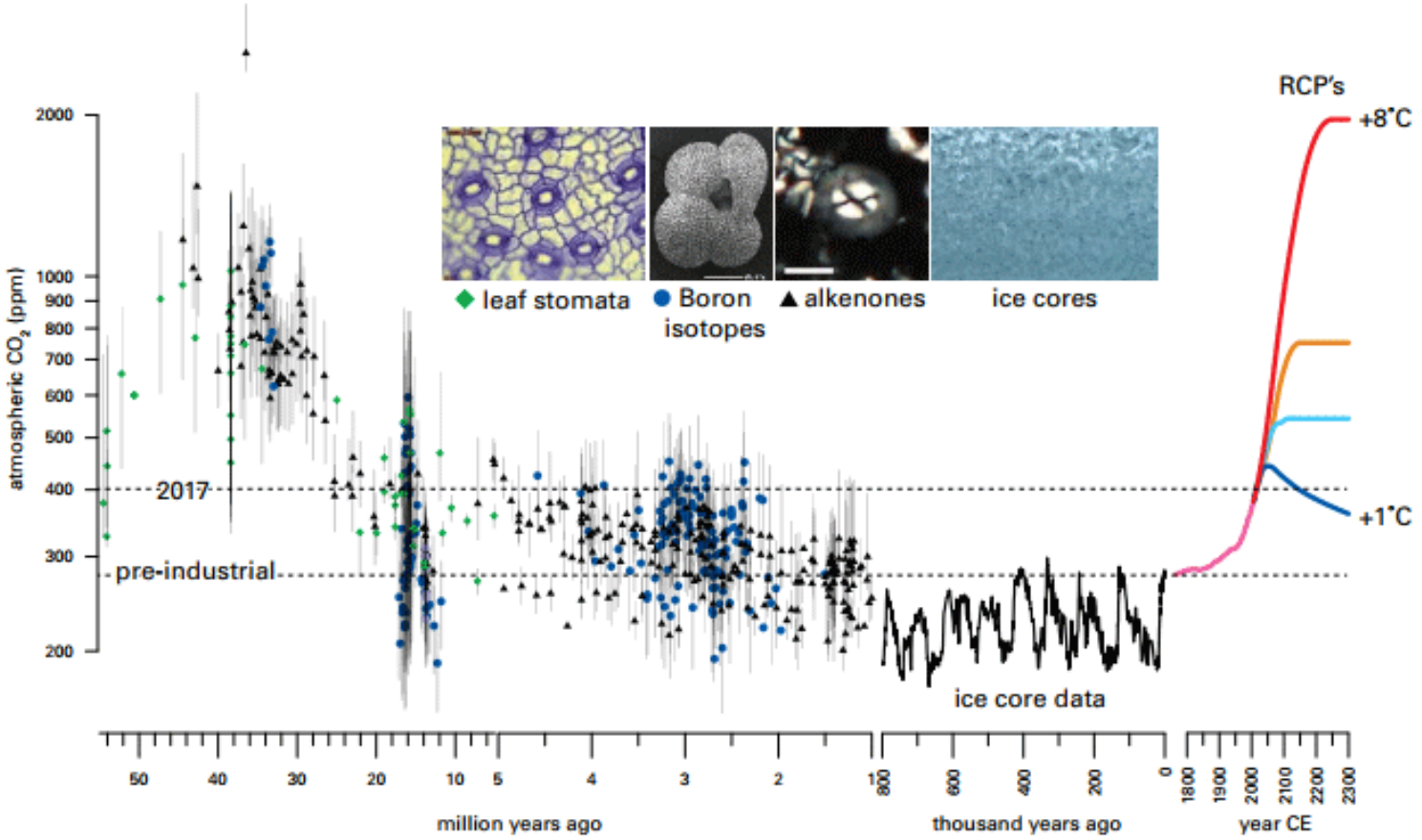
A Green Future for Freight

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

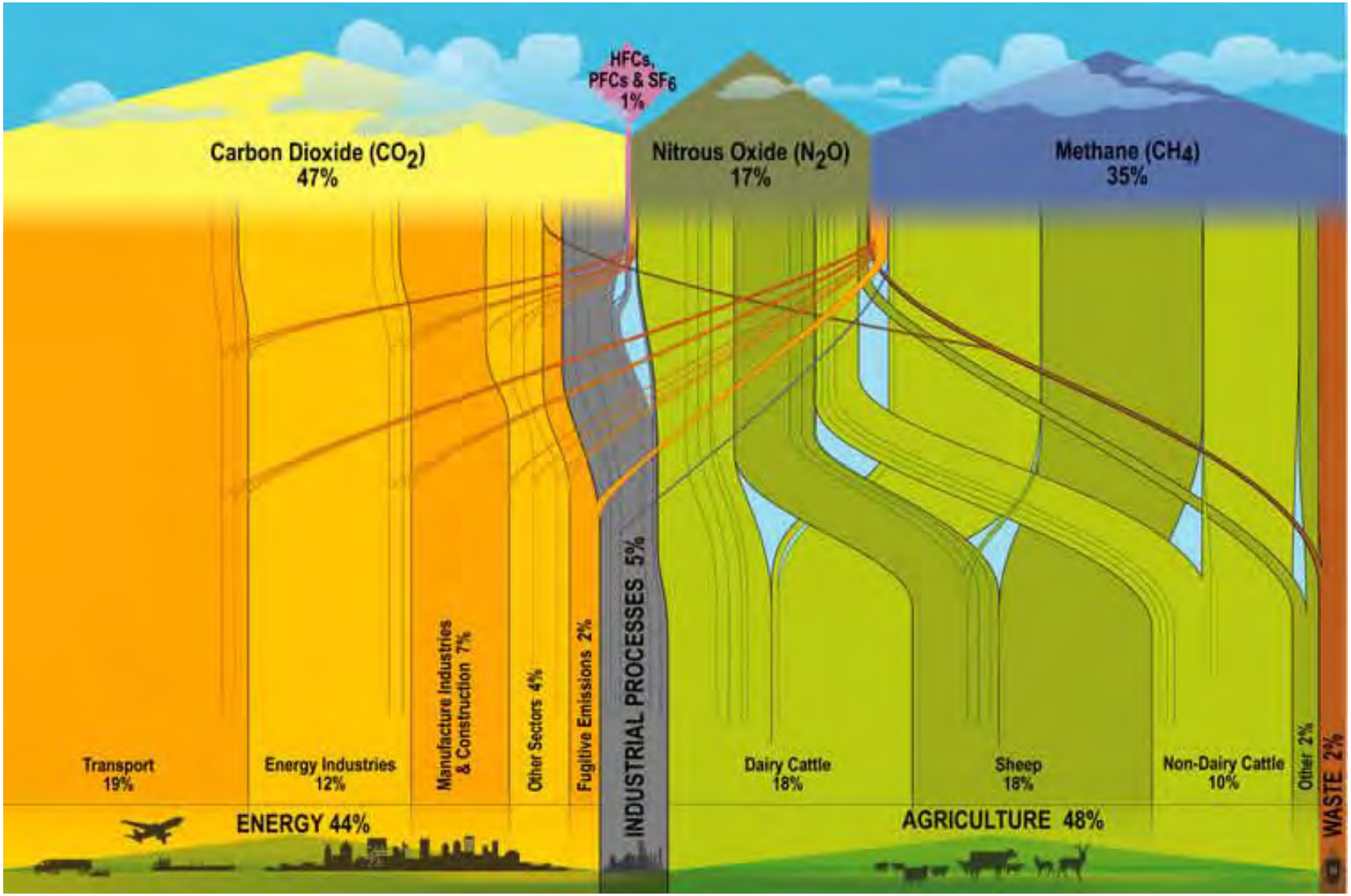
Photos courtesy Getty Images, Vindskip and Daimler- AG

“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

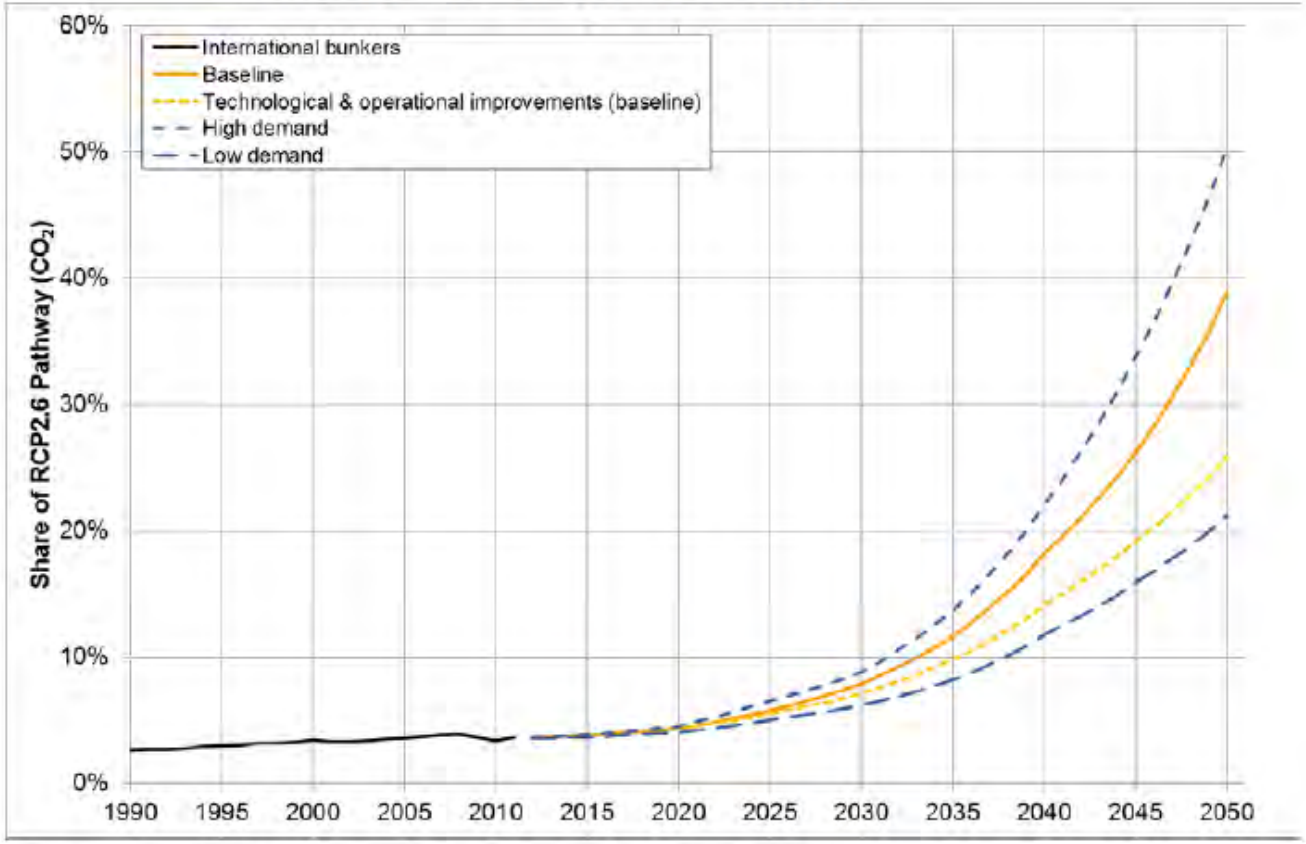
Transport: 19% of GHG Emissions



Source: Sankey Diagrams

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

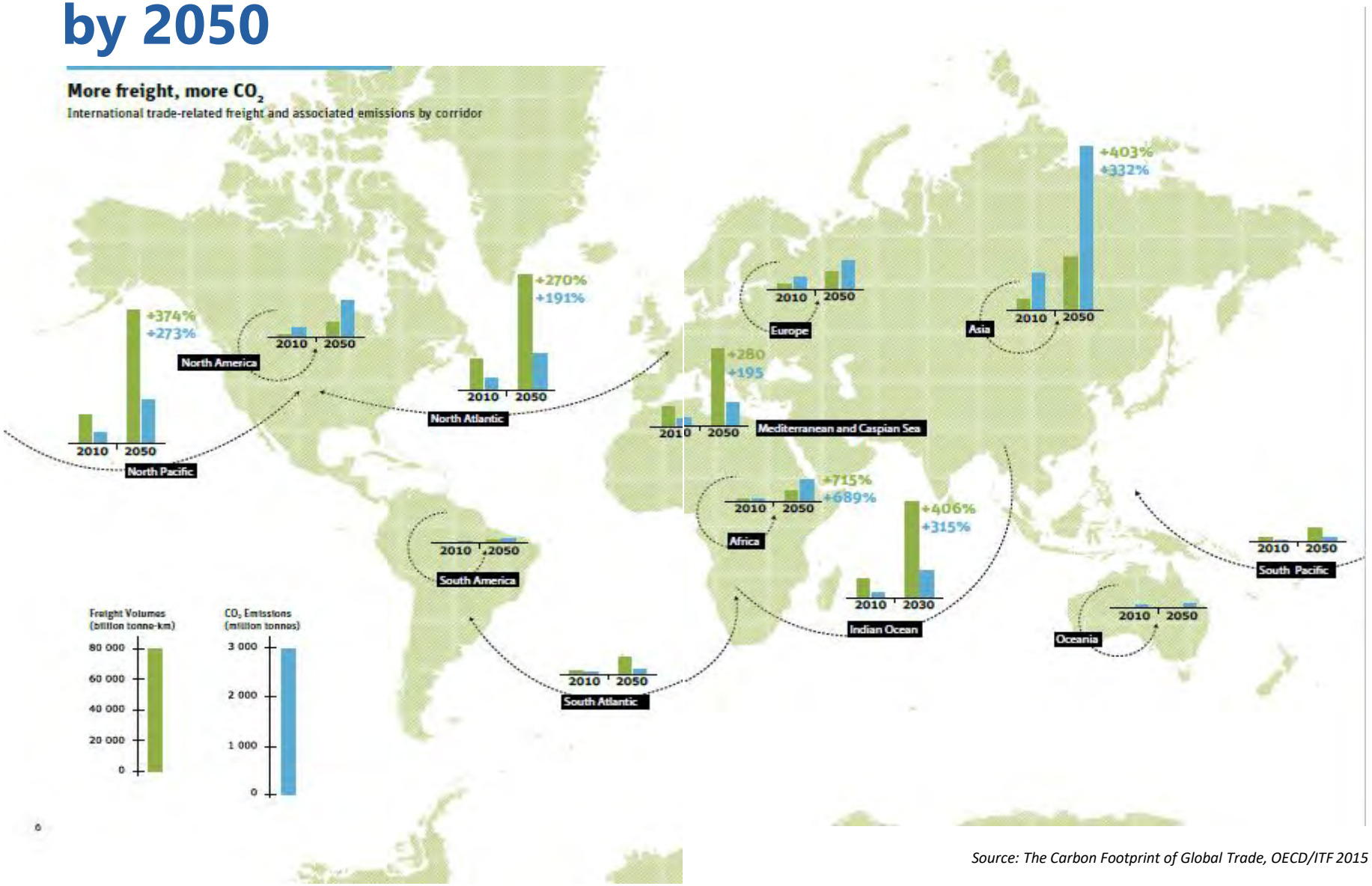
Figure 7: International aviation and maritime transport's share of global GHG emissions under the RCP 2.6 pathway



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

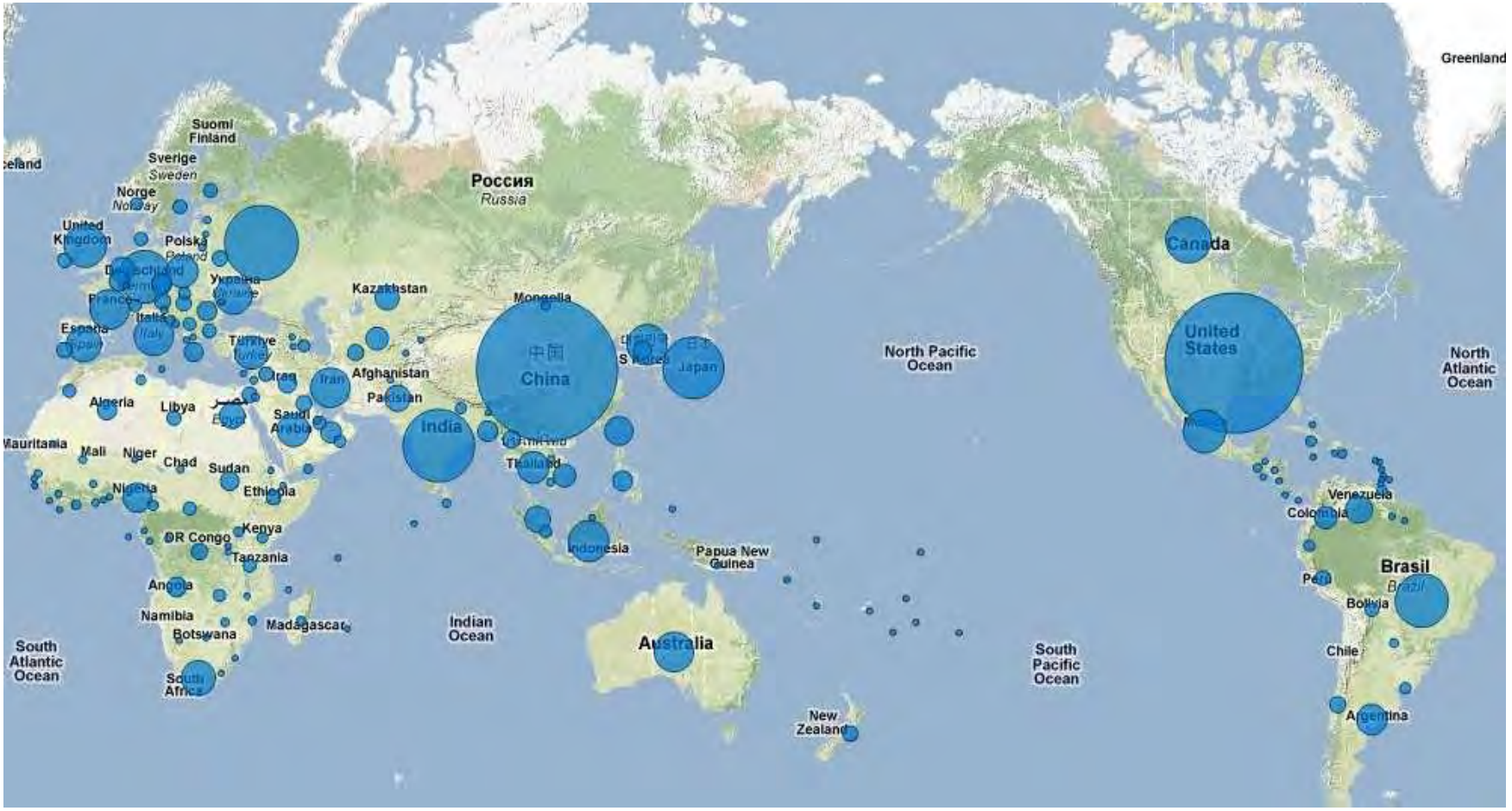
Source: Emission Reduction Targets for International Aviation and Shipping, European Parliament, 2015

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



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

Concentrating strategically on the largest GHG freight emission sources first

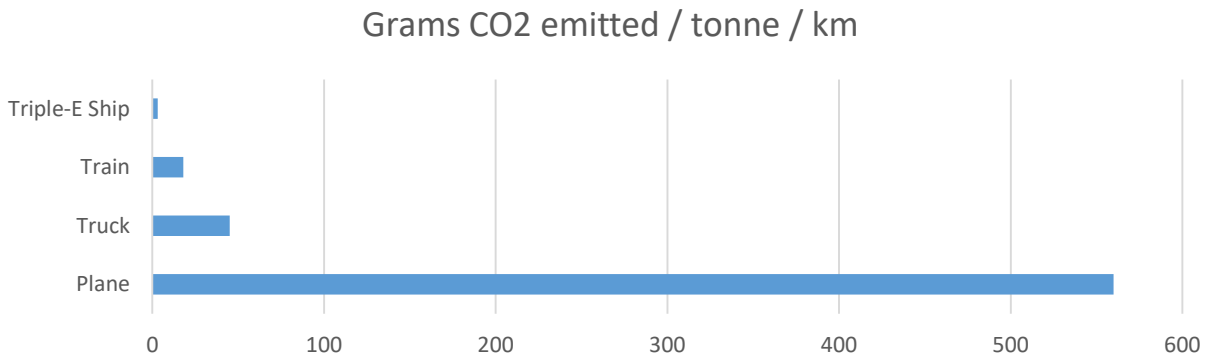


Source: World Resources Institute 2016

Transitioning to green freight: avoid – shift – improve

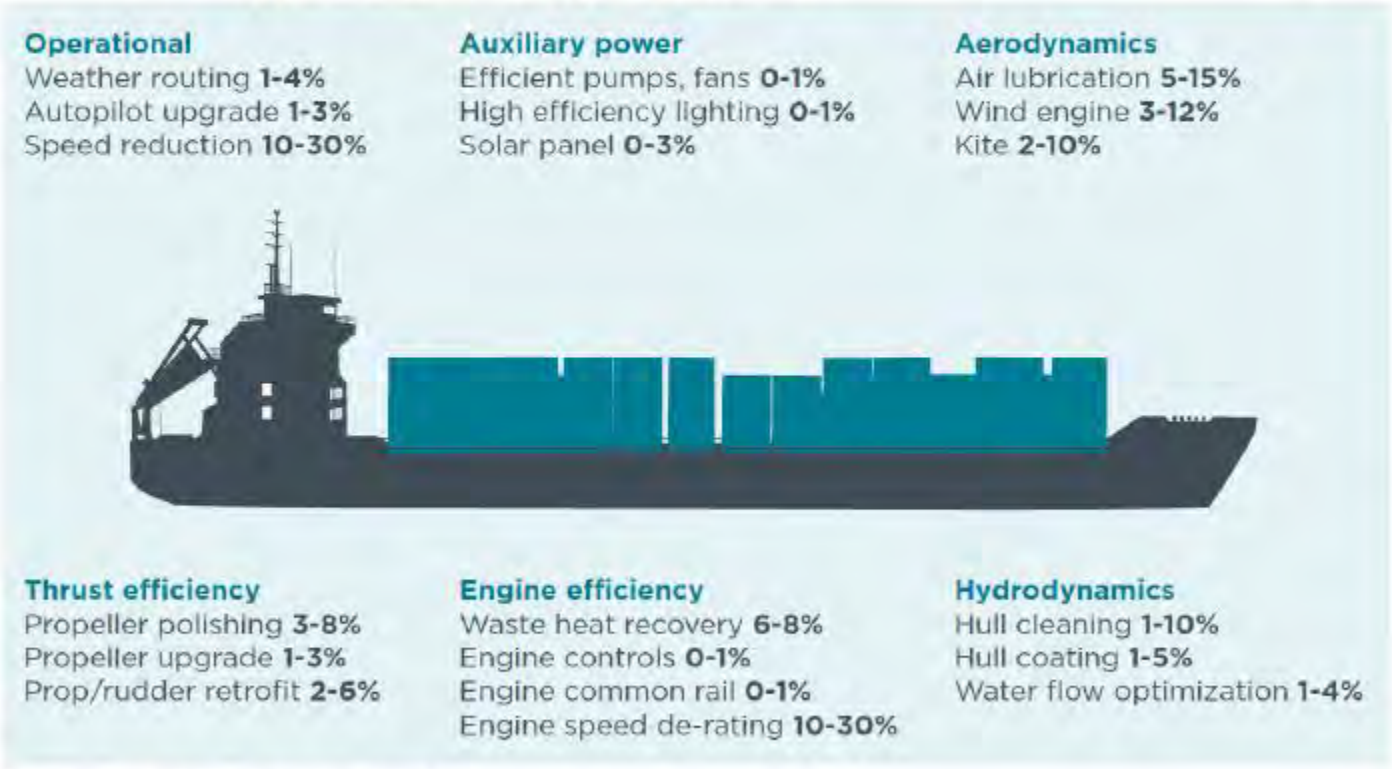
Grams of CO_2 emitted by transporting
1 tonne of goods 1km

Sources: Maersk, 2016



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

Figure 5: Potential fuel use and CO_2 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%+

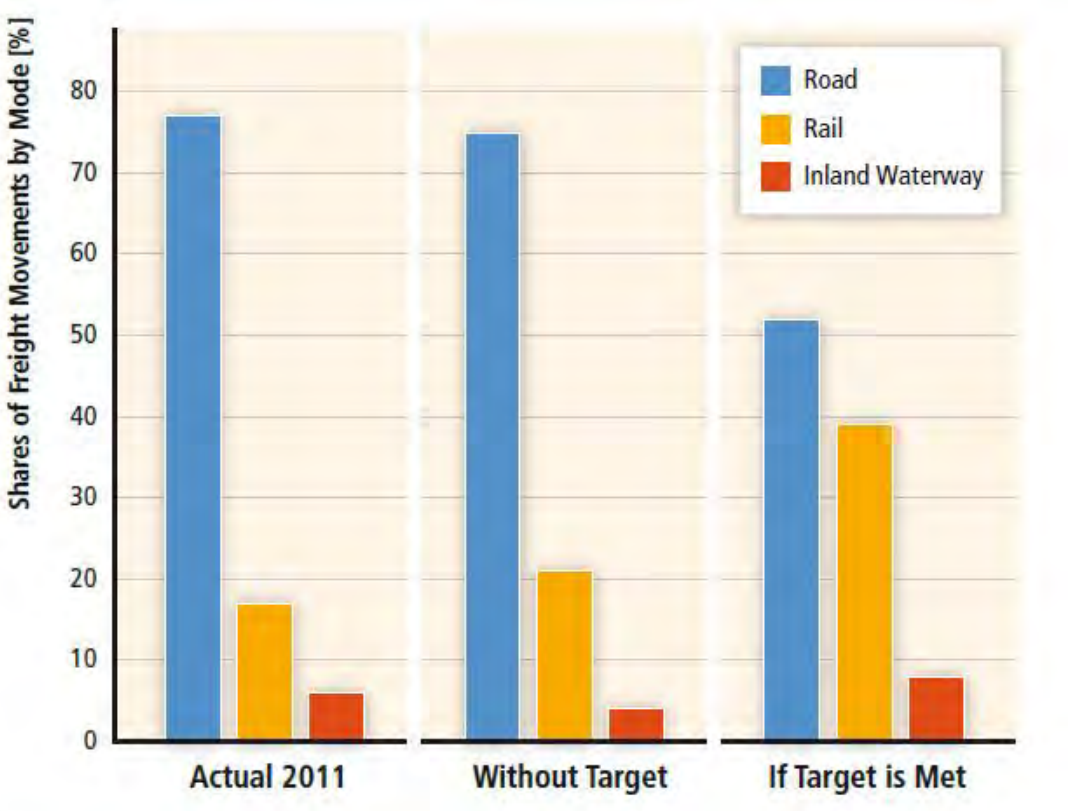
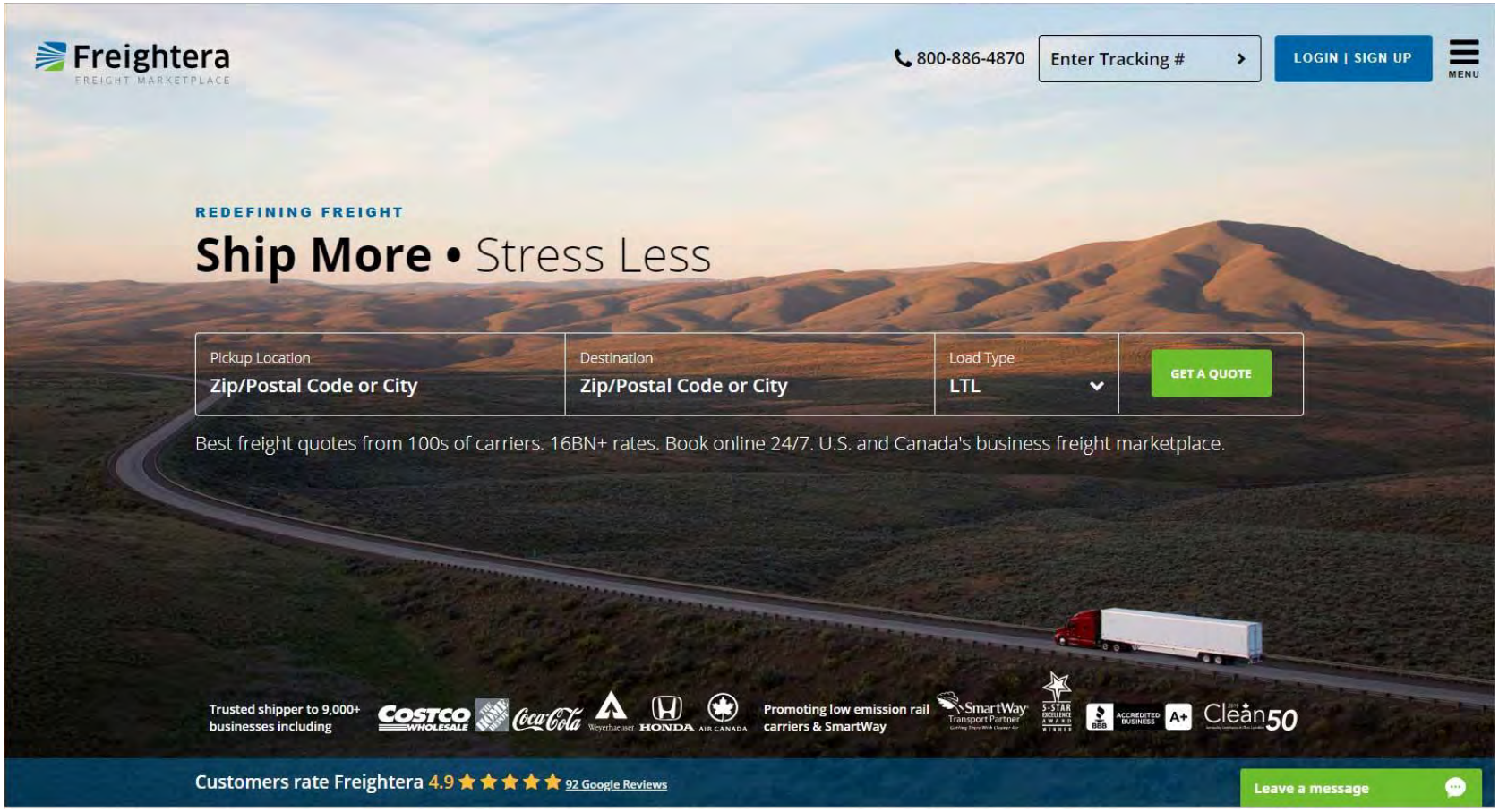


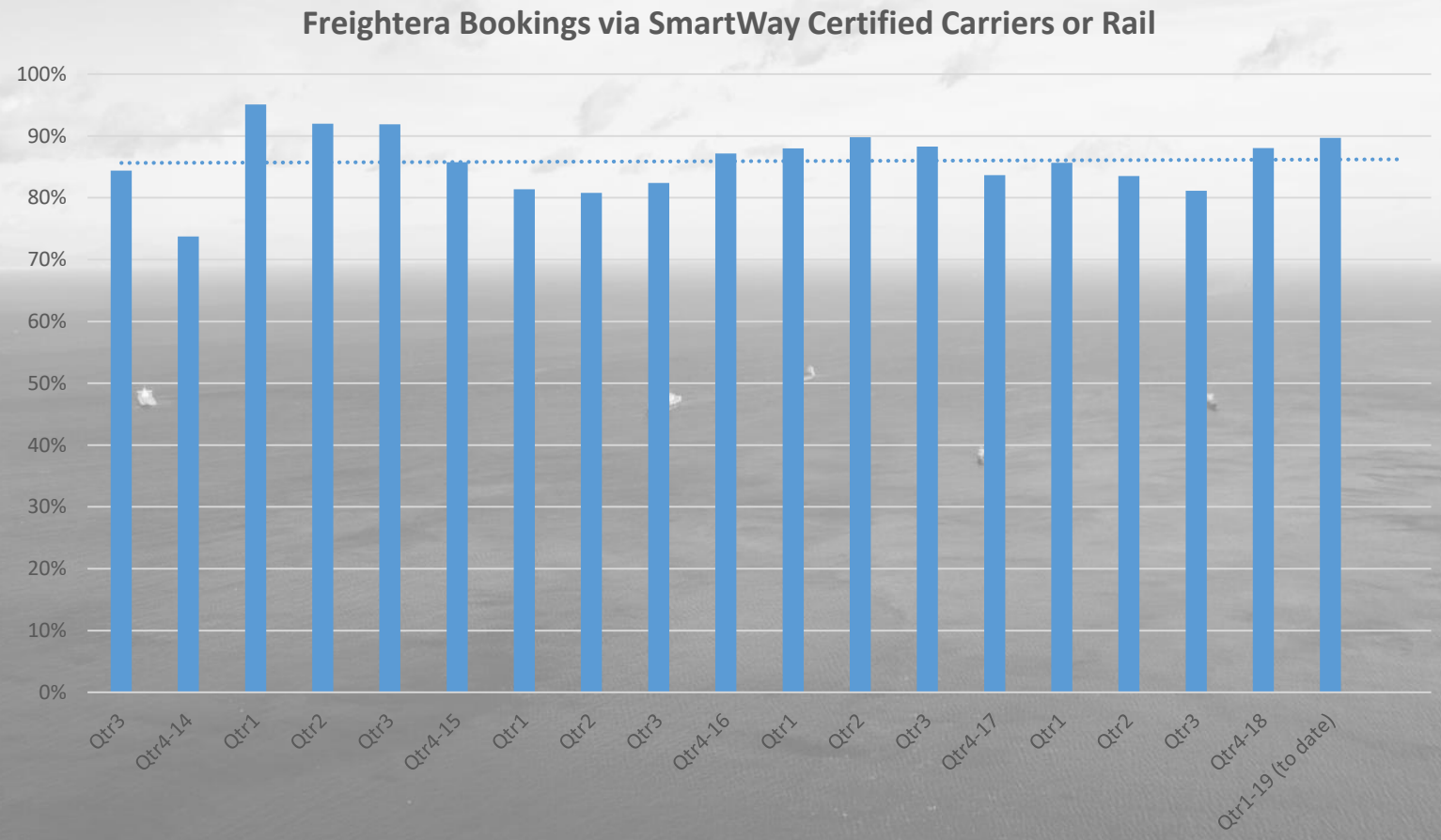
Figure 8.8 | Projected freight modal split in the EU-25 in 2030 comparing 2011 shares with future business-as-usual shares without target and with EU White Paper modal split target. Source: Based on Tavasszy and Meijeren, 2011.

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

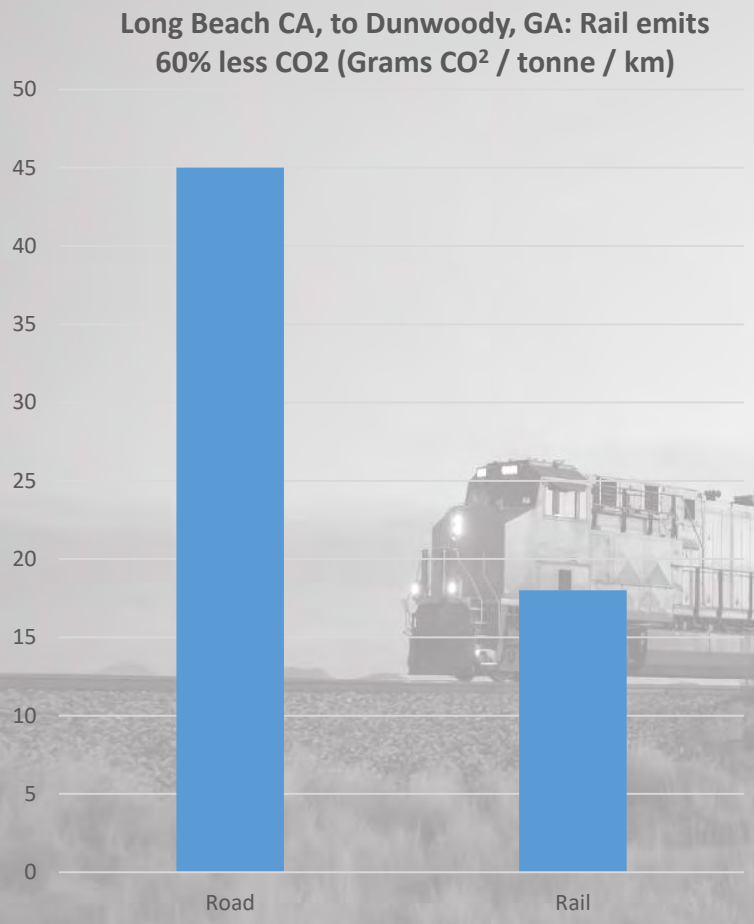
Introducing Freightera's Low Emission Freight Marketplace

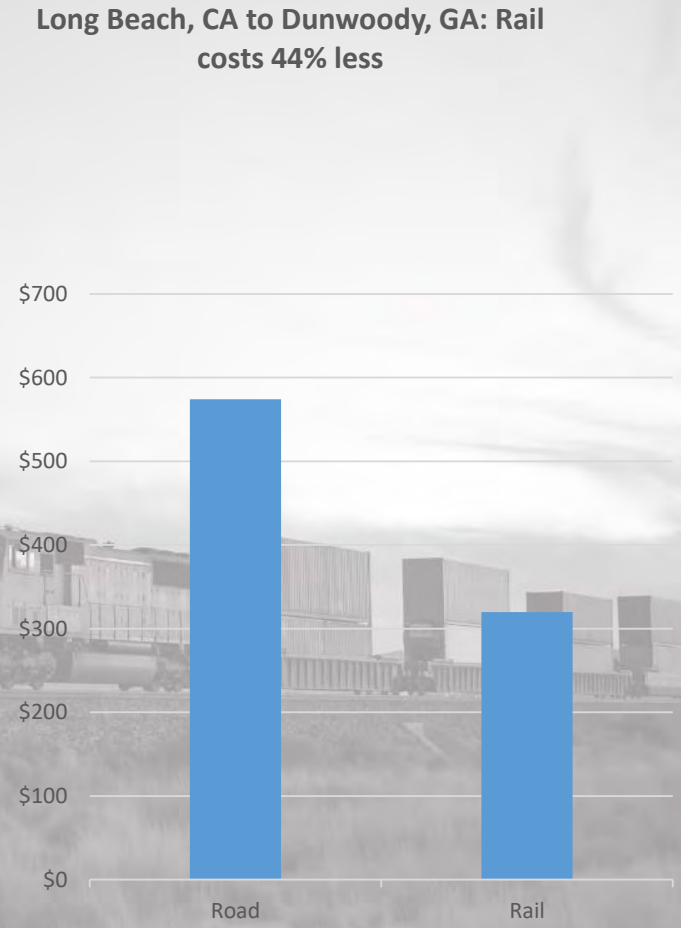


Selecting based on price, shippers are booking the lower emission option 86% of the time

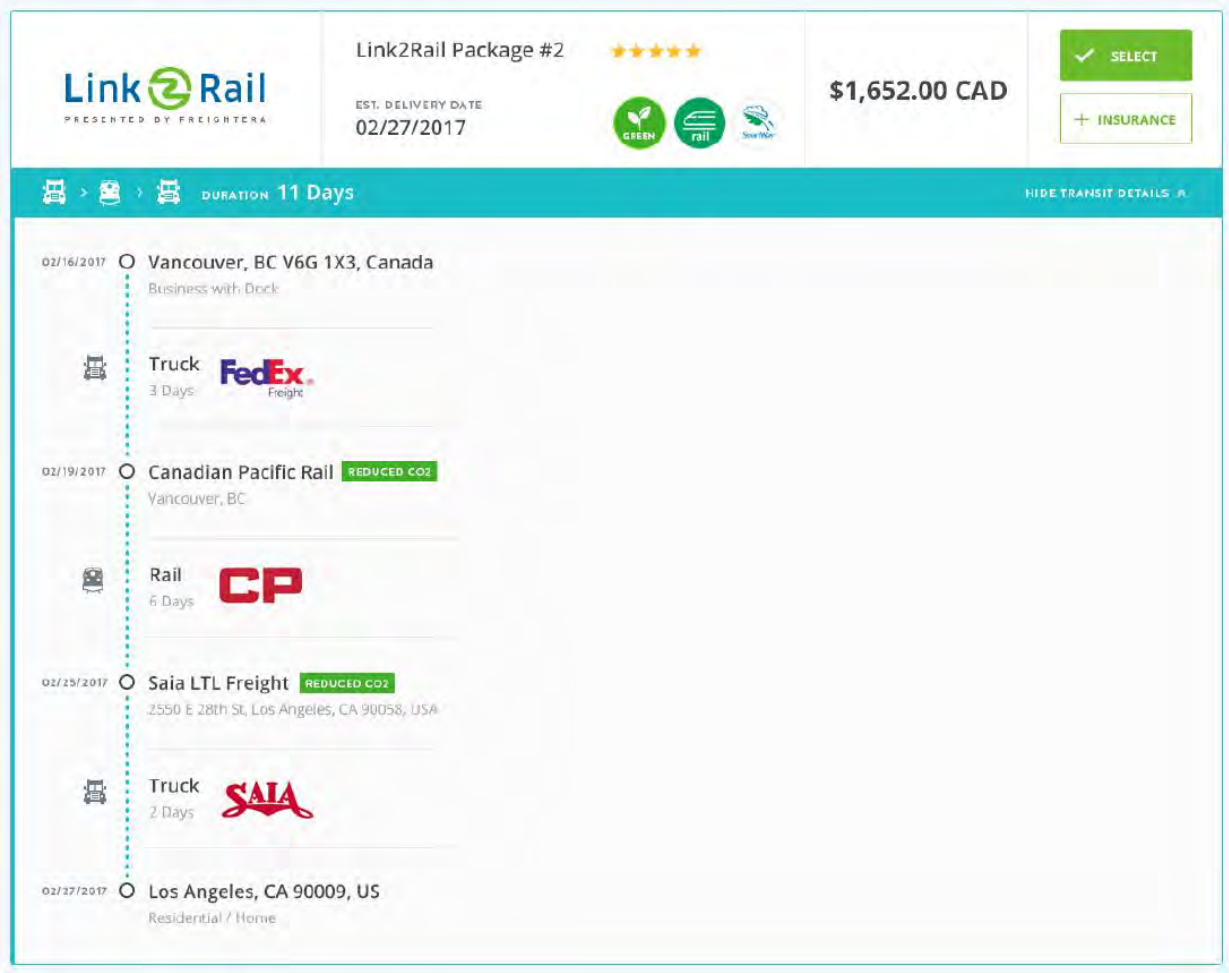


Freightera's Low Emission Freight Marketplace: 60% less CO2 emissions shipping by rail





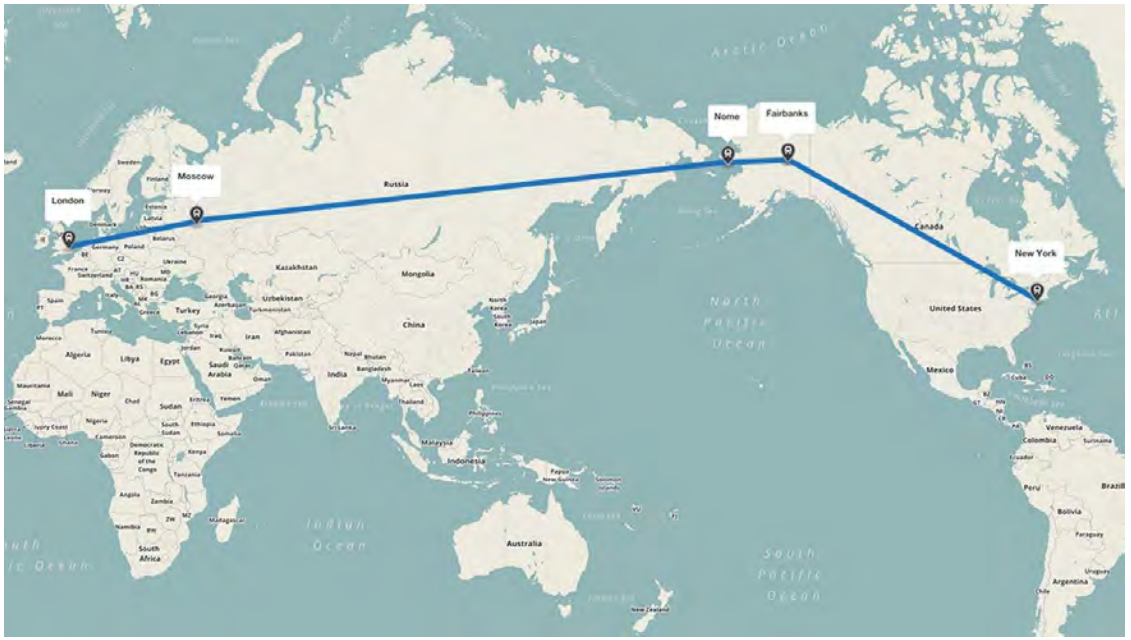
Expanding rail service with Freightera's Link2Rail

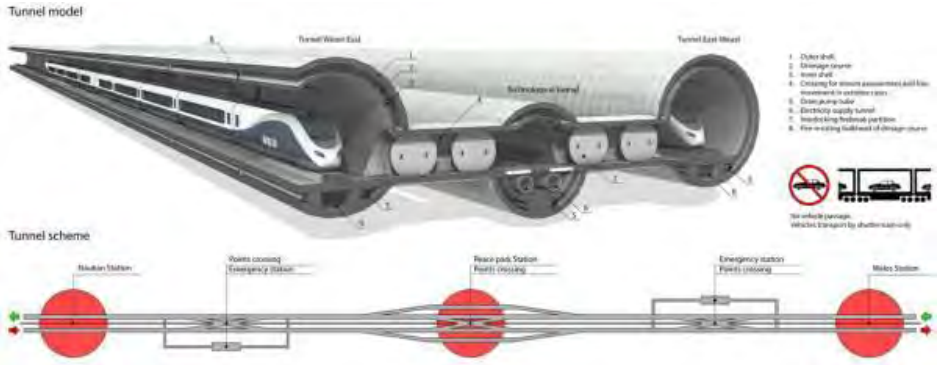


Green Future of Long Haul Freight: Sustainable Electric Rail

Source: Getty Images

Connecting the continents with sustainable electric rail



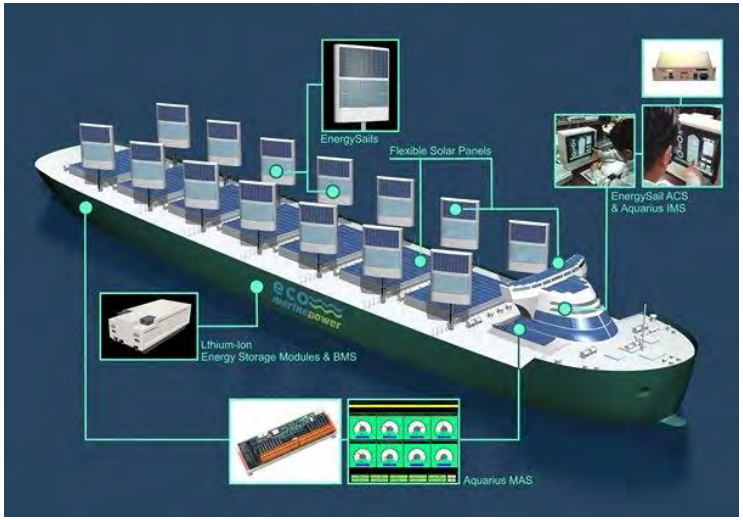


Sources: Washington Post, 2015; Shiller Institute; InterBering 2016

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%

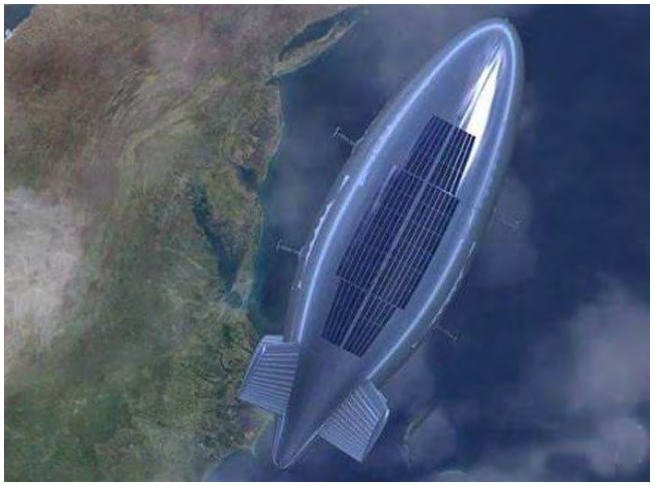


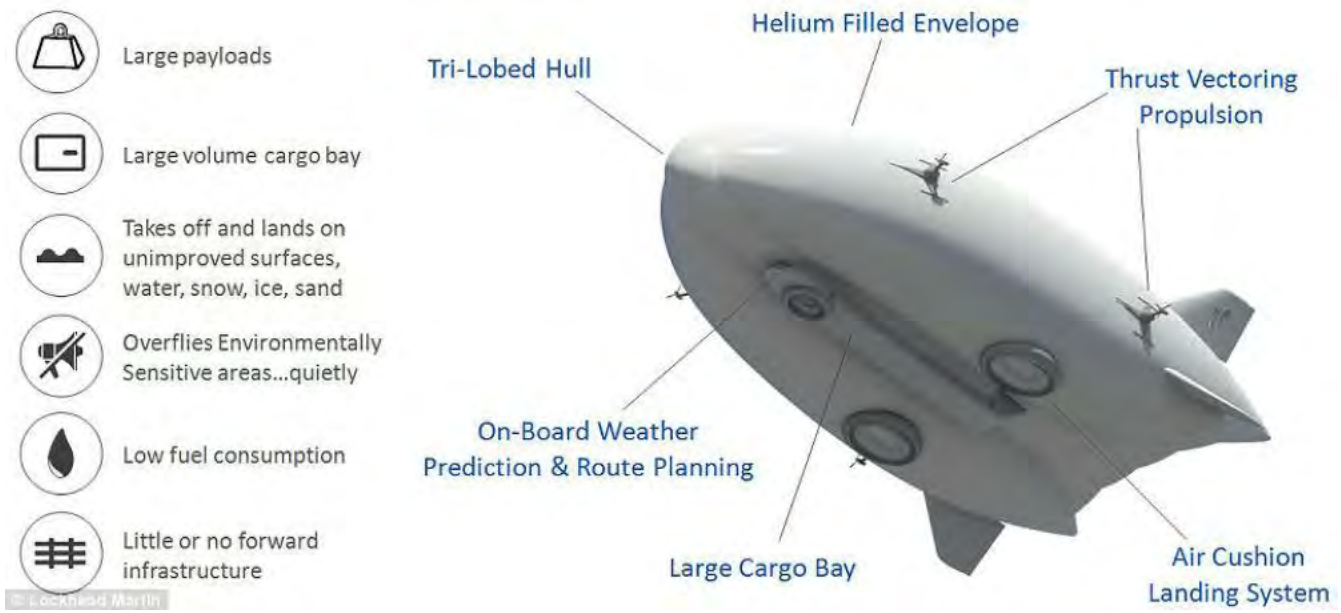
Sources: Vindskip™ by company Lade AS, Aquarius EcoShip by Eco Marine Power, Tûranor PlanetSolar by LOMOcean Design, and Black Magic by Sauter Carbon Offset Design

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

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