



The Goal

Discuss and learn about the next steps towards clean fuels: scaling-up of alternative fuels and new propulsion systems

Global Challenges

- Global sulfur cap on bunker fuel of 0.5% as of 2020, down from 3.5% today
- Uncertainty of cost implications and how to absorb these costs -> Chicken & Egg problem between Stakeholders
- Bunker expenses expected to rise
- Underutilized container capacities (volume/weight)

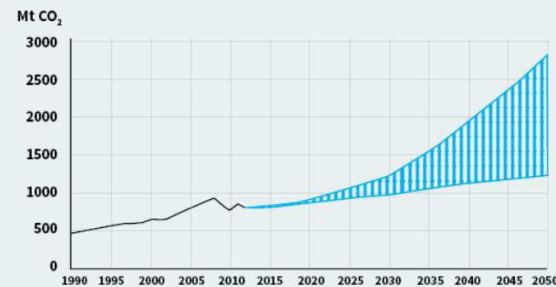
Coping Strategies

- Improve ship energy efficiency
- R&D for low carbon fuels (LNG) / bio fuels
- Creating dialogue across Value Chain
- Optimization through intermodal solutions
- Assisted ship propulsion

Other Approaches

- Port call optimization
 - Vessels rush to target harbor to then wait approx. 2 days before being served
 - Up to 30% emission savings possible

Range of expected increase in GHG emissions from shipping



Source: Third IMO GHG Study (2014)
Transport & Environment

Assisted Ship Propulsion

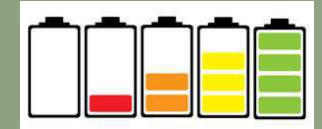
- eConowind unit is a 40ft container with two foldable VentiFoil that generate wind-thrust and fuel savings averaging 25%
- Suited for smaller vessels and heavy seaways
- No refurbishment costs or additional equipment needed -> can be switched between routes/vessels easily through "plug and play" installation

- 250k € per container
- 20 ekW @ 400V

Windspeeds	Fuel Savings up to
Bft 3 (6 m/s)	9 %
Bft 5 (10 m/s)	13%
Bft 7 (14 m/s)	40%

Scale-up Alternative Fuels

- Liquefied Natural Gas (*in use*)
- Biofuels (*in testing phase*)
- H2 fuel (*in experimental phase*)



Why LNG?

- Up to 25% less CO2
- 99% Sulphur emissions
- 99% Nitrogen Oxides emissions
- 99% particulate matters
- Limited number of changes in vessel design
 - Dual fuel solution for propelling & auxilliary engines involving limited Diesel usage for engine ignition
 - Cheaper fuel as ammortization factor
- Not explosive / hardly flammable



What can we as chain partners do?



Group 1 & 2

Realizing sustainable shipping with Biofuel and LNG

- Biofuel is considered a realistic sustainable option
 - Needs to be more readily available in busy ports
 - Infrastructure needs to be in place
 - Test bio-fuel with support of shippers (*pilot to be announced in NL*)
- Investigate test biofuel for starting fuel and aux. engine
- Both fuel options need more involvement of all supply chain participants
- Bio-LNG may be the future solution
- One common framework is needed to evaluate initiatives on success and failures
- Keep looking for other non-fossil options

Shipper

- Go for green longer term contracts
- Let consumer pay per CO₂/kg
- Apply sustainability criteria in logistics procurement strategies
- Standardize reporting
- Participate in pilots

Ports

- Create incentives for carriers using sustainable options (lower port costs or reduced fees)
- Accommodate STS delivery
- Support development of Infrastructure

Forwarder

- Promote BICEPS and bring companies together
- Join BICEPS and reward greener transport

Carrier

- Participate in pilots and execute tests
- Encourage ESI/WPCI participation
- Find partners with the same interests
- Engage ports/other stakeholders to outline possible incentives

Fuel Suppliers

- Create and offer infrastructure
- Offer viable long term contracts
- Provide know-how
- Participate in pilots and execute tests

Group 3 & 4

What could be an effective logistics chain with LNG shipping?

- Make consumers and supply chain partners more aware of benefits
 - Prove contribution to GHG emission savings beyond any doubt (methane slip concern)
 - Make impact tangible
 - Shippers need to create demand for LNG driven carriers
- Infrastructure availability required
 - Make LNG more attractive through flexibility and availability (esp. in East-West trade)
 - Less fluctuation in bunker additions
- Long-term fuel contracts
- Learn from experience stemming from other sectors i.e. road to speed up learning curve
- Allow for gradual, scalable implementation
 - New build, Retrofit, Hybrid
- LNG transport will need to be absolutely safe and accepted by authorities

Group 5 & 6

Realizing energy-efficient techniques like wind propulsion

- Wind propulsion up to vessel speed 13 KN
- Commodity goods by bulk ships are already tested good fit
- Best areas to start a pilot: North Sea, Baltic Sea, Mediterranean
 - Hubs close to the coast
- New vessel vs. retrofit not as important since installation of eConowind units do not require retrofit of vessel
- Possibly have parties buy limited number of containers and rent them out or develop lease option to reduce initial investment needed along the transport chain
 - Use government subsidies
- Feasibility study will be initiated by BICEPS Network, PORT(s), CONOSHIP, and interested companies/chain partners.