

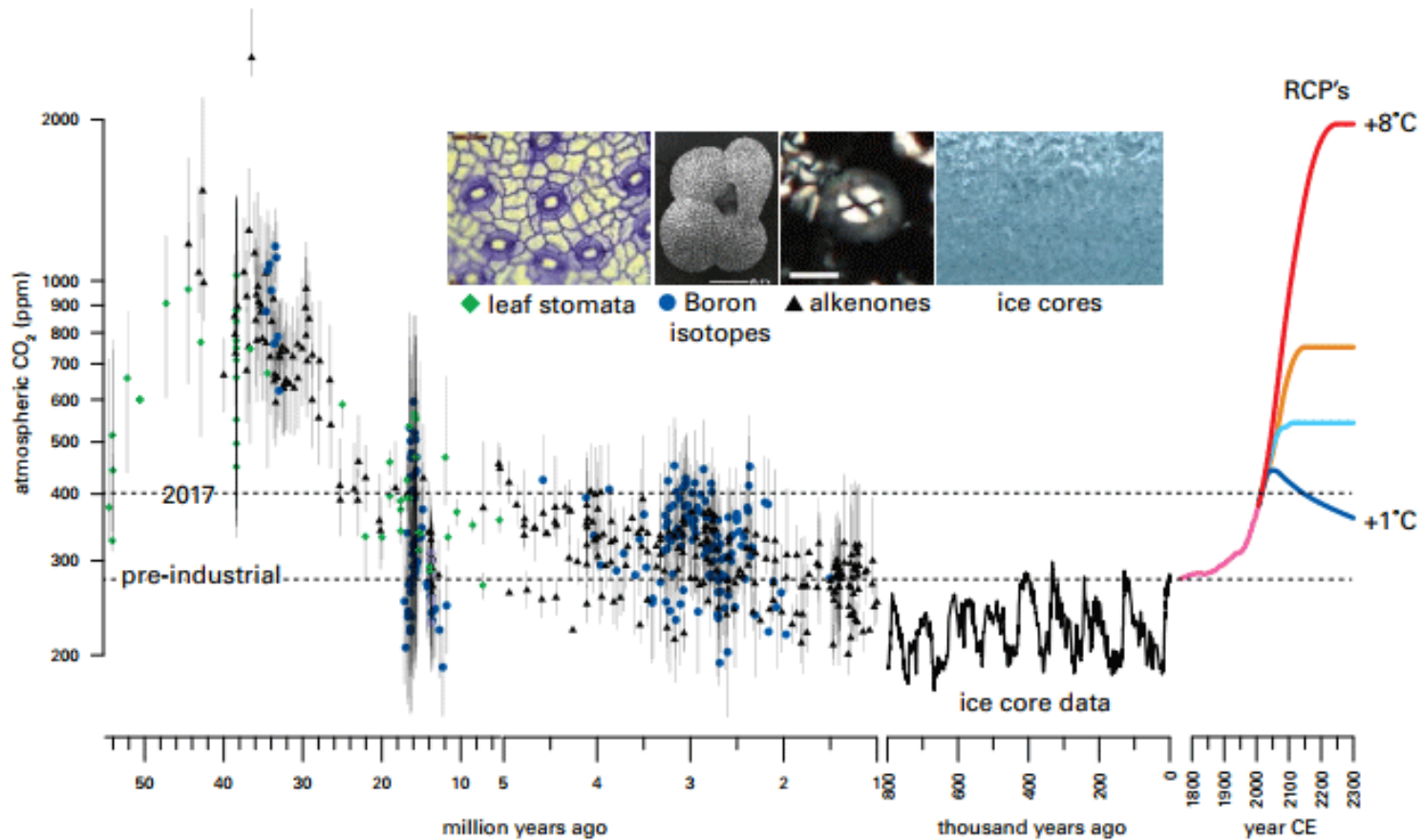
A GREEN FUTURE FOR FREIGHT

Presentation of Eric Beckwitt, CEO, Freightera, at the Clean Tech Alliance, Seattle, WA, February 13, 2019



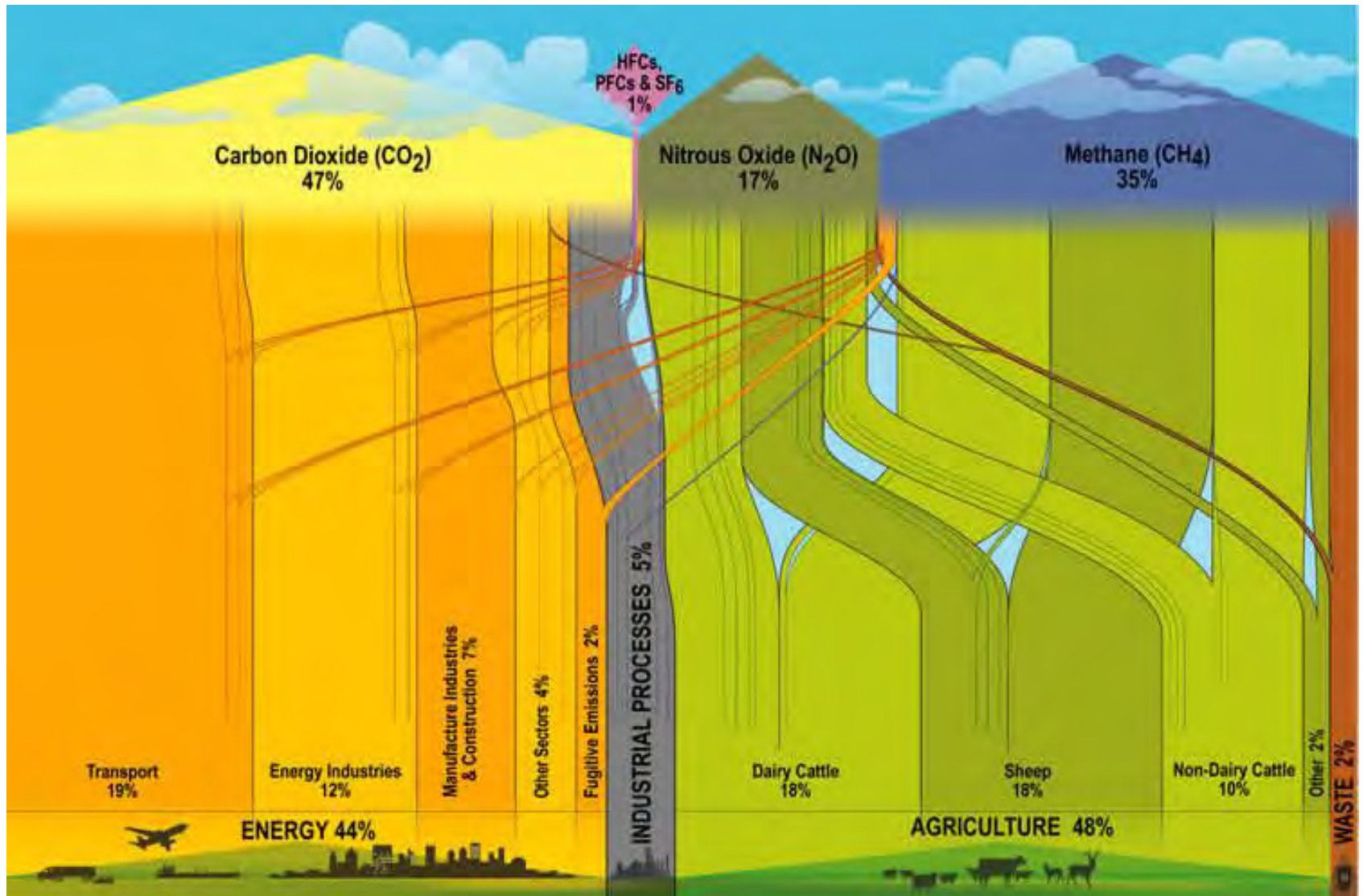
Photos courtesy Getty Images, Vindskip and Daimler- AG

“Business as Usual” = Sea Levels up 60-120 feet?



Source: World Meteorological Organization Greenhouse Gas Bulletin #13: https://library.wmo.int/doc_num.php?explnum_id=4022

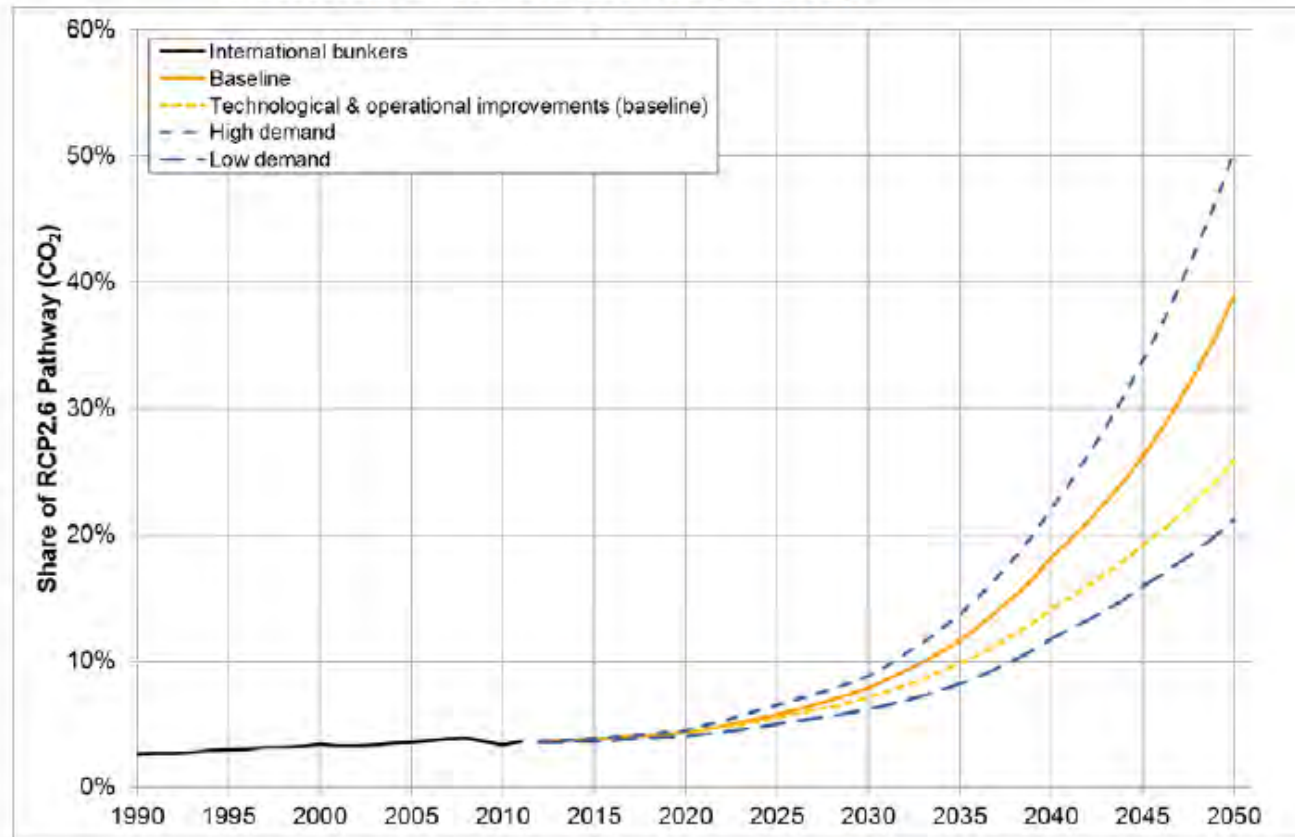
Transport: 19% of GHG Emissions



Source: Sankey Diagrams

Air and marine transport could be 20-50% of global GHG emissions by 2050

Figure 7: International aviation and maritime transport's share of global GHG emissions under the RCP 2.6 pathway



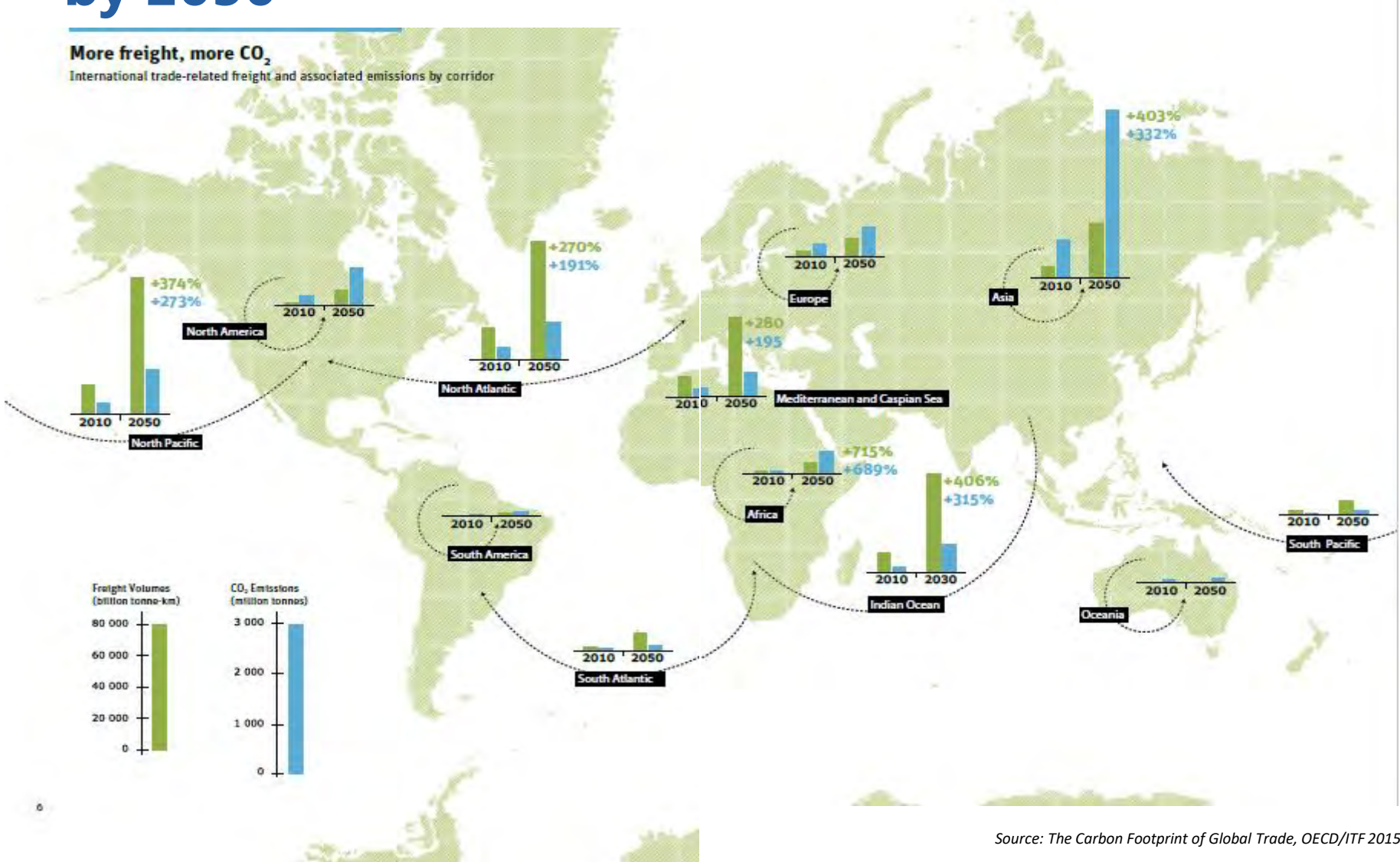
Source: ICAO 2013b, IMO 2014, van Vuuren, D. P. et al. 2011

Source: *Emission Reduction Targets for International Aviation and Shipping*, European Parliament, 2015

Freight CO2 emissions to grow 332% in Asia, 315% in Indian Ocean, and 273% in N. Pacific by 2050

More freight, more CO₂

International trade-related freight and associated emissions by corridor



Source: The Carbon Footprint of Global Trade, OECD/ITF 2015

A world map showing the distribution of countries, with blue circles of varying sizes placed over each country. The circles represent the relative size of the country, with China and the United States having the largest circles. The map includes labels for major countries and oceans.

Major countries labeled include: Russia, China, United States, Canada, Brazil, Australia, India, Japan, South Africa, and many others. Oceans labeled include: North Atlantic Ocean, North Pacific Ocean, Indian Ocean, South Atlantic Ocean, and South Pacific Ocean.

6

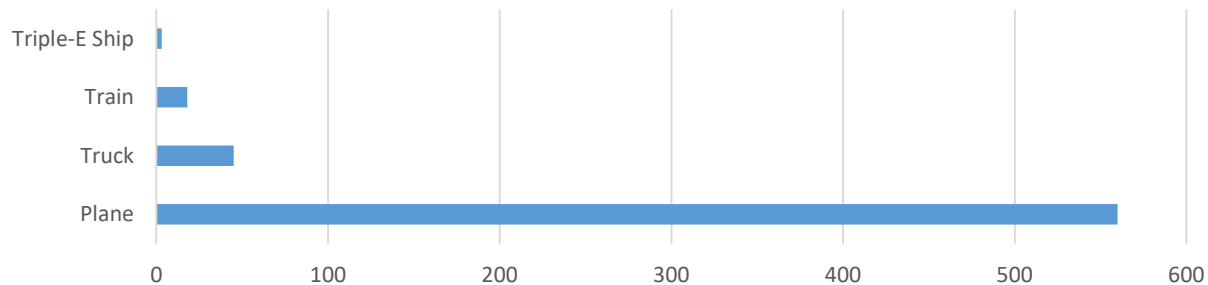
Transitioning to green freight: avoid – shift – improve

Grams of CO₂ emitted by transporting
1 tonne of goods 1km



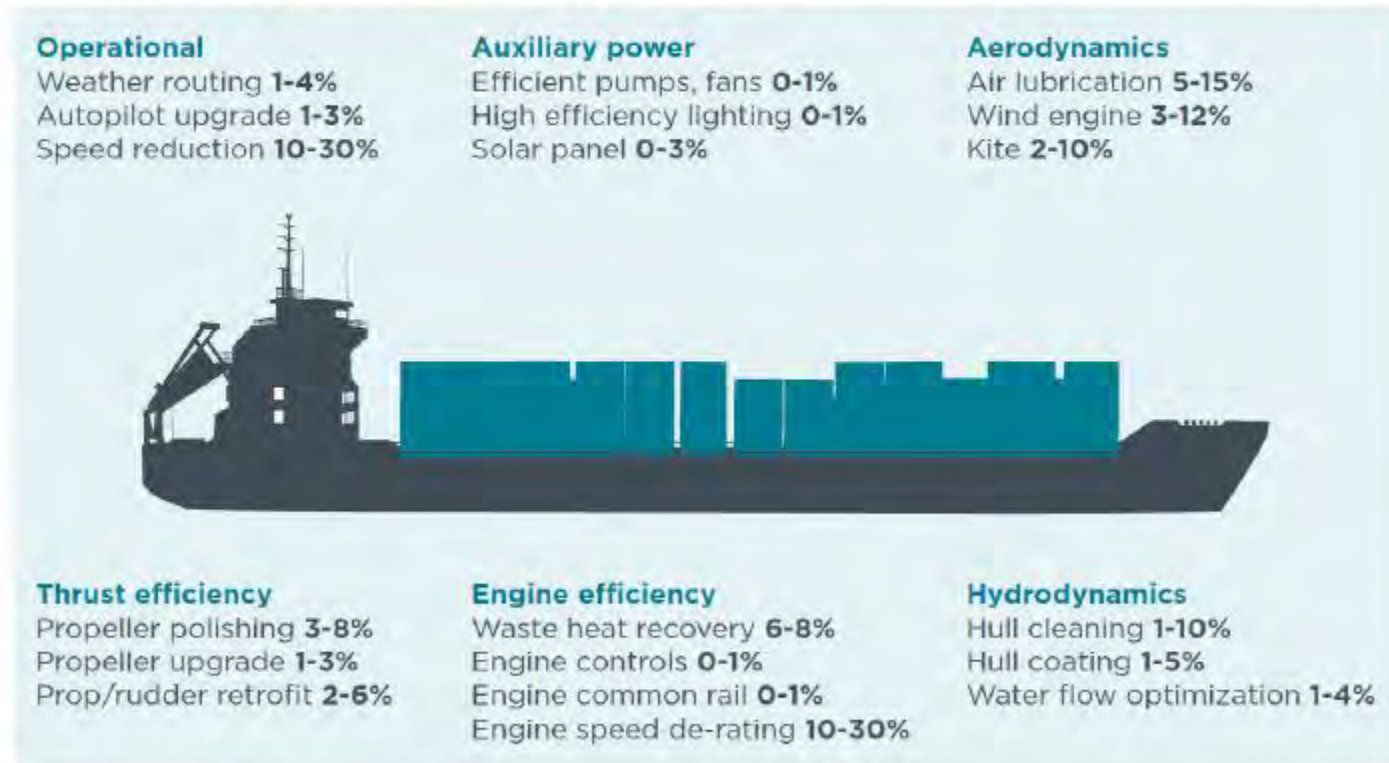
Sources: Maersk, 2016

Grams CO₂ emitted / tonne / km



Use speed reduction/other operational measures to permanently reduce marine transport CO₂ emissions 30%+ immediately

Figure 5: Potential fuel use and CO₂ reductions from various efficiency approaches for shipping vessels



Source: Wang & Lutsey 2013

Sources: Emission Reduction Targets for International Aviation and Shipping, European Parliament, 2015; Options for Reducing Logistics-related Emissions from Global Value Chains, Alan C. McKinnon, European University Institute 2014

Shift all possible long haul (>300km) freight from road to rail or inland waterways for emission reductions of 60%+

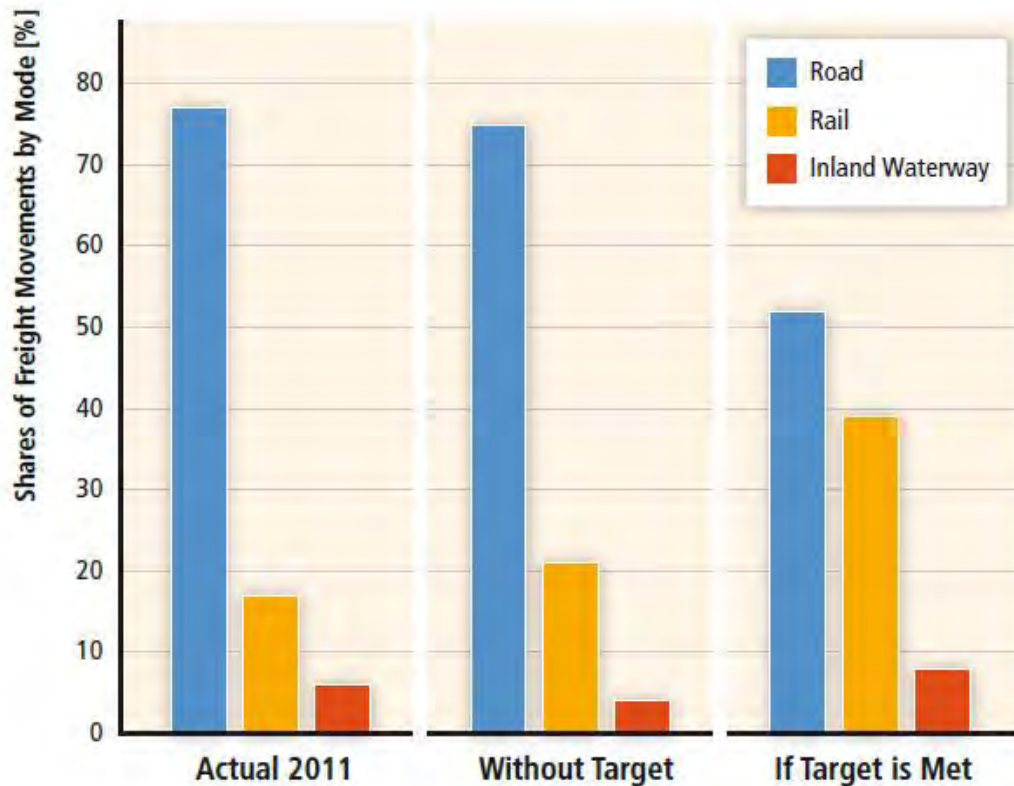
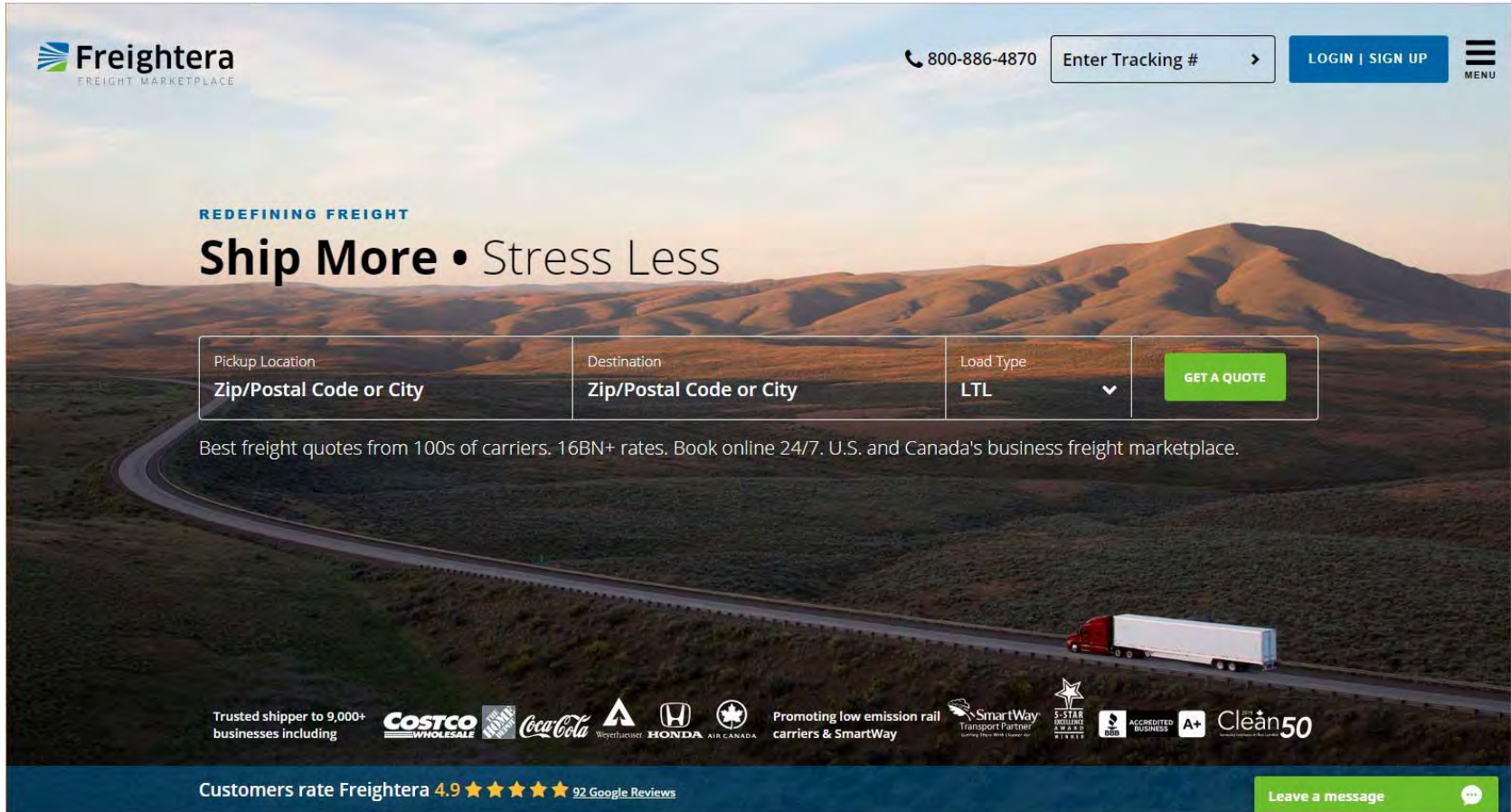


Figure 8.8 | Projected freight modal split in the EU-25 in 2030 comparing 2011 shares with future business-as-usual shares without target and with EU White Paper modal split target. Source: Based on Tavasszy and Meijeren, 2011.

Source: Intergovernmental Panel on Climate Change (IPCC) 2016: Chapter 8: Transport

Introducing Freightera's Low Emission Freight Marketplace



Freightera
FREIGHT MARKETPLACE

800-886-4870 Enter Tracking # > LOGIN | SIGN UP MENU

REDEFINING FREIGHT

Ship More • Stress Less

Pickup Location Zip/Postal Code or City	Destination Zip/Postal Code or City	Load Type LTL	GET A QUOTE
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Best freight quotes from 100s of carriers. 16BN+ rates. Book online 24/7. U.S. and Canada's business freight marketplace.

Trusted shipper to 9,000+ businesses including

COSTCO WHOLESALE **Walmart** **Coca-Cola** **Weyerhaeuser** **HONDA** **AIR CANADA**

Promoting low emission rail carriers & SmartWay

SmartWay Transport Partner
Leading Shippers Work Smarter Not Harder

5-STAR RATING
A+ ACCREDITED BUSINESS

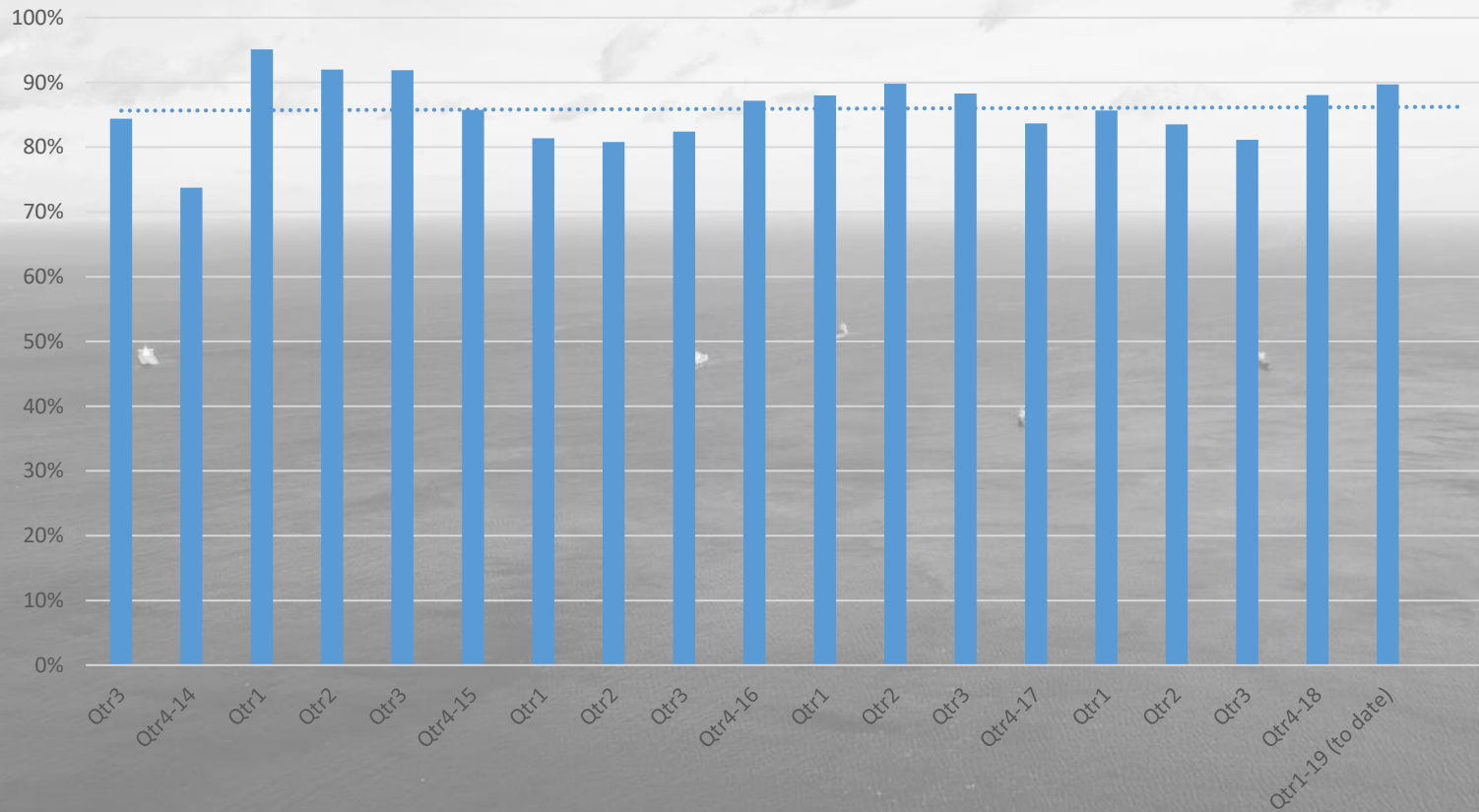
Clean50

Customers rate Freightera 4.9 ★★★★★ 92 Google Reviews

Leave a message

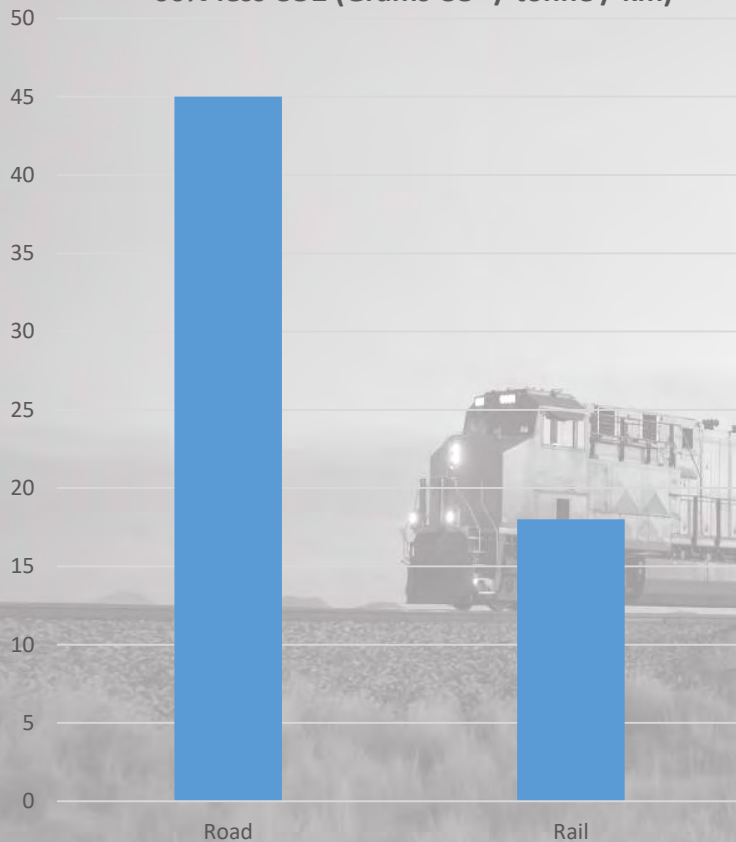
Selecting based on price, shippers are booking the lower emission option 86% of the time

Freightera Bookings via SmartWay Certified Carriers or Rail



Freightera's Low Emission Freight Marketplace: 60% less CO2 emissions shipping by rail


Long Beach CA, to Dunwoody, GA: Rail emits 60% less CO2 (Grams CO₂ / tonne / km)



Long Beach, CA to Dunwoody, GA: Rail costs 44% less



Expanding rail service with Freightera's Link2Rail






PRESENTED BY FREIGHTERA


Link2Rail Package #2


EST. DELIVERY DATE
02/27/2017




★★★★★


  



\$1,652.00 CAD











   DURATION 11 Days [HIDE TRANSIT DETAILS](#)



02/16/2017  **Vancouver, BC V6G 1X3, Canada**
Business with Dock


 **Truck** 
3 Days

02/19/2017  **Canadian Pacific Rail** 
Vancouver, BC

 **Rail** 
6 Days

02/25/2017  **Saia LTL Freight** 
2550 E 28th St, Los Angeles, CA 90058, USA

 **Truck** 
2 Days

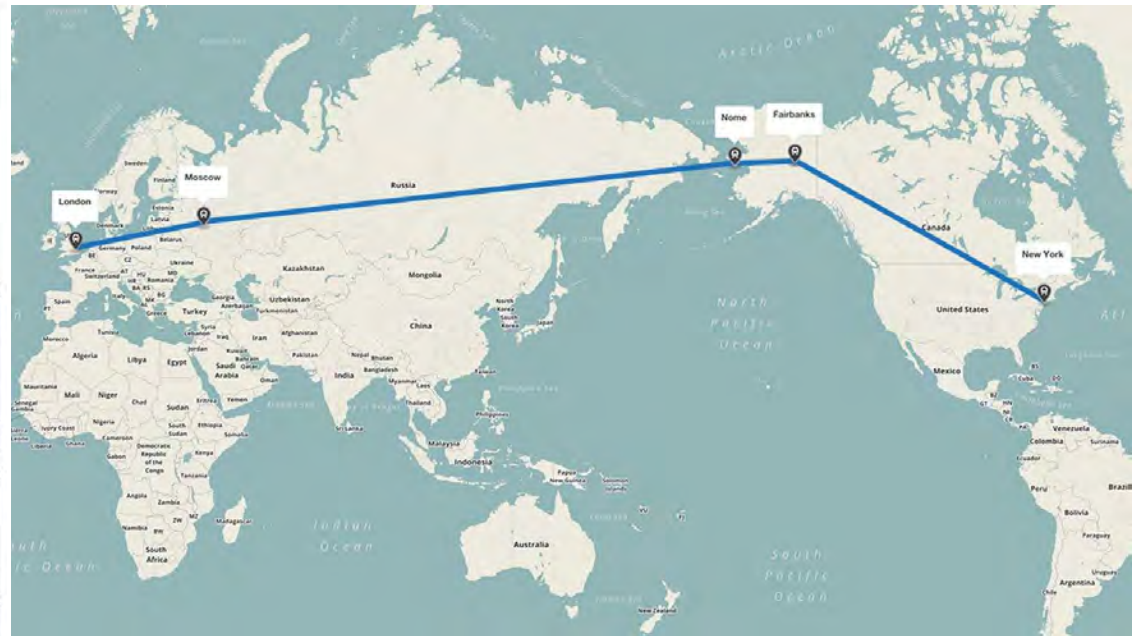
02/27/2017  **Los Angeles, CA 90009, US**
Residential / Home

Green Future of Long Haul Freight: Sustainable Electric Rail

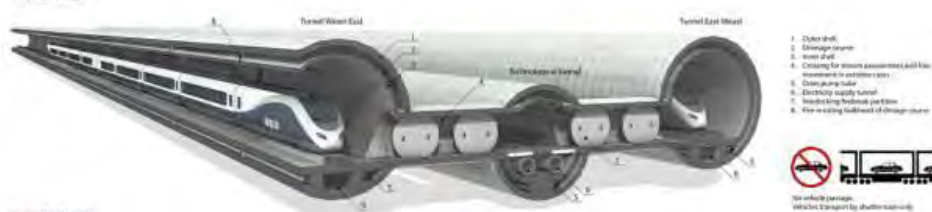


Source: Getty Images

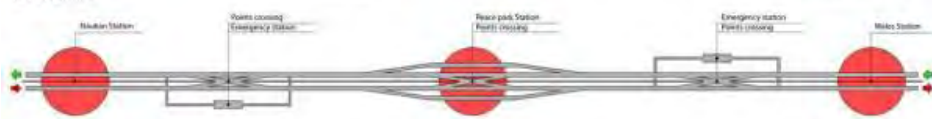
Connecting the continents with sustainable electric rail



Tunnel model



Tunnel scheme



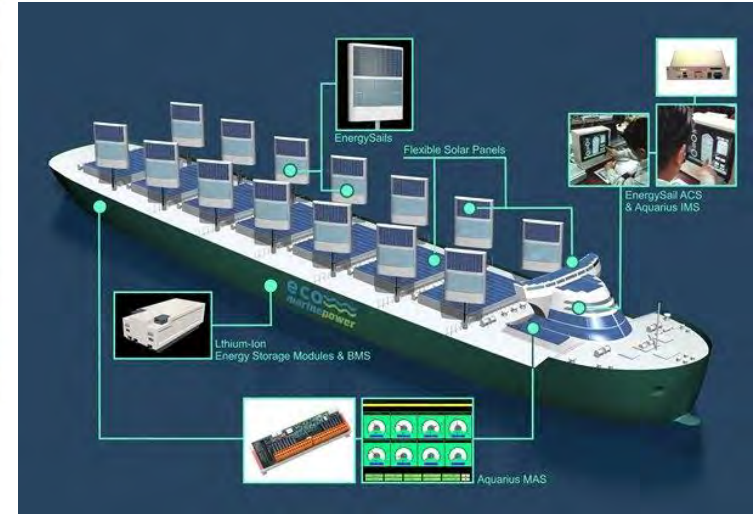
Sources: Washington Post, 2015; Shiller Institute; InterBering 2016

Green Future of Marine Transport: Wind, Solar and Hybrid Electric Cargo Ships

The cargo vessel with a hull so huge it acts as a SAIL: Innovative design harnesses wind power to reduce fuel consumption by half | Daily Mail Online



The Vindskip (pictured), designed by Lade AS, uses a hull designed to act as a so-called airfoil, or giant sail. The makers of the wind-powered hybrid merchant ship said that while engines are still needed, their design could achieve fuel savings of 60% while reducing emissions by 80%



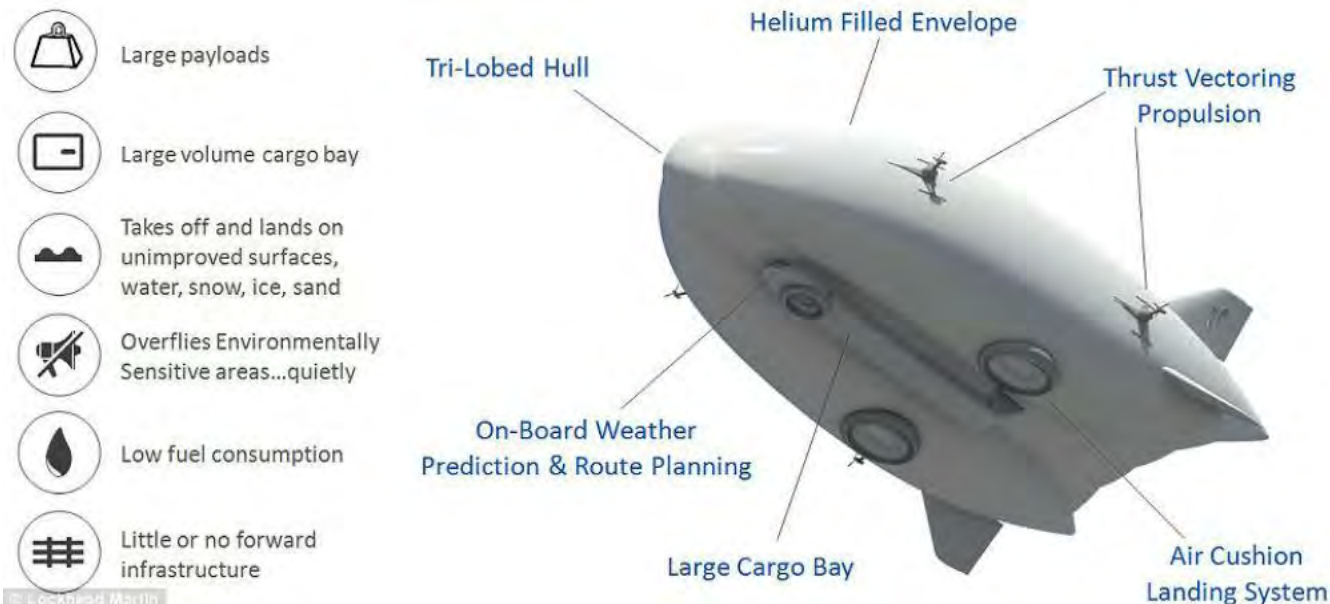
Sources: Vindskip™ by company Lade AS, Aquarius EcoShip by Eco Marine Power, Tûranor PlanetSolar by LOMOcean Design, and Black Magic by Sauter Carbon Offset Design

Green Future of Road Freight: Zero Emission Trucking



Sources: California Cleaner Freight Coalition, Smith Electric Vehicles, Nikola One by Nikola Motors, and Fuso by Daimler AG

Green Future of Air Freight: Solar and Low-E Airships



Sources: Aeros, Yuanmeng and Lockheed Martin



Zero Emission E/S Orcelle, Image courtesy: Wallenius Wilhelmsen

For more information and collaboration, please contact:

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