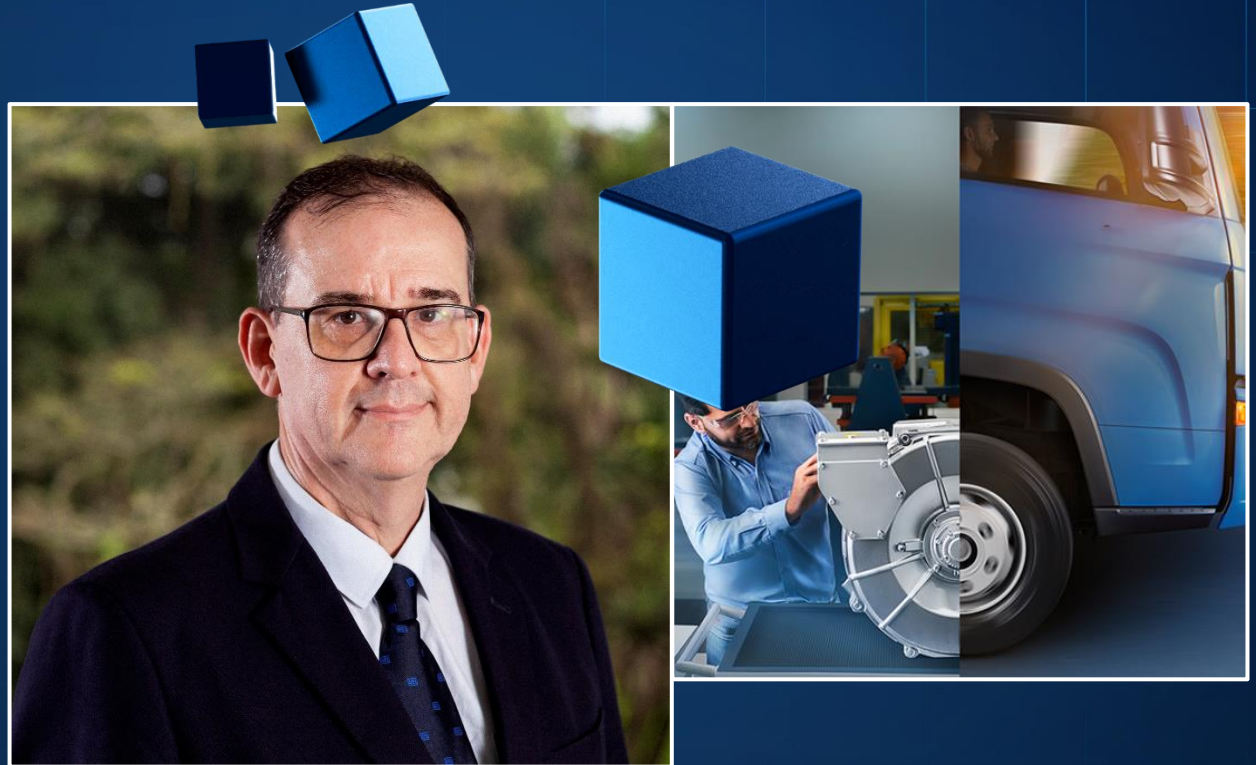


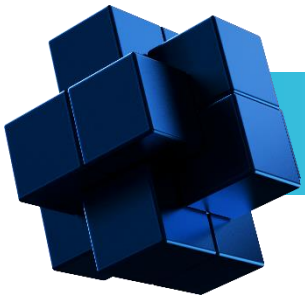
# Electric Mobility



**Carlos José Bastos Grillo**

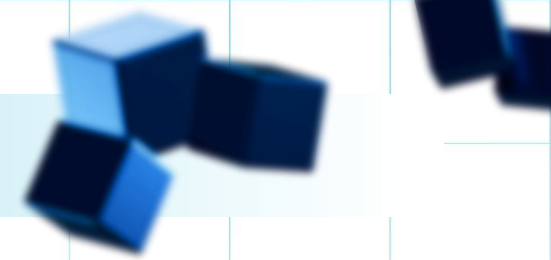
Chief Operating Officer  
WEG Digital & Systems



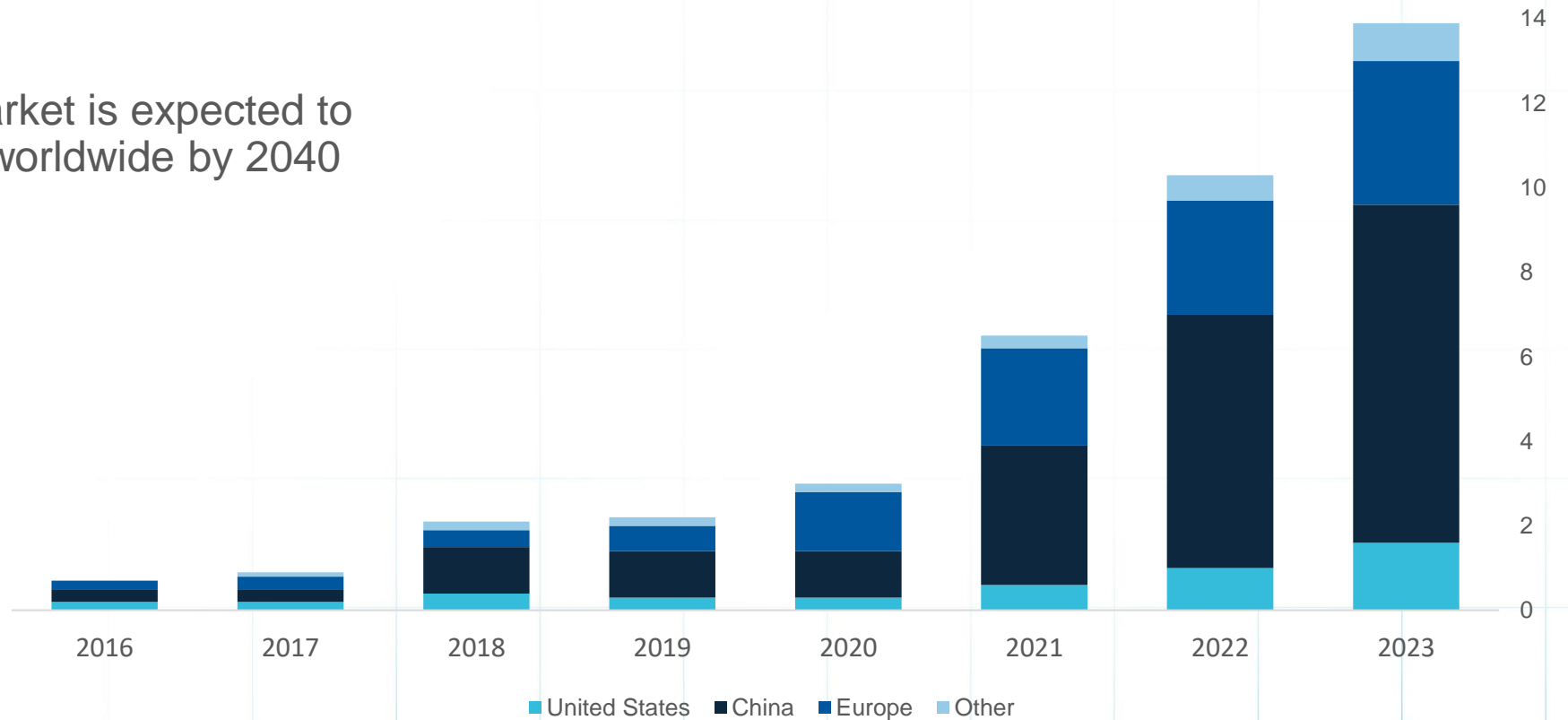


# Electric Mobility

## SALES OF ELECTRIC VEHICLES



The electric mobility market is expected to exceed **US\$65 billion** worldwide by 2040



Source: IEA, Electric car sales (in millions of units), 2016-2023, IEA, Paris. Licence: CC BY 4.0

# Electric Mobility in Brazil

RELEVANT MARKET GROWTH

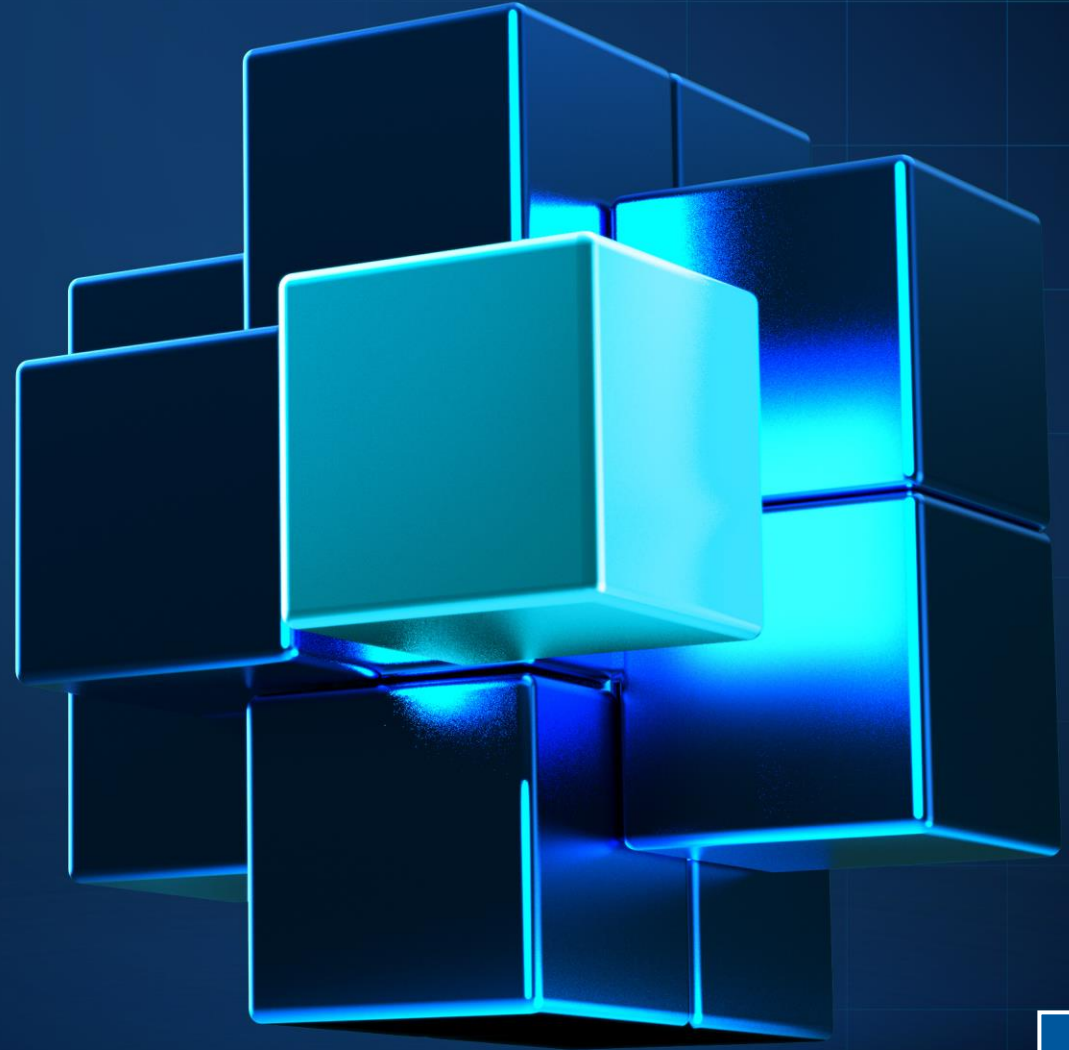
Brazil registered **49,052** electrified vehicles in the first 8 months of 2023

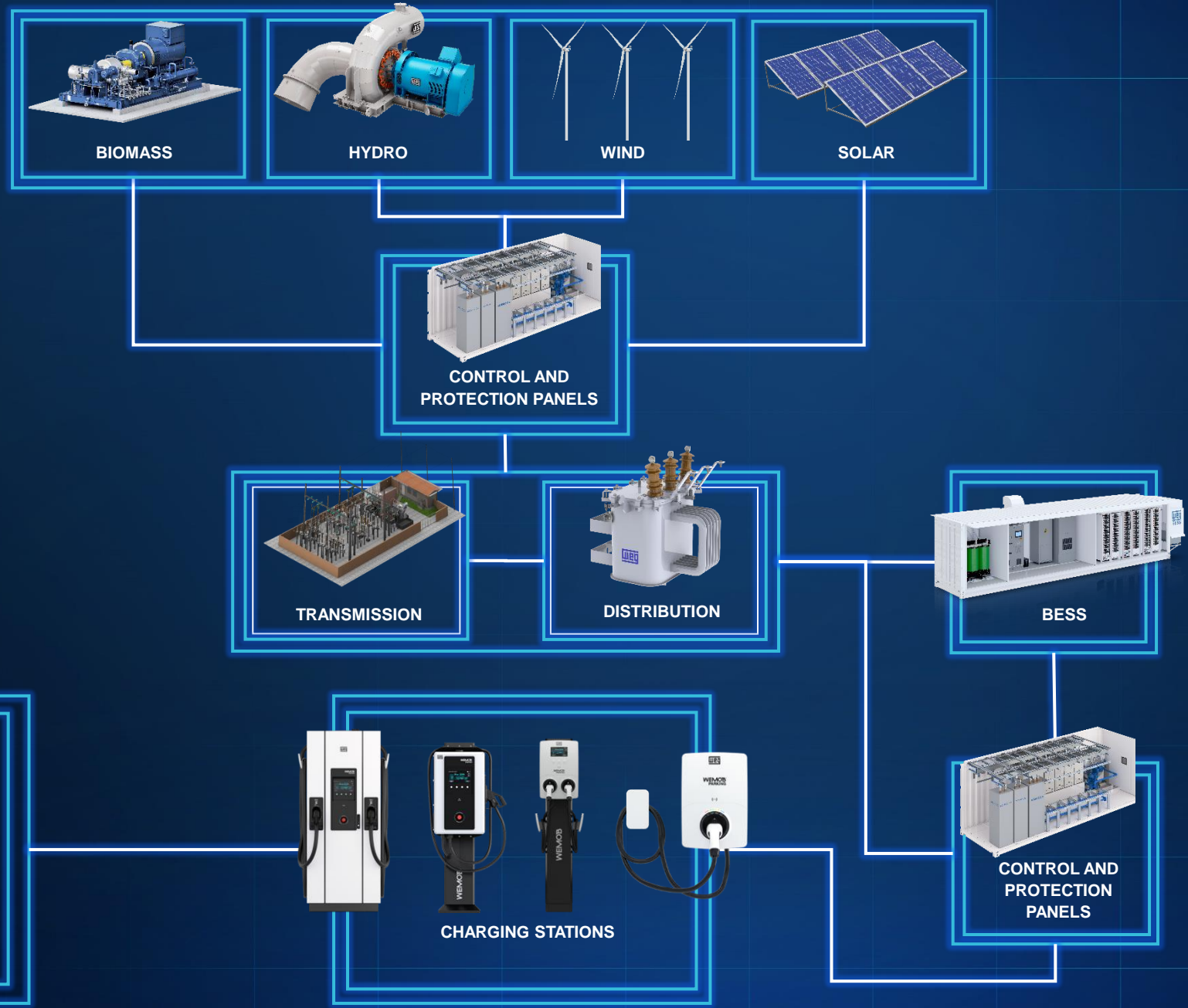
Growth of **76%** compared to the same period in 2022 (27,812)



Data from the Brazilian Electric Vehicle Association (ABVE)

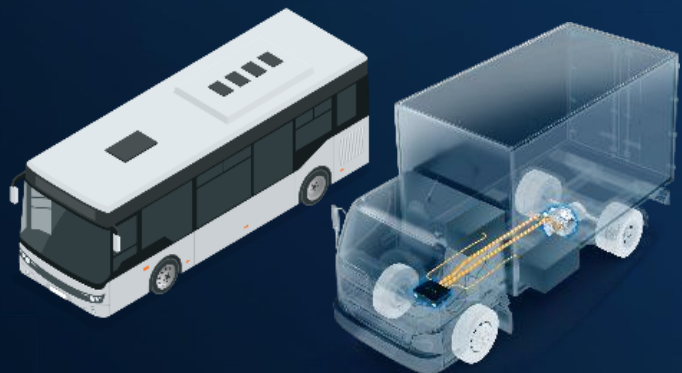
# Automotive Traction Systems





# Automotive Traction Systems

COMPLETE PORTFOLIO FOR LIGHT AND HEAVY VEHICLES



ELECTRIC VEHICLES



## Light Vehicles

Low Voltage  
(24 V to 130 V)



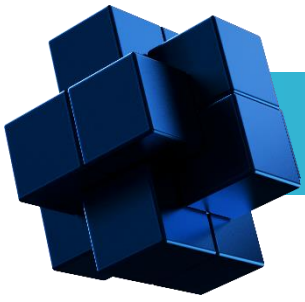
## Utility Vehicles

Medium Voltage  
(130 V to 400 V)



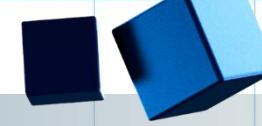
## Heavy Vehicles

High Voltage  
(above 400 V)



# WEG Traction Systems History

MORE THAN TWENTY YEARS OF HISTORY



Trolleybus - SP



Palio, pompeo and charging station inauguration



Special light vehicles: Dock Dock, Pratyko



18M Bus – 100% batteries



Dual Bus – 23M



3x H2 Bus



E-delivery truck VW MAN

2001

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2018

2020



AC and microprocessed locomotives Vitória - ES



CNG hybrid articulated bus Caxias do Sul - RS



Bus H2 RJ



Ethanol hybrid bus Itaipu Binacional



Utility Vehicles



Hybrid truck



UFSC photovoltaic energy bus



UFSC solar boat



Maglev – Cobra UFRJ



Trains

# Recent Highlights

MODERN SOLUTIONS FOR MOBILITY

2022



WEG supplies Powertrain and batteries for Transcol's new fleet of electric buses



2023



WEG is the supplier of the Powertrain and batteries for the new electric buses in São Paulo



WEG supplies Powertrain for Marcopolo electric bus



2021



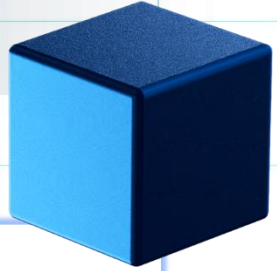
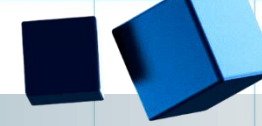
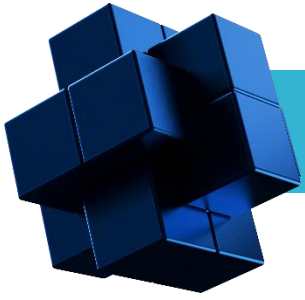
First 100% electric utility vehicle assembly line in Brazil features WEG technology



2022







# WEG Portfolio for Electric Vehicles

COMPLETE PRODUCT LINE

## Traction Systems

Driver



Motors

Electric Axle  
(Hybrid vehicles)



## Auxiliary Systems

*Pumping systems, steering systems,  
auxiliary power output*

Drives



Motors



## Power supply

Battery Pack



Generators for hybrid systems

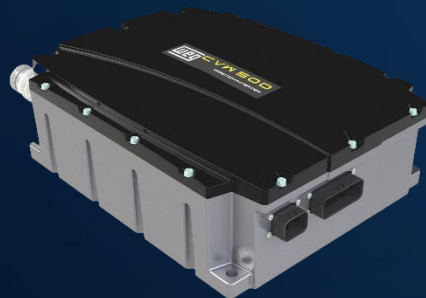


# Drives

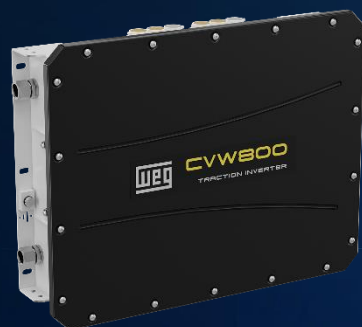
SOLUTIONS FOR THE MOST DIVERSE APPLICATIONS



**Light Vehicles**  
Low Voltage  
(24 V to 130 V)



**Utility Vehicles**  
Medium Voltage  
(130 V to 400 V)

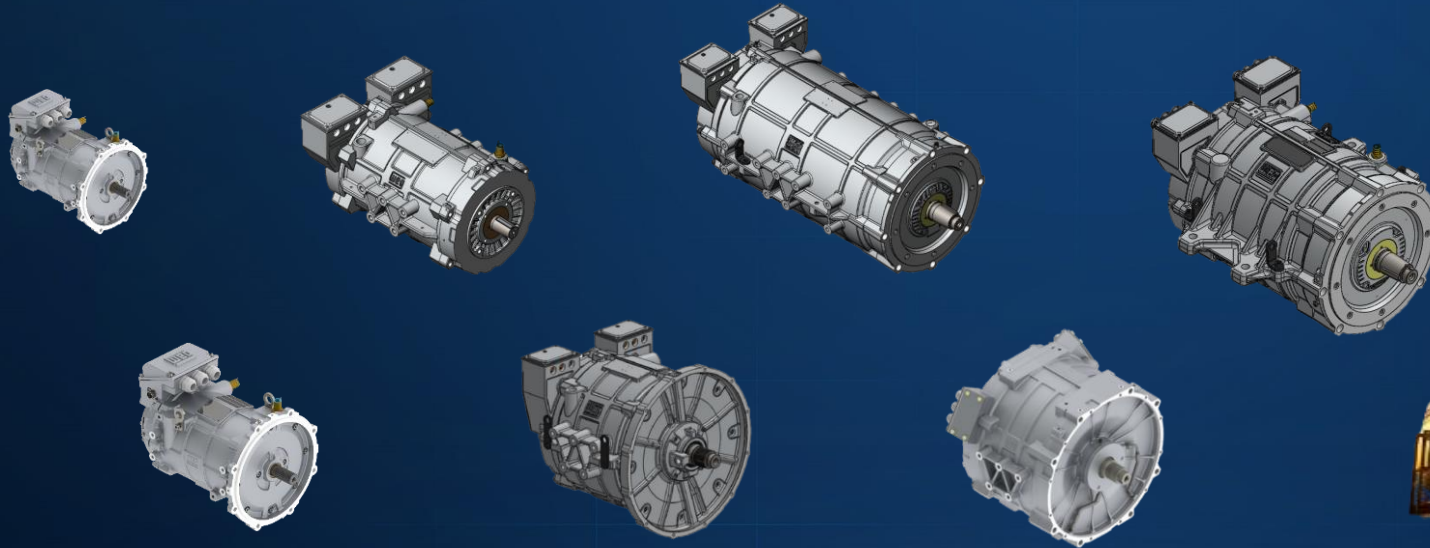


**Heavy Vehicles**  
High Voltage  
(above 400 V)



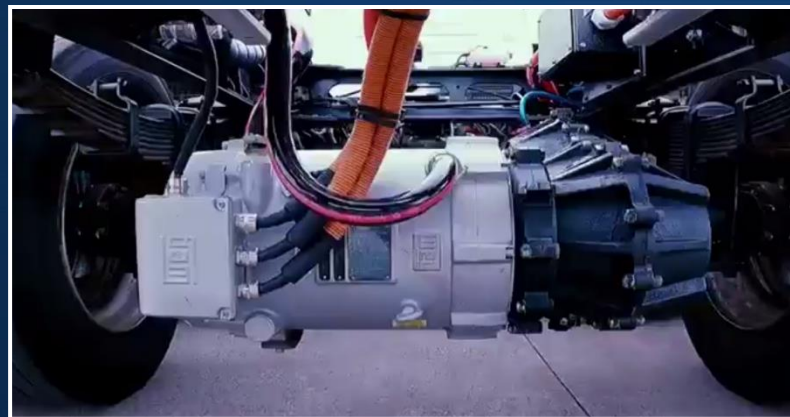
# Electric Motors for Automotive Traction

COMPLETE LINE OF MOTORS



# Electric Axle (e-axle)

## HYBRID APPLICATIONS

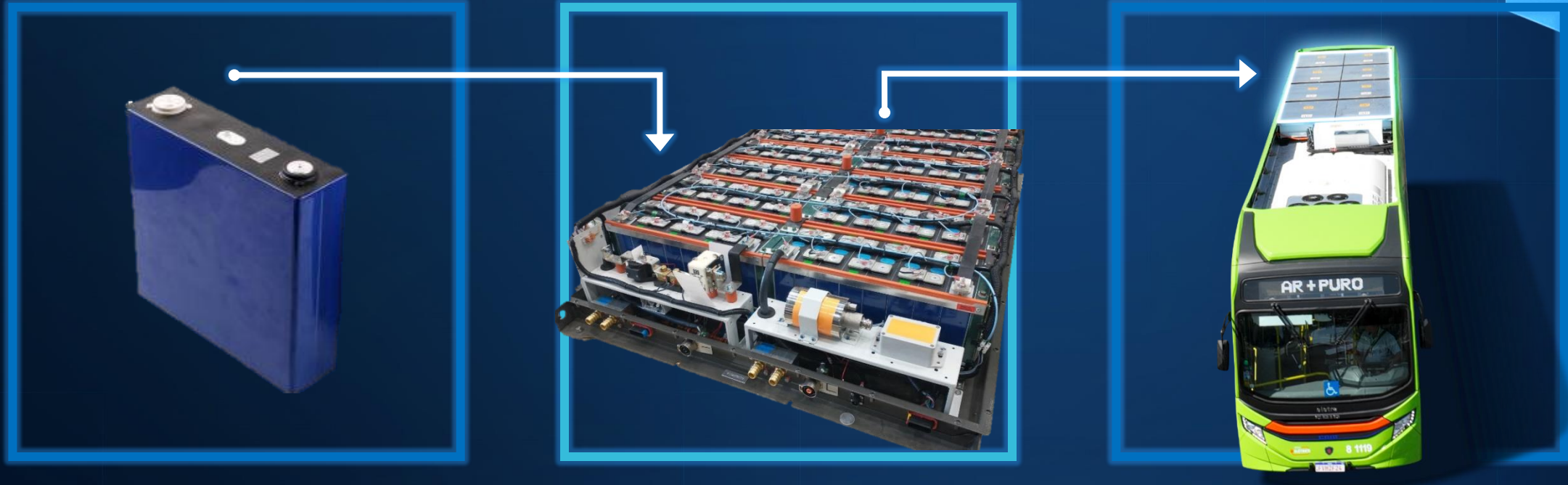


WEG provides traction systems for integration into electric axles (e-axle) for hybrid applications in heavy and utility vehicles



# Battery Pack

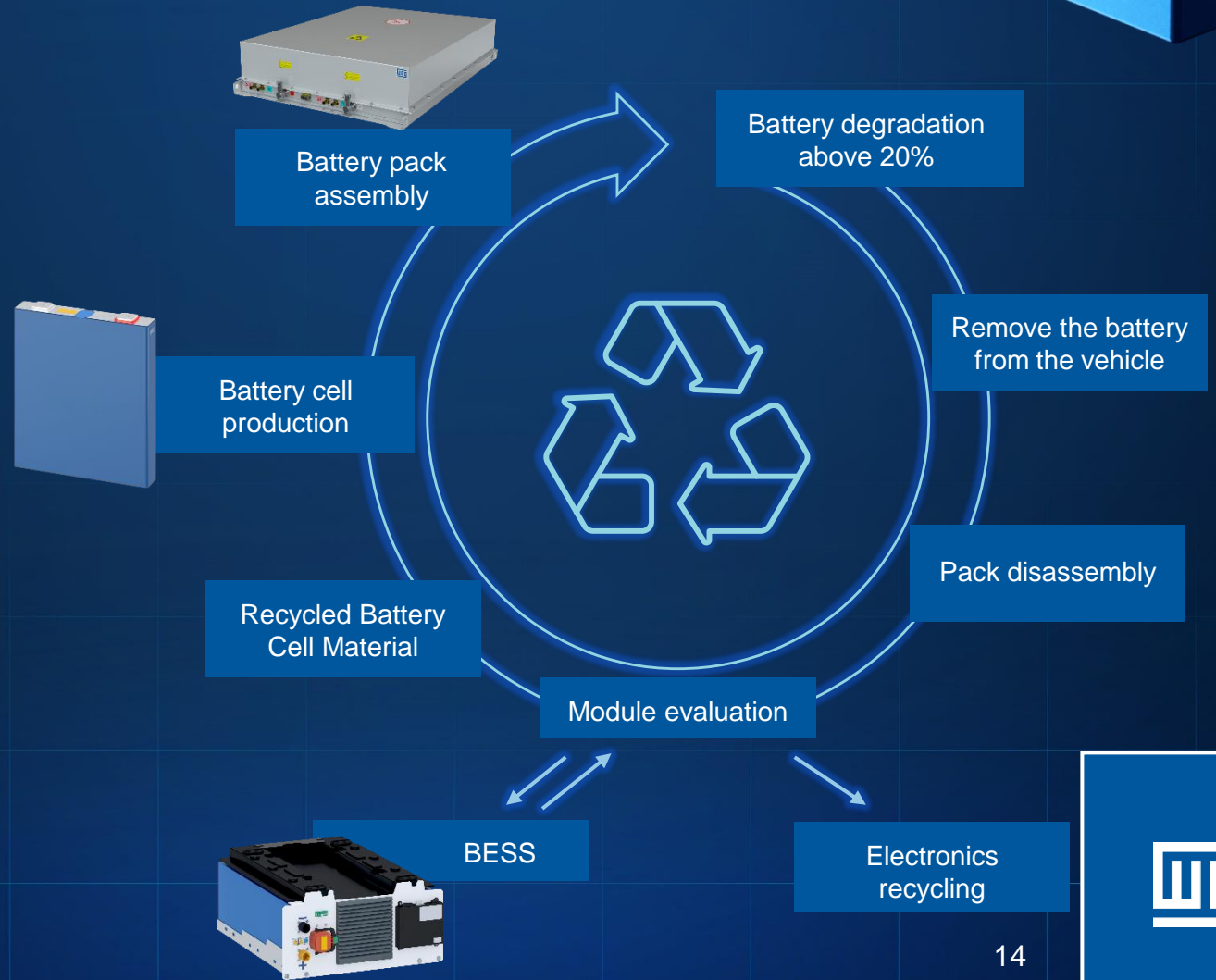
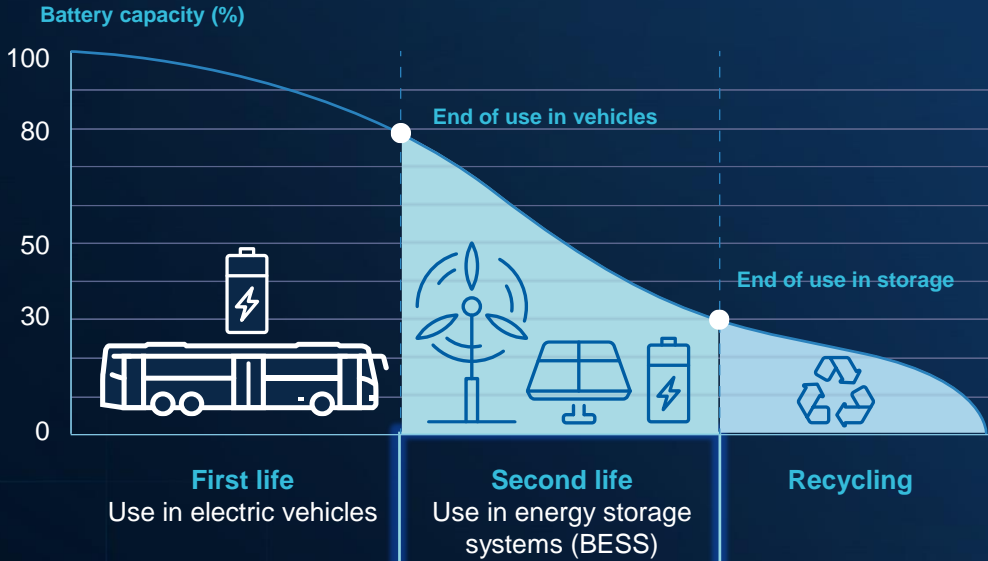
COMPLETE AND INTEGRATED SYSTEM

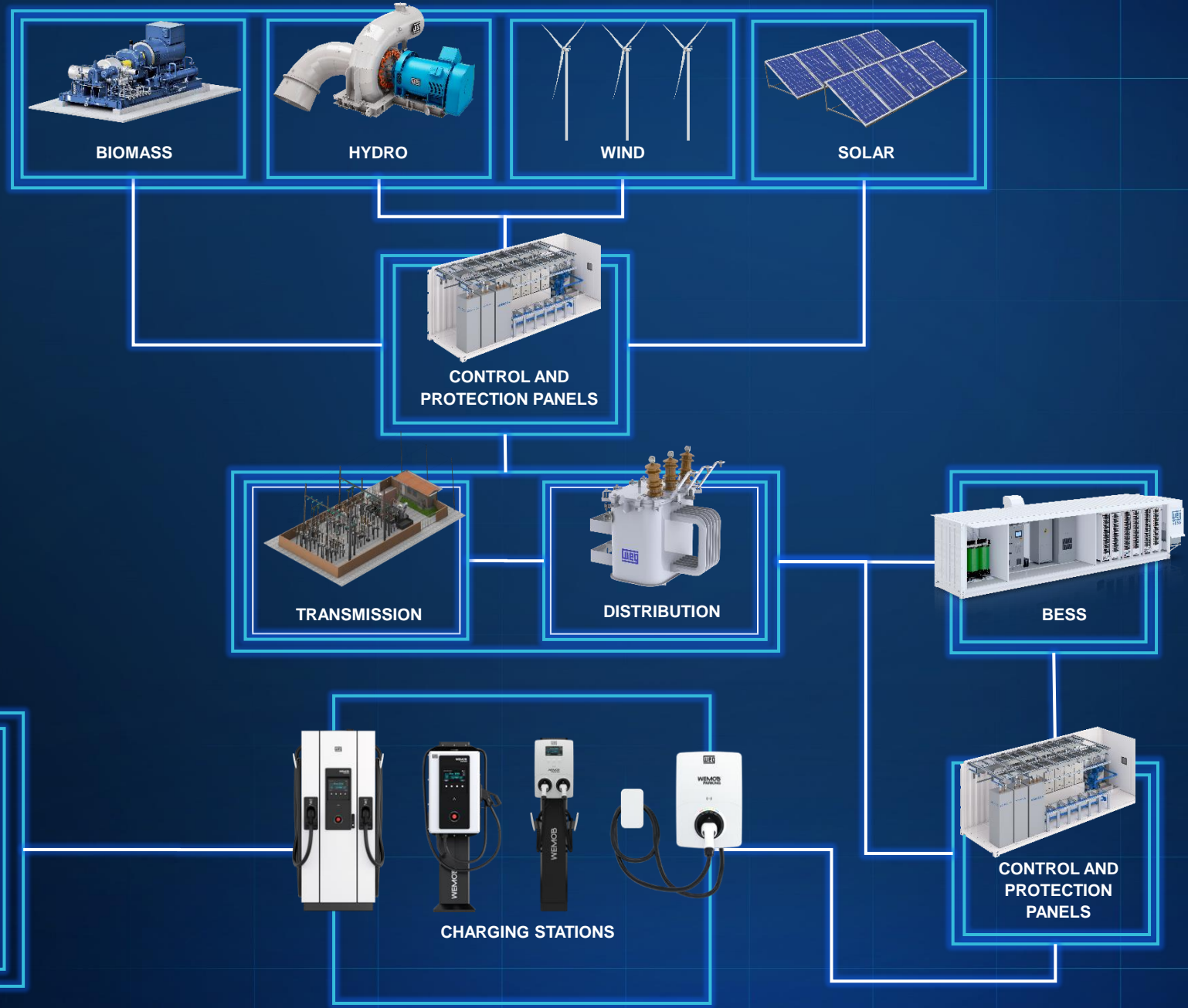


- Vehicle integration of BMS, firmware, VCU and CAN network
- Autonomous and intelligent thermal runaway prevention and suppression system
- Electrical and electronic protections with IoT sensing and monitoring
- Traceability system for second-life management

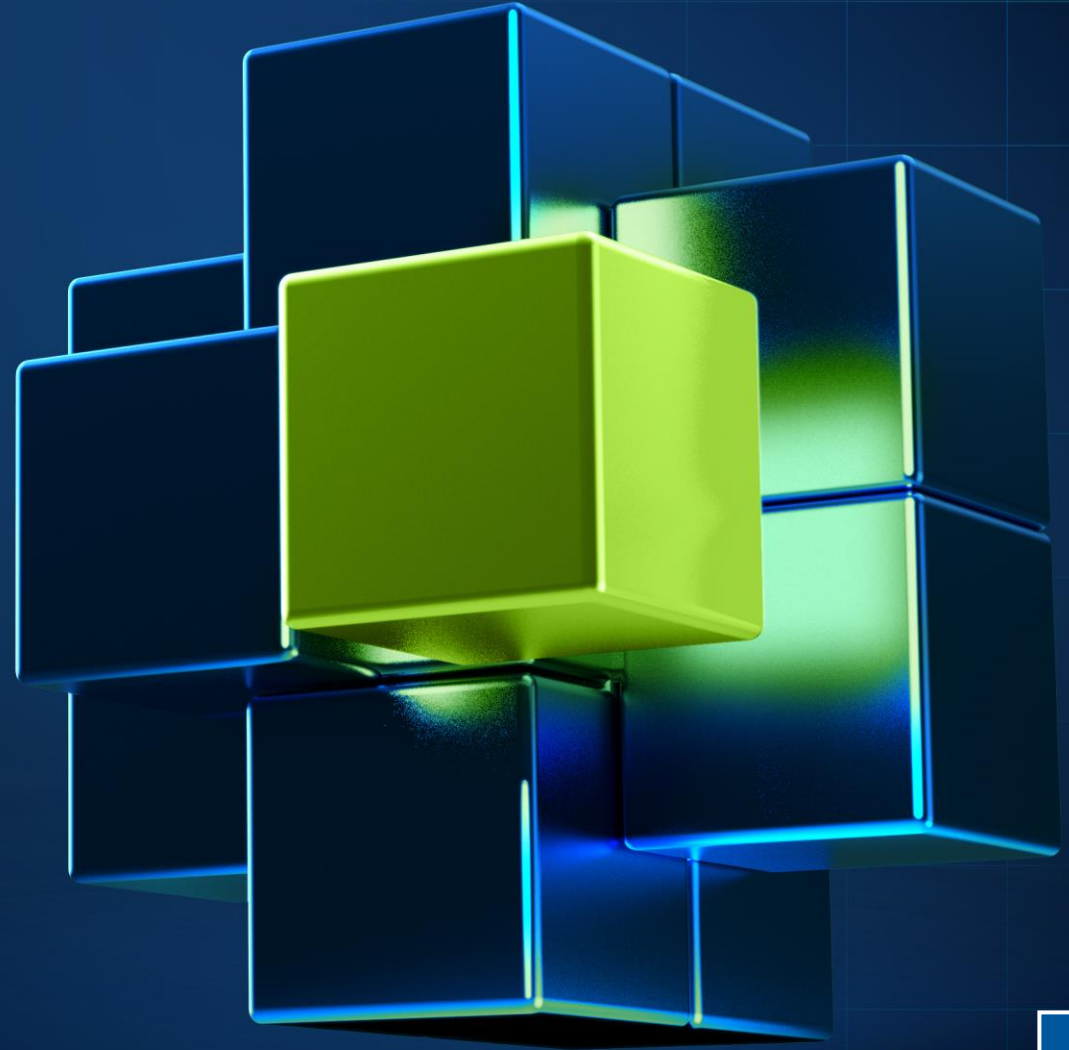
# Energy Storage

COMPLETE SOLUTION FOR CIRCULAR ECONOMY





# Charging Stations





# WEG Charging Solutions

FOR ALL APPLICATIONS

## Light Electric Vehicles

### HOME

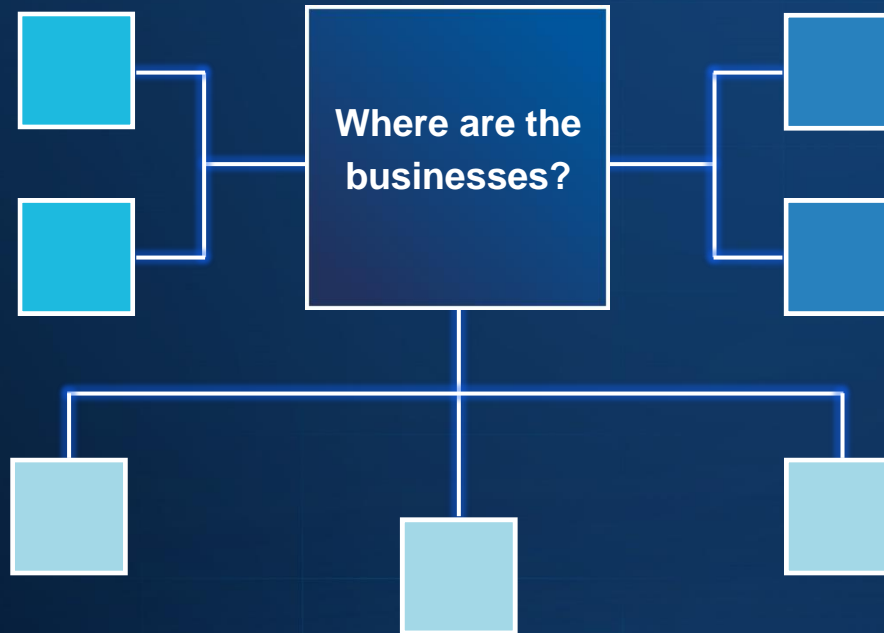
**Preferential** charging occurs slowly while the vehicle is parked. More economical recharging

### APARTMENT COMPLEX

Like houses, however, they are **collective** electrical infrastructures and require **demand control systems** and **individual measurement** of consumption for billing

### DESTINATION

These are **convenience** recharges that occur in hotels, restaurants, supermarkets, gyms, parking lots and at work



### ROUTE

Recharges **required** for **travel**. **The faster, the better**. Located on highways, associated with stopping points with power supply infrastructure, at gas stations or charging hubs in cities to serve those who do not have residential charging facilities

## Heavy Electric Vehicles

### GARAGES (buses)

**Departure and arrival point** for electric buses, recharging normally occurs at night, associated with maintenance and cleaning procedures

### DISTRIBUTION CENTERS (trucks)

Like garages, but **applied to electric trucks**, recharges normally occur associated with loading and unloading procedures

### TERMINALS AND STOPPING POINTS

These are **stopping points along the route**, lasting more than 30 minutes, for loading and unloading goods or boarding and passengers

# Residential Charging

80% OF RECHARGE HAPPENS IN HOUSES  
AND APARTMENT COMPLEXES

## WEMOB®

VOLVO



FIAT



Jeep



SERES



Mercedes-Benz



RENAULT



CITROËN



DS AUTOMOBILES



NISSAN



Caminhões  
Ônibus



VOLVO TRUCKS



SCANIA



**EASY – 4,4 kW AC**  
~ 12 hours

Portable charger to take in  
the vehicle and with wall  
mount.



**WALL – 7,4 kW AC**  
~ 8 hours

Wall-mounted smart charging  
station with access control and  
app management



WEG is a supplier to 24 electric vehicle manufacturers,  
with dealerships being an important distribution channel

# Destination charging

SUPPLIER OF MAIN PROJECTS IN BRAZIL

- Complete product
- Easy customization
- Customer visual identity

## WEG supplies electric mobility solutions for the largest electric vehicle charging hub in Latin America

The partnership between Volvo Car Brasil, WEG, BeGreen and São Paulo Corporate Towers accelerates the movement towards sustainable mobility

06/09/2023



**PARKING – 2 x  
22 W AC  
~ 3 hours**

Semi-quick charging station to be mounted on a **wall or totem** with LCD that allows you to recharge up to 2 vehicles simultaneously



# Charge on the route – Fast and Ultrafast

SUPPLIER OF THE LARGEST NETWORK IN BRAZIL



**STATION – 30 to 180 kW  
< 30 minutes**

Fast and ultra-fast charging stations, with the three main charging standards used in Brazil, covering more than 98% of applications.



## Volvo will invest R\$50 million in an electric car charging network in Brazil

Swedish automaker announces installation of over 73 charging stations in different states across the country

epbr — September 19, 2023 In energy transition



## CEEE Equatorial Group invests in electrical route project in Mercosur



## WEG and Gas Station Network Move Towards a More Sustainable Future

WEG is supplying electric vehicle charging stations that will be installed in a network of 25 gas stations in Brazil.

12/07/2023



# Charging Infrastructure – Turn-Key

COMPLETE CHARGING OFFER FOR HEAVY VEHICLES

Synergy between:

- Traditional businesses (substations, electrical panels, cubicles, protection devices and skids)
- New business (EV Charger and management platform)
- Complete package supply + design, execution, installation, and maintenance



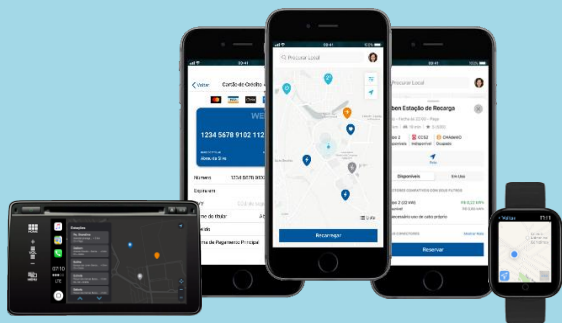
Garages and distribution center

# WEMOB Smart Charging

EV CHARGING MANAGEMENT PLATFORM

## COMPLET Ecosystem for charging infrastructure

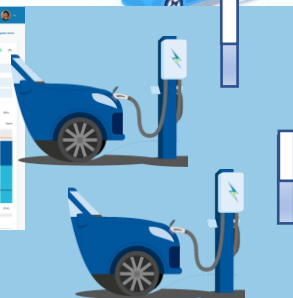
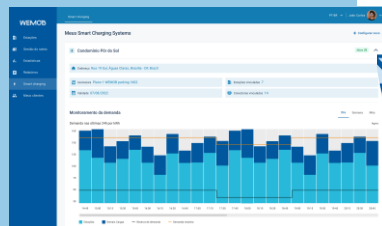
### WEMOB EV Drivers



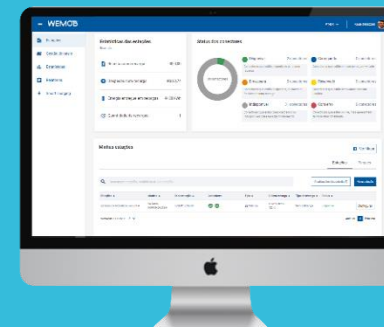
- Locates stations and recharge status
- Vehicles and Smartwatch ready
- Billing via credit card

### WEMOB Smart Charging System

- Load balancer
- Demand Controller



### WEMOB Station Fleet Management

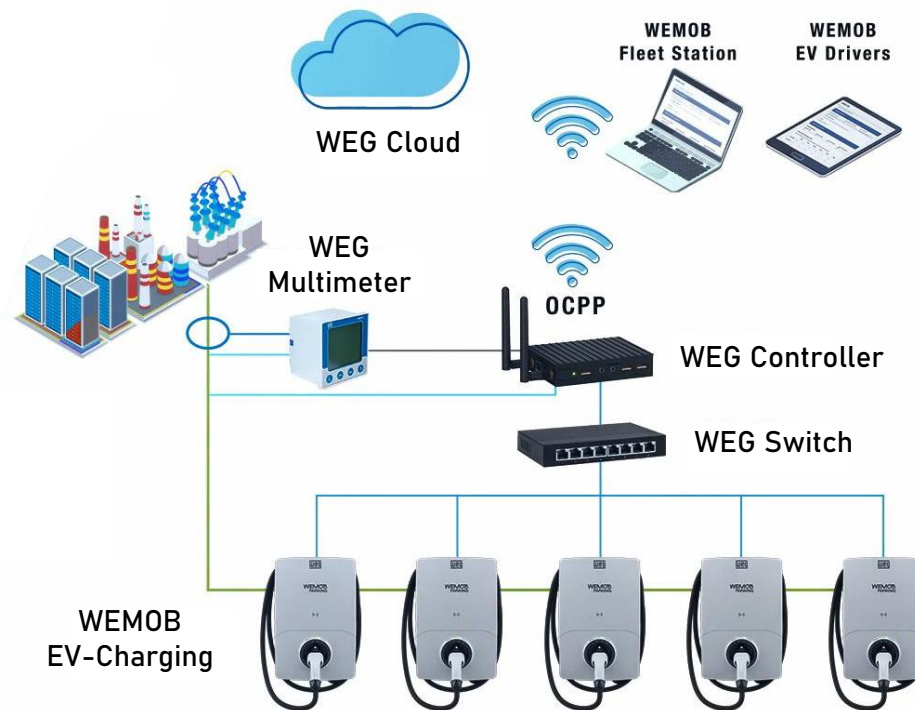


- CPO/Station Owners (station registration)
- SaaS subscription per connector
- Monitoring/reporting

# WEMOB Smart Charging System

## SOLUTIONS FOR URBAN CENTERS

- System to control, monitor and manage power available for charging stations
- Provides safe recharging
- Apportionment and billing per user



# WEMOB Integrators

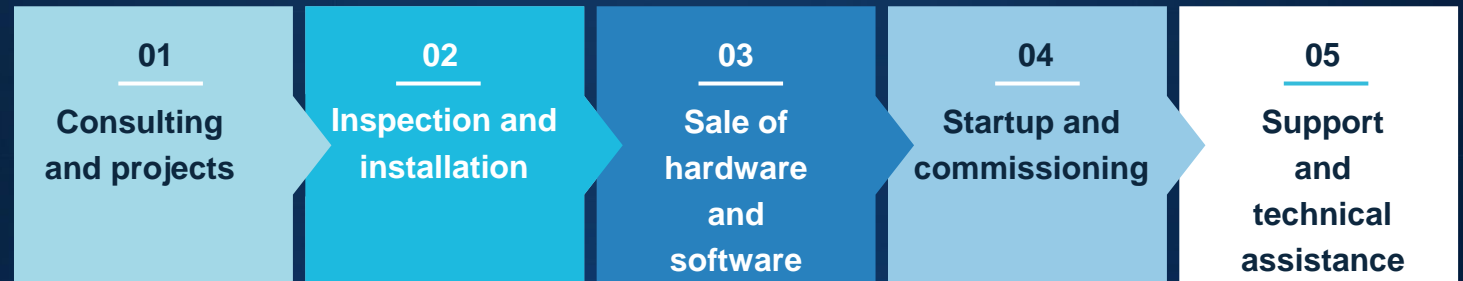
LARGEST SPECIALIZED NETWORK IN BRAZIL



Network with **+140** exclusive resellers



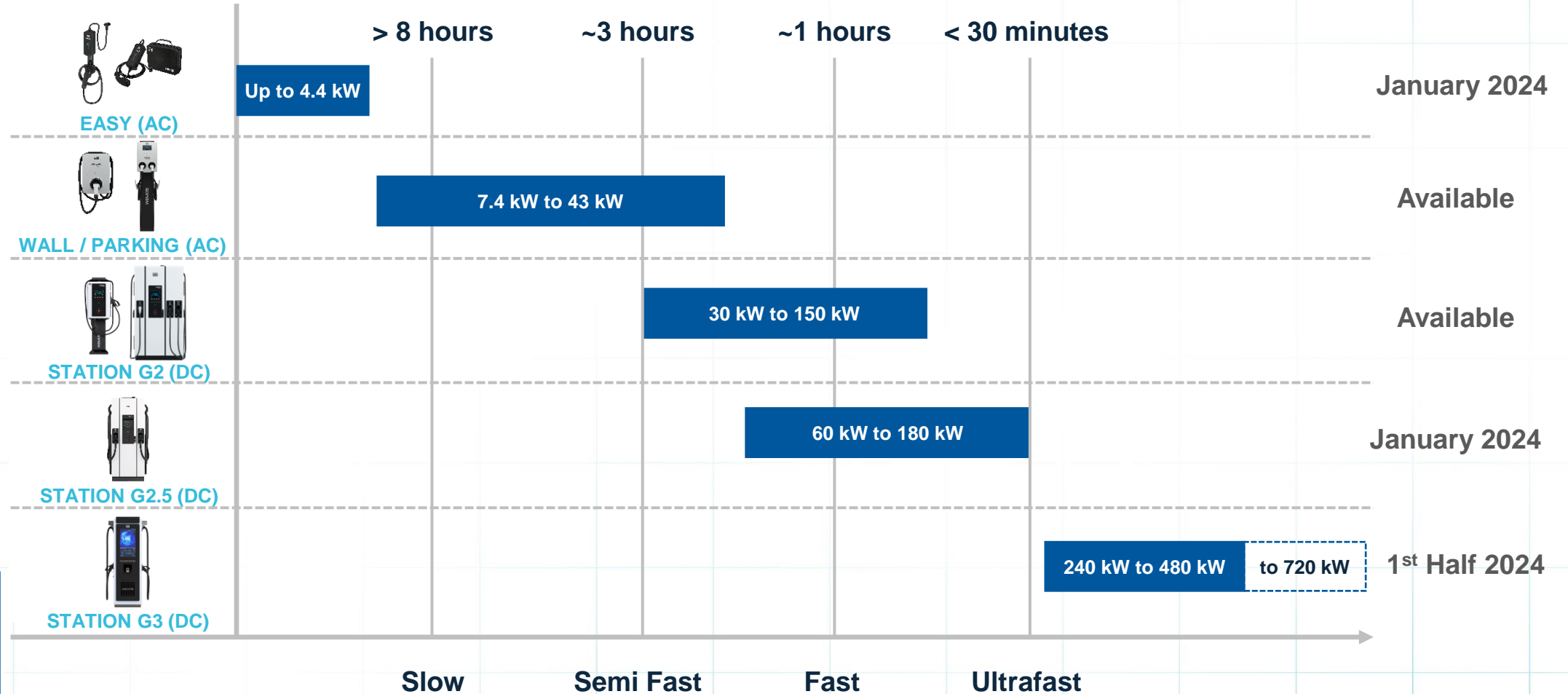
INSTALLATION AND SUPPORT  
FOR ELECTRIC VEHICLE  
CHARGING INFRASTRUCTURE  
IN BRAZIL





# WEMOB Roadmap

## INVESTMENT IN RESEARCH AND DEVELOPMENT OF GLOBAL PRODUCTS



# Green+ Version

2024 RELEASES



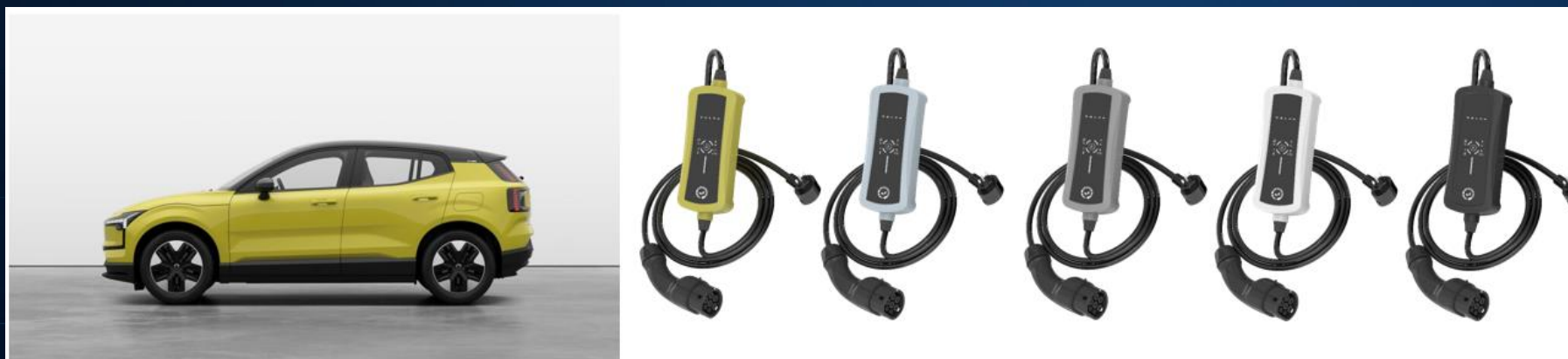
- Version made with 50% recycled resin
- PCR (Post-Consumer Recycled)
- Available for EASY, WALL and PARKING models
- Reduction of 3.4 kg of CO<sub>2</sub> equivalent emissions per product
- Reduction of 42% in electrical energy for resin production
- Maintains mechanical performance, UV protection and flame-retardant characteristics
- 100% recyclable material



# WEMOB Easy

2024 RELEASES

- Portable charging station, more powerful and safe for the Brazilian plug standard (NBR)
- WEMOB EASY line, produced in vehicle colors
- Produced in standard and **Green+** versions
- 100% recyclable material



# WEMOB High Power Charging (HPC)

2024 RELEASES

- 240, 480 and 720 kW
- Ability to recharge up to 4 vehicles simultaneously
- Can recharge 80% of the battery in less than 15 minutes
- AI for power sharing optimization



# WEMOB – In numbers

GROWING OPERATION



+  
**10.000**

Charging  
Stations

+  
**140**

Integrators  
WEMOB

+  
**135 MW**

Installed  
charging power

**+150%**  
of growth  
**CAGR**  
(2021 – 2023)

Global Product Line

**15**  
countries

in

**4**  
continents

**Plug-in + 70 thousand**  
in the Brazilian market

**BEV 30%**  
units

**PHEV 70%**  
units

Capacity to **recharge all plug-in electric vehicles**  
in **Brazil** in less than **14 hours**

Recharges enough energy in one day to travel up  
to **18,000,000 km (450 laps around the globe)**



# Internationalization

EXPANSION OF PRODUCT OFFERINGS OUTSIDE BRAZIL

## Product certification



Colombia



United Kingdom



Mexico



European Community



Brazil

## Participation in events abroad



ExpoTransporte – Mexico



EMEX – London, UK



Exposolar – Colombia



EV Show 2023 – London, UK

## Initial deliveries in 15 countries



Peugeot – Argentina

Renault – Mexico

CIRES – Portugal

DS – Argentina



# Growth Strategies



# Investments

## JARAGUÁ DO SUL – INDUSTRIAL AND TRACTION MOTORS



- Part of the R\$660 million investments announced in 2022
- 18,600 m<sup>2</sup> (200,000 ft<sup>2</sup>) built area
- Begins operation in 2024
- Allows gradual and continuous production increase
- Support demand of the next years



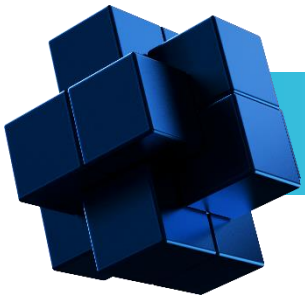
# Investments

EXPANSION OF THE CURRENT BUILDING AND  
CONSTRUCTION OF THE NEW BATTERY PACK FACTORY



- Investment of R\$ 100 million
- 6.000 m<sup>2</sup> (64,500 ft<sup>2</sup>) built area
- 140 new employees
- Start of Operations in 2024
- It will feature WEG automation, digitalization and industry 4.0 solutions



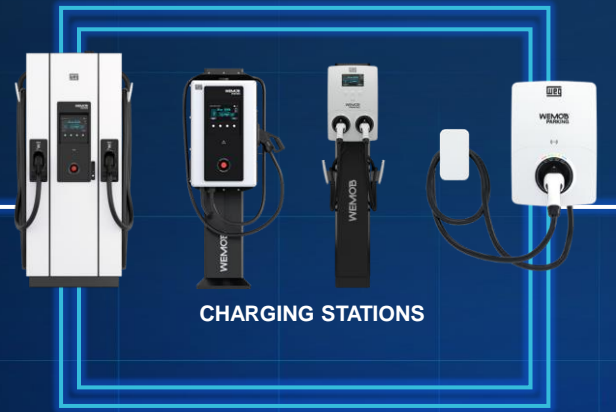
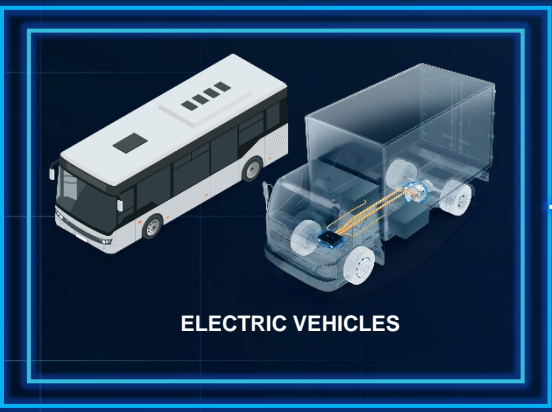
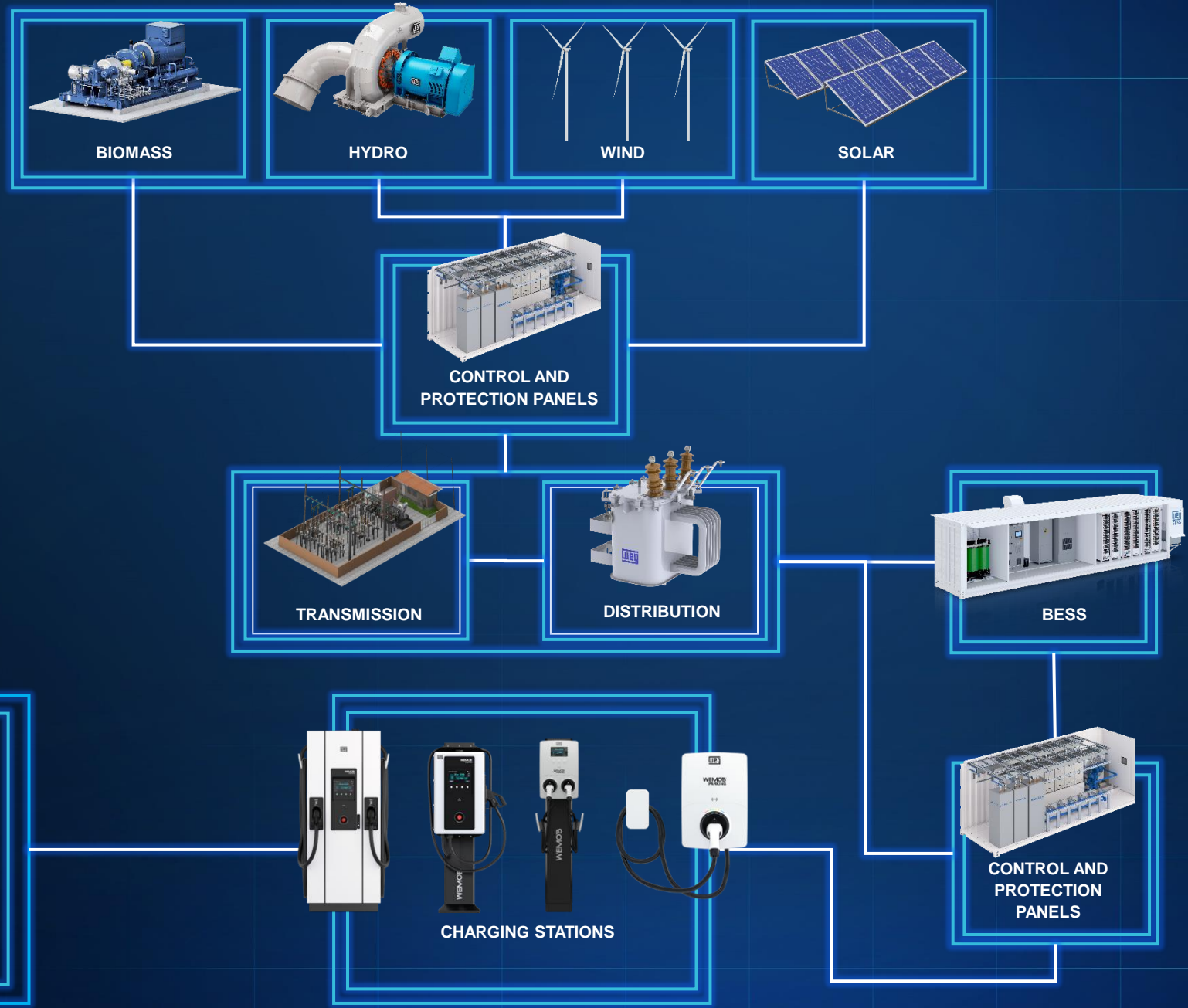


# Investments

## NEW ASSEMBLY AREA FOR RECHARGE STATIONS

WEG AI automatic  
SuperVision





# Key Messages



Strengthen position in electric mobility business in Brazil

Expand participation in Latin America

Continue expansion of production capacity

