



CHRIS POYNTER, DIVISION PRESIDENT

# System Drives



MAY 17, 2022

**ABB Motion Capital Markets Day**

Helsinki, Finland

# Important notices

This presentation includes forward-looking information and statements including statements concerning the outlook for our businesses. These statements are based on current expectations, estimates and projections about the factors that may affect our future performance, including global economic conditions, and the economic conditions of the regions and industries that are major markets for ABB Ltd. These expectations, estimates and projections are generally identifiable by statements containing words such as “expects,” “believes,” “estimates,” “targets,” “plans,” “outlook,” “on track,” “framework”, “ambition” or similar expressions.

There are numerous risks and uncertainties, many of which are beyond our control, that could cause our actual results to differ materially from the forward-looking information and statements made in this presentation and which could affect our ability to achieve any or all of our stated targets or anticipated transactions.

## **The important factors that could cause such differences include, among others:**

- Business risks associated with the volatile global economic environment and political conditions
- Costs associated with compliance activities
- Market acceptance of new products and services
- Changes in governmental regulations and currency exchange rates
- General market conditions, and
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# Our business at a glance

## Our market

 ~\$6 bn<sup>1</sup>

 **#1 globally**

## Our business

 **\$750 – 1,250 mn**  
2021 revenues

 **2.5 k**  
employees globally

**Our strategic mandate:  
profitable growth**



1. Omdia market research reports including MV Drives, Premium LV AC Drives and DC Drives (2021, based on 2020 data)

# System Drives

## Where we play



### **Process industries**

Running critical process at best performance



### **Infrastructure and Utility**

Saving energy



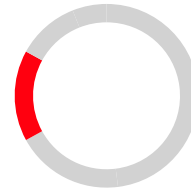
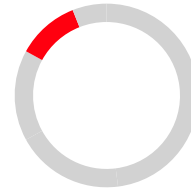
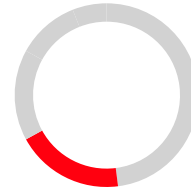
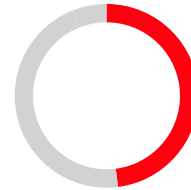
### **Transportation**

Delivering high performance and reliability in demanding conditions



### **Renewable energy**

Reducing cost of sustainable energy

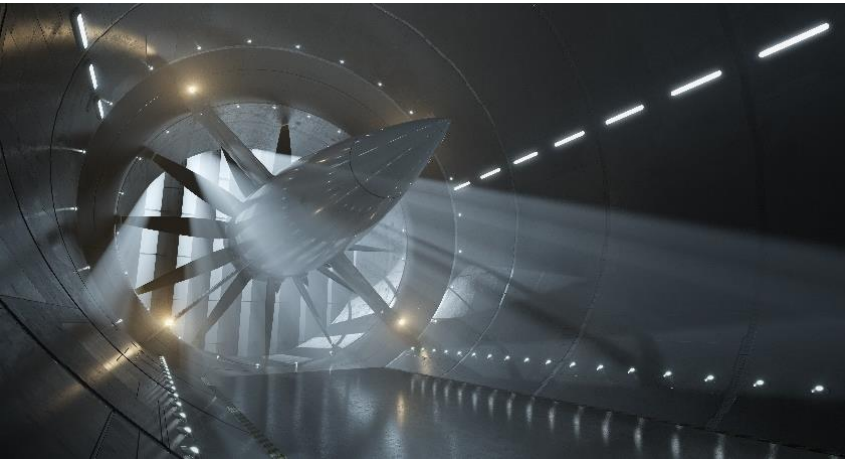


Performance and reliability in mission critical applications



# Pioneering technology leader

**Power**



**Precision control**



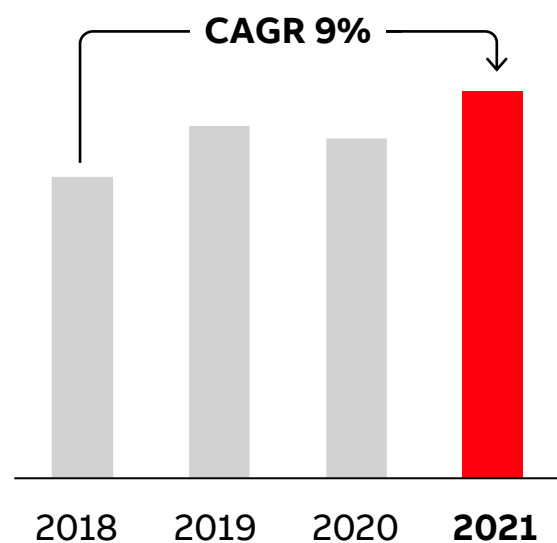
**Reliability**



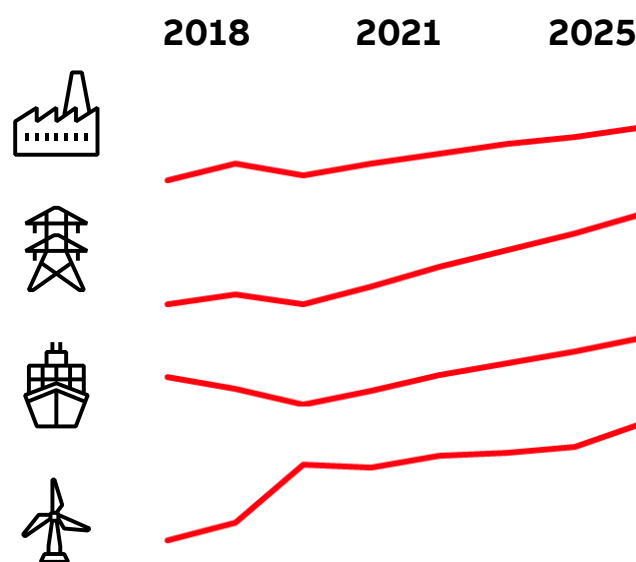


# Growing from a strong foundation

## Proven performance



## Good market outlook



## Focused growth plans

- 01 Grow market share in Americas**  
Sales and portfolio development for a key market
- 02 Develop integrator and OEM channels**  
New portfolio and services for integrators and OEMs to speed growth, improve mix and minimize risk
- 03 Capitalize on energy transition**  
Continue to shift portfolio to energy efficiency, renewables and decarbonization

# Decarbonizing industry

System Drives' story beyond energy efficiency

**Enabling renewable  
power generation**



**Improving  
grid stability**



**Developing emerging  
applications**



**Decarbonizing industrial  
process and transportation**





# Hydrogen economy

Enabler for low-carbon society

## Production

Powering electrolyzers for H<sub>2</sub> production

## Infrastructure

Compression powertrains for storage and distribution

## Downstream

Connecting fuel cells to electrical grids





# Turbine replacement

## Process industries

Electric drivetrains instead of gas and steam turbines

- Greenfield investment accelerating
- Brownfield opportunity developing

Driven by ABB high-power motors and drives





# Industrial heating

## Pulp & Paper

Replacing 9 MW oil heater for drying pulp  
with an electric system

Powered by ABB thyristor power controllers



Saving over 14,000 tons  
of CO<sub>2</sub> per year



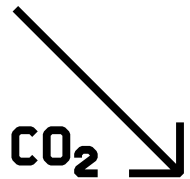


# Sustainable ports

## Fully electric vessels

Three electric harbor tugs serving LNG export port

Supported by ABB shore-to-ship solutions and propulsion drives



Eliminating over 5,000 tons of CO<sub>2</sub> per year compared to diesel-powered alternatives





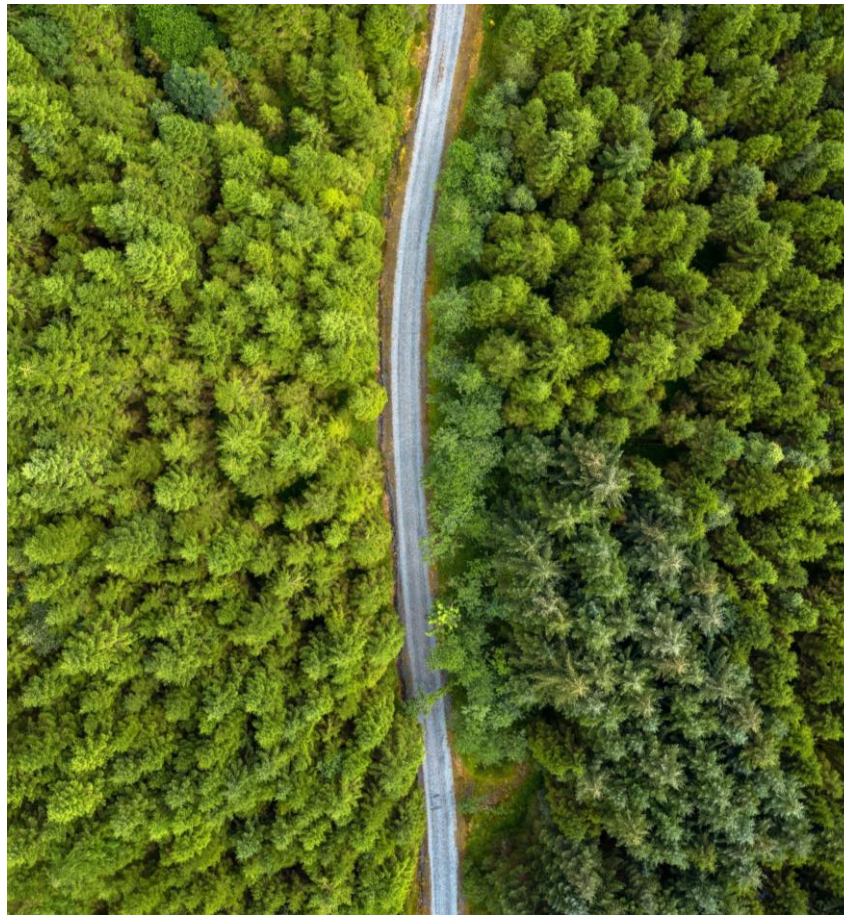
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# System Drives

**The trusted market leader**



**Great market outlook**



**Driving profitable growth**







EDGAR KELLER, DIVISION PRESIDENT

# Traction



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# Single components or complete traction packages for rail & e-bus



**Superior travel comfort**  
with smooth acceleration



Light weight solutions to  
**maximize passenger capacity**



**Reliability & availability**



Most energy efficient solutions  
for **sustainable transportation**



Very-high-speed  
and high-speed



Locomotive, dual,  
electric, diesel-electric



Multiple  
unit trains



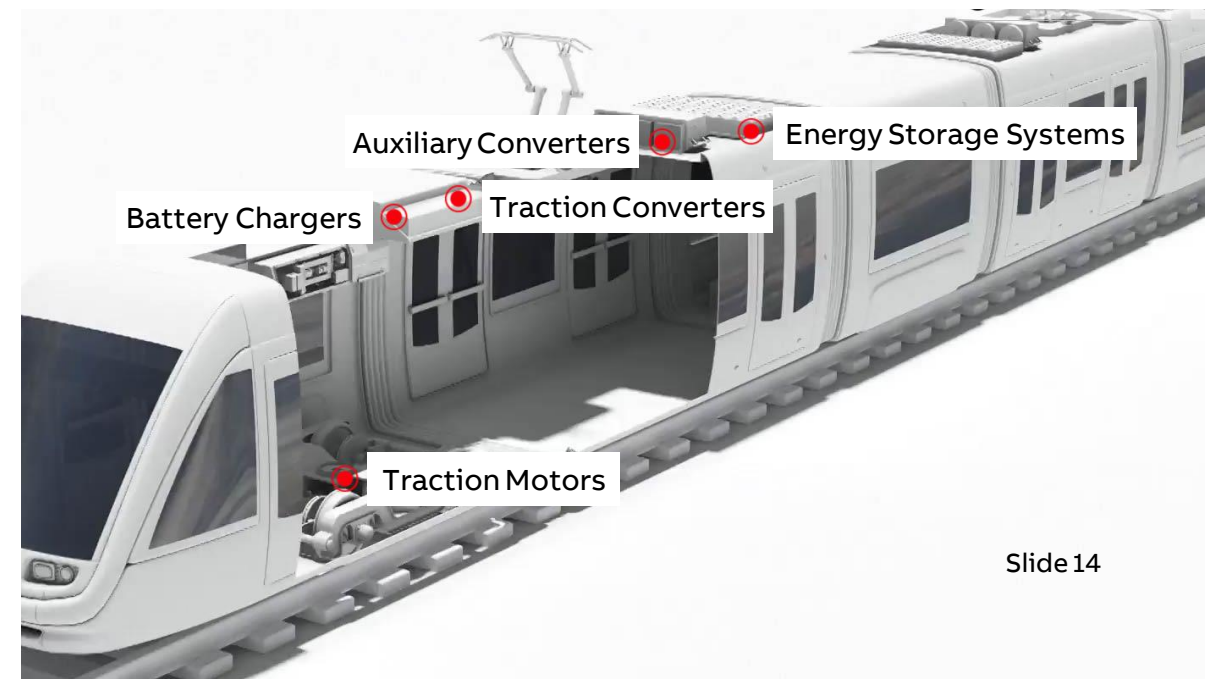
Metro



Light rail  
vehicles



People mover,  
monorail, e-bus





# Our business at a glance


The #2 independent traction propulsion system player

## Our market

 **~\$4 bn**  
(accessible market)

 **#2 globally**

## Our business

 **<\$1 bn**  
2021 revenues

 **~1 k**  
employees globally

**Our strategic mandate:  
profitable growth**





—  
**This recent converter  
replacement in 120  
locomotives saves  
around 30 GWh of  
energy every year,  
equivalent to  
the average electricity  
consumption of  
10,000 Swiss  
households**







# Global and local supplier of propulsion applications

## Strategic partnerships with OEMs and Operators

STADLER

arriva Hitachi Rail STS HESSE DSB

HARSCO Plasser & Theurer

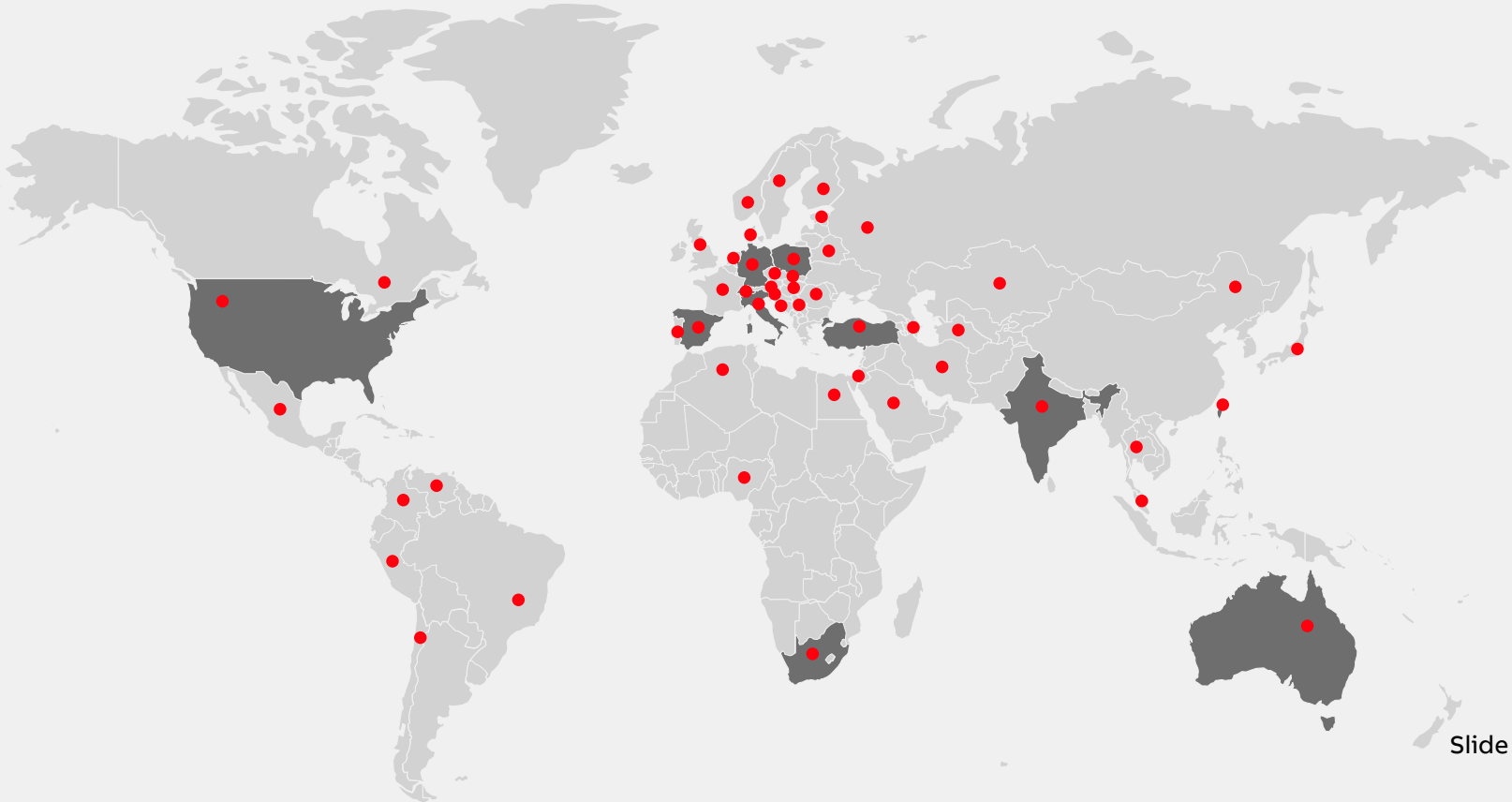
pesa SNCF R DURMAZLAR ALSTOM

BVG Berliner Verkehrsbetriebe DB OBB RZD Russian Railways bozankaya

SBB CFF FFS N Norske tog TTT Transmashholding

## Global and local presence

- Traction local footprint
- Traction projects, some examples







## Our competitive advantage...

~20%

potential energy savings through our latest technologies

### Technology leadership...

... advanced, flexible and most energy efficient propulsion systems combined with most modern battery storage solutions



## 30+ years

of operations with close relationships with our key partners

### Strong and long-lasting relationships with leading industry OEMs & Operators...

... due to highly demanding applications and long lifecycles of the products



## 6

dedicated production sites with access to the whole ABB footprint

### From fast developing new markets to servicing old trains...

... global and local presence to develop new markets and support servicing needs in more mature ones



## The most energy efficient propulsion systems

A recent comparison of a 2L converter and a 3L converter in two separate rail lines, found that the 3L converter delivered **energy savings of 20%, 10% lower harmonic losses** and **55% lower motor temperatures**



# Transferring our existing rail know-how to emerging markets

- We have a **strong foundation in rail** with deep domain expertise
- Our modular offering, which is customizable for the most demanding applications, can **easily be applied to other high growth niche markets**
- We have tried and tested this through a collaboration with OEMs & operators on a **zero-emission battery electric rigid dump truck** which utilizes powerful energy storage solutions to facilitate the transportation of over 220 tones



**Locomotive  
Converter**



**Traction  
Battery**



**Traction  
Motor**



**Trolley bus  
experience**



# From iron rails to rubber wheels

## E-MINING

The global rate of electrification of mining vehicles is expected to **increase by up to 10% or roughly 125,000 vehicles by 2025**

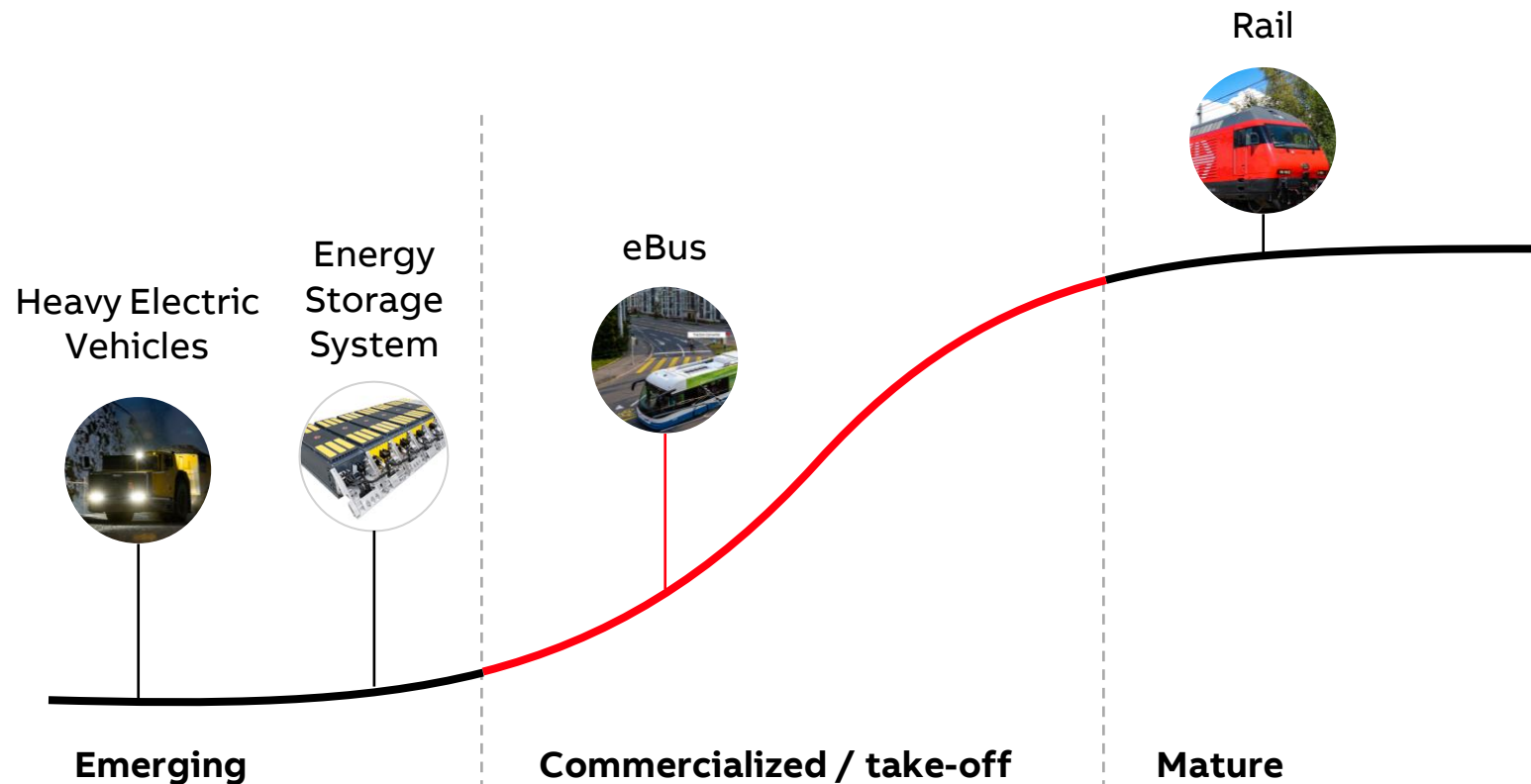
## E-MOBILITY

eBus registrations in Europe **up by 48% in 2021 (~3,200 vehicles)**. Market share in EU is expected to grow to **30% in 2025**

## MOTION TRACTION PRODUCT LINE GROWTH



■ E-Mobility ■ Rail



## KEY TRENDS & CUSTOMER REQUIREMENTS



Energy efficiency



Decarbonization



Digital solutions



Sustainable public transport

S-curve visual is illustrative





Traction Converter

Energy Storage System

Traction Motor





**The 15% energy savings on this single bus line (9 buses) equates to savings of over 200,000 liters of diesel and 540 tonnes of CO<sub>2</sub> emissions a year**



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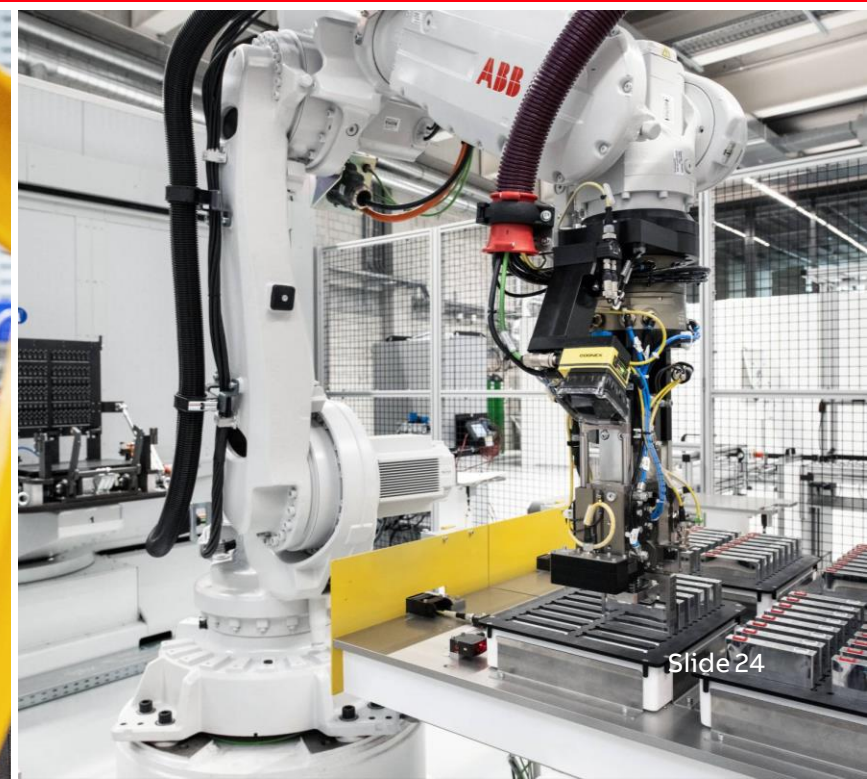
# We will deliver profitable growth

A global leader  
with local presence...

...in a \$4 bn rail market  
with a strong outlook in  
emerging markets...

...delivering  
profitable growth

**The future of transport is electric**





**ABB**