

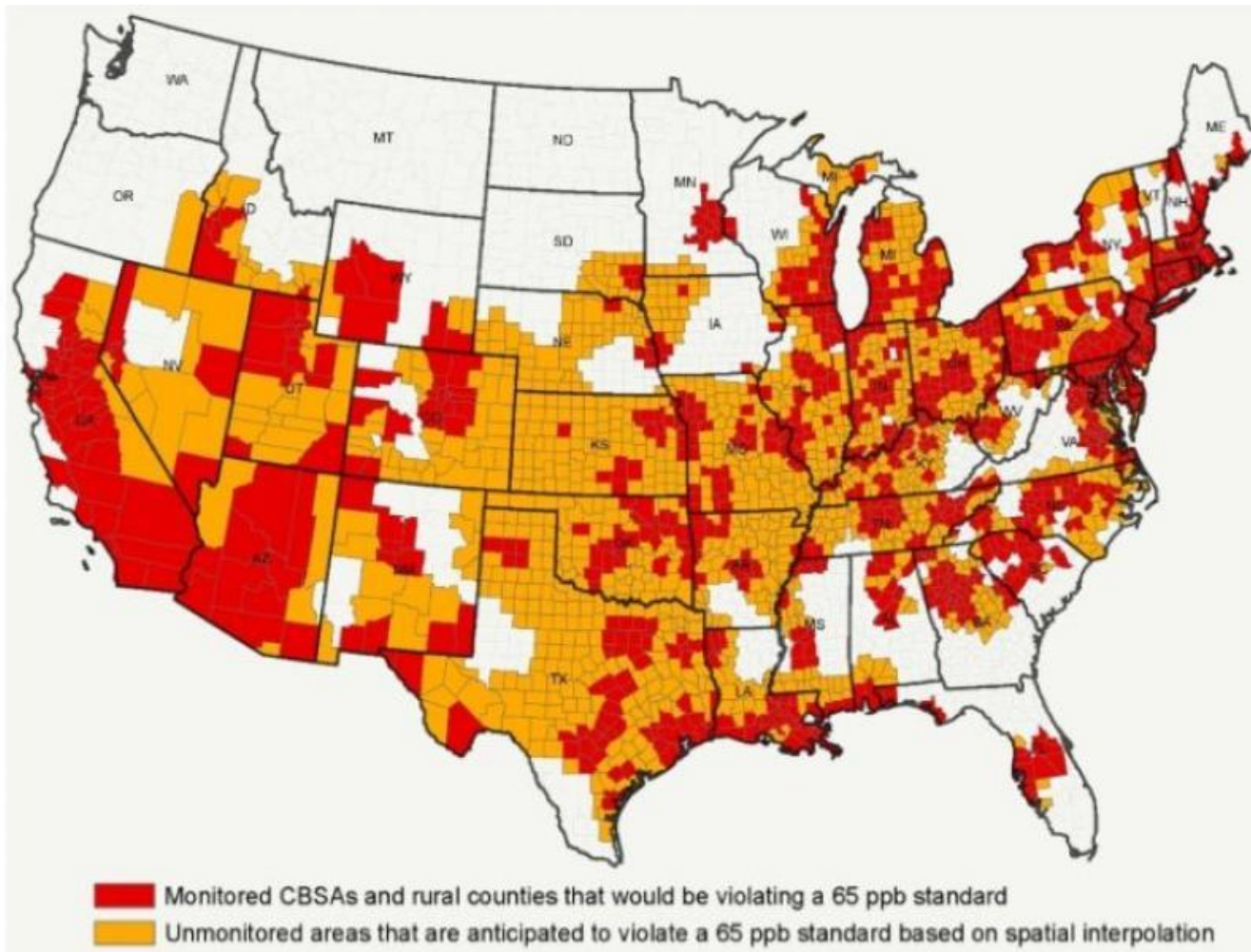
A GREEN FUTURE FOR FREIGHT

Keynote of Eric Beckwitt, CEO, Freightera, at the Urban Freight Forum's "Cities Taking Freight Action" Conference, The Globe and Mail Center, Toronto, March 3, 2020



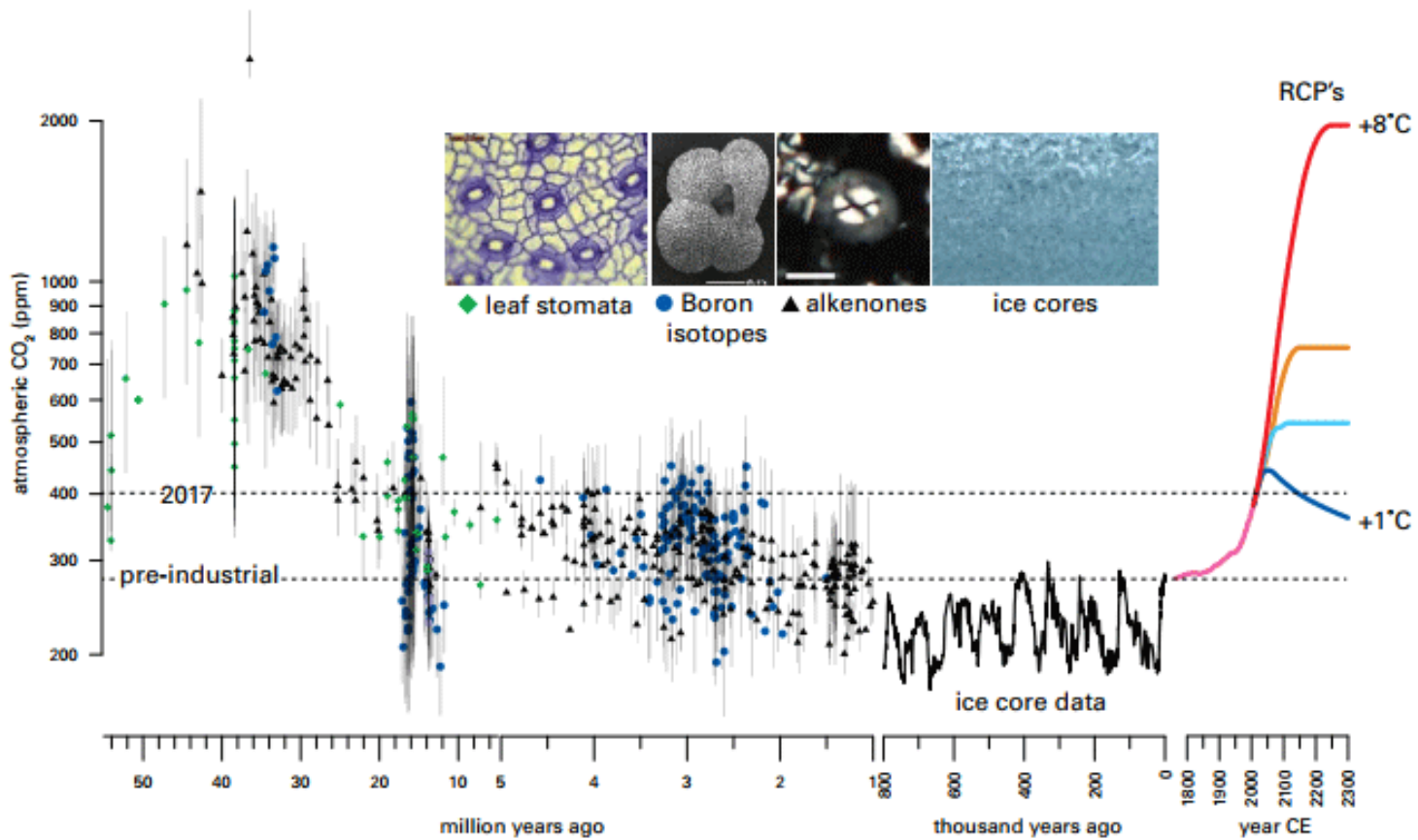
Photos courtesy Wallenius, Warsila Energy, Audi and Daimler- AG

Where can we safely raise our children?



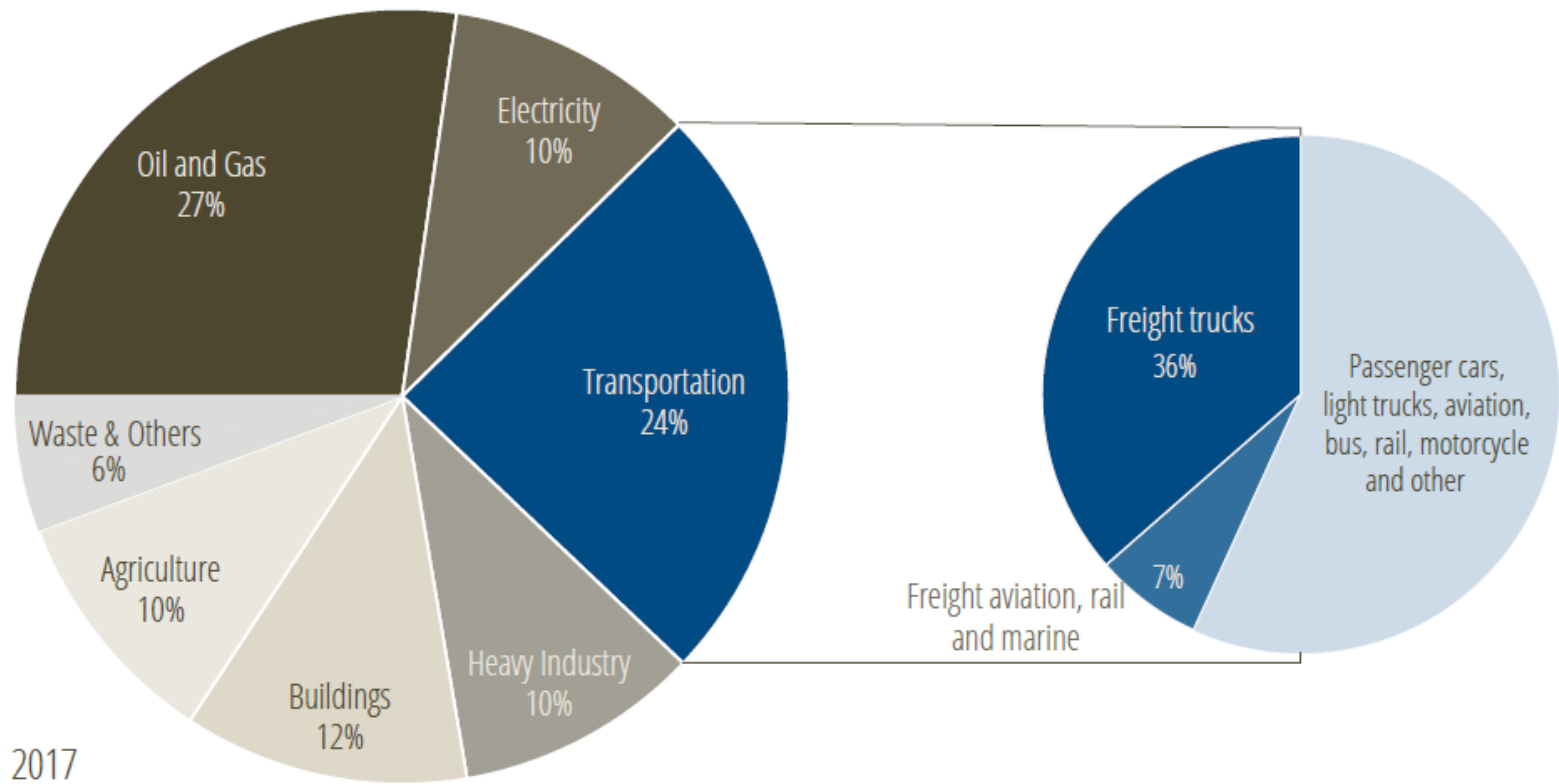
Source: American Chemistry Council: <https://blog.americanchemistry.com/2014/10/picturing-the-impact-of-epas-ozone-regulations/>

“Business as Usual” = Sea Levels up 20-40 meters?



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

Freight transport = 10.3% of Canada's GHG emissions



Source: Pembina Institute (2020), based on data from Climate Change Canada and Natural Resources Canada

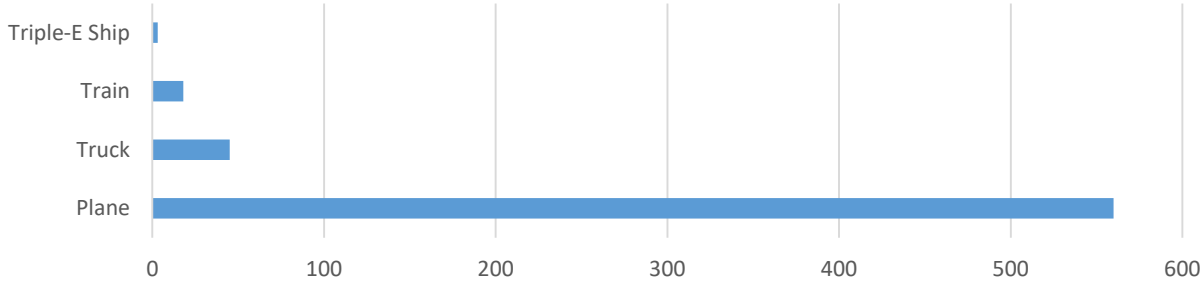
Emissions reductions NOW via avoid – shift – improve

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



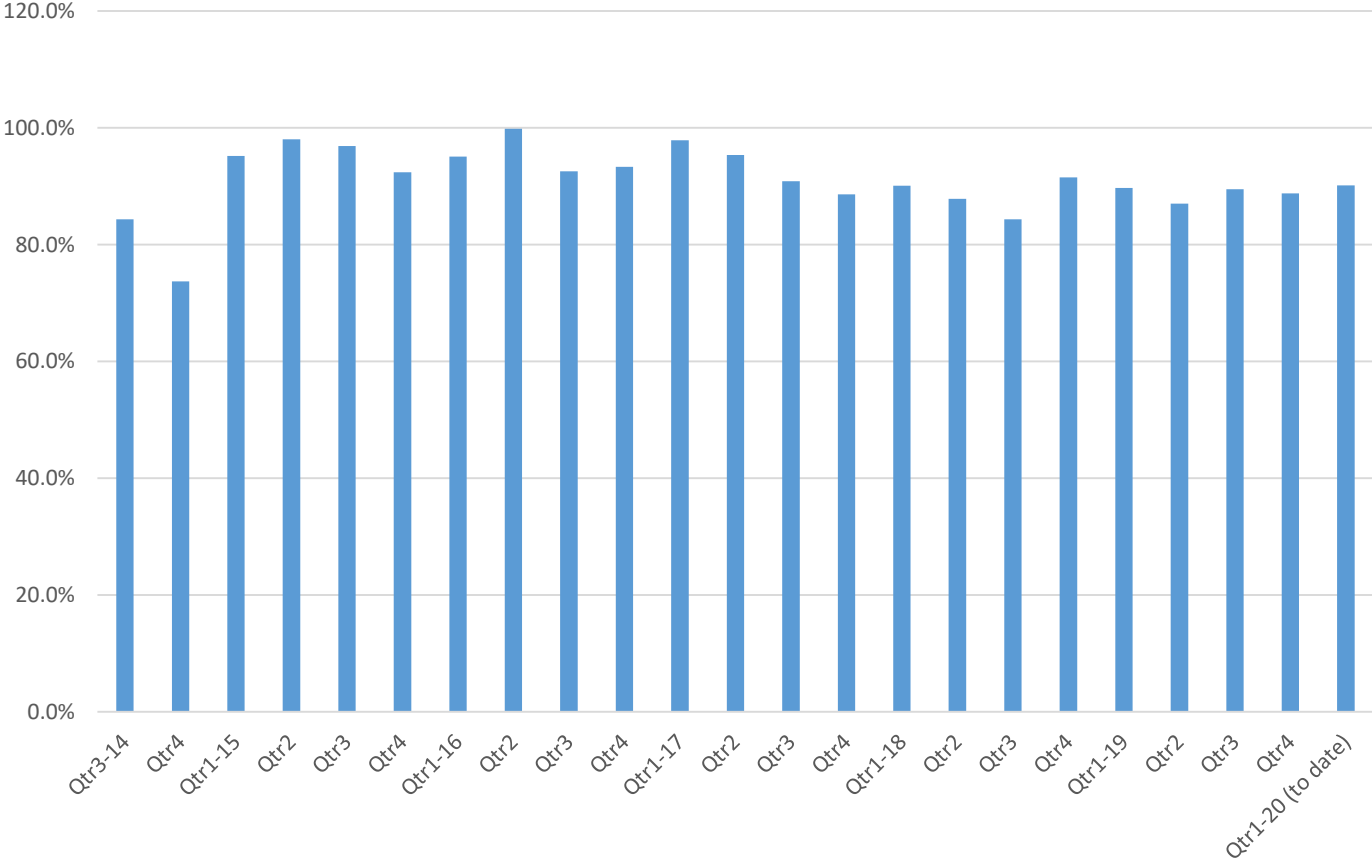
Sources: Maersk, 2016

Grams CO₂ emitted / tonne / km



Emission reduction in action at Freightera—SmartWay carriers and rail preferred on 90% of bookings

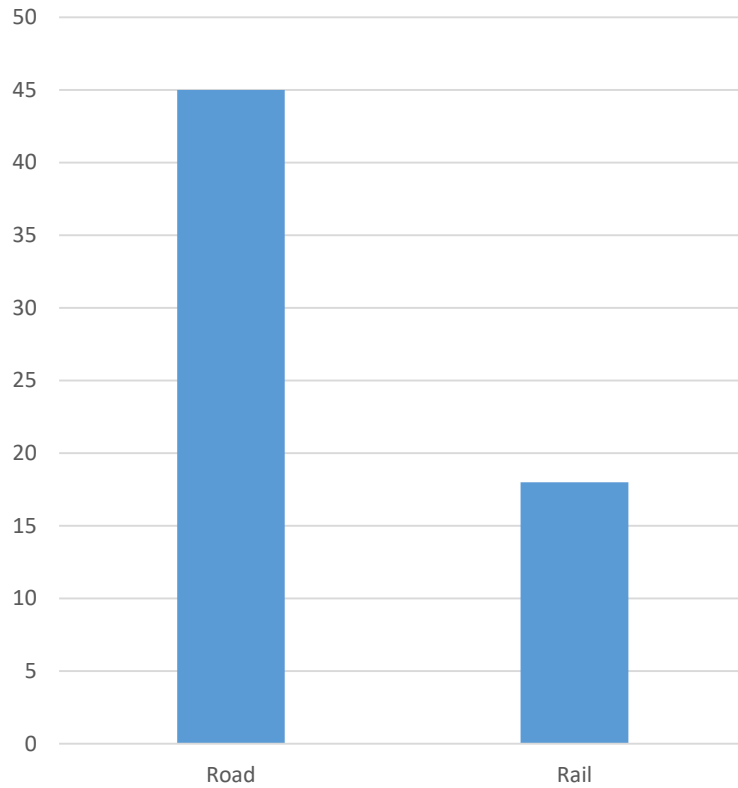
Freightera Bookings via SmartWay Certified Carriers or Rail



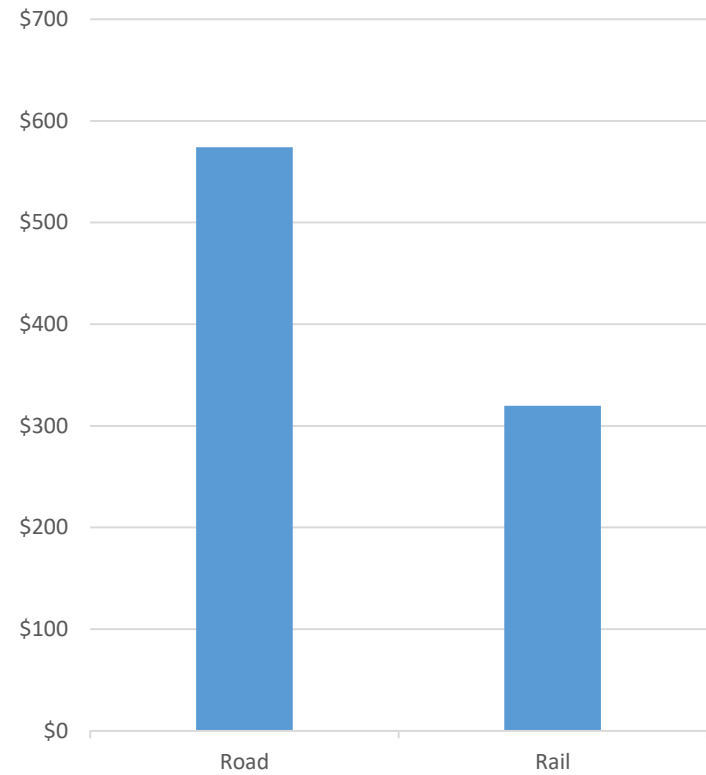
Source: Freightera

Why lower emission carriers win

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



Sources: Maersk and Freightera

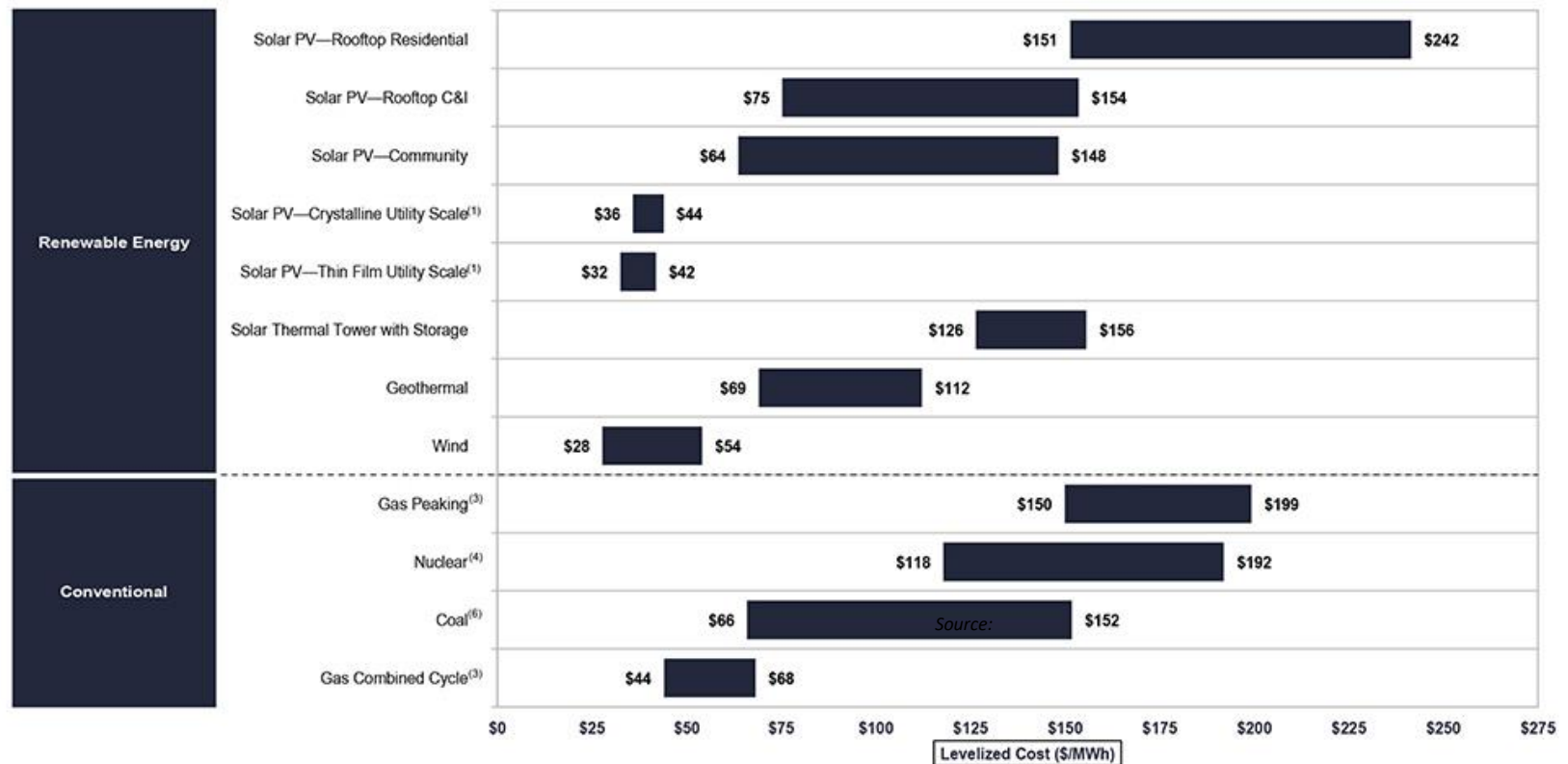
Renewable energy costs continue to decline, with 2019 levelized cost of wind and solar now 27-36% less than any conventional sources (oil, gas, coal or nuclear)

LAZARD

LAZARD'S LEVELIZED COST OF ENERGY ANALYSIS—VERSION 13.0

Levelized Cost of Energy Comparison—Unsubsidized Analysis

Selected renewable energy generation technologies are cost-competitive with conventional generation technologies under certain circumstances



Source: Lazard 2019

Cost savings can drive the transition to zero emission freight

North American road freight costs may decline up to 80% by 2050 as transport is electrified and renewable energy and storage costs continue to decline

Global Energy System based on 100% Renewable Energy
Regional and Sectoral Outlook: North America



The final transport passenger costs decline from around 0.11 €/p-km in 2015 to 0.05 €/p-km by 2050, as shown in Figure 3.9-21. Final transport passenger costs decline for road transport through the transition, whereas for marine and aviation there is a marginal decrease. Similarly, final

transport freight costs decline from around 0.065 €/t-km in 2015 to 0.02 €/t-km by 2050, as shown in Figure 3.9-21. The final freight costs in the case of road declines through the transition, whereas it remains stable for rail, aviation and marine.

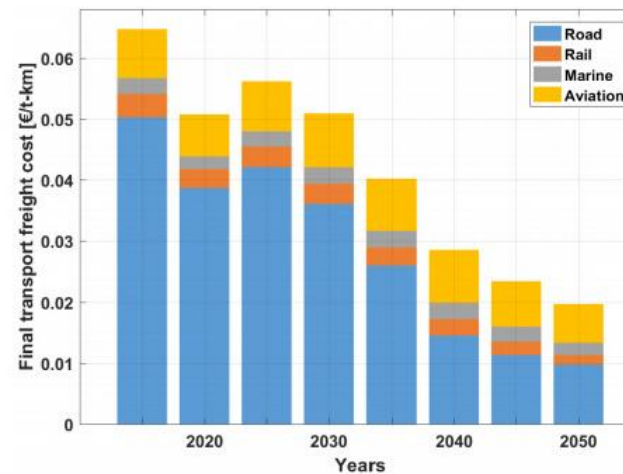
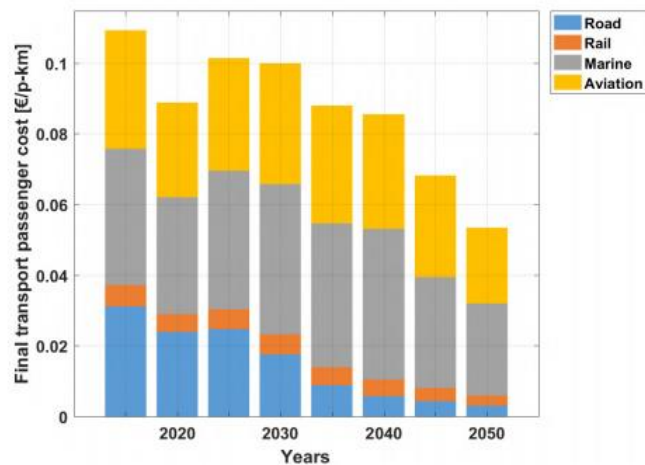


Figure 3.9-21: North America – Final transport passenger cost (left) and final transport freight cost (right) during the energy transition from 2015 to 2050.

Systems like Freightera's Link2Rail can automatically route freight via rail, or via the optimal micro-hub in your city

Link2Rail
PRESENTED BY FREIGHTERA

Link2Rail Package #2 ★★★★★

EST. DELIVERY DATE
02/27/2020

GREEN rail SmartWay

\$1,652.00 CAD

✓ SELECT

+ INSURANCE

Truck > Rail > Truck DURATION 11 Days HIDE TRANSIT DETAILS

02/16/2020 ○ Vancouver, BC V6G 1X3, Canada
Business with Dock

Truck **FedEx** Freight
3 Days

02/19/2020 ○ Union Pacific Rail **REDUCED CO2**
Vancouver, BC

Rail **UNION PACIFIC**
6 Days

02/25/2020 ○ Saia LTL Freight **REDUCED CO2**
2550 E 28th St, Los Angeles, CA 90058, USA

Truck **SAIA**
2 Days

02/27/2020 ○ Los Angeles, CA 90009, US
Residential / Home

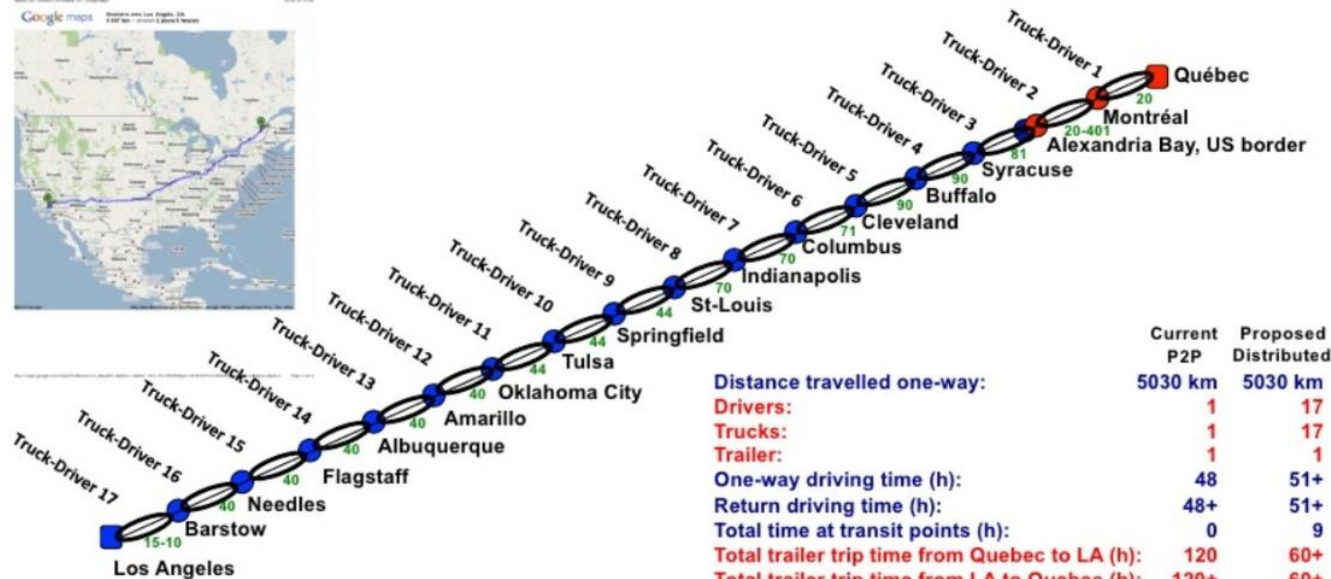
Source: Link2Rail by Freightera (patent pending)

The physical internet can automatically consolidate freight across carriers and route it through the lowest cost or lowest emission network as freight “packets”

What are the targets of the Physical Internet?

7. Enabling an efficient and sustainable Mobility Web

From point-to-point hub-and-spoke transport to distributed multimodal transport



Multi-segment travel from Quebec to Los Angeles

| | Current P2P | Proposed Distributed |
|--|-------------|----------------------|
| Distance travelled one-way: | 5030 km | 5030 km |
| Drivers: | 1 | 17 |
| Trucks: | 1 | 17 |
| Trailer: | 1 | 1 |
| One-way driving time (h): | 48 | 51+ |
| Return driving time (h): | 48+ | 51+ |
| Total time at transit points (h): | 0 | 9 |
| Total trailer trip time from Quebec to LA (h): | 120 | 60+ |
| Total trailer trip time from LA to Quebec (h): | 120+ | 60+ |
| Total trailer round trip time (h): | 240+ | 120+ |
| Average driving time per driver (h): | 96+ | 6 |
| Average trip time per driver (h): | 240+ | 6,5 |



Physical Internet
Efficient Sustainable Logistics



Physical Internet Manifesto, version 1.10
Professor Benoit Montreuil, CIRRELT, Université Laval
2011-10-29, 41/72

On the ocean and inland waterways: wind, solar and hydrogen hybrid electric cargo ships are coming fast



Sources: Vindskip™ by company Lade AS, E/C Orcell, Port Liner of The Netherlands and the SanSkip Autonomous, Hydrogen Powered Containership.

Zero emission sustainable electric rail can be the optimal mode for most long-haul freight



Source: Getty Images

Zero emission electric and hydrogen hybrid trucks are already available, and long-haul tractors coming faster than predicted



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

Thank You

Please contact me for more information and collaboration. We can only do this together.

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Catalyst Business Coalition Meeting with BC Premiere Horgan



Clean50 Award Ceremony 2019



Freightera #3 Fastest Growing Company 2019