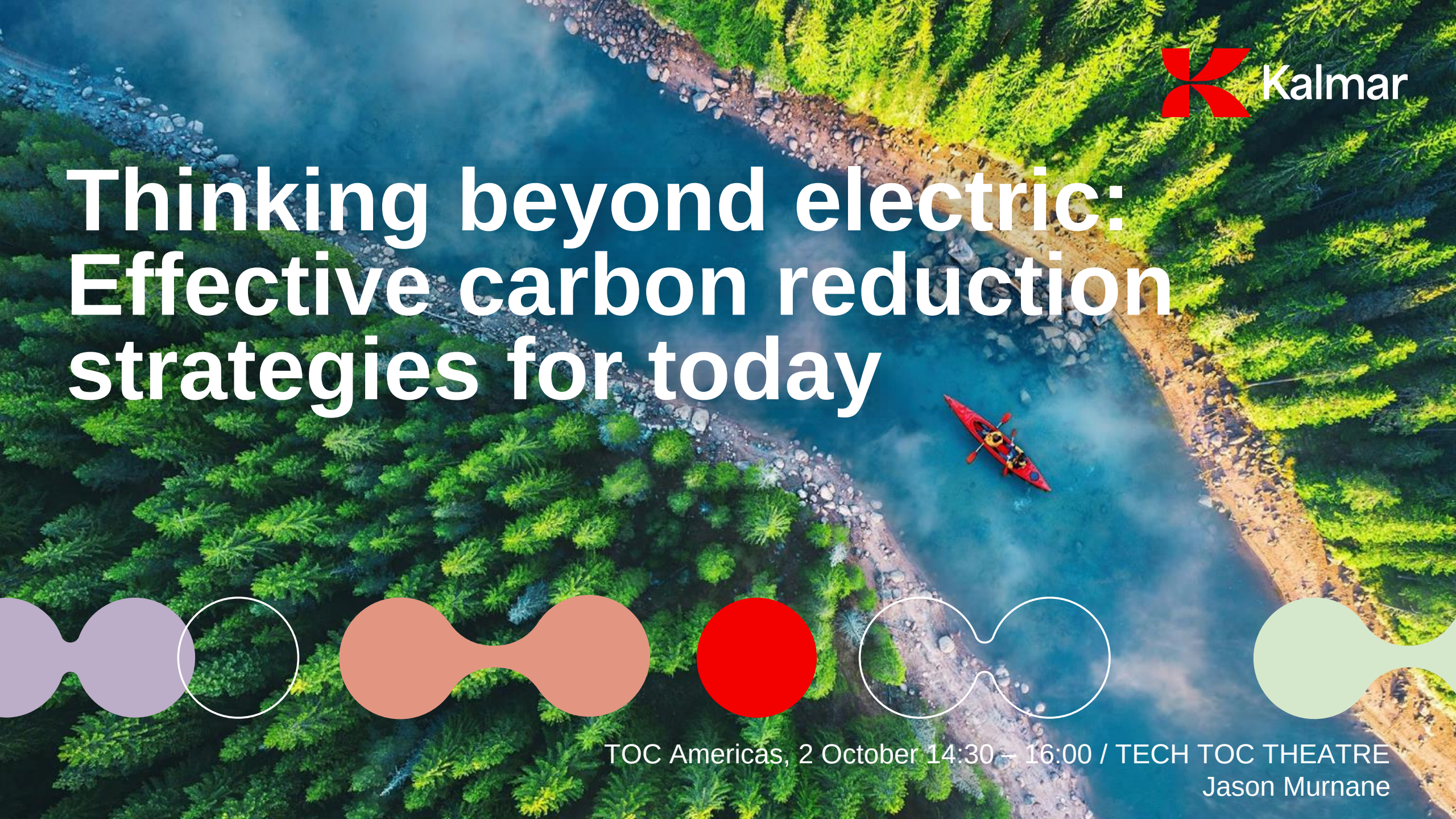


Thinking beyond electric: Effective carbon reduction strategies for today

TOC Americas, 2 October 14:30 – 16:00 / TECH TOC THEATRE

Jason Murnane

Jason Murnane

Sales Development Lead, Americas
Counter Balanced Equipment

Kalmar

Agenda

- Electrification in Latin America - where are we today?
- Alternatives to electrification to reduce CO2 emissions
- The climate and financial impact of equipment and fuel alternatives
- Key takeaways

Kalmar

Electrification in Latin America – where are we today?

Kalmar

What steps have been taken to boost electric vehicles in Latin America?

27 countries have named transport a priority for climate change mitigation

13 countries mention EVs as part of their mitigation strategies

But infrastructure still lags behind

And policies to incentivise uptake and access to EVs are lacking

Diálogo Chino

Kalmar

Electric cargo handling equipment is nothing new…

1971 — Electric RMG 1st gen

1980 — Light Electric Forklift 1st gen (Lead-Acid)

1989 — Electric ASC with automation

2000 — Electric Straddle Carriers 1st gen

2002 — Electric RTG Zero Emission 1st gen

2009 — Hybrid drive RTG and Straddle Carrier 1st gen

2016 — Light Electric Forklift 1st gen (Li-Ion), Hybrid Straddle & Shuttle Carriers (FastCharge), Electric ASC

2017 — Medium Electric Forklift 1st gen (Lead-Acid)

2018 — Electric Terminal Tractor 1st gen (Li-Ion), Hybrid RTG 2nd gen, Hybrid SC 8th gen

2019 — Electric EC-Handler DCG70 (Lead-Acid & Li-Ion)

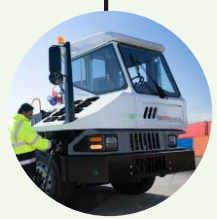
2020 — Medium Electric Forklift 1st gen (Li-Ion), Electric RTG 2nd gen

2021 — Electric Reachstacker (Li-Ion) 1st gen, Heavy Forklift Reachstacker (Li-Ion) 1st gen, Electric Terminal Tractor 2nd gen

2022 — Light, Medium Electric Forklifts (Li-Ion) 2nd gen

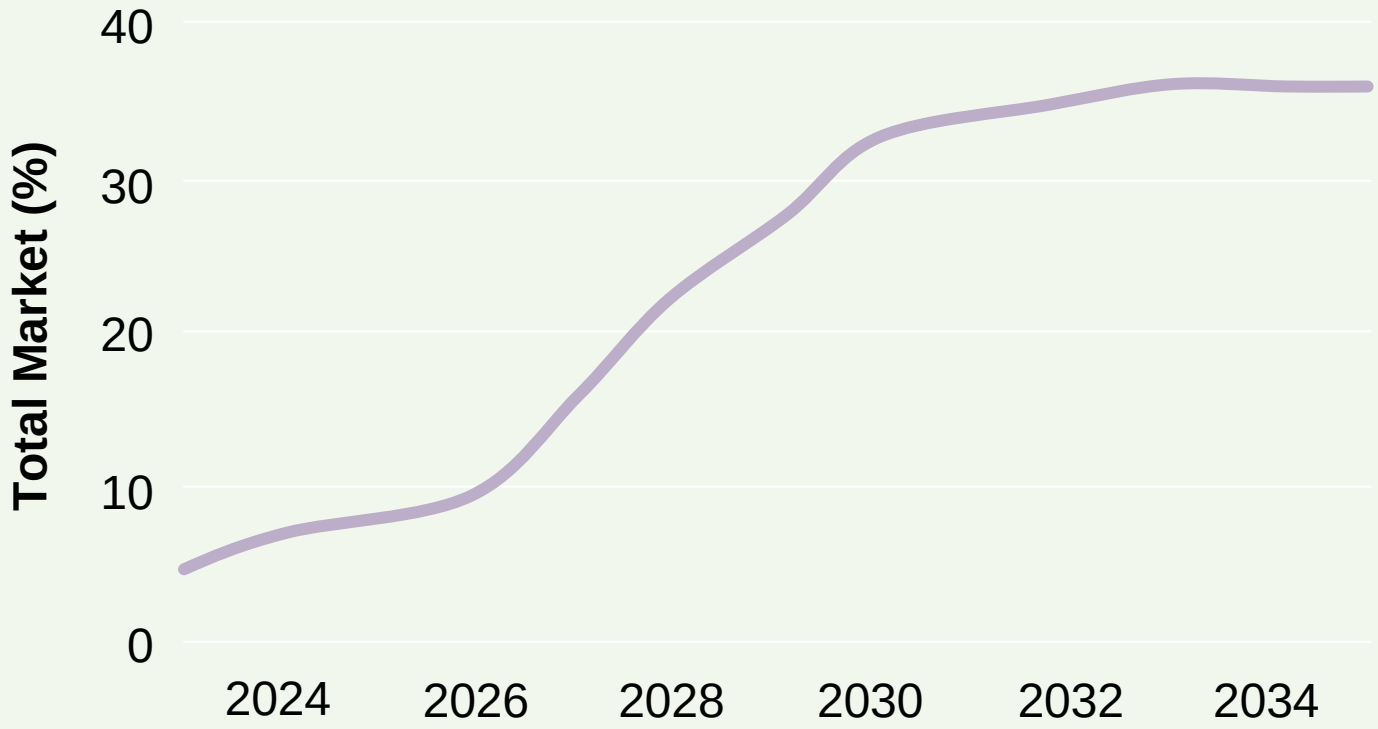
2024 — Electric Empty DCG90-110 Container Handler (Li-Ion) 1st gen

Electric Terminal Tractor 3rd gen (Li-Ion)



Kalmar

Expected market growth for electric material handling equipment in Latin America



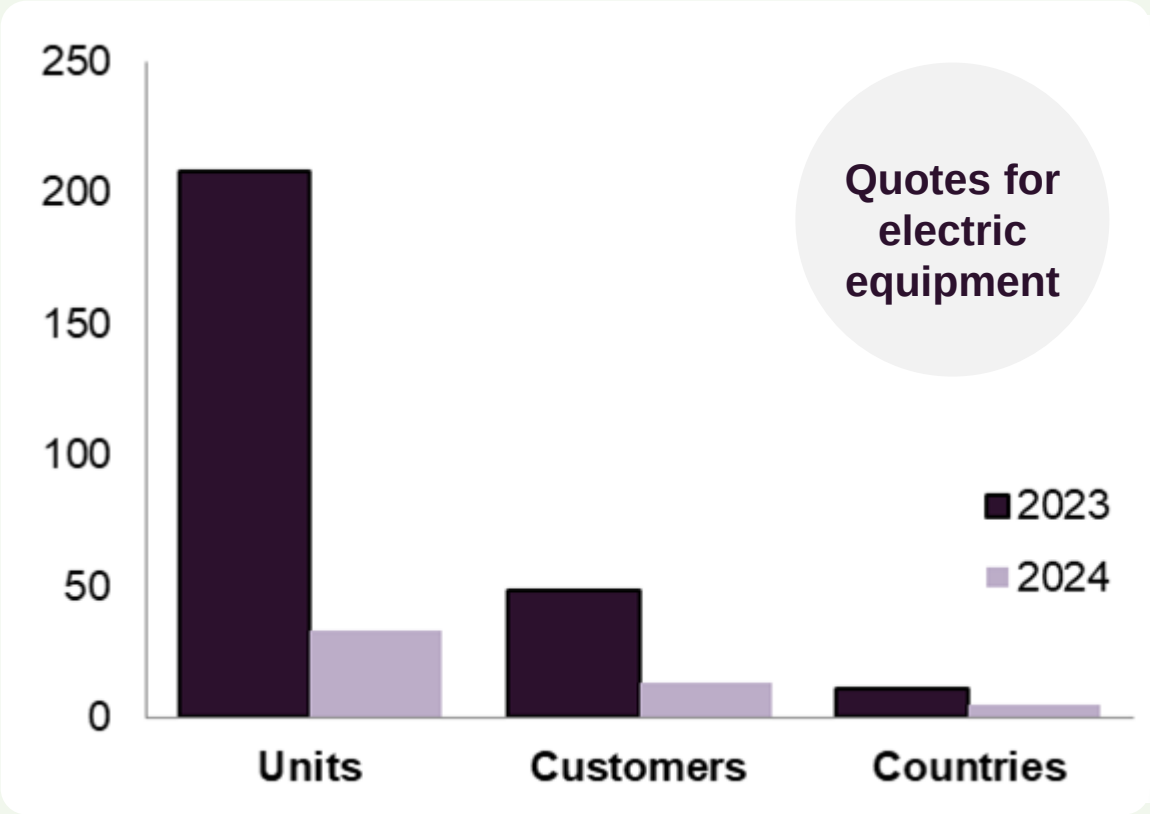
Assumptions

- More mature products
- New launches and new technology roadmap
- Technology cost reduction
- Infrastructure investments
- Government incentives for low emission investments
- Cleaner sources of energy
- Peak should start in 2026 and stabilize around 2035

Challenge: **Infrastructure, Energy Sources and Operational Costs**

Kalmar

What is the LATAM market perspective on this?



Kalmar Latam Customer Behavior

- Around 80% of our customers inquired about EV solutions
- Some customers decided only invest in eco efficient equipment from 2025/2026
- Most inquiries coming from Ports, but also pulp & paper and metal Industries
- Brazil, Chile, Mexico, Dominican Republic, Peru, and Uruguay are leading the inquiries

LATAM is currently in the analysis phase, before taking the next step

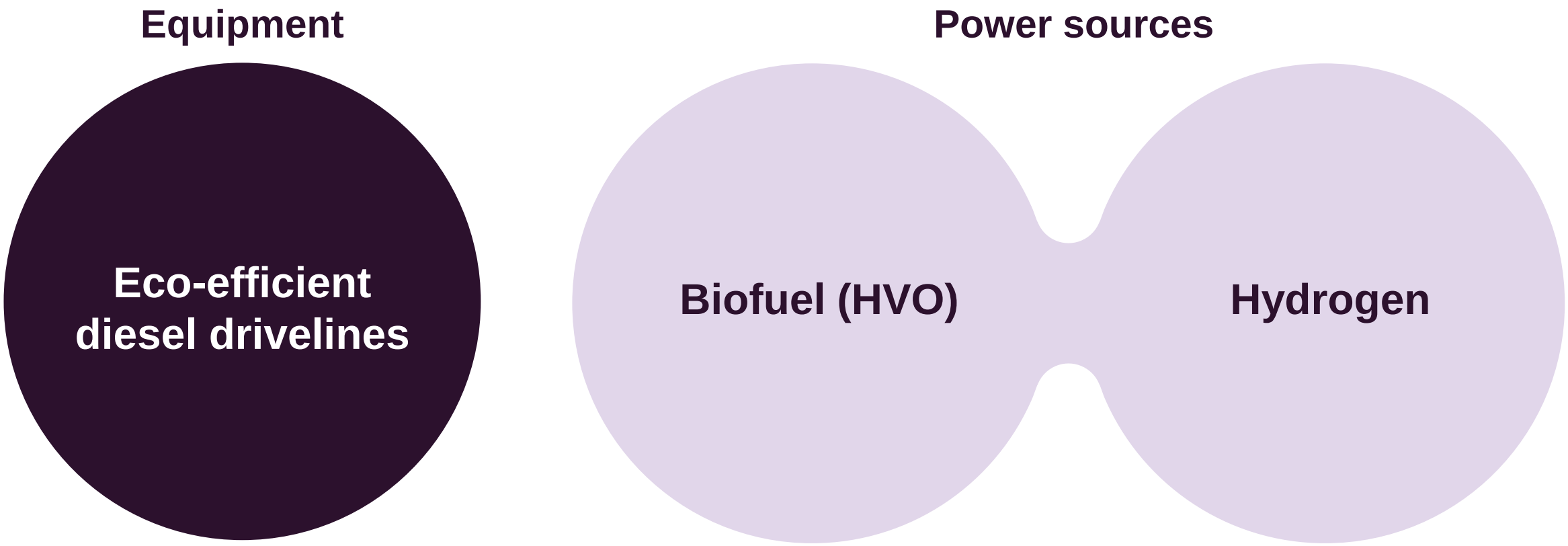
Kalmar

Eco-efficient diesel drivelines and renewable fuel

Alternatives to electrification to reduce CO2 emissions

Kalmar

3 examples of available options



Kalmar

Kalmar's Eco Reachstacker

- Most powerful, quiet and fuel efficient diesel Reachstacker in Kalmar's portfolio
- Guaranteed fuel savings up to 40% (backed by a fuel saving guarantee)
- Unique driveline developed by Kalmar, Volvo and Dana Rexroth with technical exclusivity
- Available with both Volvo and Cummins engines
- Proven technology with 10 years in operation

"With the new Eco reachstackers we have saved 3 to 4 litres per hour per machine"

Torbjorn Lundstrom
Equipment Coordinator
Copenhagen Malmö Ports

"We were the first container terminal in South America to buy an Eco Reachstacker from Kalmar, allowing us to operate with lower fuel consumption and reductions of up to 40% in CO_2 emissions."

Cleiton Faber
Reachstacker operator
Portonave - Brazil

Kalmar

The Kalmar Eco Reachstacker.

The Kalmar Eco Reachstacker has reduced global emissions by:

69,086,000

Kilos of CO_2

With over **500 Eco Reachstackers** now sold and operating in over **30 countries**, our customers are benefitting from significant reductions in both fuel costs and emissions.

Kalmar

Hydrotreated Vegetable Oil (HVO)

- HVO is a paraffinic synthetic diesel fuel made of renewable raw materials
- Reduces CO2 emissions by up to 75% compared to fossil based diesel
- Can be mixed freely with diesel at any rate
- Same consumption as diesel
- All Kalmar’s diesel equipment is HVO compatible
- Perfect for a decarbonisation transition

Latin America is already the world’s largest biofuel producer and, more importantly, it has ample room to increase production

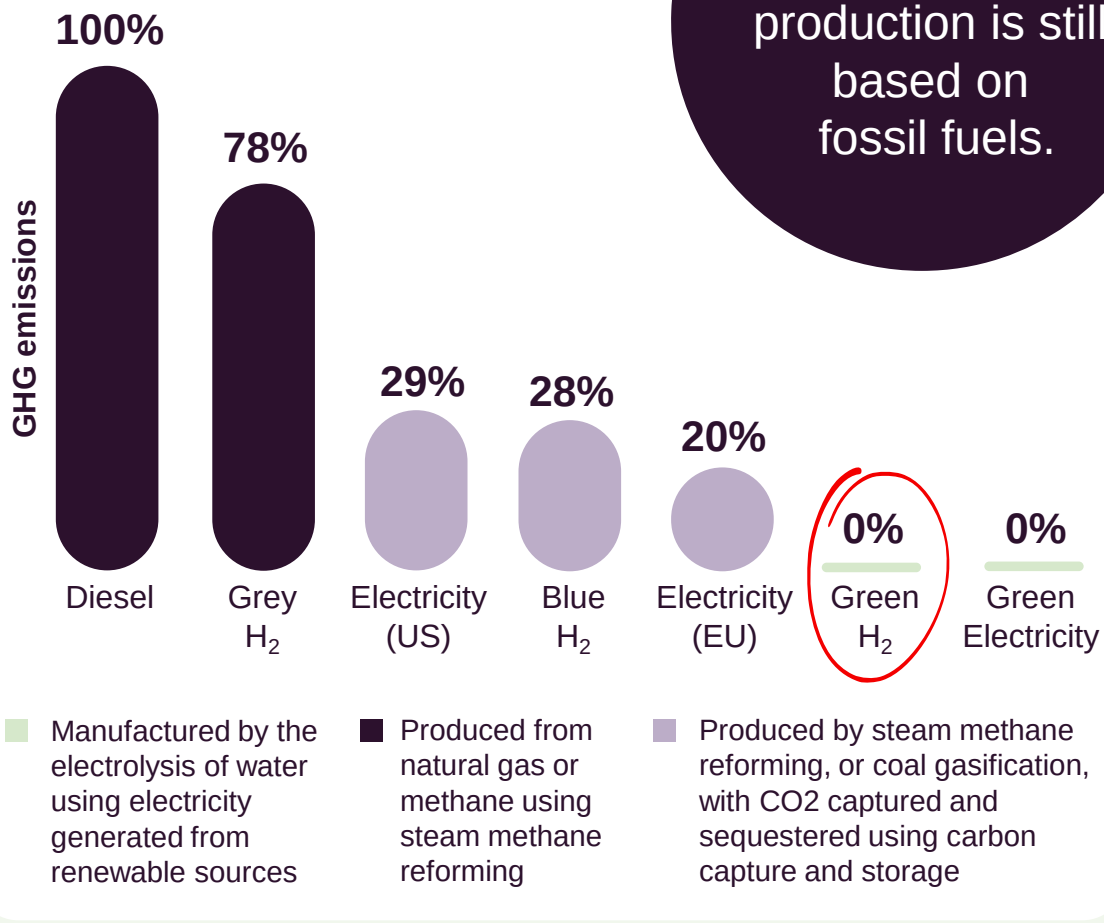
Kalmar

Hydrogen as energy source

Pros	Cons
Clean power with no on-site emissions	Limited worldwide production of green hydrogen
Long operating times compared to battery solutions	Global transport and storage infrastructure required
Lower demand on electrical grid	Much higher cost
Smaller on-site infrastructure if H_2 is readily available	Special challenges in handling hydrogen

Pros and cons of hydrogen fuel cell technology versus battery-powered technology

Currently, **98%** of global hydrogen production is still based on fossil fuels.

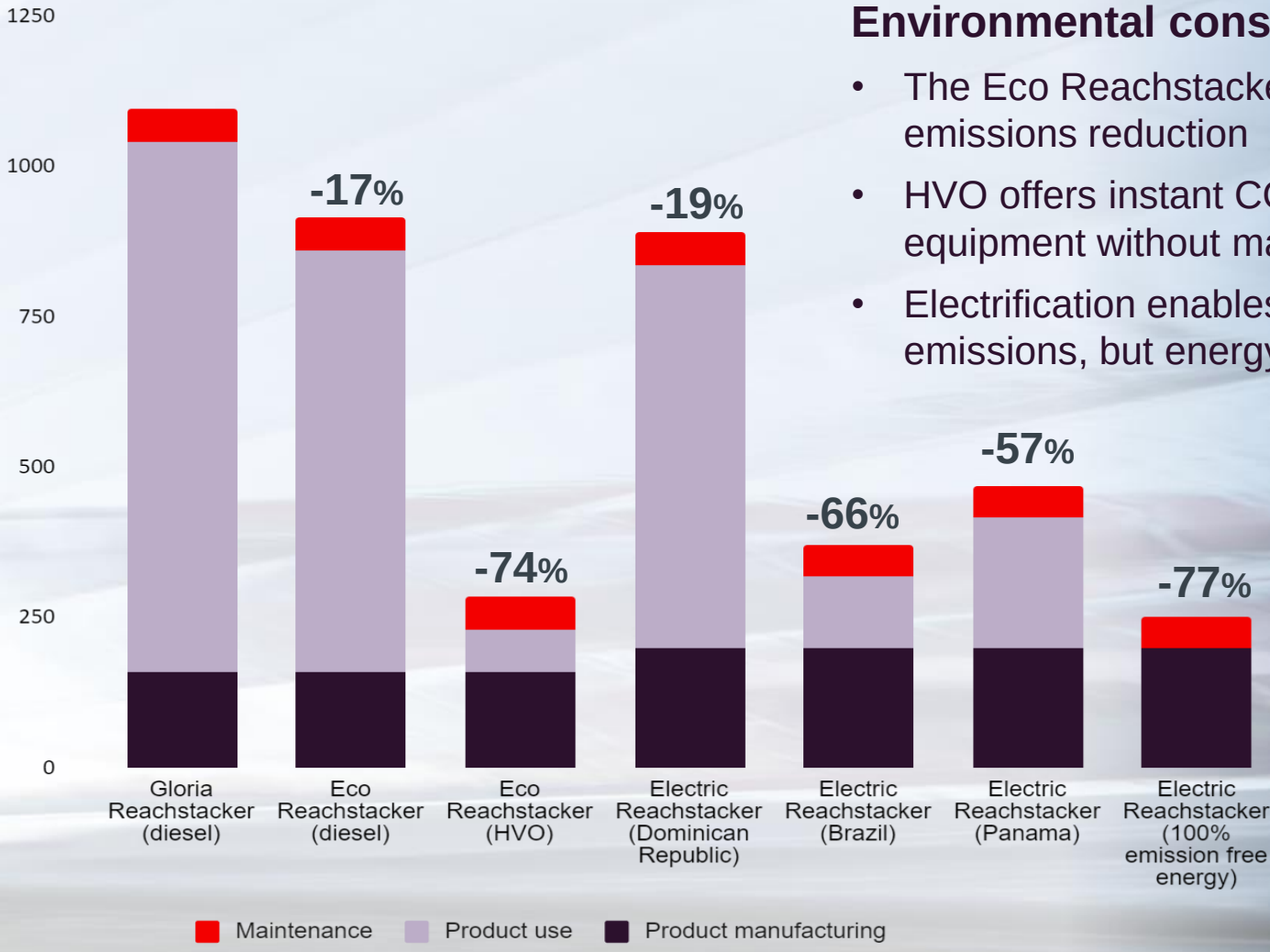


Kalmar

The climate and financial impact of equipment and fuel alternatives

Kalmar

Lifetime emissions comparison for reachstackers (tCO2e)



Environmental considerations

- The Eco Reachstacker offers a quick and easy emissions reduction
- HVO offers instant CO2 reductions in existing diesel equipment without major infrastructure changes
- Electrification enables high impact in the operational emissions, but energy source is key

Kalmar

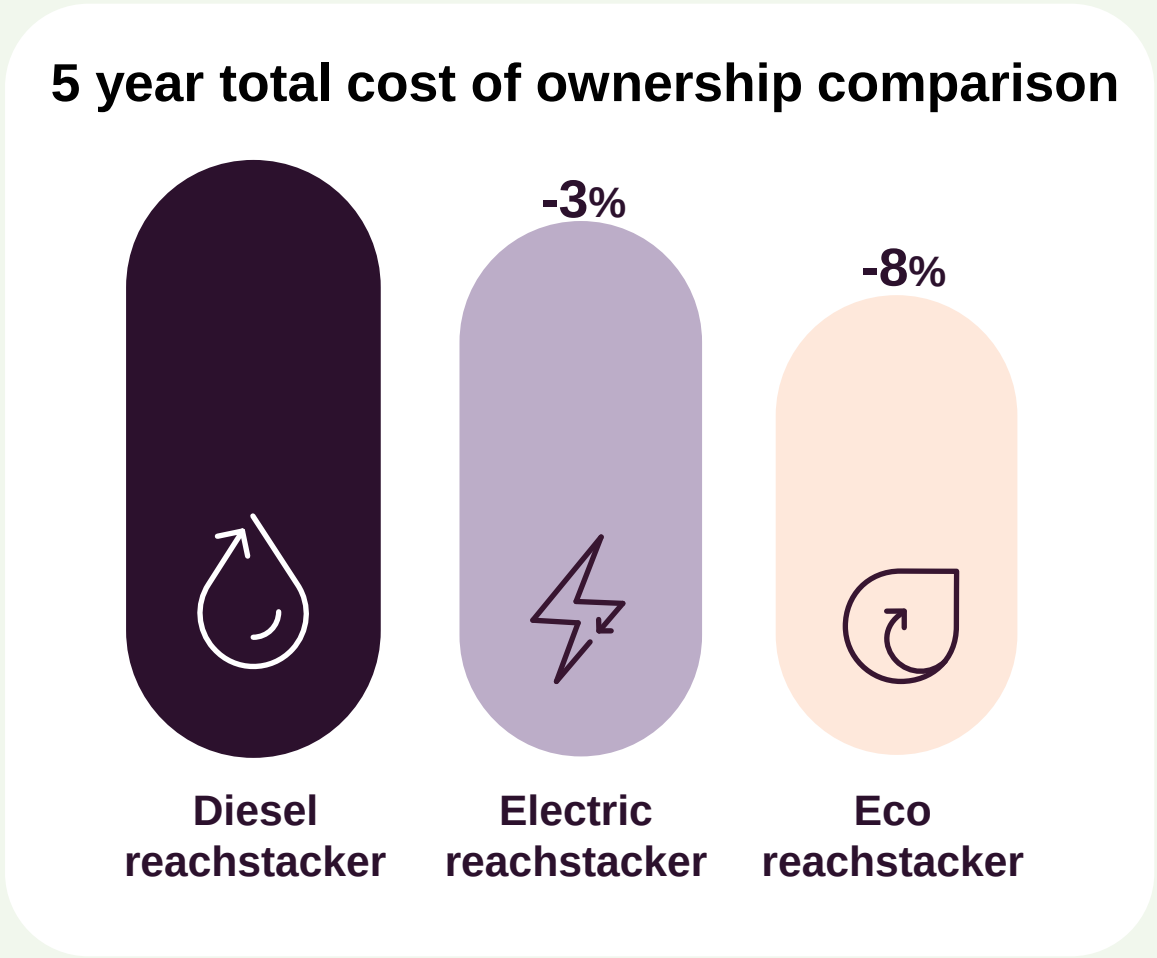
Comparing the total cost of ownership for Reachstackers

Equipment assumptions

- Same machine model sizes and capacities
- Basic configurations for all machines
- 326 kWh battery for ERG450
- Same drive cycle and energy consumptions
- 3000 running hours/year

Cost assumptions

- Diesel cost: 1.31 USD/liter (California)
- Electricity cost: 0.14 USD/kWh
- No charger or infrastructure cost included



Kalmar

We can’t wait to go greener, so start today with even the smallest step!

Key takeaways

- Electric has big emission reduction potential, but requires infrastructure investments and depends on the emission factor and availability of electricity
- Latin America Market is transitioning to EV equipment, but is still in the analysis phase - 30%-35% of the total market in Latam is expected to be EV by 2035
- Hydrogen costs are not expected to be appealing until after 2030
- Available technologies like Eco Reachstackers offer a valuable option for a greener transition with no or minor infrastructure changes
- Biofuels like HVO offer instant emission reduction in existing diesel equipment
- **Local infrastructure is key to choosing the right solution for a green transition**.

Kalmar


Thank you for
your attention
Kalmar

Feeder questions

How many units do we know are operating with HVO fuel?

Are there any long term impacts to the engines using HVO fuel?

Would an example be what percent of Kalmar’s orders are currently Eco or electric?

What would be your recommendation on where to start the green transition?