



IEA Bioenergy
Technology Collaboration Programme

Task 39
IEA Bioenergy



Update on biofuels in marine shipping report

Issues affecting utilisation of advanced biofuels in the marine sector

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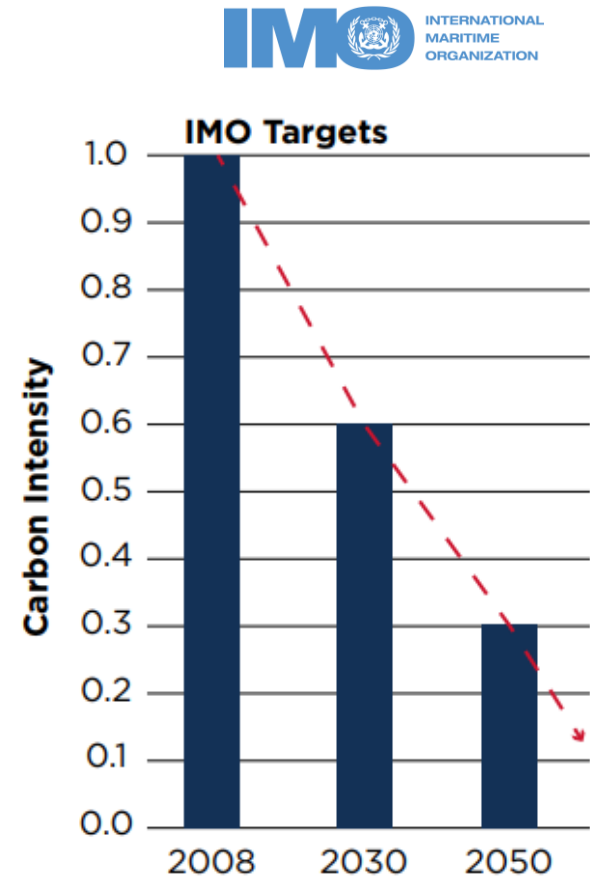
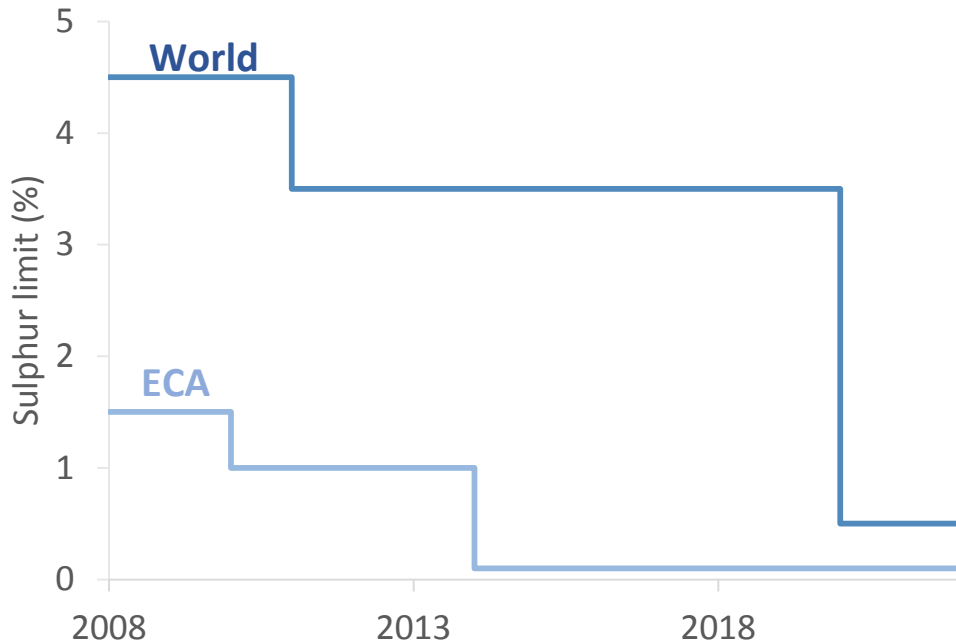
by **iea**

“What are the barriers for implementation and deployment of biofuels in the marine sector?”

Plan

- April-May 2020 – Scope report and agree on outline, agree on collaboration with other tasks
- June-September 2020 – Data collection and writing first draft
 - Conduct interviews with stakeholders
 - Analyze stakeholder response
 - Collecting information on status technologies and regulations since last report
- October 2020 – Circulate and get feedback on first draft from the reference group.
- **November-December 2020 – Revise (and expand) manuscript**
- January 2021 – Circulation of revised manuscript and draft executive summary.
- February 2021 – Final review of report
- March 2021 – Final update of manuscript and executive summary
- April 2021 – Final approval of report incl. executive summary
- May 2021 – Final layout and report ready for sharing on member's site
- June 2021 – Presentation of report on IEA Bioenergy webinar (tentative).

Justification

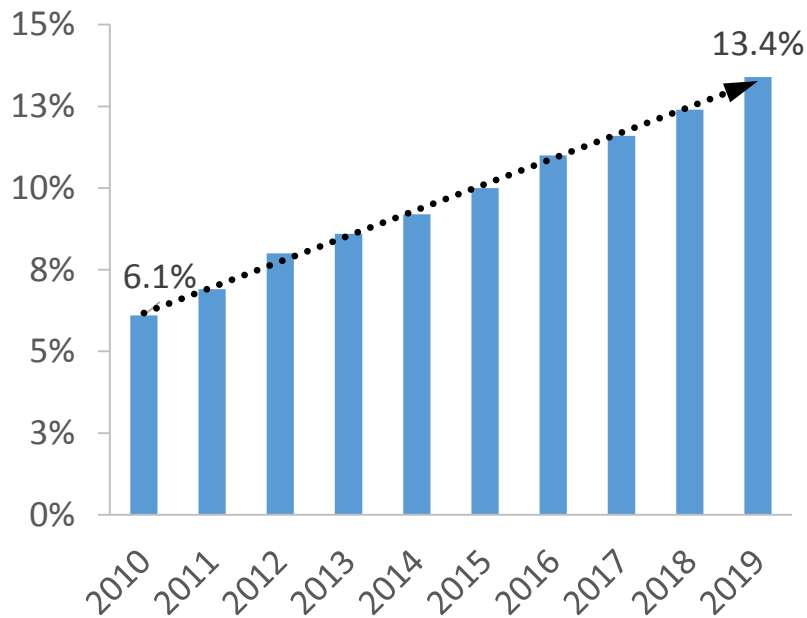


“The shipping industry will not be able to meet the IMO target of 50% of GHG emissions unless we accelerate our efforts.”

Christopher J. Wernicki, President & CEO, ABS (American bureau of shipping).

Challenge

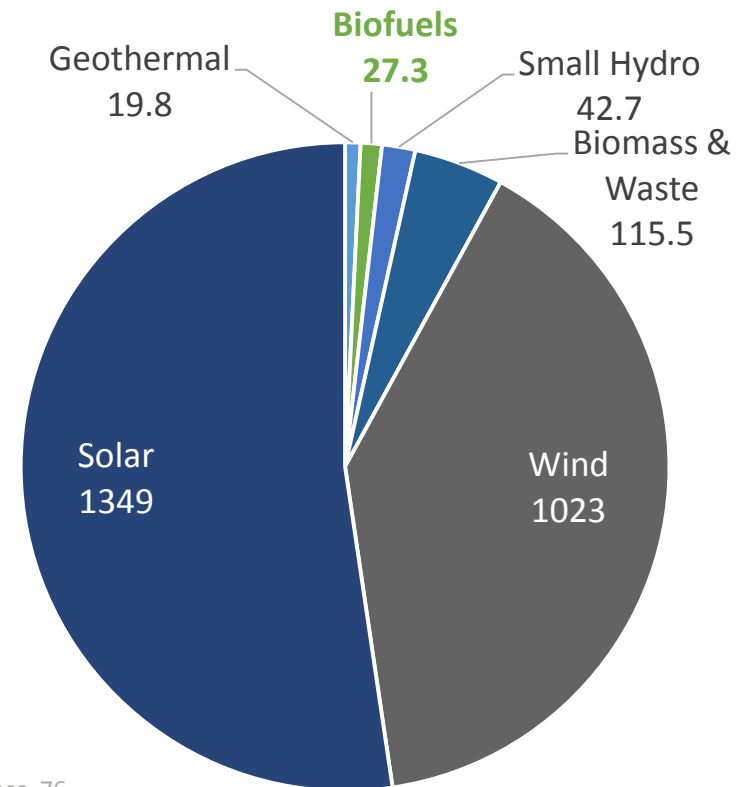
Share of renewable power in energy generation globally from 2007 to 2019 ¹



¹Statista.com

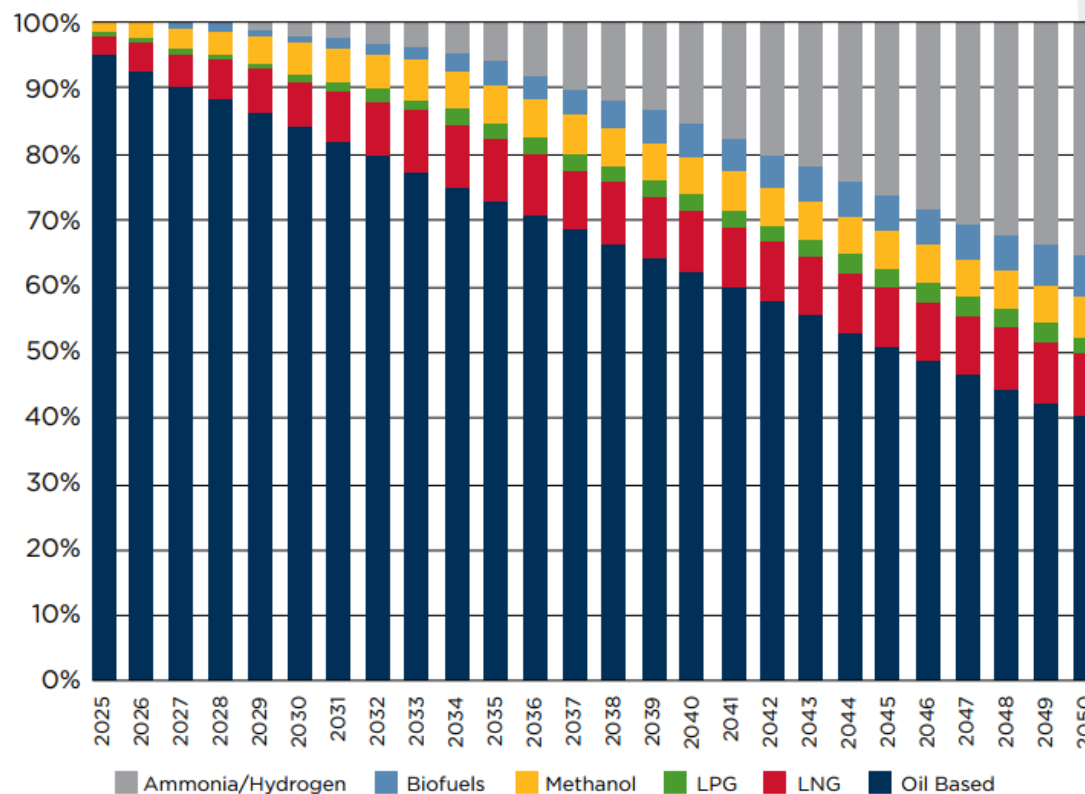
²Global Trends in Renewable Energy Investment 2019." Bloomberg New Energy Finance, 76.

Renewable energy capacity investment between 2010-2019 in \$Bn ²



Challenge

Projected marine fuel use to 2050 ³



³ ABS (American bureau of shipping), Sustainability Whitepaper, Ammonia as Marine Fuel. 2020.

Justification (2)

Strengths

- Feedstocks are extremely low in sulphur content
- 2nd generation lignocellulosic feedstocks are abundant
- Marine fuels are of lower quality and **do not need intensive upgrading and refining**
- Drop-in fuels do not require major changes in the bunkering infrastructure



Opportunities

- Regulations regarding bunker fuels and emissions have become stricter
- Introducing new alternative fuels in the marine fuel mix would reduce fossil fuel dependency
- Drop-in marine biofuels show a strong potential to replace part of the fuel mix
- New engine technologies may open a marine market for bioethanol

Justification (3)

“We are in the middle of the biggest change since naval architects started drawing shipping containers, or since the ship propulsion went from coal to oil.”

Tim Reeve, Senior Project Manager at Maersk

Stakeholder interviews

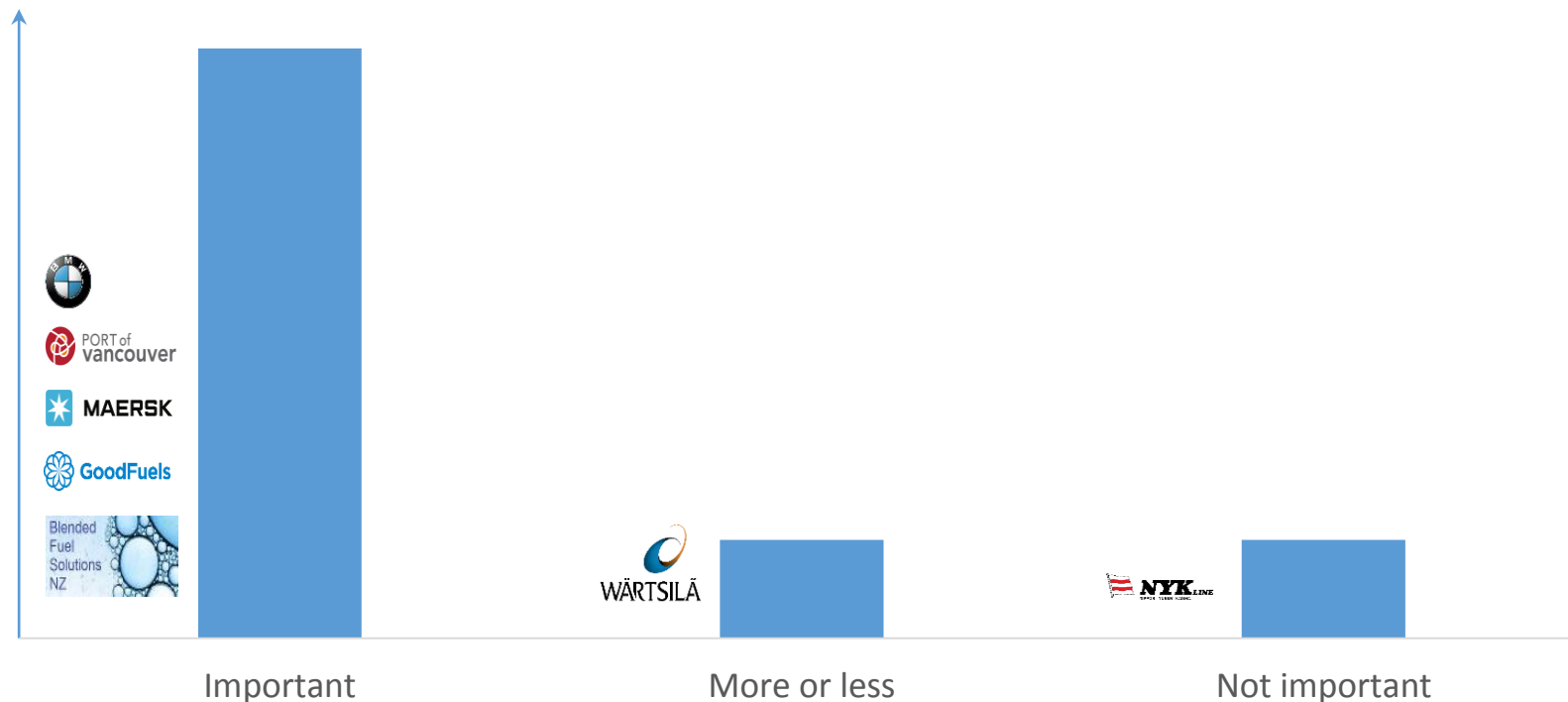
We are interviewing two actors within each stakeholder category:

- Fuel producers/distributors
- Engine manufacturers (OEMs)
- Deep-sea vessel owners
- Short-sea vessel owners (*need contacts)
- Cargo owners (*need a contact)
- Ports



Future role of biofuels in the marine fuel market

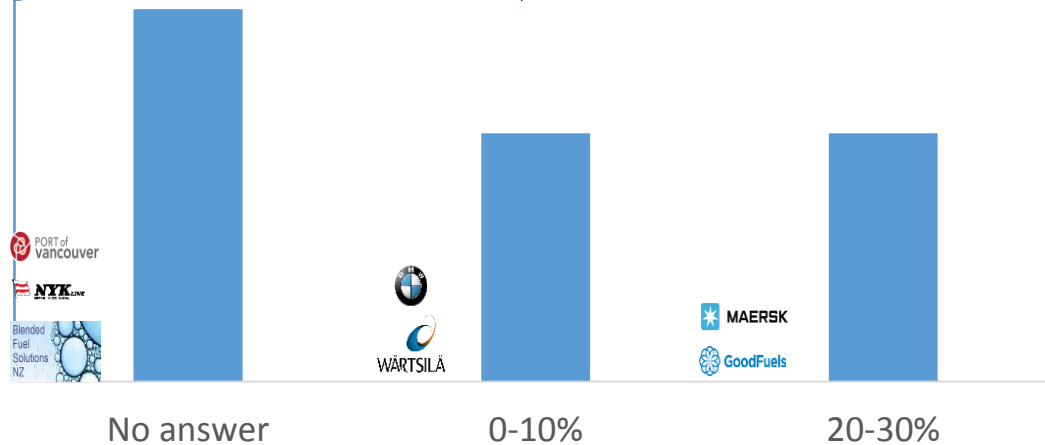
(According to stakeholders)



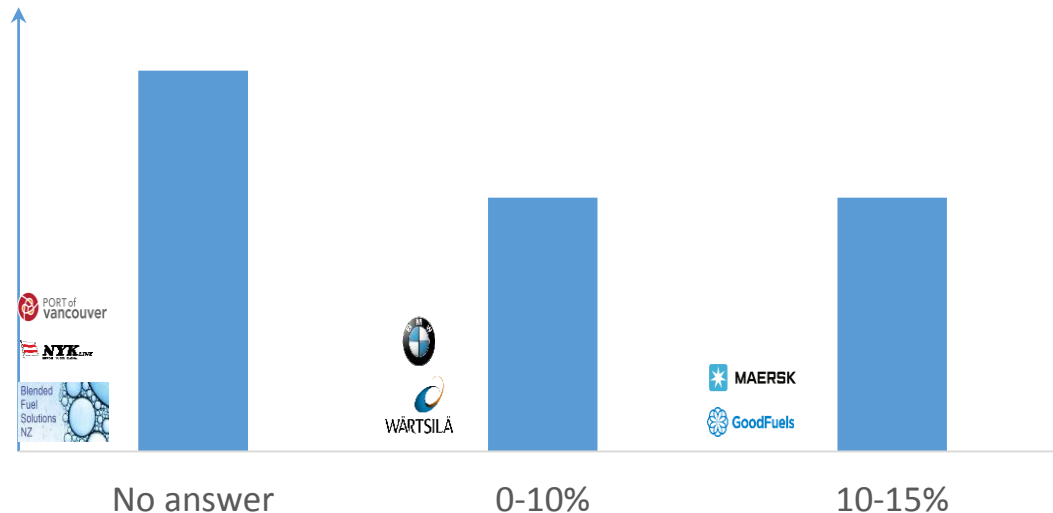
Expected biofuel market share in:

(According to stakeholders)

2050



2030

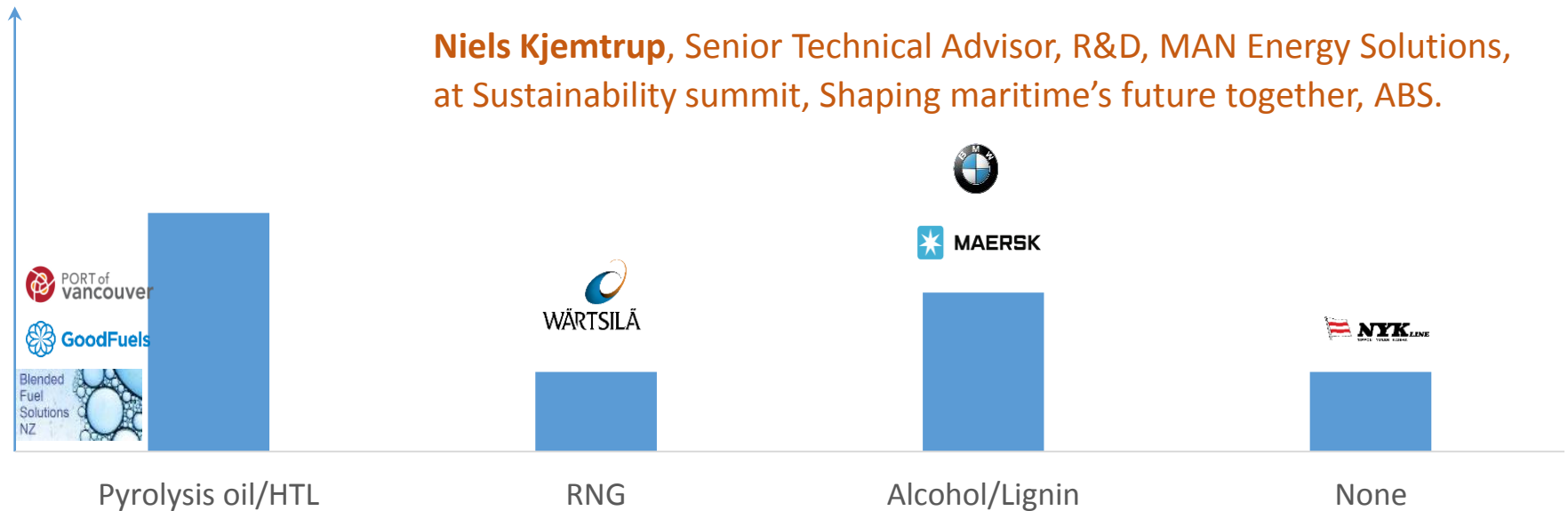


Most promising alternative fuel

(According to stakeholders)

“The time where a fuel system lasts the life of a vessel is probably over. In the future you should expect to retrofit your vessel more often. What is needed is to prepare yourself by the outmost to be flexible.”

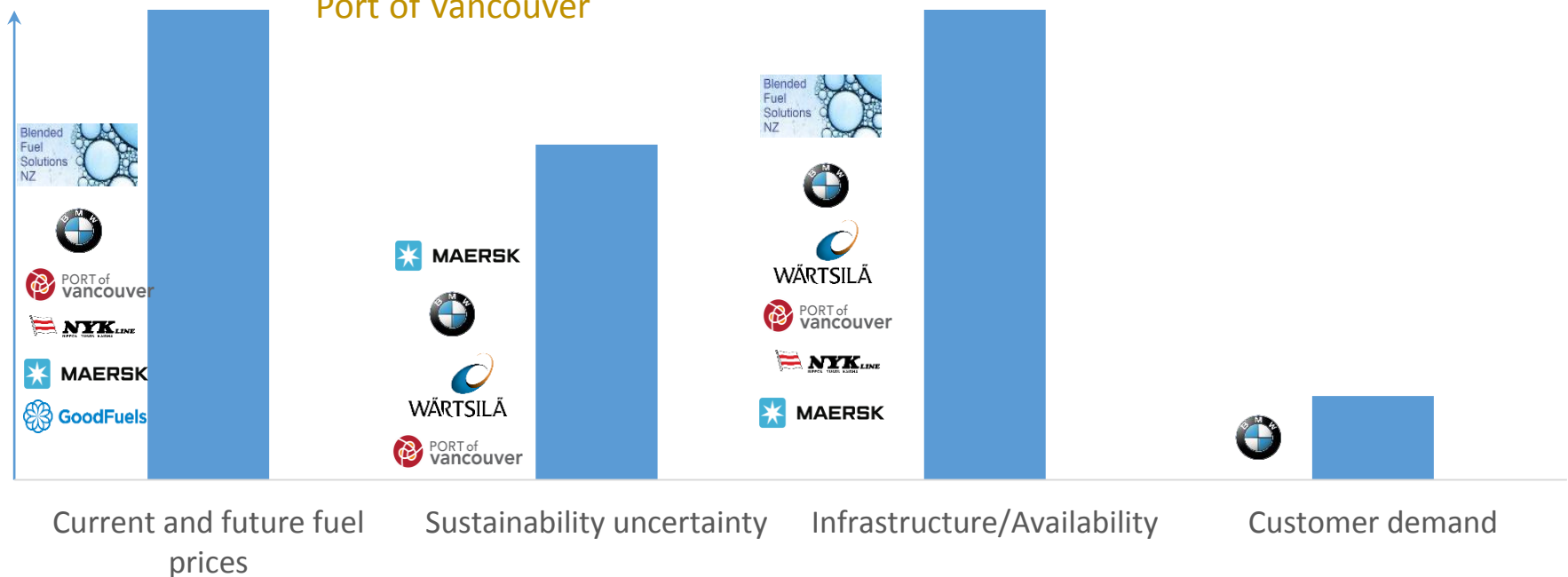
Niels Kjemtrup, Senior Technical Advisor, R&D, MAN Energy Solutions, at Sustainability summit, Shaping maritime's future together, ABS.



The largest barriers for marine biofuels (According to stakeholders)

“There is not a globally recognized certification of sustainability when it comes to biofuels. There is no way to differentiate between similar fuel with different carbon intensities.”

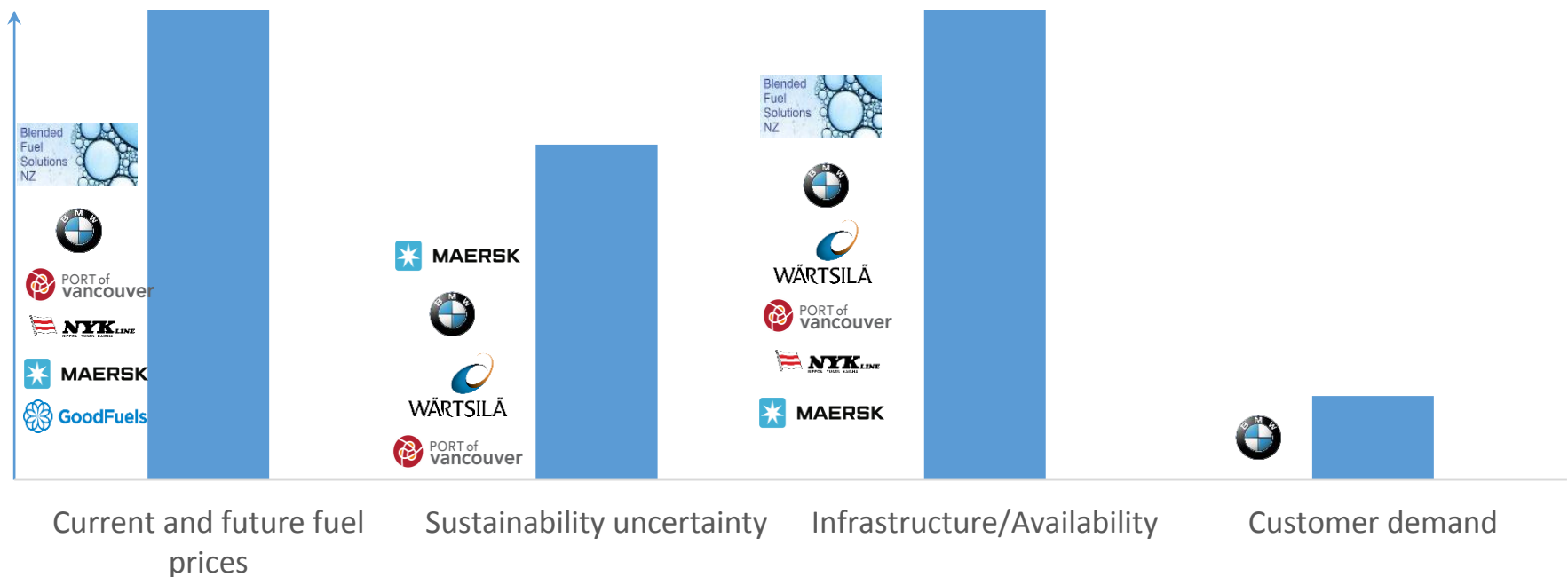
Ronan Chester, Manager, Strategic Environmental Initiatives at Port of Vancouver



The largest barriers for marine biofuels (According to stakeholders)

“As it is now, the ship-owner would absorb most of the extra cost involved with alternative fuels. They cannot.”

Ronan Chester, Manager, Strategic Environmental Initiatives at Port of Vancouver



Goes along with what we see in literature

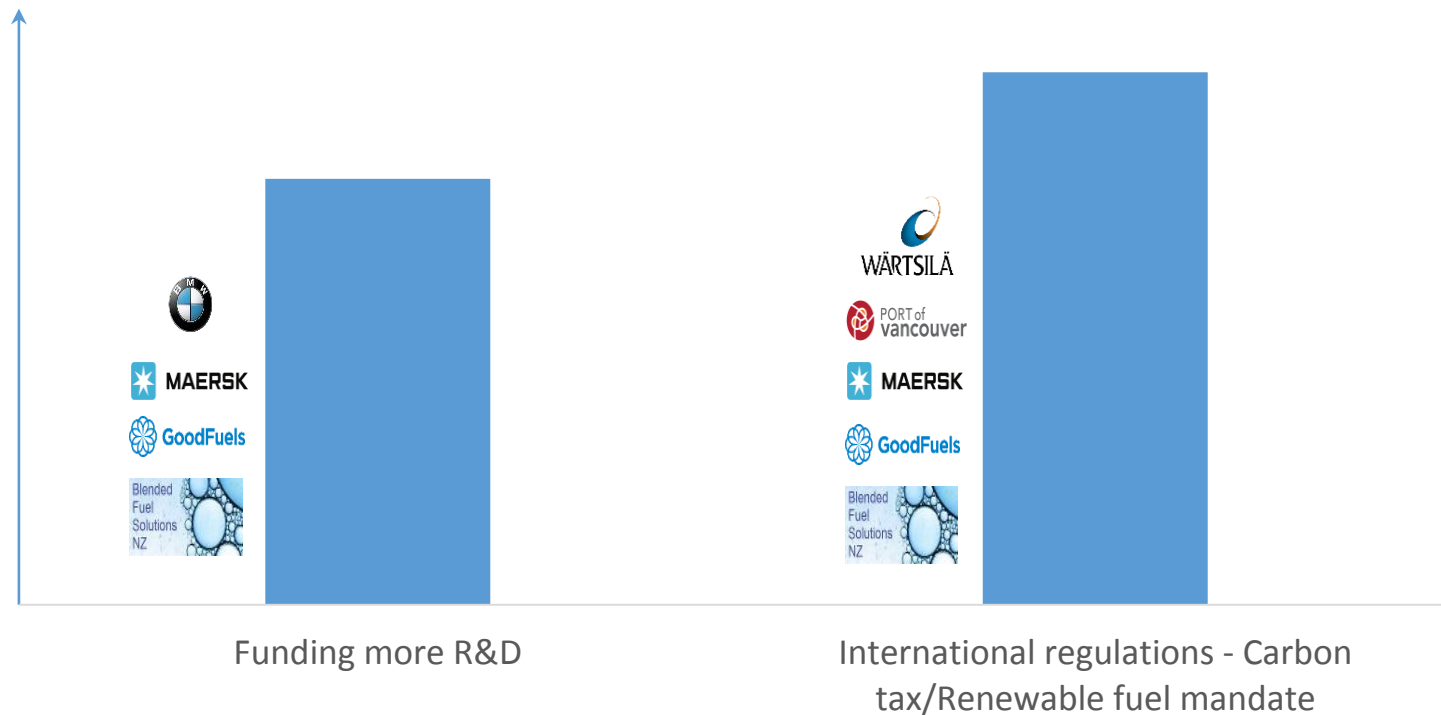
- In an analysis of a survey of 14 business executives in the advance biofuel industry ⁴.
 - From the producers perspective regulatory uncertainty was identified as the biggest barrier.
 - A general worry that the sustainability criteria may become more stringent in the future.
- Another study on biofuels in the maritime sector concludes that the level of production does not match the level of positive outlook on biofuels in the marine sector. ⁵

4) International Renewable Energy Agency. IRENA (2019). ADVANCED BIOFUELS What holds them back?

5) Andriantsiferana KM. Decarbonising the Global Supply Chain: Which Fuel Alternative Should Shipping Companies Turn To? A Feasibility Study of the Implementation of Biofuels. 2019

How to get there?

(According to stakeholders)



Barriers (1)

Supply chain

Feedstock

- Logistics
- **Sustainability certification**
- Price development

Production

- TRL
- Cost efficiency
- Energy efficiency

Transport/Storage

- **Compatibility**
- Safety
- Fuel stability

Port/Bunkering

- **Fuel standards**
- Infrastructure

The definition of sustainability can change over time...

Barriers (2)

Fuel utilization

Fuel system

- Fuel tank volume
- Fuel compatibility
- Fuel stability

Engine

- Compatibility
- Retrofitting
- Maintenance

Emissions

- NOx
- SOx
- PM
- GHG

End-users / Legislators

- **Managing higher shipping price**

The big question is, who should pay?

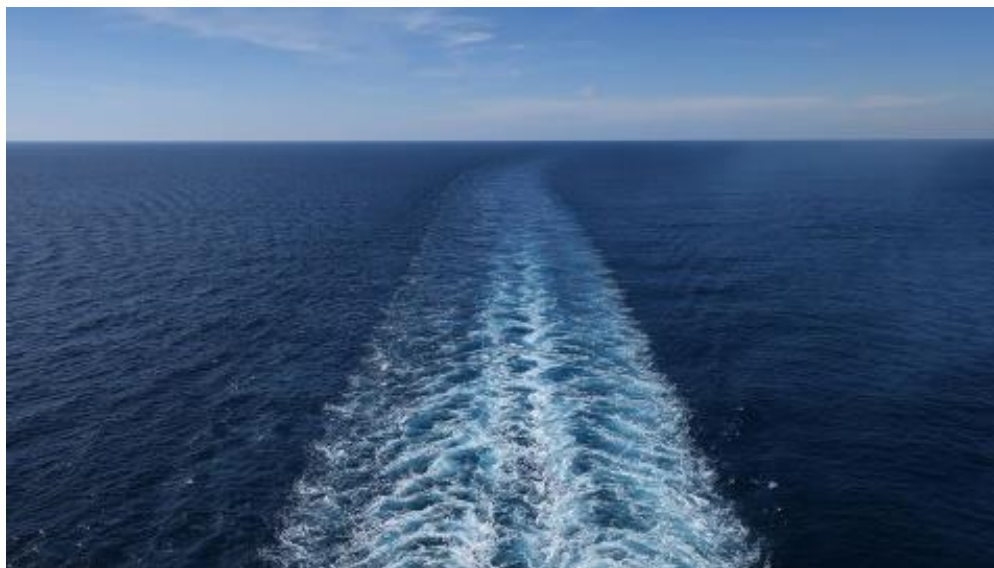
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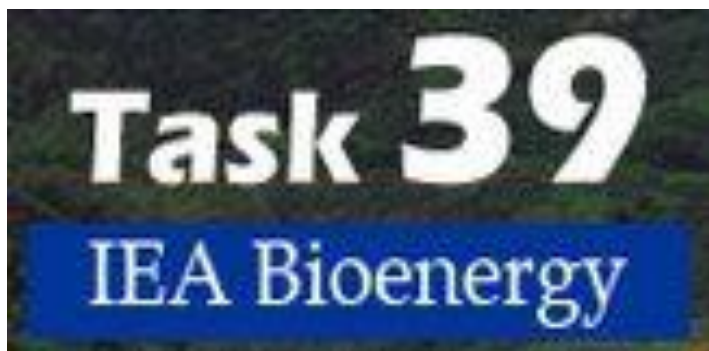
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and more!*



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