From Short–Term Measures to Zero Emissions Vessels

2019 ANNUAL MEETING OF MARINE TECHNOLOGY- HIMT

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Lloyd's Register

Eugenides Foundation
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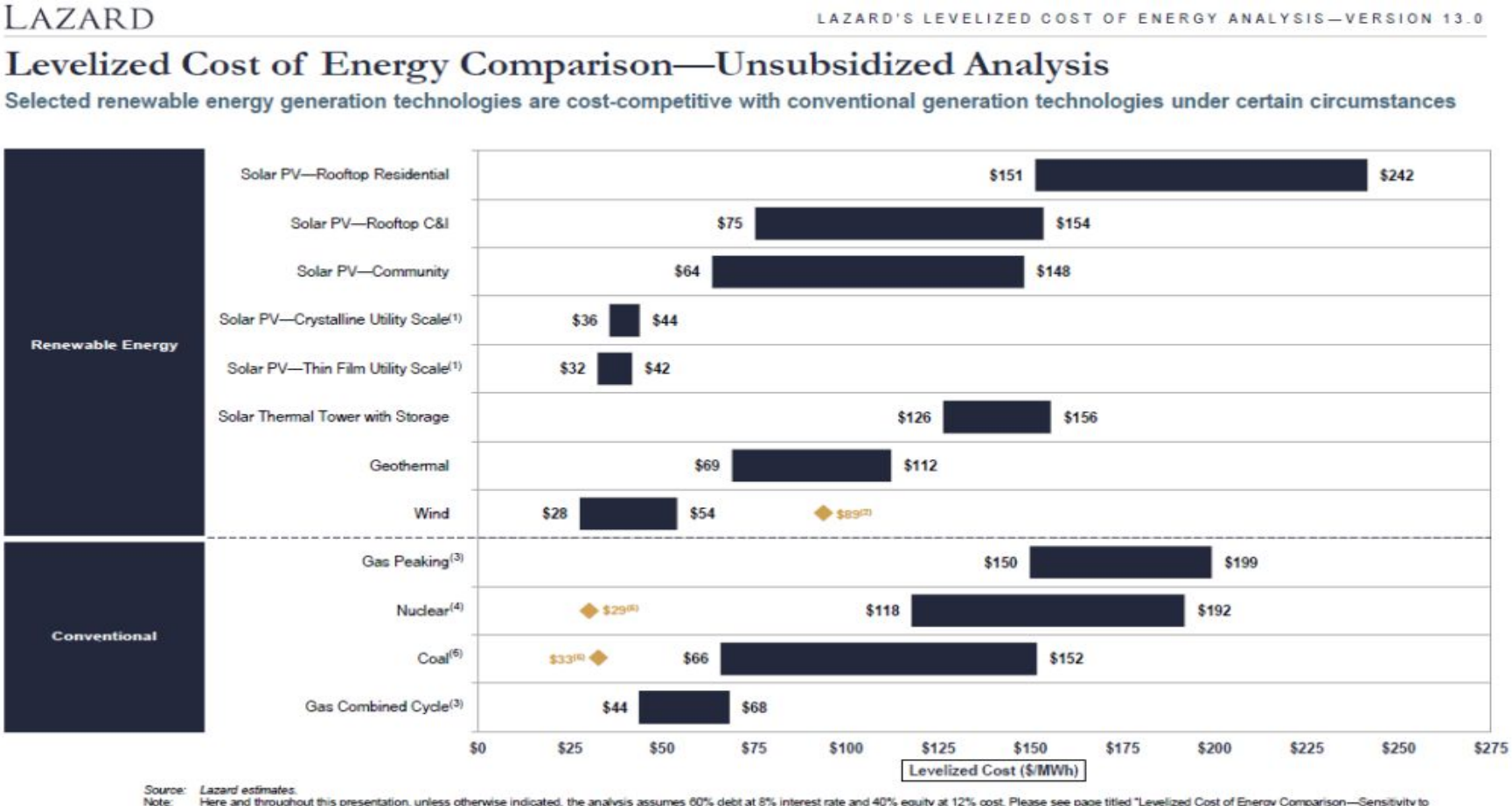
World Scientists Warning of a Climate Emergency

“We declare clearly and unequivocally that planet Earth is facing a climate emergency,” it states. “To secure a sustainable future, we must change how we live. [This] entails major transformations in the ways our global society functions and interacts with natural ecosystems.”

What is happening in other industries ?



Source: LAZARD' s 2019 LCOE

What is happening in other industries ?

Source: QUARTZ

What is happening in other industries ?

Table 1. Electric vehicle and battery manufacturing plant investments

Automaker group	Announced investment[a]	Electric models[b]	Annual global electric sales (shares)[c]
Nissan-Renault-Mitsubishi	• $9 billion over 2018–2022 (in China only)	• 12 electric models by 2022	3 million (30%) by 2022
Volkswagen Group	• $40 billion manufacturing plant by 2022 • $60 billion battery procurement	• 80 electric models by 2025 • 300 electric models by 2030	2–3 million (20%–25%) by 2025
Toyota	• (not available)	• All vehicles hybrid, battery, or fuel cell electric by 2025	2 million (25%) by 2025
Chongqing Changan	• $15 billion by 2025	• 21 electric models by 2025 • 12 plug-in hybrid models by 2025	1.7 million (100%) by 2025
BAIC	• $1.5 billion by 2022 • $1.9 billion (with Daimler)	• (not available)	1.3 million (100%) by 2025
Geely	• (not available)	• All models hybrid or electric by 2019 (Volvo)	1.1 million (90%) by 2020
General Motors	• (not available)	• 20 electric models by 2023	1 million (12%) by 2026
Tesla	• $4–5 billion battery manufacturing	• 3–4 electric models (S, X, 3, Y)	0.5 million (100%) by 2020
Mercedes	• $12 billion manufacturing plant • $1.2 billion battery manufacturing	• 10 electric models by 2025 • 50 electrified models by 2025	0.4–0.6 million (15%–25%) by 2025
BMW	• $2.4–3.6 billion procurement by 2025	• 12 electric models by 2025 • 13 plug-in hybrid models by 2025	0.4–0.6 million (15%–25%) by 2025
Ford	• $11 billion manufacturing plant by 2022	• 16 electric models by 2022 • 24 plug-in hybrid models by 2022	(not available)
Great Wall	• $2–8 billion over 10 years	• (not available)	(not available)
Jaguar	• (not available)	• All models hybrid or electric by 2020	
Inifiniti	• (not available)	• All new models plug-hybrid or electric by 2021	(not available)

Source: International Council on Clean Transportation

Shipping: Timelines and decision points

GHG Emissions Reduction

The Initial IMO Strategy

Vision

Reduce GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century

Levels of Ambition

2030: Reduce carbon intensity of ships by 40% compared with 2008

2050: Reduce carbon intensity of ships by 70% compared with 2008

2050: Reduce GHG emissions by 50% when compared with 2008

Review

- The Initial Strategy will be revised in 2023
- Upward pressure on levels of ambition

Delivering on the Initial IMO Strategy

Intersessional Working Group 6 Outcome

- Short-Term Measures
- Amendments to MARPOL Annex VI
- Foundation not solution

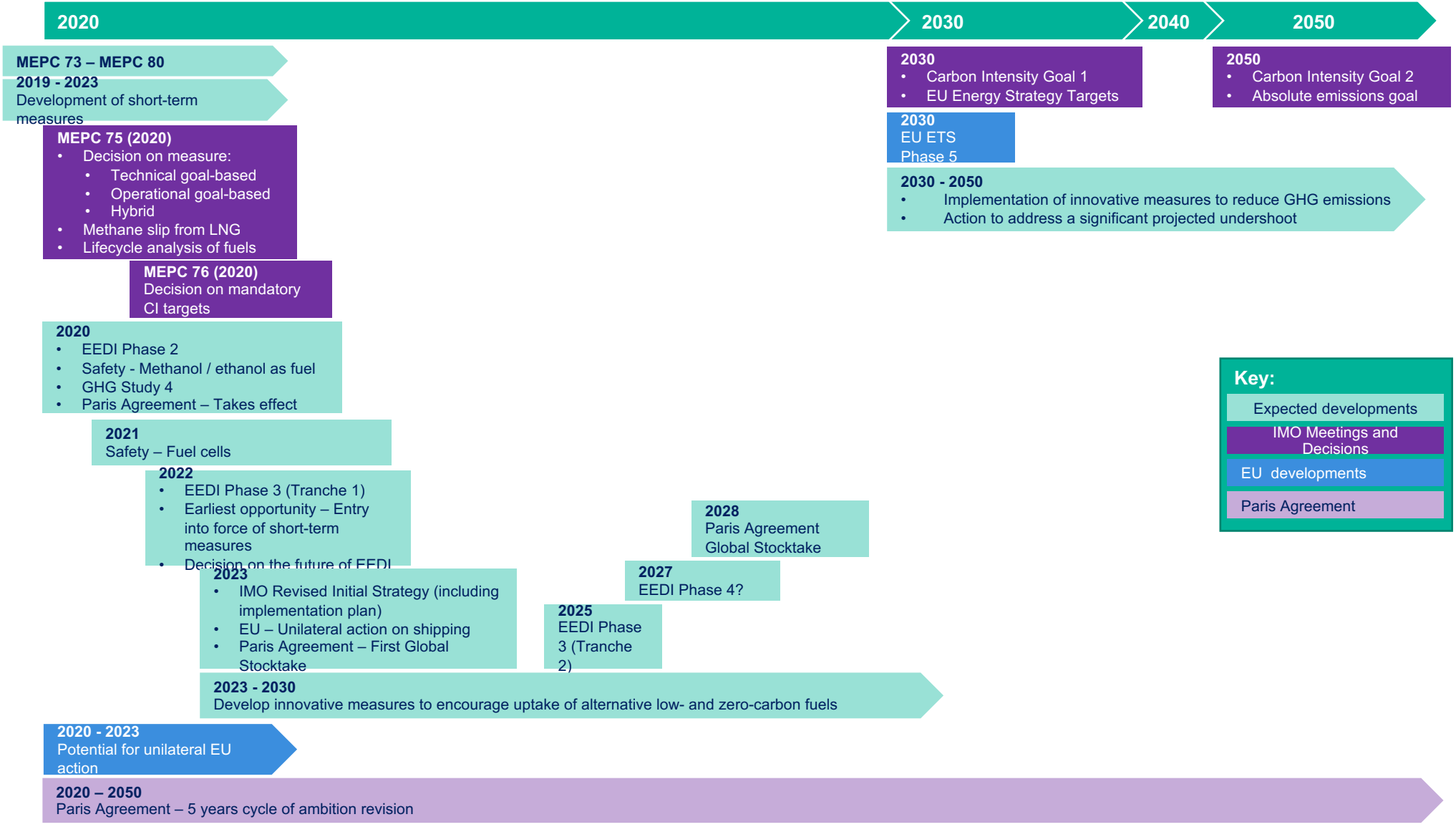
EEDI (New Ships)

Goal-Based **Operational** Efficiency Measures (All Ship)

Goal-Based **Technical** Efficiency Measures (Existing Ships)

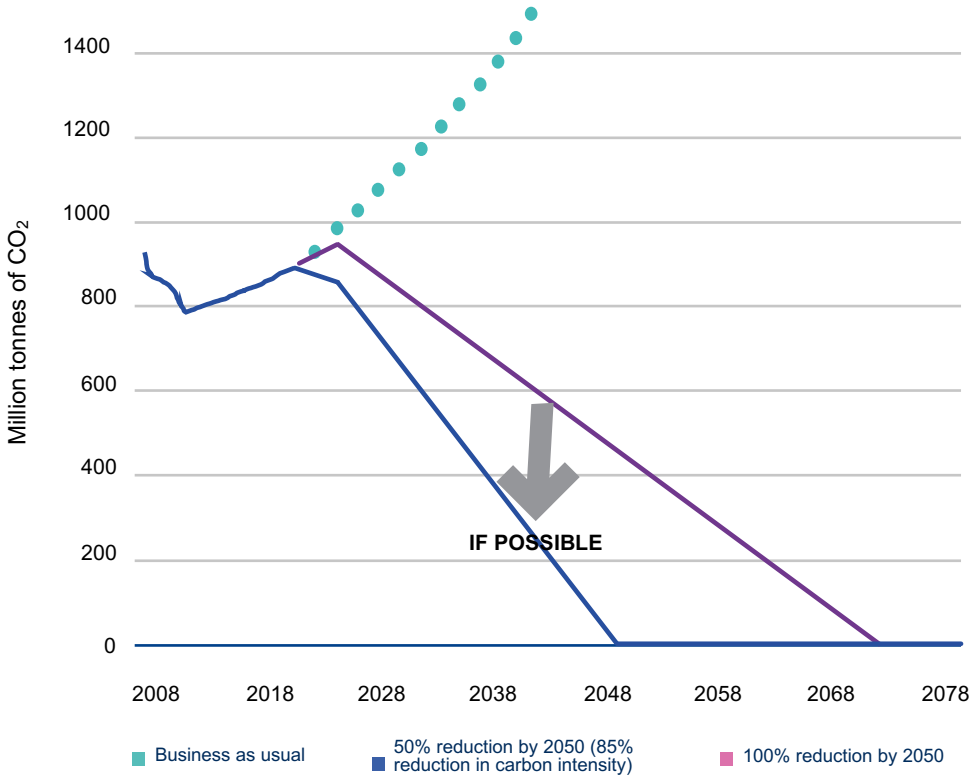
- Mid- and Long-Term Measures
- *Novel* Approaches
- Zero-Carbon Fuels
- Zero Emissions Vessels

Encouraging Uptake of Low- and Zero-Carbon Fuels


2020
2030
2040
2050
MEPC 73 – MEPC 80
2019 - 2023
Development of short-term measures
MEPC 75 (2020)
• Decision on measure:
• Technical goal-based
• Operational goal-based
• Hybrid
• Methane slip from LNG
• Lifecycle analysis of fuels
MEPC 76 (2020)
Decision on mandatory CI targets
2020
• EEDI Phase 2
• Safety - Methanol / ethanol as fuel
• GHG Study 4
• Paris Agreement – Takes effect
2021
Safety – Fuel cells
2022
• EEDI Phase 3 (Tranche 1)
• Earliest opportunity – Entry into force of short-term measures
• Decision on the future of EEDI
2023
• IMO Revised Initial Strategy (including implementation plan)
• EU – Unilateral action on shipping
• Paris Agreement – First Global Stocktake
2025
EEDI Phase 3 (Tranche 2)
2027
EEDI Phase 4?
2028
Paris Agreement Global Stocktake
2023 - 2030
Develop innovative measures to encourage uptake of alternative low- and zero-carbon fuels
2020 - 2023
Potential for unilateral EU action
2020 – 2050
Paris Agreement – 5 years cycle of ambition revision
2030
• Carbon Intensity Goal 1
• EU Energy Strategy Targets
2030
EU ETS Phase 5
2030 - 2050
• Implementation of innovative measures to reduce GHG emissions
• Action to address a significant projected undershoot
2050
• Carbon Intensity Goal 2
• Absolute emissions goal
Key:
Expected developments
IMO Meetings and Decisions
EU developments
Paris Agreement

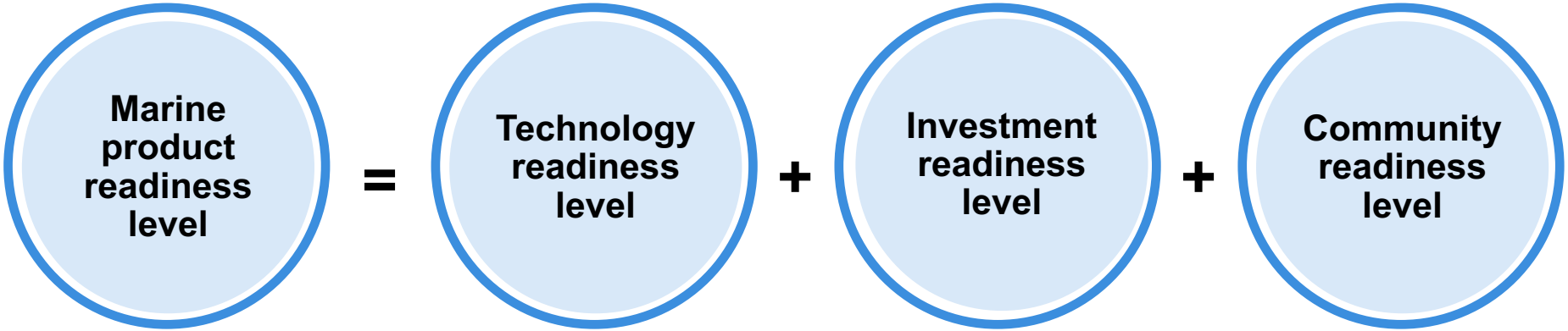
The Need for Zero-Carbon Fuels

Pathways for international shipping's CO_2 emissions

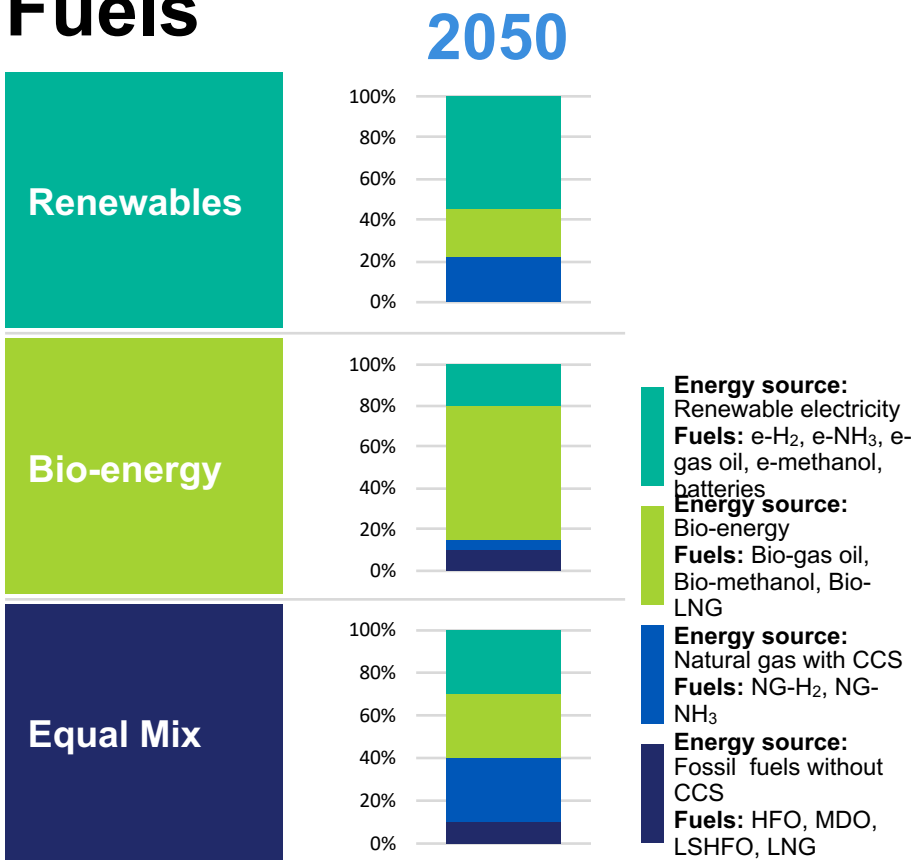


To achieve an absolute reduction in GHG of at least 50% by 2050 or an 85% reduction in carbon intensity, zero-emissions vessels need to be entering the fleet in 2030.

Our ‘Getting to Zero’ model.



Three Pathways. Three Dominant Fuels

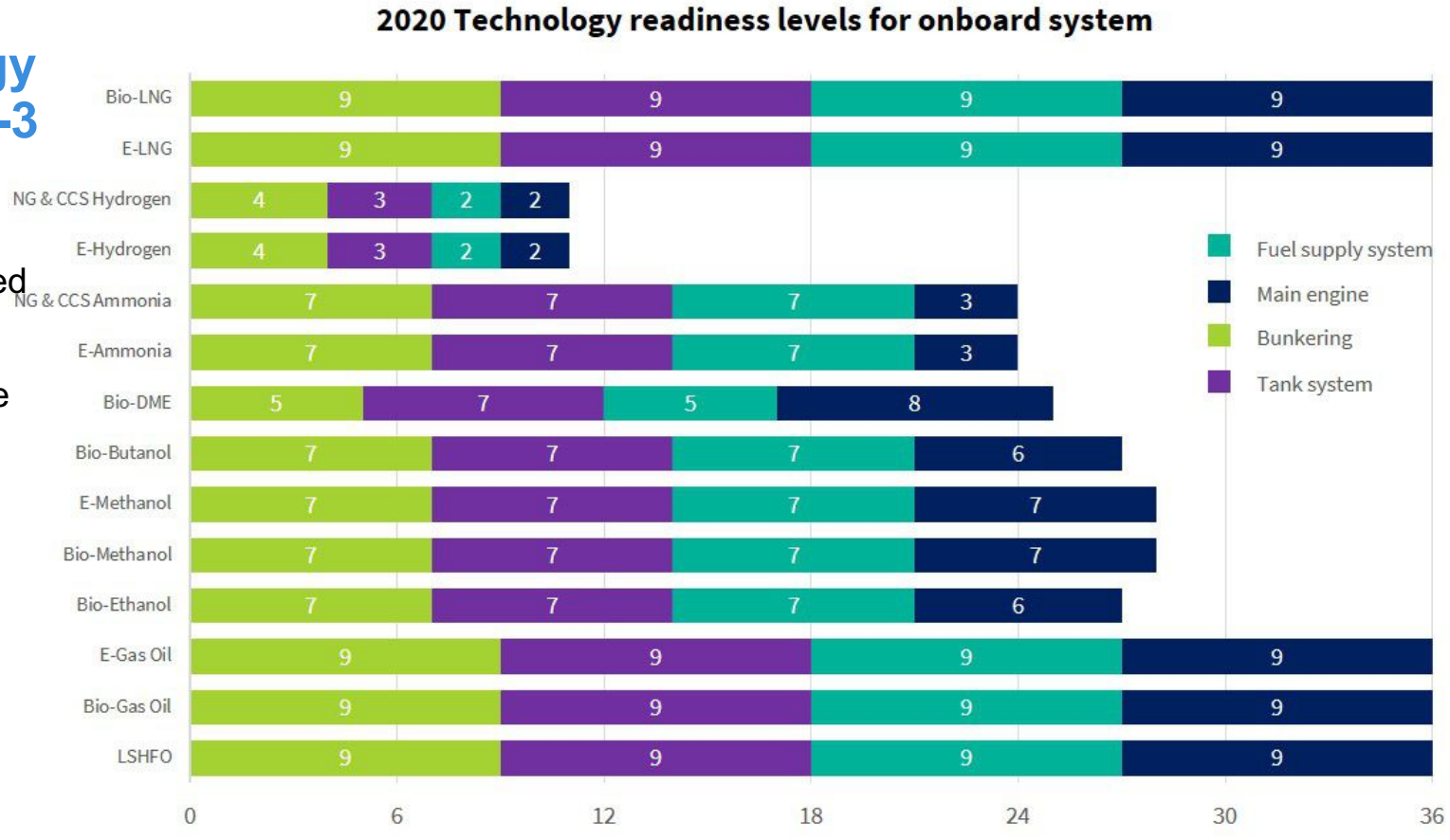


Decarbonising shipping is strongly linked to the evolution of zero-carbon production and supply.

Technology readiness.

Onboard technology systems ready in 2-3 years

- Safety risks can be mitigated
- Experience building phase
- Technology challenge is the supply infrastructure



Bunkering
Fuel supply system
Tank system
Main engine

From Short-Term Measures to Zero-Emissions Vessels

By 2023

- Technical and operational efficiency of ships
- Revising the Initial IMO Strategy with a focus on 2050

Before 2030

- Enable Uptake of Zero-Carbon Fuels
- Enable Zero Emissions Vessels to enter the fleet

In 2050

50% Reduction in GHG Emissions

LR welcomes the UK's Clean Maritime Plan.

11 Jul 2019 SUSTAINABILITY MARINE & SHIPPING

'Environmental Route Map of Maritime 2050' outlines the UK's determination to take a proactive role in the transition to zero-emission shipping.

Share this news item

- zero-emission capable ships to be in UK waters by 2025
- competition launched to spark innovation in clean maritime technology
- clean maritime plan part of long-term strategy to keep UK as world leader in maritime sector

Thank you

"Climate change is one of the greatest challenges for the safety of our world. All participants in the maritime value chain must collaborate to accelerate the transition to low, or no, carbon operating models."

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