23RD ANNUAL

NAUTICAL SYSTEMS GLOBAL User Conference

Hosted by

ABS WAVESIGHT™

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

Key Insights in Maritime

Featuring ABS Bureau and ABS Group

Moderator: Joe Kelly, Vice President, Maritime Solutions

10/26/2023

Presented by

ABS WAVESIGHT™

GET ON THE LEADERBOARD!

REMINDER: You can earn points during this session! Submit your questions, answer polls and leave feedback on this presentation through the NSUC23 mobile app.

The more you use the app, the more points you earn. Winners will be announced daily.

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

Ben Komar

Director, Business Development,
Global Government
ABS

Marcia Lee

Partner Manager,
Industrial Cybersecurity
ABS Group

Shankar Vaidhyanathan

Senior Engineer,
Global Sustainability
ABS

Agenda

- Government Applications for ABS Wavesight Products
- Group/Cyber
- Future Fuel Projections and Emerging Value Chains
- Audience Question & Answer Session

Government Applications for ABS Wavesight Products

ABS WAVESIGHT™

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

What are some advantages of using ABS Wavesight products for government clients?

Does NS integrate with Compliance requirements?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

What are the most common NS modules the government shipowners are interested in?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

What ABS Wavesight products are government shipowners showing most interest in?

OT Cybersecurity with ABS Group

Company Overview

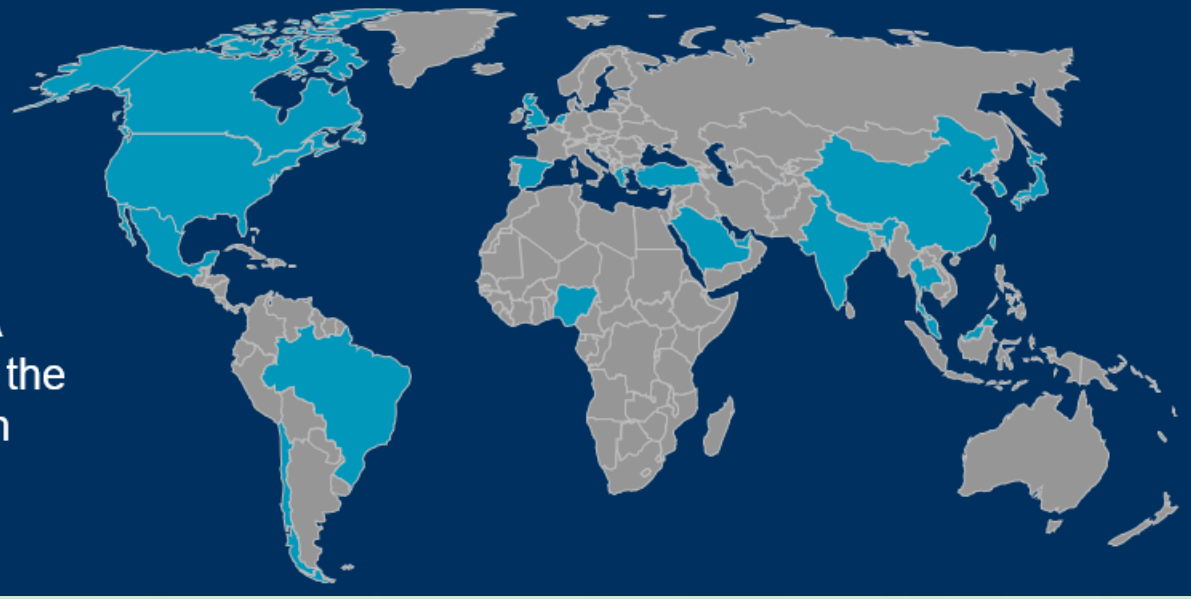
ABS Group provides data-driven risk and reliability solutions and technical services that help clients confirm the safety, integrity, quality and environmental efficiency of critical assets and operations.

ABS Group is focused on adding value to the industries served and strategically capturing synergies with the American Bureau of Shipping (ABS).

1000+ Professionals

20+ Countries

50 Years



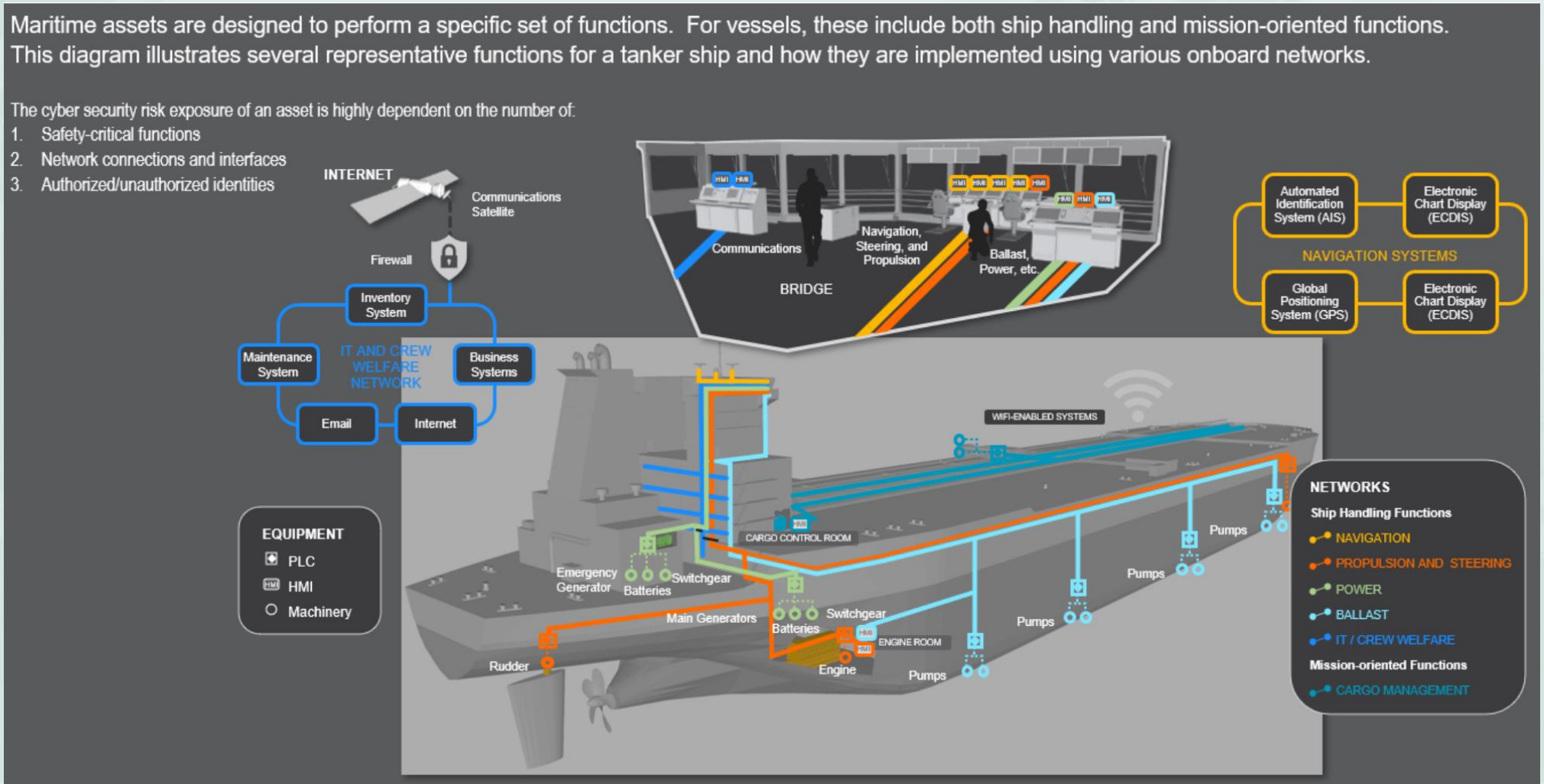
ABS Group is headquartered in Spring, TX, USA and is an independent subsidiary of ABS, one of the world's leading marine and offshore classification societies founded in 1862.

The Virtual Asset

Maritime assets are designed to perform a specific set of functions. For vessels, these include both ship handling and mission-oriented functions. This diagram illustrates several representative functions for a tanker ship and how they are implemented using various onboard networks.

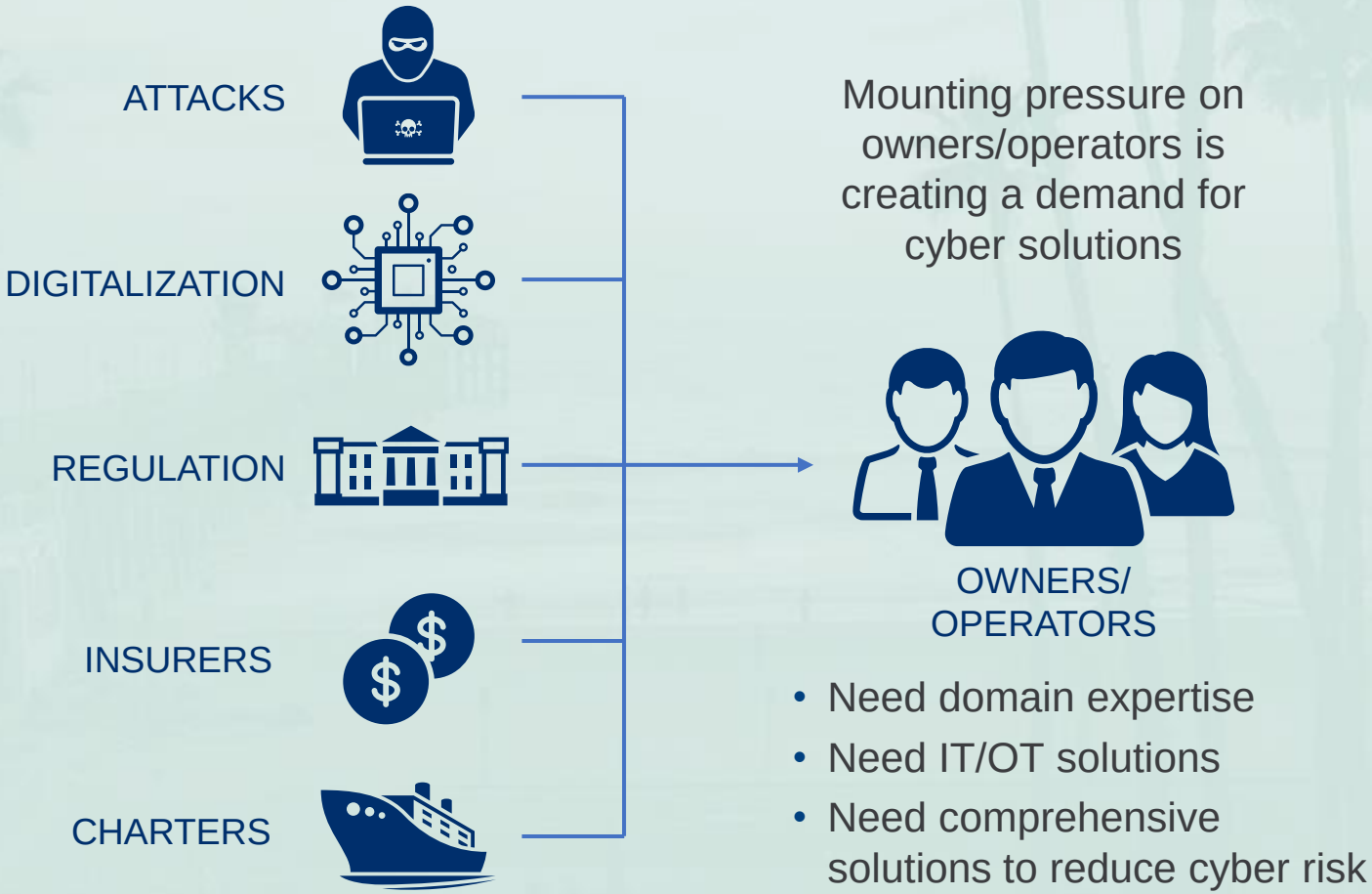
The cyber security risk exposure of an asset is highly dependent on the number of:

1. Safety-critical functions
2. Network connections and interfaces
3. Authorized/unauthorized identities



Pressure on the Maritime Industry

Several factors are driving demand for comprehensive cybersecurity solutions.



What are the requirements for IACS UR E26 and E27 and when do they take effect?

How should Owners/Operators prepare for IACS?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

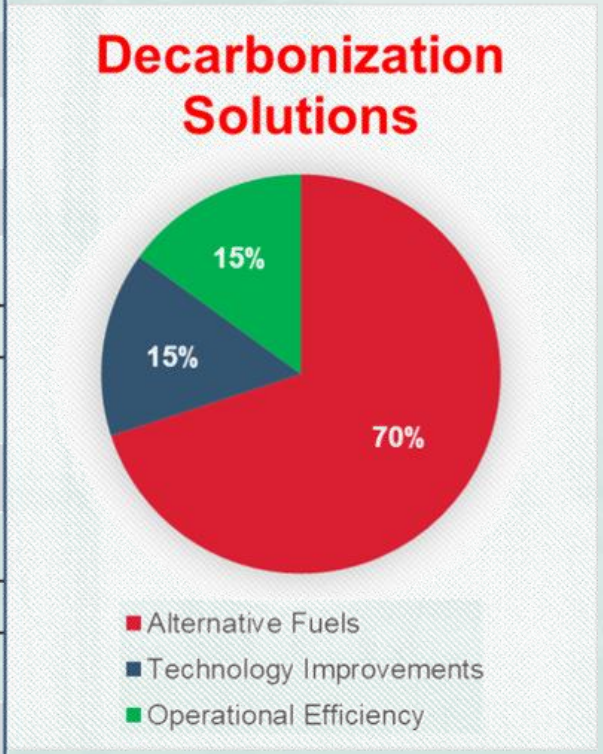
What initial steps can Owners/ Operators take to improve their cybersecurity posture for critical systems?

How can NS be leveraged for improving/developing OT cybersecurity processes?

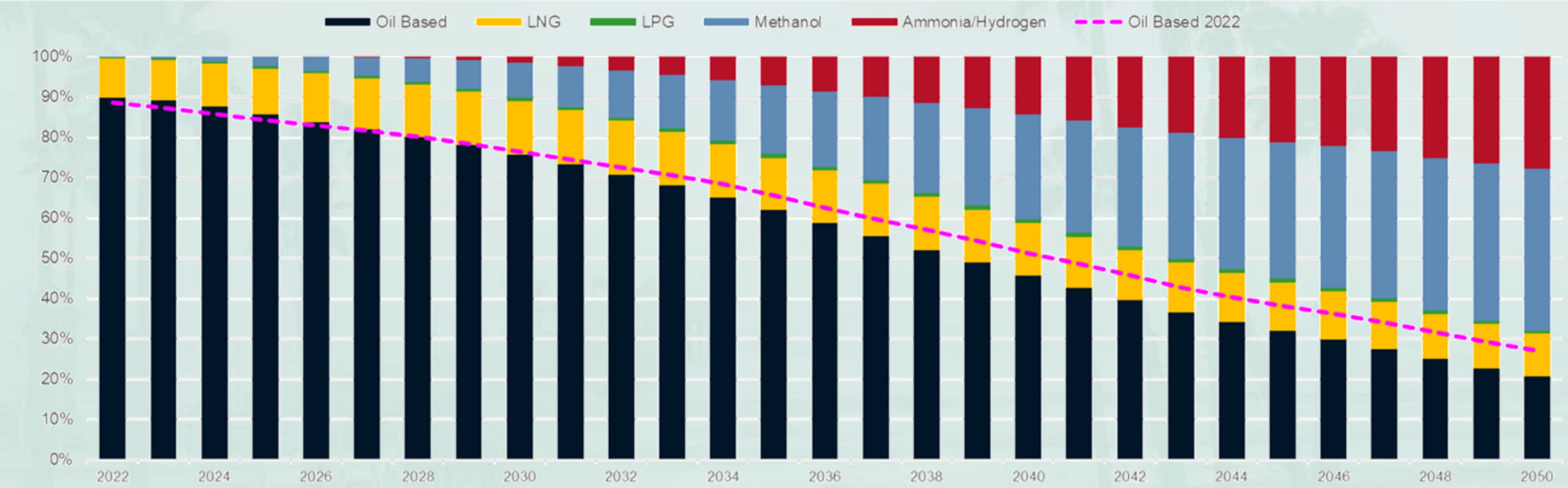
Future Fuel Projections and Emerging Value Chain

Decarbonization Solutions

Alternative Fuels and Energy Sources	LNG		Hydrogen
	LPG/Ethane	Ammonia	
		Methanol	
	Biofuels		
			Nuclear
Technology Improvements	Air Lubrication	Improved Hull & ESD Options	Wind/Solar
	Hybrid	Fuel Cells	Electric Propulsion
		Cold Ironing	Carbon Capture (Shore/Side)
Operational Efficiency	Weather Routing		New Charter Arrangements
	Speed Optimization	Shipping	Just in Time
	Vessel Performance Reporting	Smart Vessel / Improved Reliability	Fleet Interactive Performance / Optimization
	PATHWAY to 2050		



ABS Fuel Mix Projections

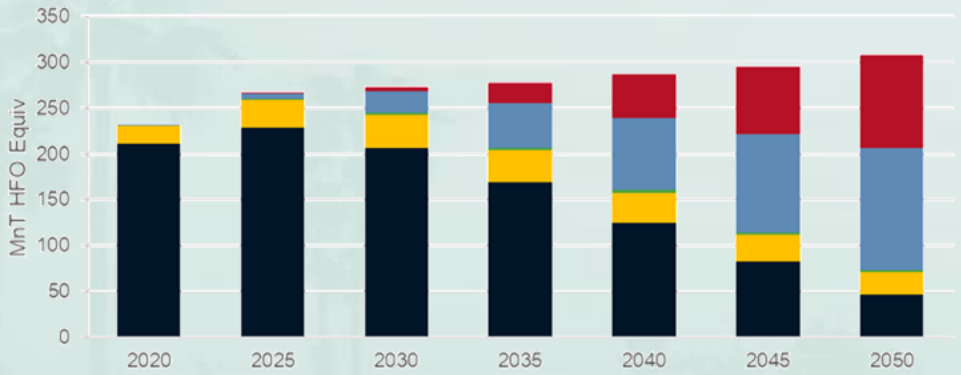


* *Ship types included: oil and chemical tankers, dry bulk carriers, containerships, LPG, LNG, car carriers, general cargo, RoRo, RoPax and Cruise.*

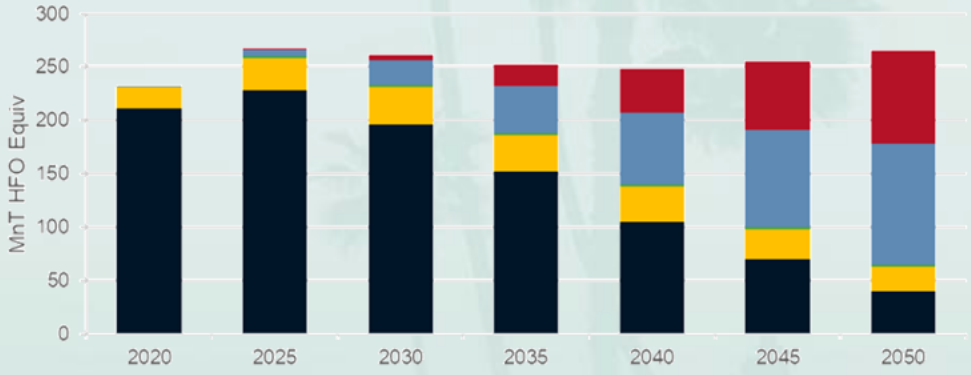
Base Case	• Oil-fueled vessels will still be constructed until the next decade
Scenario 1	• EET's - widespread adoption of EETs on both existing and new ships
Scenario 2	• EETs and OCCS - potential impact of onboard carbon capture technologies on emissions
Scenario 3	• EETs, OCCS and adoption of biofuels/e-diesel - oil consumption is gradually replaced by a mixture of biofuels and e-diesel

Fuel Mix Projections Toward Net Zero

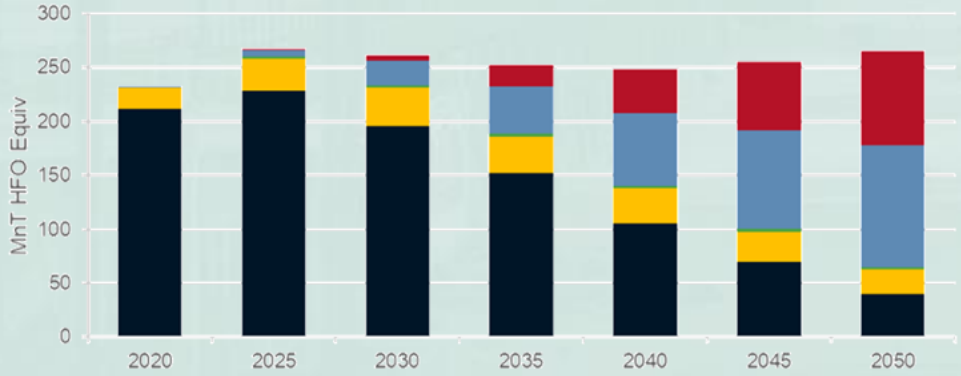
Base Case



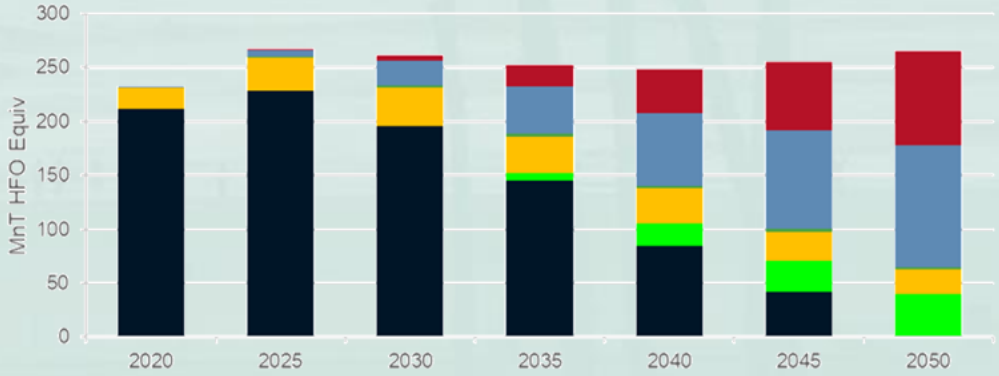
Scenario 1



Scenario 2

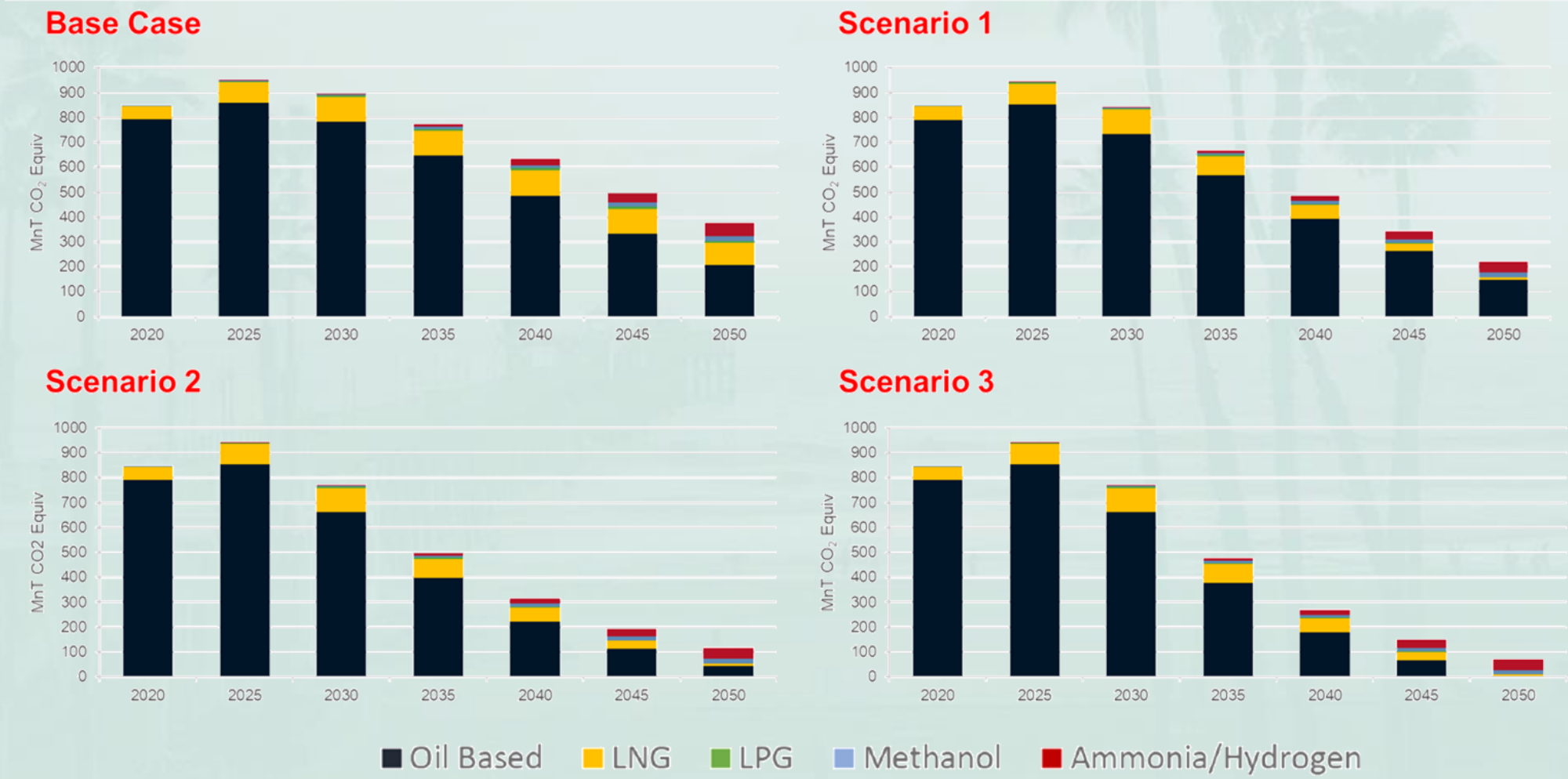


Scenario 3



HFO/MGO/MDO e-Diesel/Biofuels LNG LPG Methanol Ammonia/Hydrogen

Well-to-Wake CO2 Emission Projections Toward Net-Zero



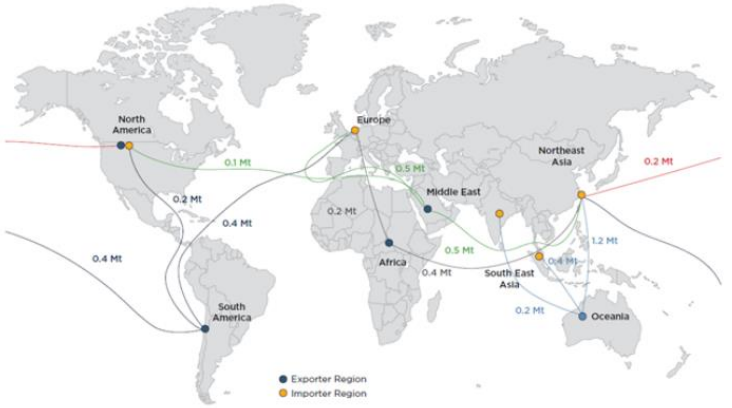
EET uptake % — Orderbook, 02 August 2023

Energy Efficient Technology	Bulkers	Tankers	Containerships	LNG	LPG	General Cargo	Ro/Ro or PCC	Passenger	All Ship Types
Air Lubrication System	-	-	9.1	38.6	1.3	-	17	2.9	6.6
Hull Fin	6.1	0.5	1.7	-	-	-	-	-	2.1
Twin Fin	-	-	-	-	-	-	-	-	-
Bow Enhancement	8.8	1.9	20.2	-	9	11	2.1	0.3	8.8
Bow Foil, Retractable	-	-	-	-	-	0.3	-	-	0
Hull Skating System	-	-	-	-	-	-	-	-	-
Propeller Boss Cap Fin (PBCF)	4.3	3.9	1.4	2.1	-	1	7.4	0.3	2.8
Propeller Duct	5.9	3.2	4.9	-	9	-	1.6	-	3.7
Wake Equalizing Duct	-	0.7	-	-	-	-	-	-	0.1
Stator Fin – Pre Swirl	12.5	1.5	1.4	-	-	-	5.9	-	4.3
Stator Fin – Post Swirl	-	-	-	-	-	-	-	-	-
Rudder Bulb	8.6	10.5	20.1	2.1	8.4	0.6	1.1	2.2	9.5
Rudder Fin	4.4	-	-	-	-	-	-	-	1.2
Gate Rudder	-	-	-	-	-	-	6.4	-	0.3
Solar, Panel	0.6	-	-	-	-	-	12.8	3.2	1
Wind, Flettner Rotor	0.3	-	-	-	1.3	-	-	-	0.1
Wind, Kite	-	-	-	-	-	-	-	-	-
Wind, Rigid Sail	0.1	-	0.6	-	-	-	0.5	-	0.2
Wind, Suction Wing	-	-	-	-	-	5.8	-	-	0.2
Wind, Inflatable Sail	-	-	-	-	-	-	-	-	-
Exhaust Gas Economizer	0.1	2.4	5.2	8.7	9.7	-	0.05	4.5	3.2
Waste Heat Recovery System	-	1	0.9	-	-	-	1.1	4.5	0.8
All ESDs	24	17	43	43	26	16	29	15	28

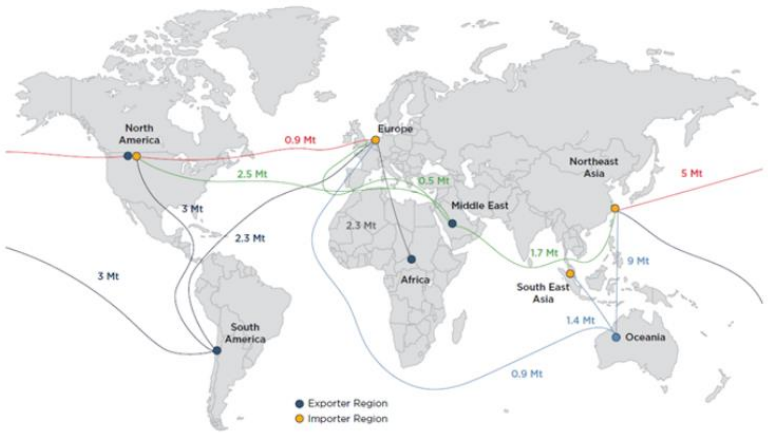
Global Trade Route Projections

Global Carbon Trade Routes Projection

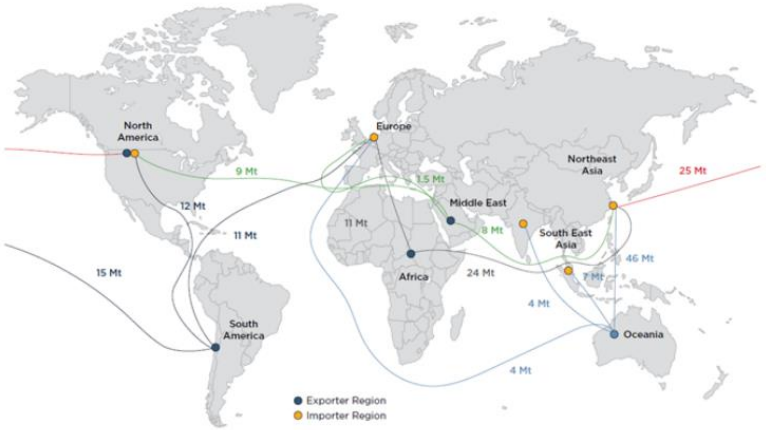
Clean Hydrogen Trade Routes Projection 2050



Global Low-Carbon Ammonia Trading Routes Projection 2030



Global Low-carbon Ammonia Trading Routes Projection 2050



23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

Key Takeaways

01 Net Zero by 2050 – Scenarios Created by ABS

- Lower 15 percent fuel consumption with EET from 2023 levels
- Carbon capture with a target of achieving 70 % reduction of global onboard emissions
- Green fuels adopted at a 5% annual adoption rate

02 Production of Alternative Fuels

- Supporting measures required
- Carbon neutral green fuels needed at scale
- Green methanol, ammonia and bio-LNG production scaling to meet shipping demand

03 GHG decline with renewable fuels, demand for EET Retrofits & OCCS

- WtW GHG emissions
- Supply of methanol and ammonia is green, LNG progressively green
- Oil fueled vessels constructed until 2030

04 Economics, Carbon Pricing are Critical to Adoption

- Economics of using green fuels & CC to be favorable before 2050
- Methanol remains a relatively minor component, unless renewable methanol and green methanol proven

05 Period leading to 2030, shipping in competition with other sectors

- Chemical industry, power generation, road transport, HVAC, steel, cement, aviation etc.
- Short term, using gray methanol 10% reduction in TtW

06 Decarbonization will have dramatic repercussions

- Crude oil will decline by 40% and coal trade will fall by 43% between 2025 and 2050
- Container volumes will continue to grow, bulkers will decline from 64% in 2022 to 45% in 2050
- Smaller vessels adoption in containers and bulkers

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

Which alternative fuels will dominate the fuel mix projection in 2050? Which decarbonization solutions have you covered in your outlook?

ABS proposed a comprehensive carbon value chain named as Carbon capture, utilization, storage and transportation (CCUST) value chain; What additional value was brought to industry by adding a new element of a traditional CCUS supply chain?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

Which ammonia pathways are more promising for the latest IMO GHG strategy?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

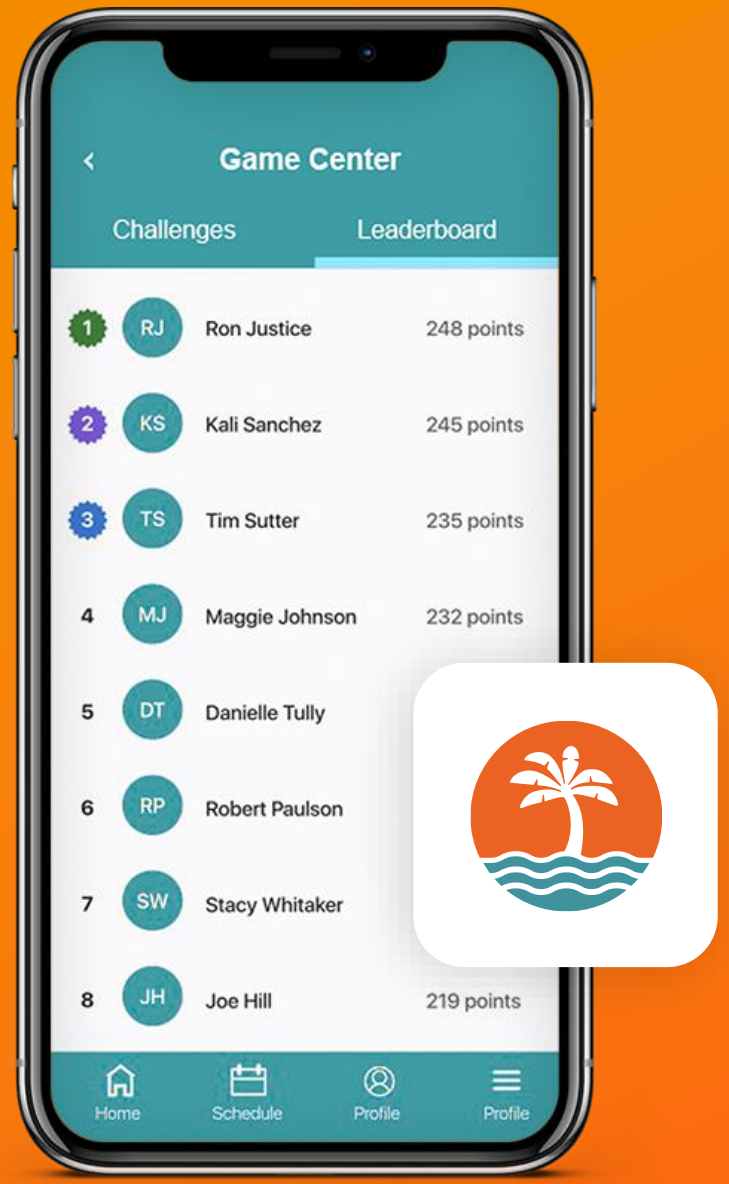
ABS WAVESIGHT™

What is the status of hydrogen as a marine fuel? What are the biggest hurdles to make it a promising maritime decarbonization solution?

23RD ANNUAL NAUTICAL SYSTEMS GLOBAL User Conference

ABS WAVESIGHT™

Is demand for LNG-fueled vessels likely to wane given the growing concerns about its greenhouse gas footprint?



How many points did you get?

Use the NSUC app leaderboard to check your score and keep participating throughout the conference for a chance to win prizes (and bragging rights)!

#NSUC23

THANK YOU

Be sure to opt-in to notifications to receive updates on when new content is added.

#NSUC23

ABS WAVESIGHT™

23RD ANNUAL

NAUTICAL SYSTEMS GLOBAL User Conference