

Calculating and Reducing Co2 Emissions





Team

Seasoned with relevant industry experience and network

20%

Up to 20% in proven energy reduction applications

99%

Emission shipment calculation accuracy*

500m+

Data points stored

R&D

10-man years R&D

Patents

a family of patents that protect core IP

Proprietary

designs, solutions and code

Context

Geofence 1K marine terminals, all rail tracks, roads and waterways

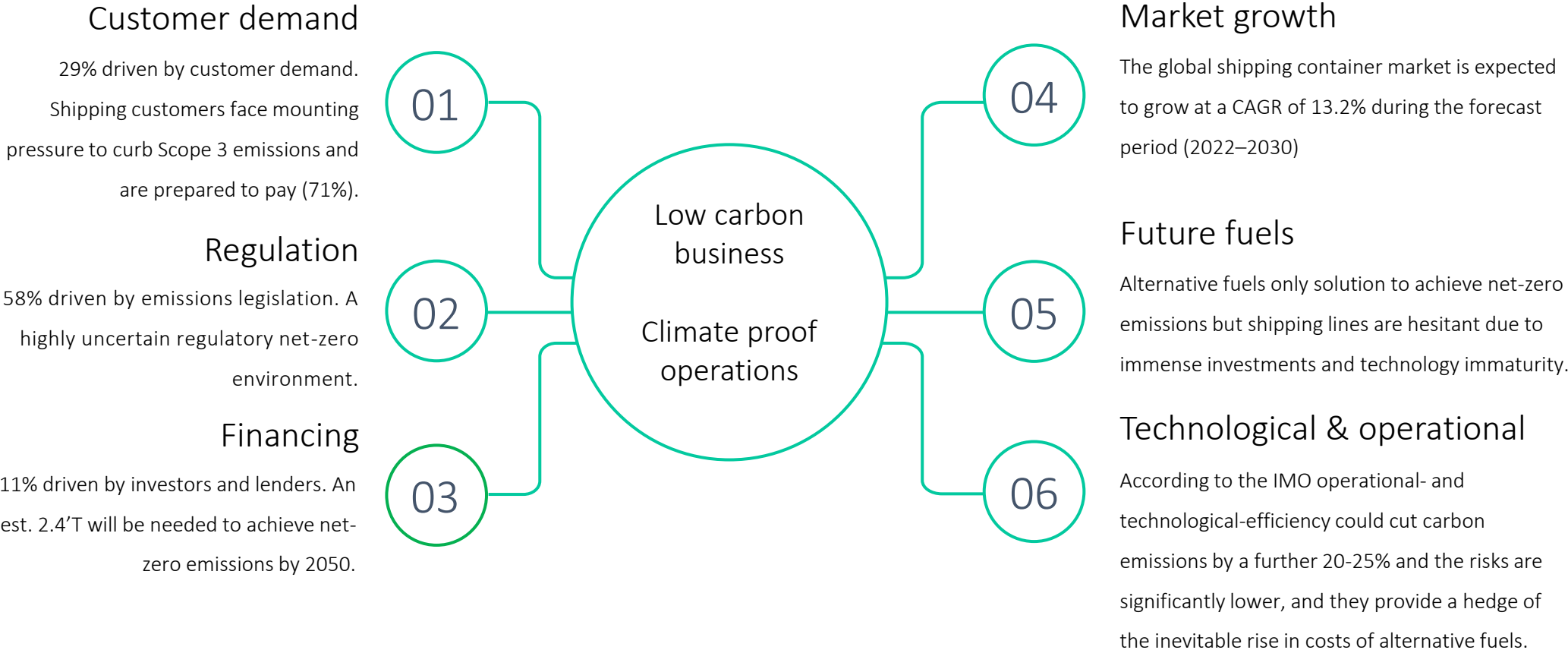
*For real-time connected shipments and 95% accuracy for non-connected shipments

Introduction



- This decade will be critical for achieving net-zero emissions goals in our industry and it is a collective challenge.
- UN Secretary-General warned that the era of global warming has ended and “the era of global boiling has arrived.” Acting now is essential to prevent such outcomes.
- IMO and EU Emission Trading System (ETS) are leading the way in the shipping industry decarbonization with IMO’s new and strengthened strategy (20-40% / 2030, 70% / 2024 & 100% 2025) and ship emissions will be priced through ETS from 2024.
- Further advances in technology, infrastructure and sustainable practices are required to comply to IMO’s net-zero decarbonization strategy and will come with a significant cost.
- Stakeholders need to both prepare and prudently invest in long-term reduction solutions like alternative fuels as well as innovative technologies that are less risky and capital intensive.
- Businesses and industries that invest in emissions reductions and sustainability measures are likely to gain a competitive edge.

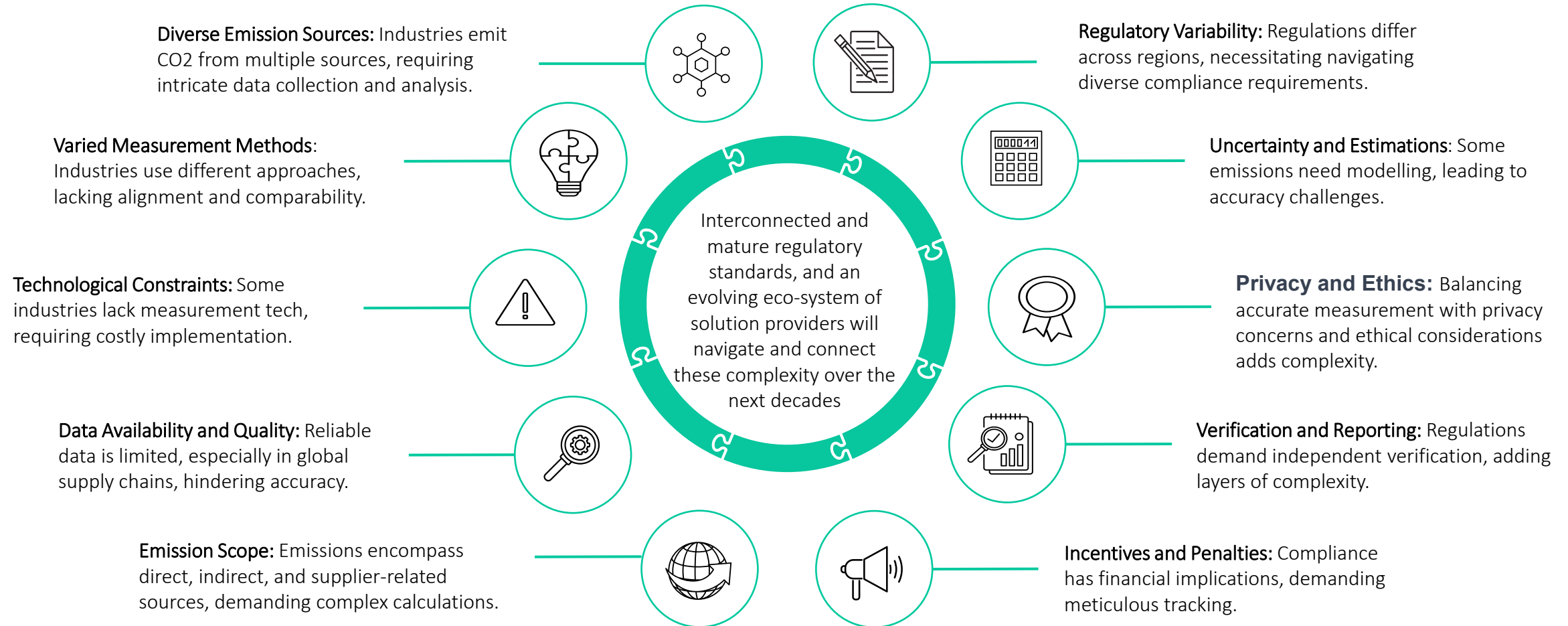
Market Drivers



The Complexity



The complexity of measuring and complying with CO2 regulations arises from the intricate interplay of technological, regulatory, operational, and data-related challenges.



Market



Freight transportation contributes approximately 8 % of global greenhouse gas emissions and combined with warehousing operations this figure inflates to 11 %.



Reefer
1.6m



Dry
20m



Vessels
4.9K



Waterways
Barges (5% of land)



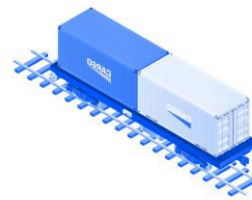
Air
2K



Sites
835 Terminals
10K warehouses



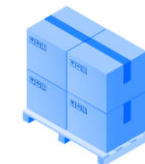
Trips
200m+
container trips



Rail
5m



Road
25m+

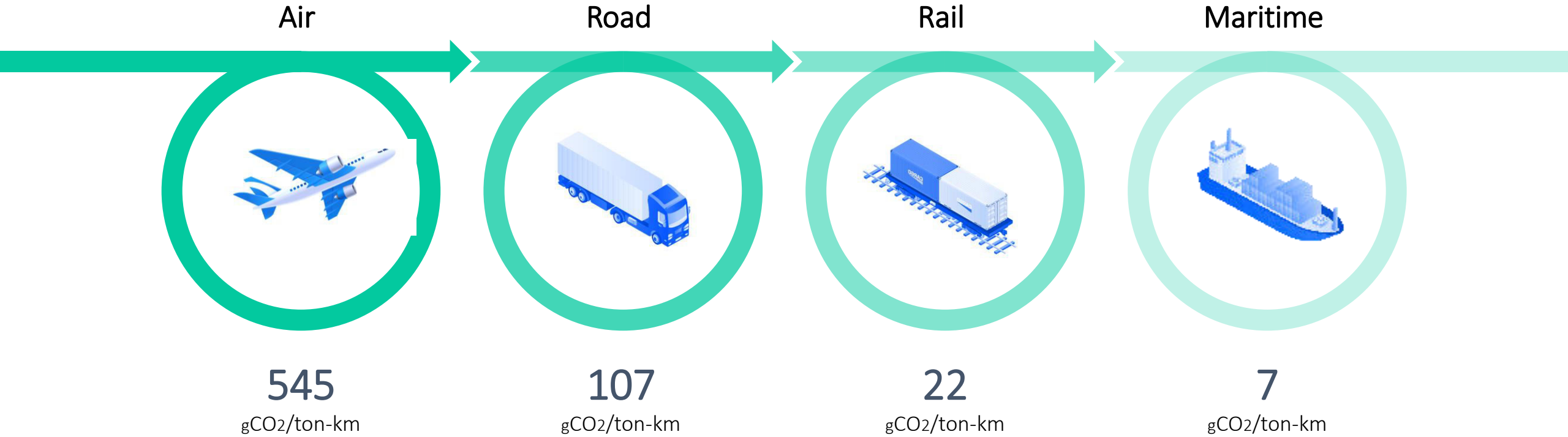


Pallets
9.9 Billion

Carbon Emissions by Mode of Transport



Maritime container transportation is the Achilles heel of the intermodal supply chain transporting 90% of all cargo globally at some point from origin to destination and together with rail the lowest emitters and largest potential contributors to driving down carbon footprint in the intermodal supply chain



*European Environment Agency, Methodology for GHG Efficiency of Transport Modes, 2020

Progress & Challenges in the Shipping Industry



- IMO's updated greenhouse gas strategy ignites net-zero ambitions.
- EU Emissions Trading System, starting in 2024, intensifies the urgency. Estimated to cost the shipping industry 10B USD when fully implemented in 2026.
- Shipping decarbonization is progressing, but like a supertanker, it's a slow turn.
- New ship running lower-carbon fuels show promise, but maturity and related risks is a barrier. Meeting the IMO GHG goal for 2030 requires securing 30–40% of global carbon-neutral fuel supply – an almost impossible task according to DNV.
- Carbon capture and nuclear propulsion can become long-term viable options.

Navigating Complex Waters



- Regulatory change, and stakeholder and public pressure to decarbonize, will continue to impact and push decarbonization boundary conditions.
- Ensuring sound long-term CAPEX decisions hinges on prudent and well defined decarbonization strategies.
- It's essential to thoroughly evaluate all aspects, including fuel options, digital technologies, fleet management, and optimization, to develop customized and financially prudent decarbonization strategies.
- Prioritize lower-risk innovative technologies that help reduce emissions as alternatives to costly and scarce carbon-neutral fuels.



Operational Efficiency examples

● Emission drivers

Poseidon Principles: the principles are intended to guide financial and insurance institutions in assessing and managing the climate-related risks and opportunities associated with their shipping portfolios.

IMO GHG emission strategy: 20-30% reduction by 2030, 70-80% reduction by 2040 and net-zero by 2050 with measures such as the Energy Efficiency Existing Ship Index (EEXI) and the Carbon Intensity Indicator (CII) that went into effect on January 1st, 2023.

EU Emissions Regulations: Emission Trading System (ETS) requires ships (≤5K tons) to allocate allowances for 40% of verified emissions for 2024 increasing to 100% for 2026 onwards covering all voyages to, from, or between EU ports, irrespective of their flag

30+ other regulations and standards: EPA, China's Emission Standards, IATA, United Nations' SDGs, ISO 14001, GLEC. Many countries have set emission reduction targets in line with international agreements like the Paris Agreement as well as carbon pricing mechanisms.

ESG practices: has gained significant traction in recent years as investors and stakeholders increasingly recognize the importance of sustainable and responsible business practices.

● Savings

Operational deficiencies: hot loads, load violation can increase energy, power-off times and others can increase energy usage by up to 30%.

Measure: Logistics companies need to accurately measure and report their emissions to comply with emissions regulations and avoid extra costs.

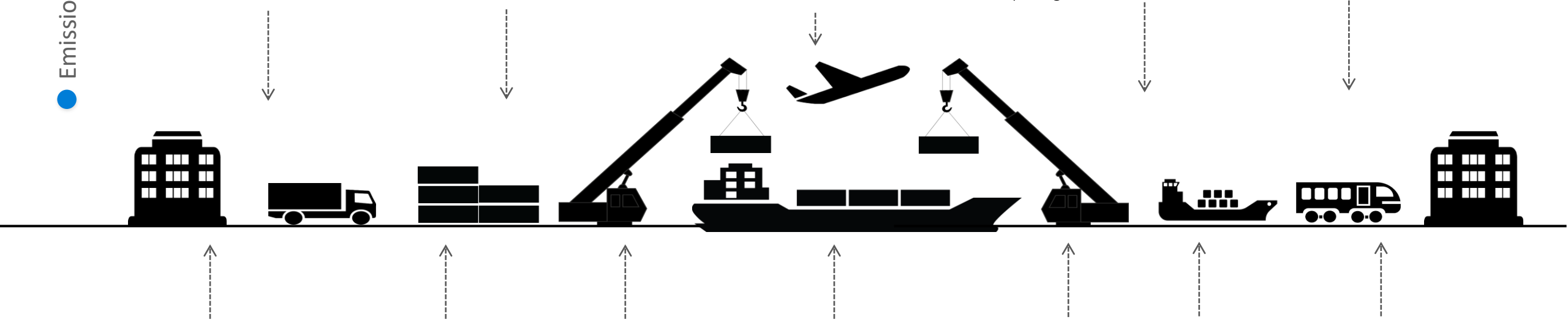
M&R: predictive M&R can save up to 5% total reefer energy consumption.

Weather conditions (route): weather-based route optimization can reduce reefer energy consumption by up to 10%

Terminal: 40-50% of a terminal energy costs goes to powering a reefer.

Route optimization: Route optimization can reduce emissions significantly. Leveraging Barges and rail reduction can reach 60-90%.

Reefer fit: having the right reefer portfolio and leveraging the best reefers based on cargo type and trade lane can reduce energy by up to 10-20%.



Embrace Digital Innovations and Unlock Efficiency



- Innovations like air lubrication systems, wind-assisted propulsion and data driven operational efficiency solutions can all reduce fuel consumption.
- The integration of smart and digital systems within vessels and fleets has the potential to represent a quantum leap in energy efficiency.
- These digital systems incorporate a wide array of innovations that through data intelligence and IoT can automate and optimize routes and voyages and operational efficiency and much more.

Unparalleled Emission Accuracy and Granularity

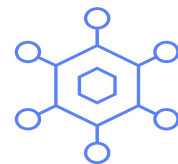


It all starts with verified and trusted accurate and granular data – whether you want to gain insight into emission reduction strategies or inform on scope 1,2 & 3 emissions the data is imperative.

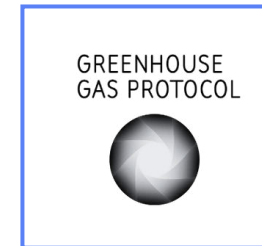
- 1 Accredited by the Smart Freight Center for GLEC compliance
- 2 Regularly updated data and methodologies, vetted by experts
- 3 Audited calculation trail including applied emission factor & data source



Booking data



Other 3rd party data

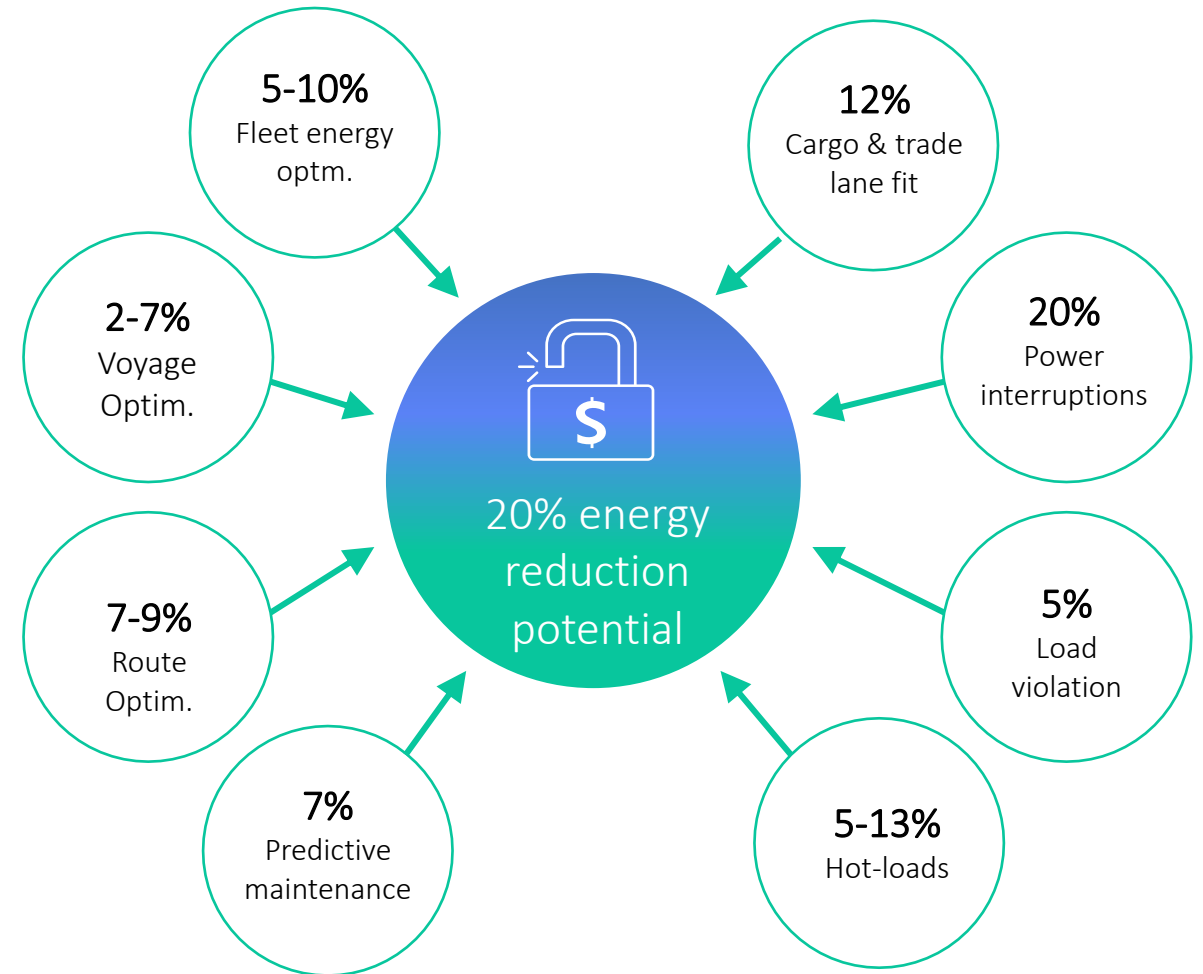


Unparalleled Energy Reduction



Operational efficiency will play a critical role on the short- and medium-term because of the constraints of alternative fuels and carbon capture and on the long-term because of the operational cost impact of alternative fuels.

- 40% of new ships are LNG and 10% alternative fuel but LNG has a similar CO2 emission factor compared to fossil fuel.
- Carbon capture projects have yet to prove successful
- meeting the IMO GHG goal for 2030 is a daunting, nearly impossible task.
- Thus, 'Smart' and digital systems on individual vessels and fleets offer high rewards through operational efficiencies and it all starts with accurate and granular energy and emission calculations.



Final Remarks



- A Decisive Decade - together, we can shape this decade into a turning point for maritime decarbonization by taking prudent but impactful steps.
- It is time to get the “house in order” to reduce or avoid immanent carbon taxes, fines and brand damage.
- Let's take action to steer our industry toward a sustainable, net-zero future!

Q&A



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Thanks.



www.greensee.ai



calculate. understand. reduce.