

Zero-Carbon for Shipping



Sailing carbon-free along North America's west coast



Executive summary

The shipping sector presents a significant opportunity in the transition from fossil fuels in North America. Often operating out of sight and out of mind for the general public, the shipping sector remains the backbone of the global supply chain.

Its decarbonization presents some unique challenges including long ship lifetimes, high energy demands and the consideration of fuel infrastructure requirements in various regions. Yet the solutions and scalable technological advancements that will allow the sector to decarbonize have already been devised and many are on the road to implementation.

Zero-carbon fuels have an important role to play in transitioning the shipping industry to a zero-carbon and emission free future, alongside the adoption of improvements in vessel energy consumption and operational efficiency.

The west coast of North America is an important and valuable route for the shipping industry. A significant proportion of the trade between the United States, Canada, and Asia (especially China and Japan) happens through or interacts with ports in this route. Decarbonization of vessel traffic through this route would therefore deliver tangible decarbonization benefits and could also be a catalyst of wider decarbonization for the industry as a whole.

5 Major Ports on the west coast of North America

This report explores the potential opportunity for five major ports on the west coast of North America, of adopting zero-carbon electrofuels: green hydrogen and ammonia produced with renewable power with no associated emissions from their production. Each Port has a considerable opportunity for adoption of zero-carbon electrofuels.

Together, these ports have the potential to form a zero-carbon shipping corridor up and down the west coast of North America. This corridor would provide vessels with multiple refueling stops that would allow them to adopt electrofuels without compromising their range. To take this step, vessels will need to be able to access these same facilities and resources in their other regions of destination and are likely to require more frequent refueling than fossil fuel-powered ships.

By developing and promoting zero-carbon fueling infrastructure along this route, there is a further opportunity to drive the change across the shipping industry, leveraging the influence that these ports and the associated stakeholders have. The characteristics and opportunities shown by these case studies could act as a blueprint for other ports – both in North America and beyond.

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UNALASKA, ALEUTIAN ISLANDS (ALASKA): **Disruptive opportunities in a small and remote island.** The unique combination of untapped renewable energy resources and local needs can give birth to complete electrofuel supply chains and even circular economies.

PORT OF VANCOUVER (BRITISH COLUMBIA): **Getting Canada's largest port ready for a zero-carbon future.** Producing and supplying electrofuels can help fill the revenue gaps that fading coal imports will eventually leave behind.

PORT OF TACOMA (WASHINGTON): **Enabling electrofuel adoption while decarbonizing local passenger transport.** Zero-carbon power can be used to decarbonize local ships moving passengers and vehicles and produce electrofuels to allow larger ships to switch fuels.

PORT OF OAKLAND (CALIFORNIA): **Outstanding potential for renewable electricity generation can support a green hydrogen economy beyond the shipping industry.** Mixing renewable energy resources both near the port and further afield can help decarbonize adjacent industries and rail operations in the future.

LOS ANGELES (CALIFORNIA): **Building on sustainability aspirations to decarbonize the busiest port in the United States.** Being able to offer zero-carbon fueling options to the huge numbers of vessels in the area could support take-up of these fuels significantly.

