

# IAME Conference 2024

## Evaluating the Investment Value of Alternative Fuel Vessels: A Scenario-Based Approach

June 26, 2024

NYK Line

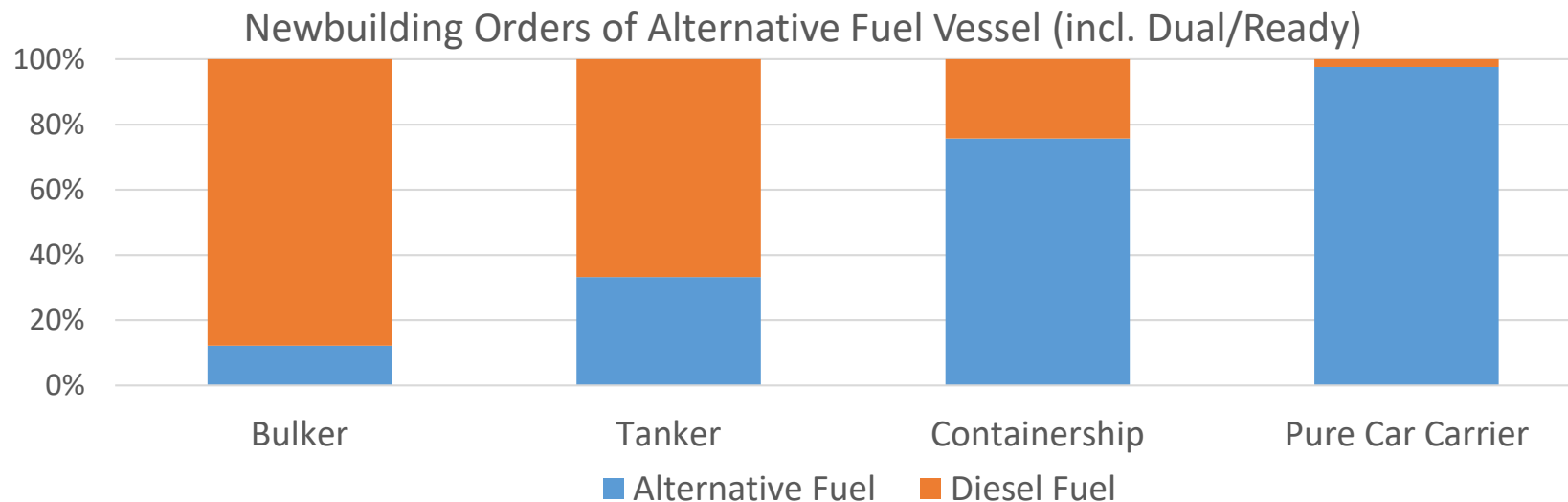
Koichiro Hayashi

# Summary of Presentation

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- Background
- Challenges in Investment Value Evaluation
- Data and Methods
- Estimated Investment Value
- Results
- Conclusion and Next Steps

- Following the IMO MPEC 80 resolution in 2023, the introduction of alternative fuels such as methanol, ammonia, and LNG has become a critical challenge for the shipping industry.
- However, the pace of order activity is still slow for some ship types. For example, dry bulk carriers, which account for 40% of the global merchant fleet, represent just over 10% of alternative fuel orders in 2023.
- This is not a technical issue, as all orders for large containerships (over 13,000 TEUs) in 2023 are for alternative fuels (including 'dual' or 'ready' options). This reluctance is due to the perceived low return on investment.



- Quantifying the investment value of an alternative fuel vessel is essential to help shipowners make appropriate decisions and to help policymakers develop policies to mitigate business risks.
- However, this is very difficult. There are two main challenges.
- The first challenge is that the parameters involved are too many and too difficult to view accurately. These parameters include not only the ship and the shipping market but also the discount risks of non-mainstream fuels, the price of the alternative fuel, and the risk of diesel fuel regulations.
- The second challenge is that even if an accurate outlook for these parameters could be obtained, it would not necessarily be in line with shipowners' perceptions.

To overcome these challenges, this study attempts to estimate the investment value based solely on shipowners' perceptions of the level of adoption of alternative fuels. The approach is as follows.

- The investment scenario is that a vessel is ordered in 2023, delivered in 2025, and sold on the second-hand market in 2030.
- The investment value is defined as the present value of the option to order an alternative fuel vessel instead of a diesel vessel. The present value is calculated using the discounted cash flow (DCF) method.
- An alternative fuel vessel is assumed to be a dual-fuel diesel/methanol vessel. In addition, its operating costs (other than fuel costs) are the same as for a diesel-fueled vessel due to additional fuel-saving equipment. As a result, the operating cash flow with diesel fuel is the same for both types of vessels.
- Shipowners' perceptions of the level of adoption of alternative fuels are captured by a survey on the perceived likelihood of various scenarios.

# Data and Methods: Shipowners' Survey

Scenarios of the level of adoption of alternative fuels are provided below. These include the scenario name, description, and premium (i.e., the second-hand price of an alternative-fuel vessel compared to a diesel-fuel vessel).

Scenario	Description	Premium
Full Adoption	Decarbonization in the shipping industry fully progresses, and the value of diesel-fuel vessels aligns almost with their scrap value.	90%
Moderate Adoption	Decarbonization in the maritime industry progresses to a certain extent, leading to a discount in the charter rates for diesel-fuel vessels.	50%
Status Quo	There is no significant progress in the decarbonization of the shipping industry, and the premium for second-hand vessels remains the same as the premium for newbuilding vessels.	20%
Obsolete	It becomes clear that alternative fuels other than methanol will become mainstream, resulting in the disappearance of the premium for being able to use methanol.	0%

- As mentioned above, the likelihood of each scenario was supposed to be obtained through a survey of shipowners.
- However, this preliminary study used interviews with a small group of experts instead of a survey. This is because a survey is costly and time-consuming, and we would need to confirm the validity of the model in advance.
- Two ship types are considered: Neo-Panamax containerships as an example of fast adoption and Kamsamax bulkers as an example of slow adoption.

The likelihood for each scenario derived from the interviews is as follows.

Scenario	Kamsamax Bulker	Neo-Panamax Containership
Full Adoption	10%	30%
Moderate Adoption	30%	30%
Status Quo	30%	30%
Obsolete	30%	10%

Other parameters used in this model are as follows:

- Newbuilding and five-year secondhand prices are based on the average of the last five years from Clarkson's Shipping Intelligence Network database (Clarksons, 2024).
- The difference in newbuilding prices between dual-fuel and diesel-fuel vessels was set at 20% based on interviews with industry experts.
- The weighted average cost of capital (WACC) was set at 9% based on industry reports and other references.



# Result of Investment Value

	Kamsamax Bulker	Neo-Panamax Containership
Newbuilding Price of diesel fuel	\$31.5m	\$124.5m
Premium for dual fuel	\$6.3m	\$24.9m
Probability: Full Adoption	10%	30%
Probability: Moderate Adoption	30%	30%
Probability: Status Quo	30%	30%
Probability: Obsolete	30%	10%
Secondhand Price of diesel fuel	\$28.5m	\$107.8m
Present value for ordering dual fuel	\$-1.62m	\$3.41m
Ratio to newbuilding price	-5.20%	2.70%

Estimated investment values for alternative fuel vessels are negative for a Kamsamax bulker and positive for a Neo-Panamax containership, which is in line with order activity in 2023.

- This study presented a model for estimating the investment value of an alternative-fuel ship instead of a diesel-fuel ship simply by using shipowners' perceptions of the likelihood of alternative-fuel adoption scenarios.
- In addition, preliminary estimates confirmed that the model produced results consistent with actual orders for alternative-fuel vessels.

- The next step in this study is to conduct the survey presented in our model with shipowners to calculate the formal results. Ship types other than Kamsamax bulkers and Post-Panamax container ships should be included.
- The model in this study assumes that it is possible to build a dual-fuel vessel of the same specification at a higher price. However, this assumption may be too strong. This should be investigated in a future study.



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