦ Robert Morgenstern, SVP Alaska Operations, Holland America Group • International Maritime Organization (IMO) Regulation and Outlook ◦ Bruce Anderson, Principal, Starcrest Consulting Group; Sandy Kilroy, Senior Director, Environment, Sustainability, and Engineering, Port of Seattle	
LUNCH	12:30 – 1:30 pm
Plenary: Morning Debrief & Afternoon Introduction Selena Elmer, Aspen Institute Session Description: This plenary reconvenes participants to reflect on key themes from the morning discussions, surface where deeper exploration may be needed, and shift to the interactive sessions of the afternoon.	1:30 – 1:50 pm
Barriers and Opportunities: Breaking Down Policy Conditions for Adopting and Scaling Sustainable Maritime Fuels Session Description: In this facilitated breakout session, participants will work in small groups across sectors to identify the key policy, regulatory, and market barriers, slowing the adoption of sustainable maritime fuels in the Pacific Northwest –and the opportunities to overcome them. Through structured discussion, groups will surface priority gaps, potential policy levers, and areas of opportunity to enable SMF scale-up in the Pacific Northwest and across the West Coast.	1:50 – 2:50 pm

BREAK	2:50 – 3:00 pm
Barriers and Opportunities: Breaking Down Policy Conditions for Adopting and Scaling SMF, Continued	3:00 – 3:30 pm
Barriers and Opportunities Reflections <i>Session Description:</i> Participants will have time to review and reflect on insights generated across all breakout groups, building a shared view of the barriers, gaps, and opportunities shaping sustainable maritime fuel adoption. This session invites cross-pollination—highlighting patterns, surfacing missed perspectives, and strengthening alignment before the workshop turns toward prioritization and action on day two.	3:30 – 4:00 pm
Closing Plenary Selena Elmer, Aspen Institute <i>Session Description:</i> This plenary offers participants a chance to reflect on major themes and insights from the first day of the Summit, surface initial takeaways from the barriers and opportunities discussions, and preview how these conversations will carry forward into Day 2.	4:00 – 4:20 pm
Closing Remarks Fred Felleman, Commissioner, Port of Seattle <i>Session Description:</i> Port leadership will offer brief closing remarks reflecting on the day’s discussions before participants move into the evening reception and continue conversations informally.	4:20 – 4:30 pm
Reception at Bell Harbor Conference Center	4:30 – 6:30 pm

Day Two | Wednesday, March 18

Item	Timing
Check-in / Registration Breakfast and coffee served.	8:00 – 9:00 am
Kickoff & Housekeeping Selena Elmer, Aspen Institute	9:00 – 9:15 am
Panel: Bridging the Cost Gap	9:15 – 10:15 am

Session Description: This panel brings together finance, industry, and cargo owners to examine how the green premium for sustainable maritime fuels can be reduced—and ultimately closed. Panelists will explore emerging financing and contracting models, the role of policy and demand aggregation in de-risking investment, and what it will take to send durable market signals that unlock fuel and infrastructure scale in the Pacific Northwest and beyond. Speakers: • Tim Zenk, Managing Director, Renewable Fuels, Earth Finance • Curt Leffers, Director of Research and Development, Crowley • Nico de Golia, Director of Supply Chain Operations Sustainability, Microsoft • Moderator: Kathryn Benz, Assistant Director, Policy, Energy and Environment Program, Aspen Institute	
BREAK	10:15 – 10:30 am

Panel: Preparing for SMF Deployment: Infrastructure, Investment, and Innovation Session Description: Leaders in fuel production, vessel operations, and logistics will share insights into what it takes to bring sustainable maritime fuels from pilot to practice. This panel explores regional infrastructure, investment decisions, operational readiness, and regulatory hurdles, while highlighting Pacific Northwest opportunities and constraints. Speakers: • Louie DeCarlo, Senior Director of Engineering & Construction, HIF Global • Chris Tynan, Founder & CEO, Burnham • Bett Lucas, Senior VP Commercial, TransMontaigne Partners/SeaPort Sound • Heike Naigur, Senior Director Sustainability, Norwegian Cruise Line • Moderator: Juvarya Veltkamp, Senior Advisor, C40	10:30 – 11:30 am
Plenary: Summit Reflections Selena Elmer, Aspen Institute	11:30 am – 12:00 pm

Session Description: A brief, facilitated reflection to synthesize insights from Day 1 and the morning panels, highlight shifts in assumptions and priorities, and identify which barriers and opportunities feel most tractable or urgent in the Pacific Northwest. The session sets the stage for the afternoon power-mapping and action-identification discussions.	
LUNCH	12:00 - 1:00 pm
Small Group Discussion: Power Mapping Session Description: Building on Day 1's barriers and opportunities exploration, breakout groups will focus on one topic to map which institutions and actors hold authority, influence, or enabling power to advance sustainable maritime fuels across jurisdictions. Groups will identify where ports, partnerships, and regional collaboration can most effectively unlock action.	1:00 - 2:00 pm
Power Mapping Gallery Walk Session Description: Participants will circulate to review and comment on power maps developed by other groups on other topics, identifying shared points of agency, gaps, and connections across the topics displayed.	2:00-2:20 pm
BREAK	2:20 - 2:35 pm
Small Group Discussion: Short-Term Action Identification Session Description: Following power mapping, breakout groups will translate influence into action by identifying high-impact, achievable steps to advance sustainable maritime fuel infrastructure across near- and medium-term time horizons. Discussions will surface implementation partners, dependencies, risks, and decision points to clarify concrete next steps that can be initiated now and scaled over time.	2:35 - 3:35 pm
Plenary: Short-Term Action Identification Report Outs Session Description: Breakout groups will report on the highest-impact, achievable actions identified to advance sustainable maritime fuel uptake in the Pacific Northwest. The plenary will highlight priority actions across near- and medium-term time horizons, key implementation partners, and critical dependencies to inform next steps beyond the Summit.	3:35 - 4:00 pm
Plenary: Summit Recap & Closing Selena Elmer, Aspen Institute	4:00 - 4:20 pm

Session Description: This facilitated closing plenary provides a final opportunity to reflect on key insights, actions, and takeaways from the Summit.	
Closing Remarks Ryan Calkins, Commissioner, Port of Seattle Session Description: Port Leadership will offer closing remarks highlighting the collaboration and practical insights shared during the Summit and the importance of continued coordination to turn momentum into on-the-ground progress.	4:20 – 4:30 pm

Appendix C

Summit Working Session Photos

This section displays some of the photos from the Summit's collaborative working sessions to provide some insight into the methodologies used, the interactive nature of the sessions, and examples of how the compiled session notes were revised into actionable items in this report.

Working Session Photos







Photos of Sampling of Notes from Working Sessions



