



TOC Americas 2024

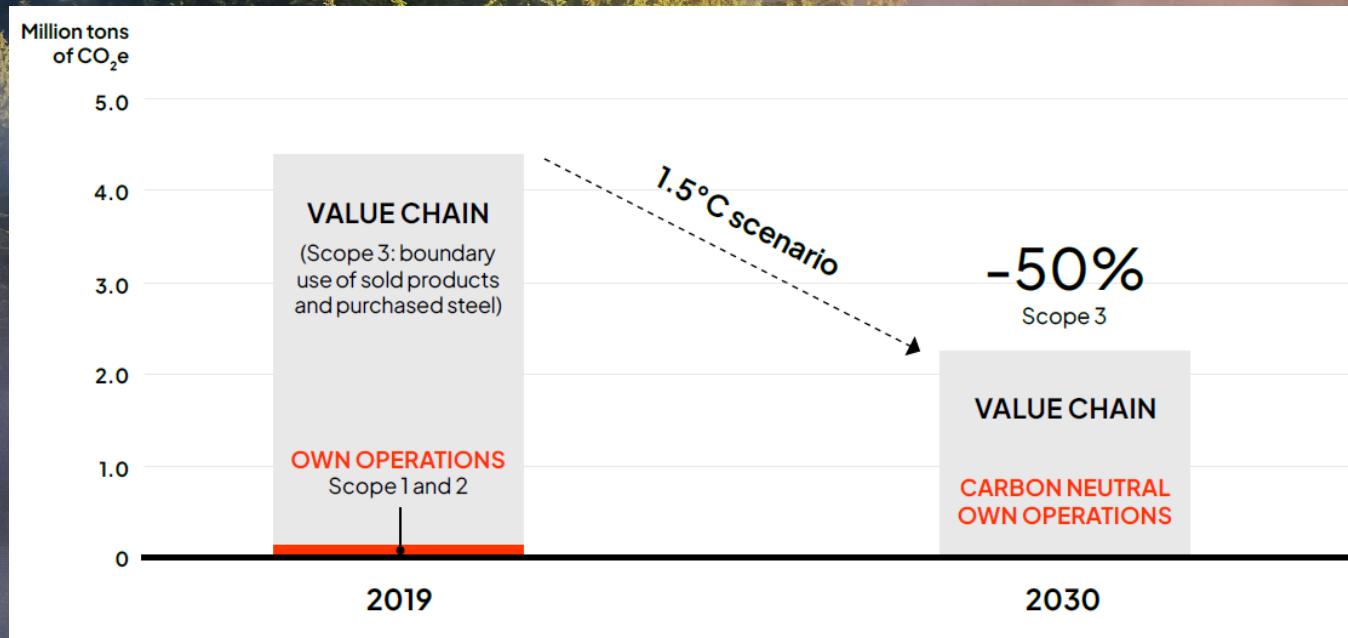
Sustainable intermodal RTG operation

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KONECRANES

Konecranes' business strategy is sustainable



KEY FOCUS AREAS

- Electrification of diesel-powered equipment
- Smart product design focusing on energy efficiency, durability and maintainability
- Optimizing material handling with automation and digital solutions
- Purchasing steel with minimum emissions
- Focusing on energy efficiency and renewable energy and offsetting the unavoidable emissions of own operations

Konecranes' sustainability

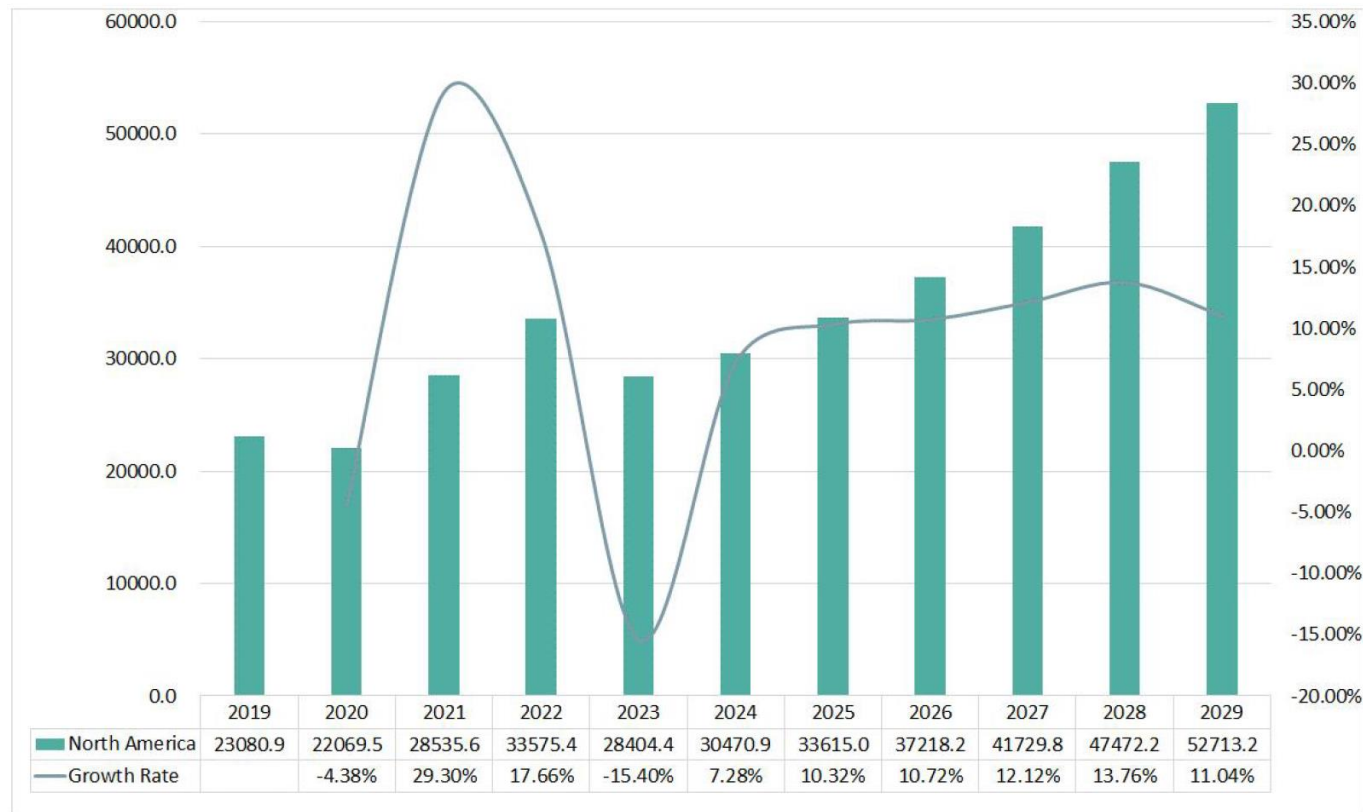
Rating	Scale	Score	Year
EcoVadis	0 to 100	78 (Gold)	2024
CDP Climate Change	D- to A	A-	2023
Sustainalytics ESG Risk Rating	0 to 100	14.4 (low risk)	2023
MSCI ESG Rating	CCC to AAA	AAA (leader)	2024
ISS ESG Rating	D- to A+	B- (prime)	2023
Moody's ESG Scorecard	0 to 100	50 (robust)	2022



More information on Konecranes.com > Sustainability at <https://www.konecranes.com/about/sustainability/the-strategic-role-of-sustainability>

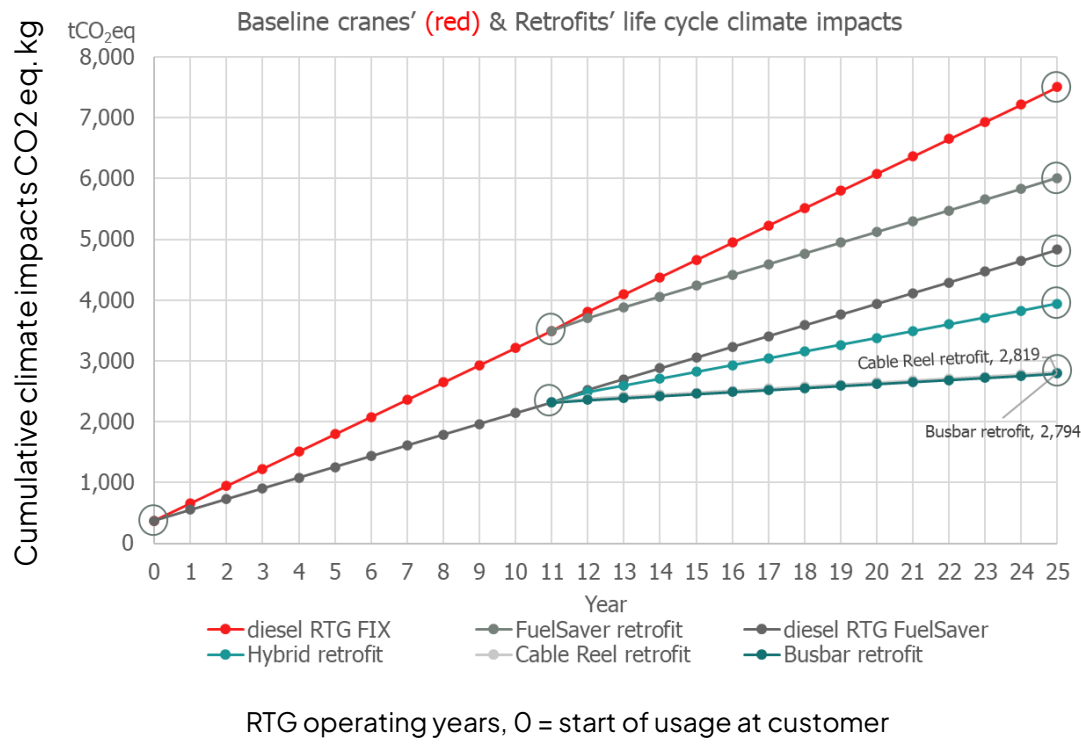
Intermodal growth

Figure North America Intermodal Freight Transportation Revenue (M USD) and Growth Rate (2019-2029)



Mode of intermodal transition becomes more challenging

RTG Ecolifting retrofit

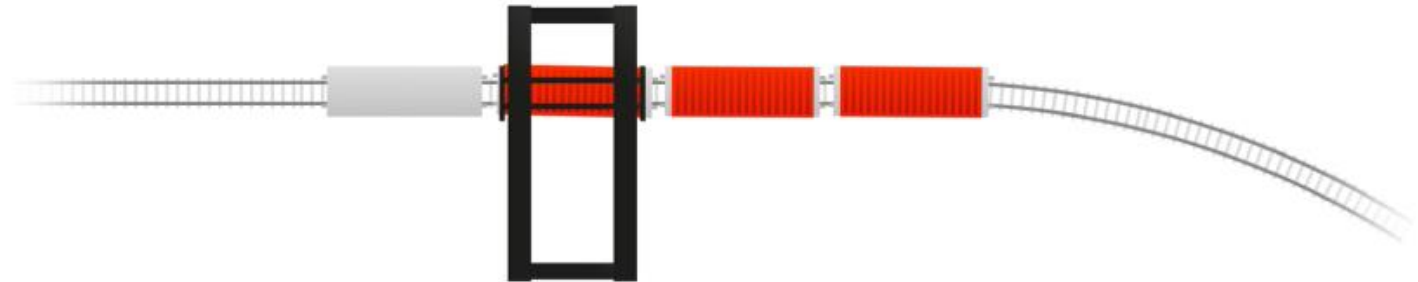


Retrofit	Δ [tCO ₂ eq/ lifetime]	Δ %
Diesel RTG fixed speed generator → Diesel RTG Fuel Saver	-1 497	-20 %
Diesel RTG Fuel Saver → Hybrid RTG	-889	-18 %
Diesel RTG Fuel Saver → eRTG Cable reel	-2 010	-42 %
Diesel RTG Fuel Saver → eRTG Busbar	-2 035	-42 %

Results represent this scenario within the presented boundaries, absolute values may vary with different LCI input data sources

Typical intermodal operation with RTGs: Less CO₂ per container move

- Traditionally intermodal RTGs have operated with diesel
- Hybrid RTG was significant improvement
- But even hybrid is not zero tailpipe emission solution



Traditional eRTG power options

It's quite easy to electrify a straight line but...

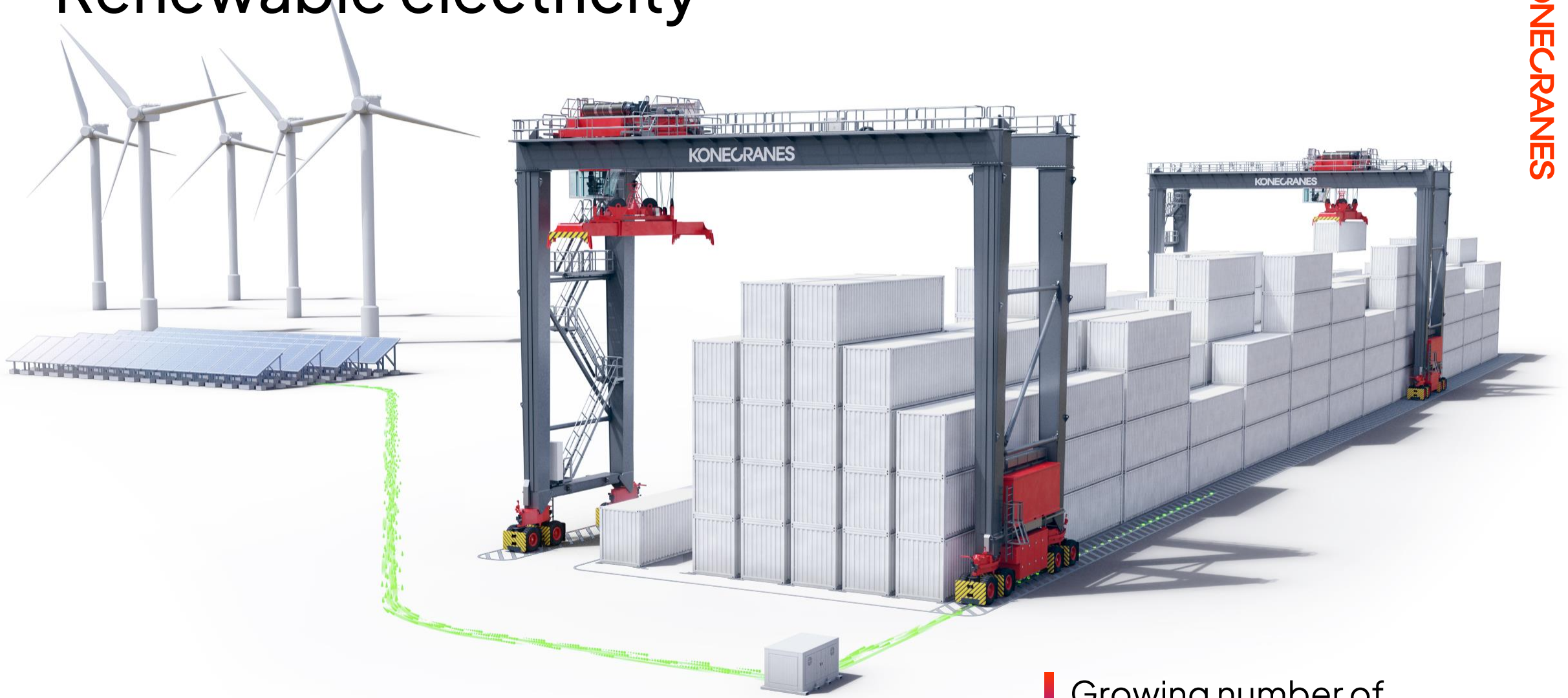


Multiple connection points needed



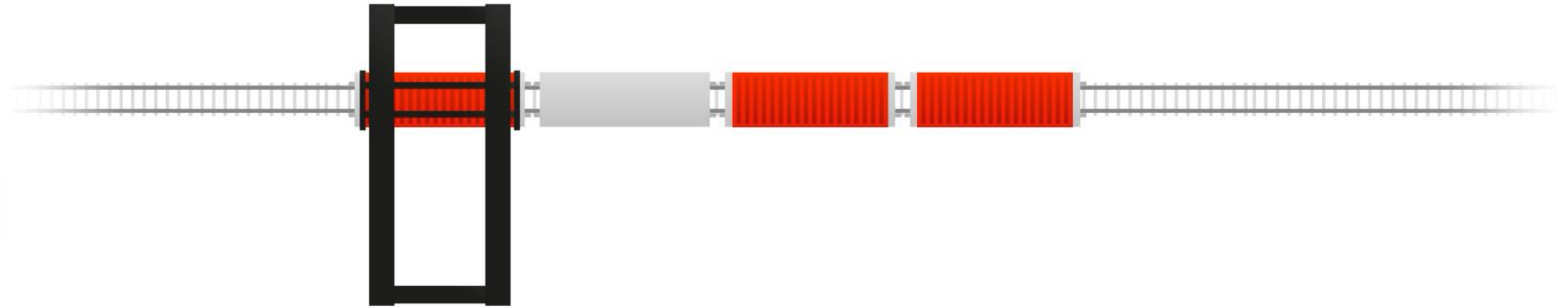
Limited reel length

Renewable electricity

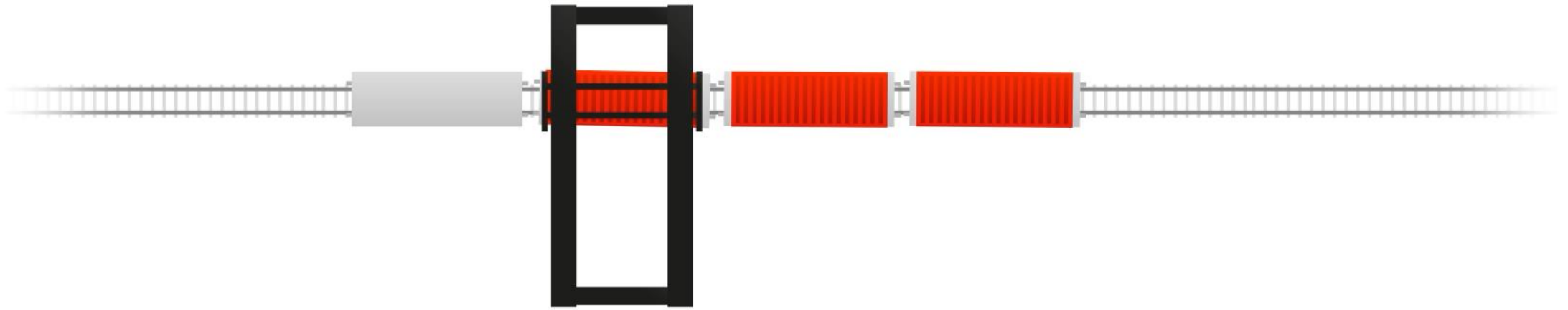


 Growing number of options

Typical intermodal operation with RTGs: Truck loading and unloading



Typical intermodal operation with RTGs: Train tracks

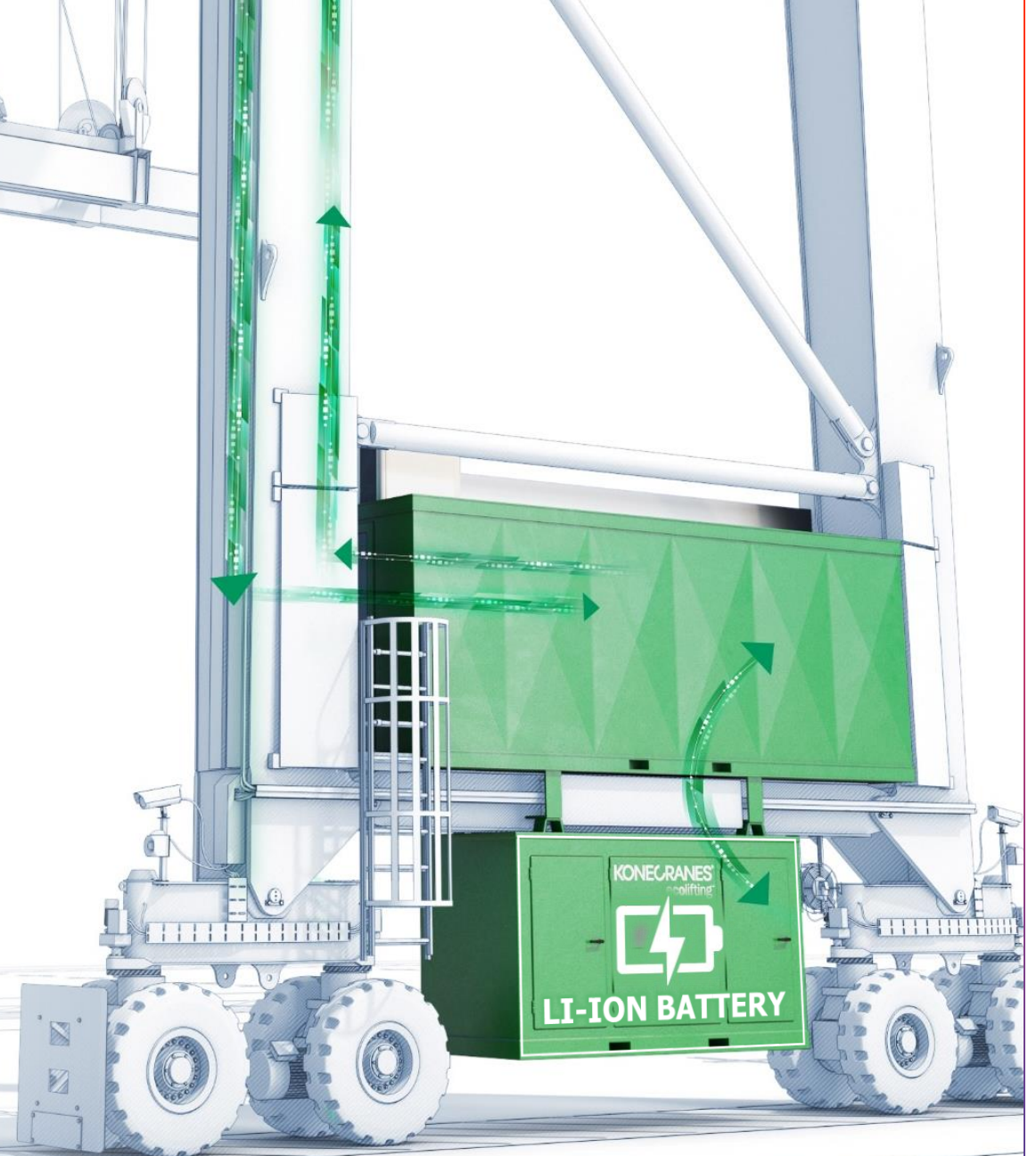


But reality is not so ***straight-forward***...

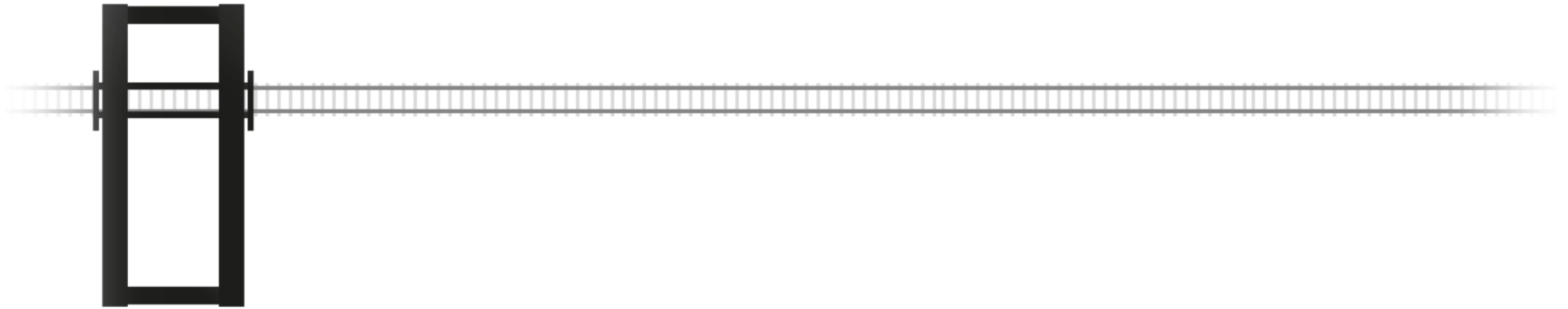
Battery-powered RTG

- Can be retrofitted to any brownfield
- No “strings attached”
- 7.5 min charging -> 1h of operation

Zero tailpipe



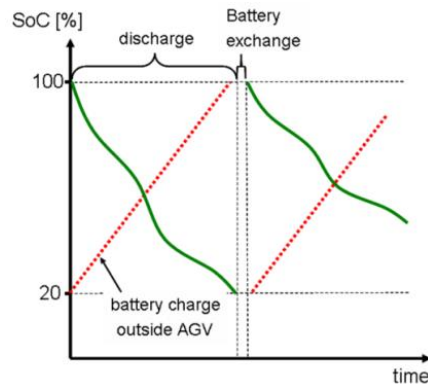
Simple charging strategy for intermodal RTG



Principal charging strategies

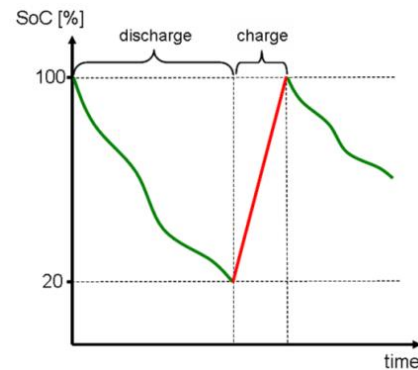
Battery exchange

Discharged battery is exchanged by a fully charged battery



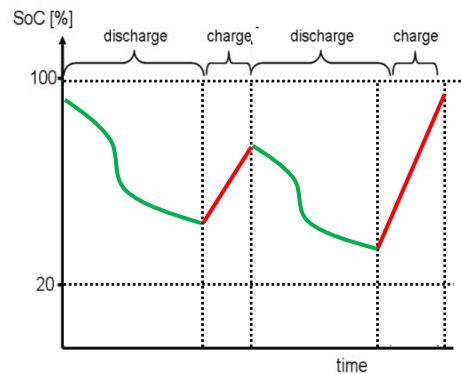
Out of operation

Vehicle is taken out of work cycle for battery charging



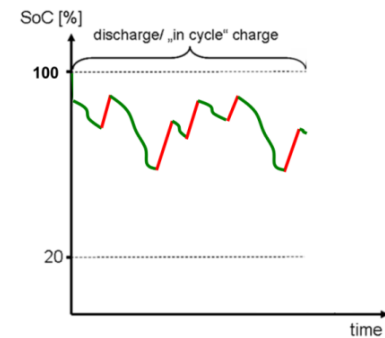
During operation breaks

Charging in times without operation



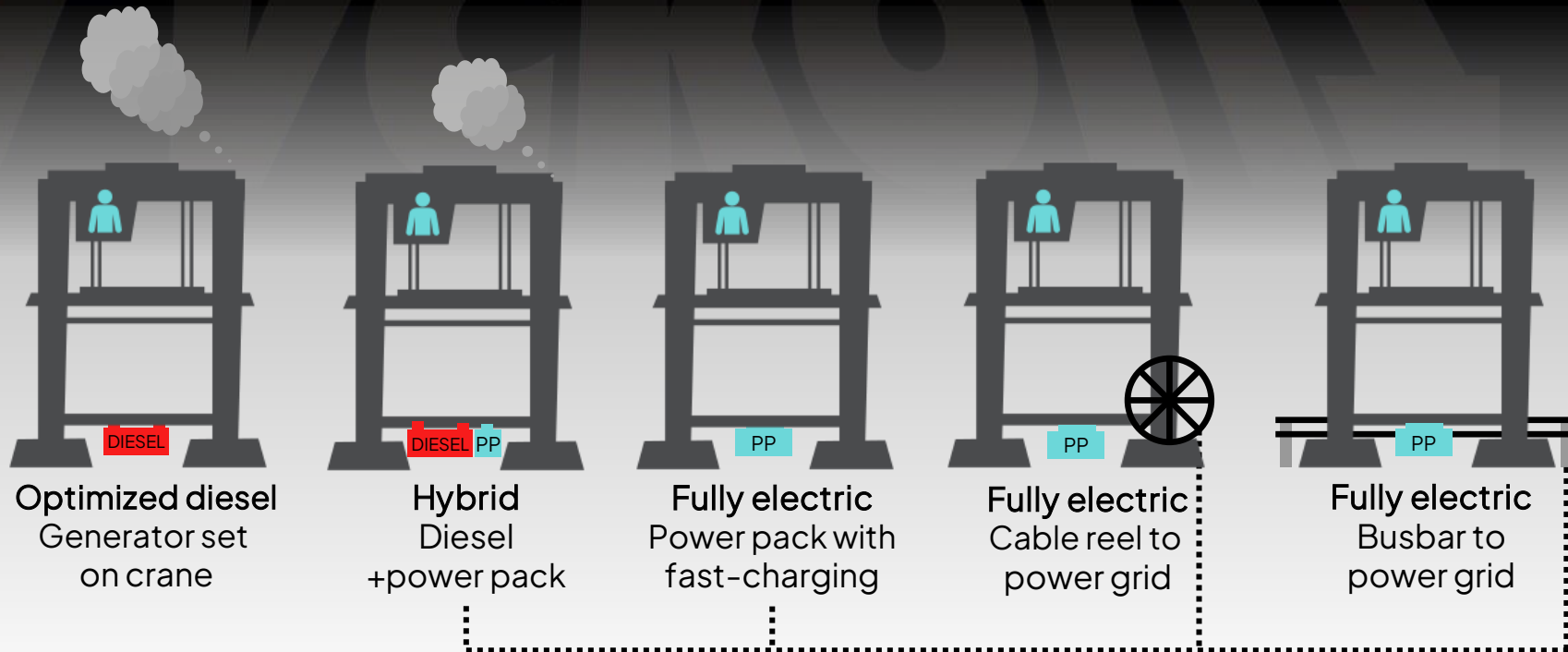
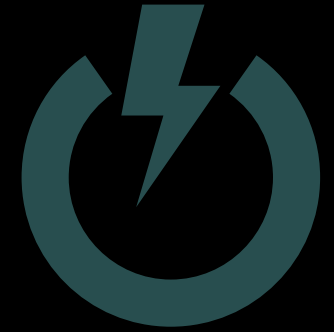
Opportunity

Charging small amounts of energy while standing still during operation



Solutions for blackout mitigation

BLACKOUT



Coupling sustainability and technology
is a wide effort with the entire supply
chain, governmental regulations, and
technological advances that extend the
realm of a traditional OEM