Wind Support NYC
107 Andes Road, Governors Island
New York, NY 10004

Mar 17, 2023

Ref: LC2B/WS/M2023-3-V1

Call for Wind Propulsion Technology developers

Introduction

Wind Support NYC develops and promotes maritime projects that advance wind propulsion solutions and increase the use of wind - the free renewable energy available at the point of use - in the energy mix.

We are currently studying the role wind propulsion can play to reduce the emissions from the shipping activity on the **trade route between the states of Washington and Alaska.**

This study is supported by the Ocean Conservancy, a US foundation that advocates at the IMO and in Washington DC to decarbonize shipping completely by 2040. Through this study, Wind Support NYC and Ocean Conservancy will expose the key role wind propulsion can immediately play on the pathway to zero emission shipping.

The results of the study will be released in April 2023: **the report will be made publicly available** and we also intend to present the results in a few conferences centered on wind propulsion & sustainable shipping.

The first part of the study introduces the route, i.e. the cargo transported, the ports of calls, the weather & sea conditions as well as the existing fleet sailing between Seattle Tacoma and the ports of Alaska.

In this call, wind propulsion technology developers are asked to assess feasibility, impact and cost of retrofitting one RoRo vessel (TOTE North Star) sailing between Tacoma and Anchorage.

Through a second call, shipping companies operating (or developing) new wind enabled commercial vessels will be invited to present a vessel.

Call

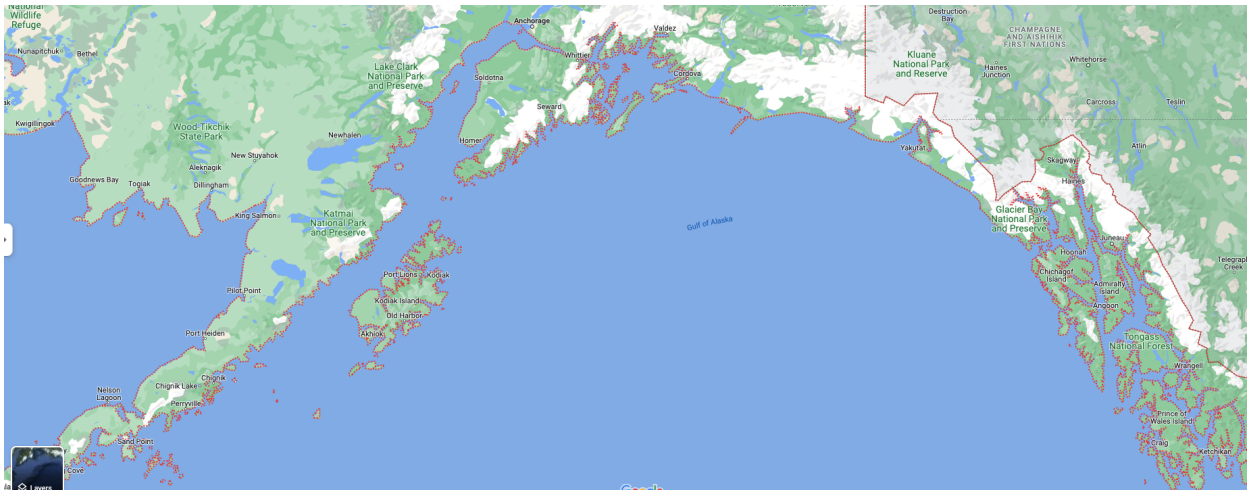
We are currently seeking contributions from Wind Propulsion Technology developers: they will help us assess the feasibility and ROI of retrofitting one vessel of the current fleet sailing between Tacoma & Anchorage (sections 4 & 5 in the plan above).

Developers' contributions will be analyzed and organized to present the impact of 3 or 4 wind propulsion technologies on the Tacoma - Anchorage trade route. A second call will be made in February, focusing on the cargo transported on barges between SeaTac and the South Western ports of Alaska.

Since the report will be publicly available, **we do not expect the technology developer to disclose any confidential information**.

Wind Corridor #1 - Washington Alaska

Alaska is the largest US state, but is connected to the rest of the world by a single highway. More than any other state, Alaska depends on maritime shipping to supply food, dry and construction goods, fuel and vehicles needed to support the daily lives of Alaskans.



The majority of this cargo is transported from the Puget Sound ports of Seattle and Tacoma by ship, barge, and articulated tug/barge (ATB).

Shipments to the Interior are primarily over the road or by rail, while shipments to the Far North by vessel during the extremely short Arctic summer. Shipments to and from Alaska occur in three main regions, Southeast, Southcentral, and Southwest.

In the Southcentral region, the largest city in Alaska, Anchorage, is served by two container vessels (Matson), and two RORO vessels (TOTE) each week, as well as weekly container on barge service operated by Samson and Alaska Marine Lines (AML), resulting in 289,000 TEU imported from Seattle/Tacoma.

Juneau, the state capital and largest city in the Southeast region is served by two AML and one Samson barge per week for a total 73,000 TEU imported per year. Smaller ports are also served by barges: Ketchikan and Petersburg are the next largest ports after Juneau, each around 30,000 TEU per year, and the remaining Southeast ports all under 10,000/year.

Bulk fuel shipments to Alaska ports consist mainly of kerosene (jet fuel), and distillate fuels (diesel and home heating oil). Alaska had the third highest per capita consumption of fuel for any US state, primarily driven by transportation

and resource extraction consumption. As each town/city typically operates its own electrical grid, oil powered generation is common throughout Alaska, accounting for 16% of electricity production, typically from diesel fuel.

Anchorage is supplied by coastwise shipments of oil products, carried on ATBs operated primarily by Crowley and Kirby, ranging from 100,000 to 200,000 barrel capacity barges and 6,000 to 11,000 hp tugs. Smaller ATBs (28k-76k barrels) are used to serve all ports except Anchorage, meaning most ports receive a vessel between 5 and 20 times per year, depending on storage capacity.

Fleet

A relatively small number of vessels carries all the cargo destined for Alaska. Three container ships, two RORO vessels, and less than 20 barges make up the fleet.

- TOTE is currently in the process of converting their vessels to operate on LNG.
- The three Matson vessels are now 35 years old, making it unlikely that the company will consider significant capital retrofits before replacing the vessels.

The AML and Samson barges are pulled by tugboats, primarily from Western Towboat, and are typically around 5000 hp, and are capable of pulling full barges at approximately 10 kts, approximately 50% of the fuel efficiency of a comparable sized ship.

Vessel Type	Vessel Name	Operator	Year Built	Size	Dimensions	Installed Power (HP)	Service Speed
Container	*Kodiak, Anchorage, Tacoma*	Matson	1987	1668 TEU	710 x 78 x 33	22540	20 kts
RORO	*Midnight Sun, North Star*	TOTE	2003	1200 TEU + 250 cars	839 x 118 x 31	60000	23 kts
Container Barge	*Chichagof Provider, Chatham Provider*	AML	1973	510 TEU	286 x 76 x 17	5000 (Titan class tug)	
Container Barge	*Tongass Provider, Taku Provider*	AML	1997	700 TEU	322 x 90 x 18		
Container Barge	*Skagway Provider, Sitka Provider, Stikine Provider, Southeast Provider*	AML	2004	800 TEU	360 x 100 x 22		
Container/ Rail Barge	*Anchorage Provider, Fairbanks Provider, Arctic Provider, Whittier Provider*	AML	2001	264 TEU + rail cars	420 x 100 x 24	5000 (Titan class tug)	
Petroleum ATB	*DALE R. LINDSEY/Petro Mariner*	Petro 49	2016	28,450 bbl	222 x 65 x 24	6000	
Petroleum ATB	550 Class (4 vessels)	Crowley	2002	155,000 bbl	477 x 74 x 24	9280	

Vessel for case study

The vessel to be used in this case study is the TOTE North Star

Built in 2003:

- Overall Length: 839’
- Beam: 118’
- Draft: 27.8'
- Speed at 90% MCR: 24 knots

Installed Power:

- 60,000 HP
- 2 shafts, diesel electric, 4 MAN 58 generators, fixed pitch propeller
- Trailer Capacity: 600 FEU
- Auto Capacity: 250
- Currently being converted to LNG

Weekly service

- Route: Tacoma-Anchorage
- Average Speed from AIS: 21.3 knots
- 15 hours in each port, rest of time in transit.

Case study

The technology developer is invited to present wind assist retrofit options and explain the performance of their technology on the TOTE North Star for the Tacoma-Anchorage route:

- Description of the technology
- Number of devices to be installed
- Recommended locations for installation on the vessel
- Expected power and fuel savings TACOMA - ANCHORAGE & ANCHORAGE - TACOMA as well as emission reductions *
- Operational impact & limits
- Installation work and costs of running the equipment.

Developers should use **0.6 total propulsive efficiency** to convert effective power to brake power, and **170 g/kWh** as the engine fuel consumption rate.

* The TOTE North Star is currently operating at an average speed of 21 knots. The technology developer is invited to provide expected fuel savings at 3 different average speeds: **21knts, 18knts, 15knts.**

Public report and confidential information

Since the report will be publicly available, **we do not expect the technology developer to disclose any confidential information**.

Contact

For any questions, please reach out to Laurent Corbel, +1 646 229 9900, lcorbel@windsupport.nyc

Wind Support NYC
Building 107, Governors Island, New York, NY 10004, USA
www.windsupport.nyc - email lcorbel@windsupport.nyc