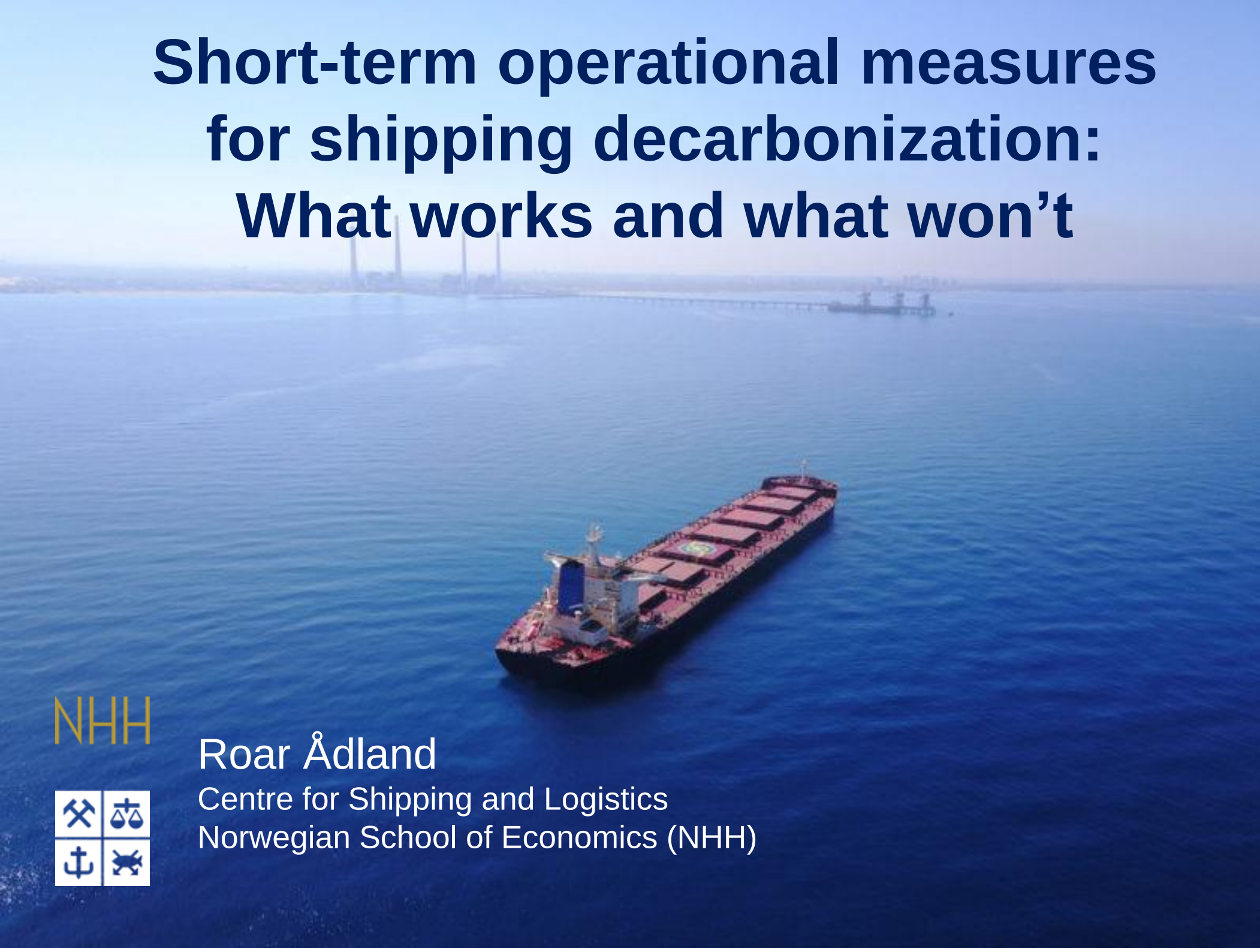
Short-term operational measures for shipping decarbonization: What works and what won't



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"Chartering an A-rated ship today is like buying an A-rated fridge and leaving the fridge door open"

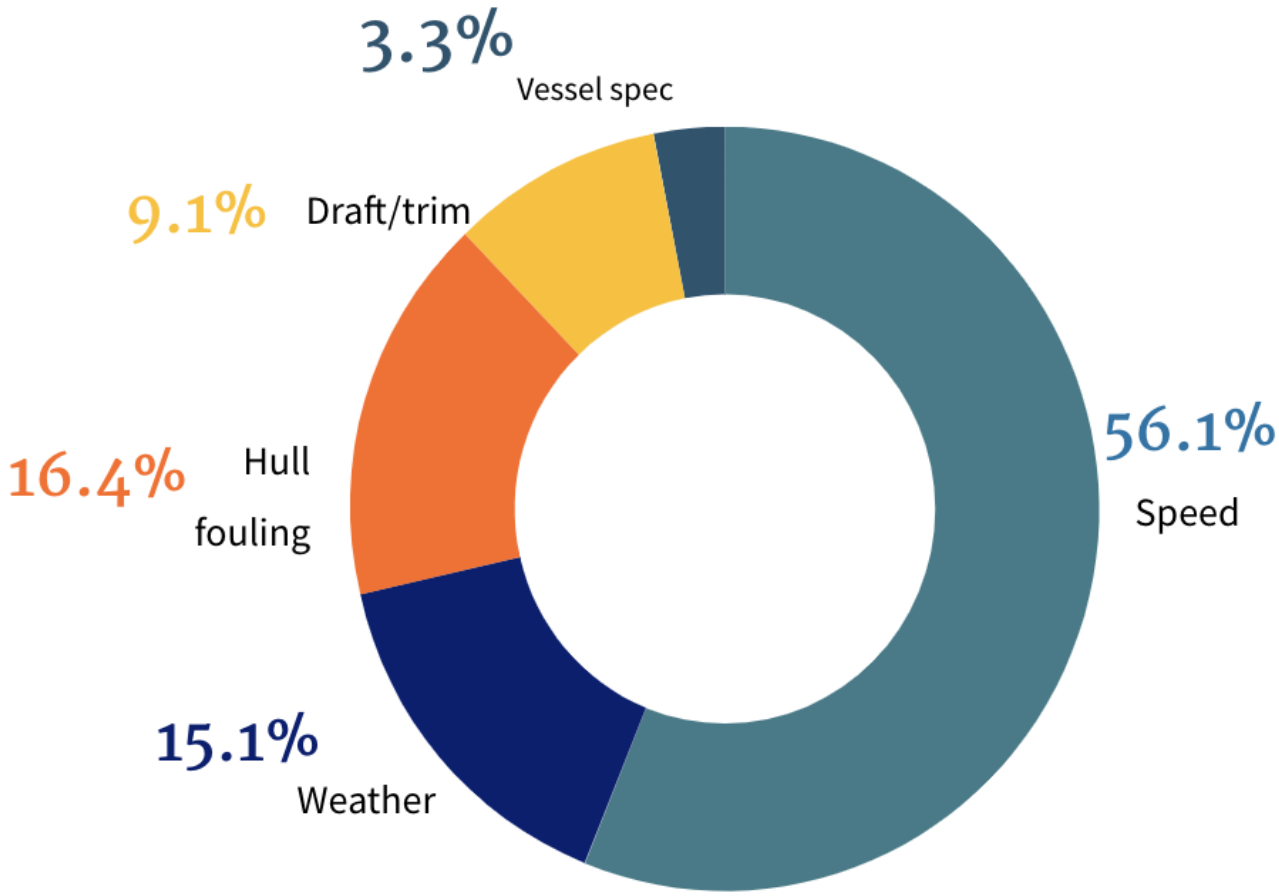
Roar Ådland

Sep 2021

Is it enough to optimize ship operations within the existing commercial framework?

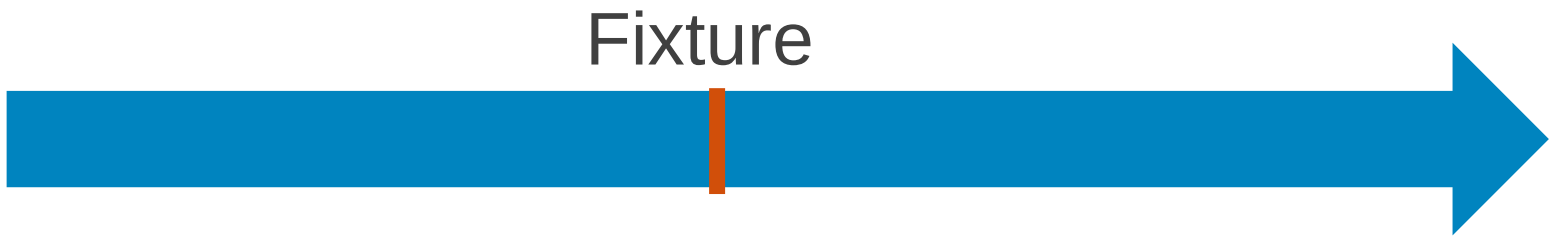
Or do we need to revamp shipping’s commercial framework itself?

What influences CO2 emissions?



Aframax tanker, ballast/laden average

What is determined when?



- Pre-fixture
  - Average voyage speed (meeting laycan, speed clause)
  - Cargo size and optionality
  - Pre-existing hull condition
- Operations
  - Local speed changes
  - Local routing, weather avoidance
  - Trim
  - Final cargo intake subject to weather, draft restrictions, fuel onboard

- **Most shipping emissions are unavoidable!**
- **Most (90%+?) of voyage emissions are effectively decided at the time of fixture!**

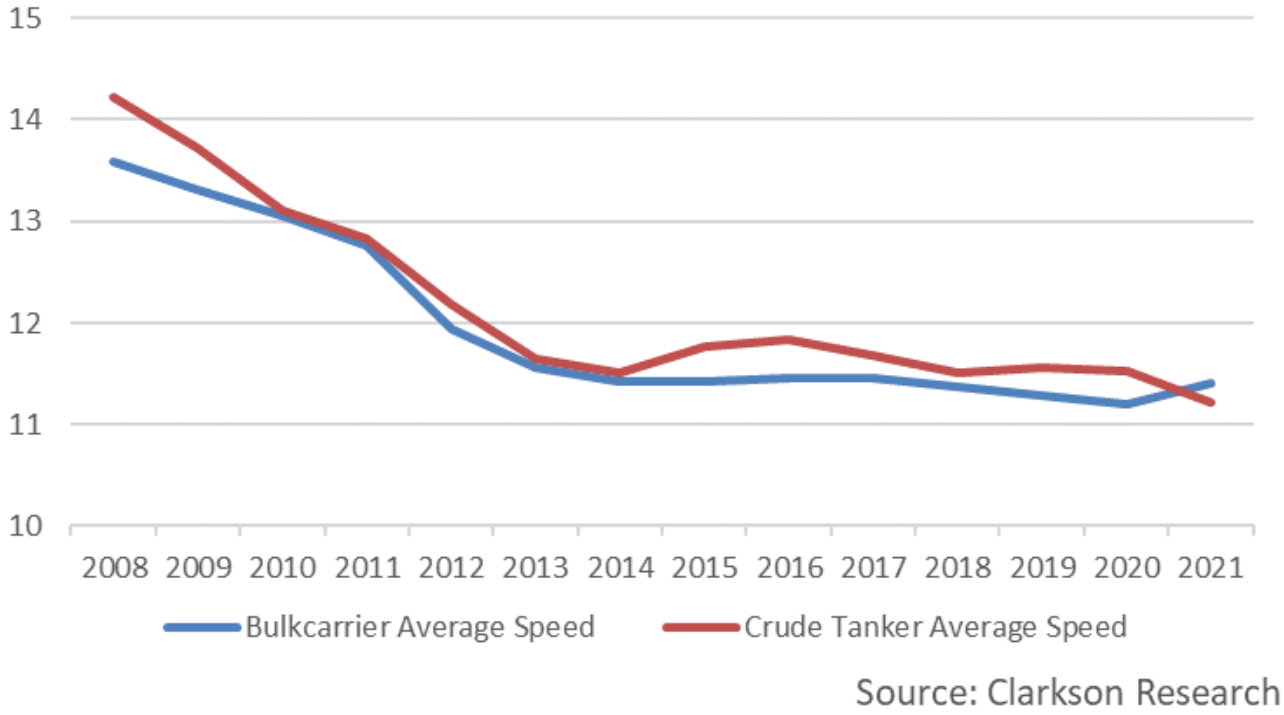
Operational measures is a misnomer…

…chartering managers are the key!

The low-hanging “low-carb” fruit

- Make hull condition explicit in the charterparty
  - E.g. as an added tonnes-per-day consumption factor
  - Enable differentiation between good and bad hulls
- Penalize long ballast voyages vs. shorter ones (for the same cargo)
  - Ballast emissions should belong to the cargo
- Always max out the cargo intake
  - If not possible, you fixed too big a vessel

What about (further) speed reductions?



- Reduction potential is already almost fully utilized
- Deteriorating vessel performance at apeeds far away from design point eventually leads to HIGHER emissions
- Our research: Abt. 10 knots is break point for an Aframax tanker

The hard part: A charterparty revolution

- 150 years of English maritime law is the greatest barrier to energy efficiency....
- Economic incentives are not at all aligned with the environment!
  - First-come-first-served berth allocation in ports is not helpful
  - Demurrage is relied upon as extra revenue in bad markets: High speeds and cargo delays are «good»
- NHH Research: Going from «Sail-fast-then-wait» to «Just-in-time» behaviour has the potential to reduce average speeds, and emissions by up to 20%.

«Carbon measures»

- Inherently unsuitable to incentivize better behaviour
- Annual energy efficiency ratio and the derived CII

$$AER = \frac{\sum_i C_i}{\sum_i dwt \; D_i}$$ i = voyage

- No account of DWT utilization
- No account of laden ratio («always carrying cargo»)
- No account of trading pattern (e.g. N. Atl. vs SEAsia)

Effectively useless for comparing the environmental performance of owners and ships in a fair manner

Wishful thinking for a better solution

- Establish a shared framework for what the benchmark fuel consumption/emissions for each cargo is
- Benchmark refers to “best practices”
  - Shortest ballast leg
  - Minimum emission average speed across ballast and laden leg
  - Clean hull
  - Zero waiting at anchorage
- Establish a carbon account for each voyage post-discharge
- Establish who (disponent owner or charterer) caused deviation from the benchmark
- Put a price on emissions in the charterparty
- The party that caused the deviation from the benchmark (on a net basis) pays compensation to the other as part of freight
- Similar principle to demurrage/despatch

The small print…

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