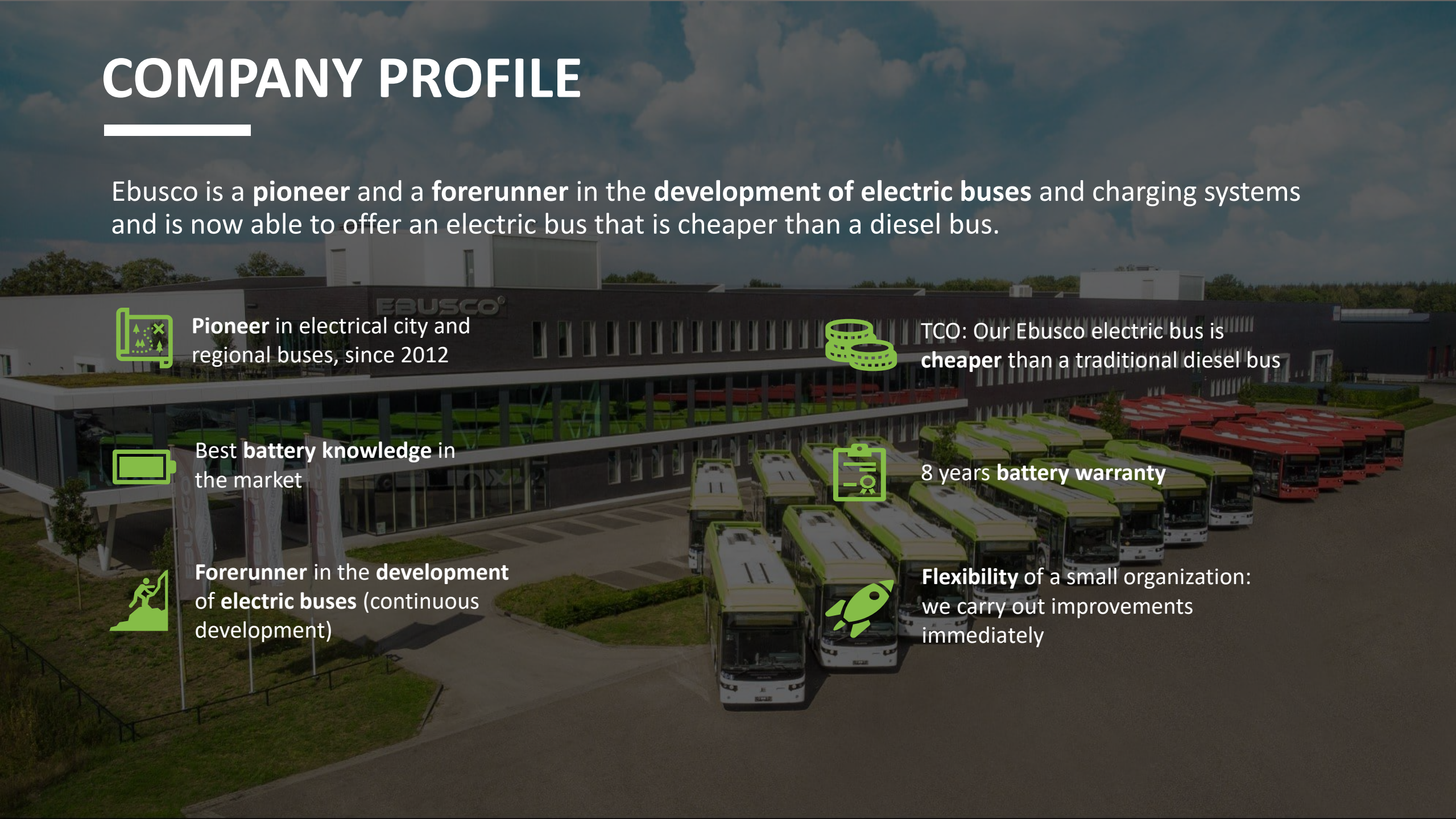
AVEA TASMANIA

CONTENTS

COMPANY PROFILE

Ebusco is a **pioneer** and a **forerunner** in the **development of electric buses** and charging systems and is now able to offer an electric bus that is cheaper than a diesel bus.



Pioneer in electrical city and regional buses, since 2012

Best **battery knowledge** in the market

Forerunner in the **development** of **electric buses** (continuous development)

TCO: Our Ebusco electric bus is **cheaper** than a traditional diesel bus

8 years **battery warranty**

Flexibility of a small organization: we carry out improvements immediately

VISION, MISSION, VALUES

Vision

Driving the transition to sustainable transport of public.

Mission

Deliver economical, reliable and progressive solutions to the demand of sustainable transport of public.

Values

- ✓ Integrity, trust & empowerment
- ✓ Value people
- ✓ Passion for disruption
- ✓ Future customer focus
- ✓ Constant innovation

ABOUT US

DUTCH 100% ELECTRIC BUS MANUFACTURER

LOCATED IN DEURNE, THE NETHERLANDS

AWARD WINNING

BUSWORLD INNOVATION LABEL (2019)

BUSWORLD ECW ECOLOGY AWARD (2013, 2015)

JEC COMPOSITES INNOVATION AWARD (2021)

HIGH QUALITY EUROPEAN PRODUCT

80% OF OUR SUPPLIERS ARE EUROPEAN

HIGH QUALITY PRODUCT

ING BANK SHAREHOLDER OF EBUSCO

SINCE DECEMBER 2016

CAPABILITY MODEL

EBUSCO®

EBUSCO® DEPOT

Green Depot + Charging Infrastructure + Facilities / Buildings

EBUSCO® WE CARE

Maintenance + Service

PUBLIC TRANSPORT

Tender

Direct Sales

B2B

Rail Replacement

Airports

Personnel Transport

LOCATIONS


Stockholm, **Sweden**
Deurne, **The Netherlands**
Paris, **France**
Munich, **Germany**
Xiamen, **China**
Sydney, **Australia**

PARTNER APPROACH

Ebusco will be involved with an aim create a best practise zero emission operations model based on a customer centric, high performance culture, which delivers excellence in service delivery, operations, and maintenance. Our partnering approach will be demonstrated by:

- Sharing common values and mission based on ensuring a successful trial.
- Identifying and utilising the combined skills of our respective organisations, people, systems, and experience.
- Providing a transparent shared view on performance which will enable joint initiatives to provide even better service to our passengers and improve our overall performance.
- Develop processes for sharing feedback and celebrating successes.

TECHNICAL CAPABILITIES – ELECTRIC VEHICLES

Ebusco v2.3 Specification

Body type	12.5m Low Entry / Low Floor
Passenger capacity	61 persons (based on ADR regulations, max. 18.000kg and count 80kg per passenger) 45 seated, 16 standing
Gross Vehicle weight	12850kg
Front Axle Capacity	6825kg
Rear Axle Capacity	11175kg
Length	12500mm
Width	2490mm
Height	3300mm
Floor to ceiling height	2400mm
Step-in height / kneeling	380mm / 310mm
Batteries	CATL 422kWh
Range	350-450km
Driven axle	ZF AVE 130
Max. speed	100km/h
Maximum power	250kW
Maximum Torque	17300Nm
Rim	Steel 22.5 x 8.25
Tyre	295/80-R22.5 Continental Urban TL HSU LRH

EBUSCO 2.3

Ebusco 2.2
18 meter

Ebusco 2.2
12 meter

Ebusco 2.2
13 meter

PORTFOLIO

EBUSCO **2.2**

✓ **12-meter**	2/3 door	LF/LE	363 kWh / 423 kWh	plug / panto
✓ **13-meter**	2/3 door	LE	363 kWh / 423 kWh	plug / panto
✓ **13,5-meter**	2/3 door	LE	363 kWh / 423 kWh	plug / panto
✓ **18-meter**	3/4 door	LF	363 kWh / 525 kWh	plug / panto

EBUSCO **3.0**

- ✓ 12 and 18 meter
- ✓ Light weight body of composite — **35% LIGHTER**
- ✓ All batteries located in the floor — **SPACIOUS**
- ✓ Lifetime extension till 25 years — **TCO**

MIRROR- AND CORNER EYE

DRIVER ASSIST

Cooperation with Knorr Bremse

Supplier of brake system

Most reliable system in the world

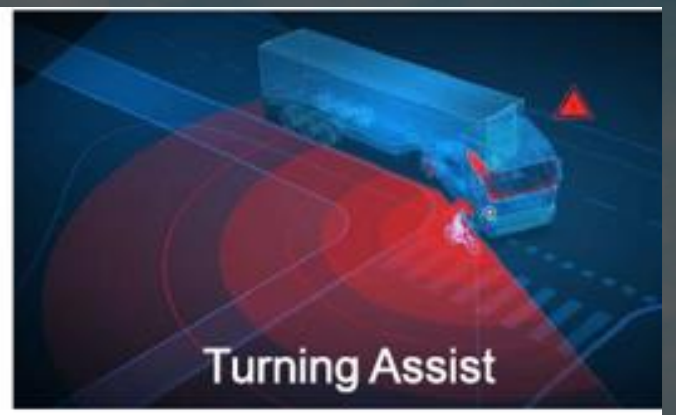
Due to combination with raders

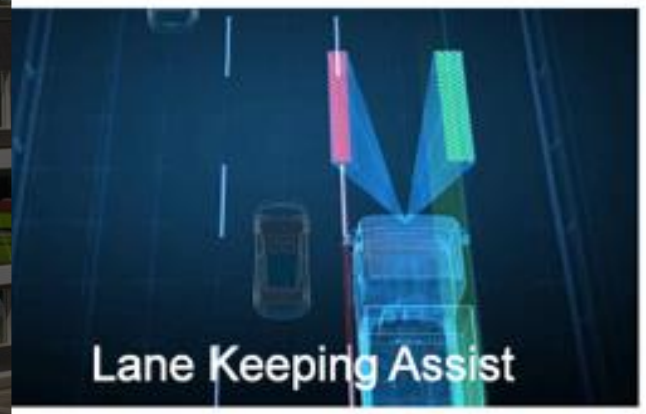
Passive + active functionality

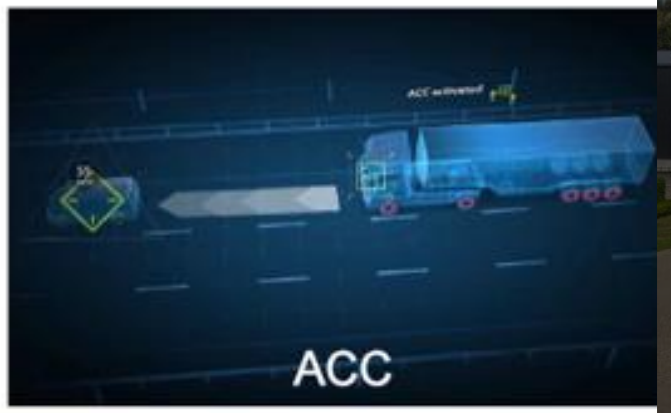
Automatic braking

Introduction in spring 2022

0 deaths in 2023





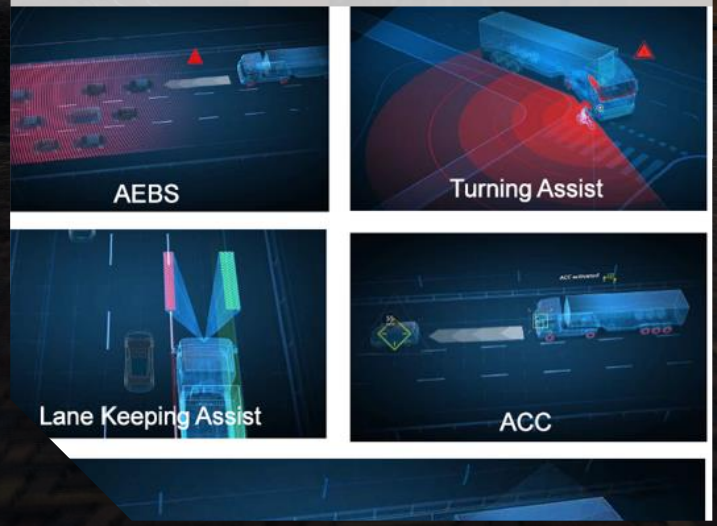


ROAD TO AUTONOMOUS

1ST LEVEL

ADAS

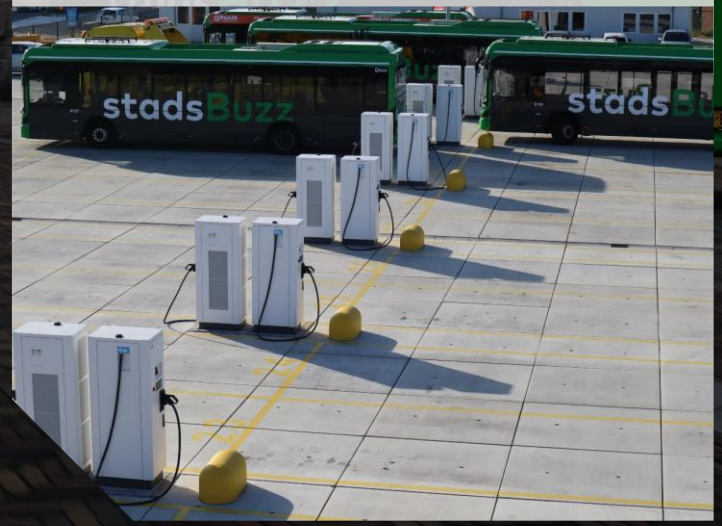
Autonomous Driver Assistance Support



2ND LEVEL

Autonomous depot

Save time with an autonomous depot



3TH LEVEL

Autonomous driving

Completely automated bus transport

DEPOT CHARGING

- Long range – Ultimate flexibility
- Low profile charging stations with plug
- Ultimate battery lifetime

VS

OPPORTUNITY CHARGING

- Delay sensitive – No flexibility at all
- High pantograph cost – Expensive infrastructure
- Fast charging reduces battery warranty

CHARGING OPTIONS

50-120 kW by plug

- ✓ Most robust and cost-efficient solution
- ✓ Possible on 4 locations
  - ✓ Front (standard)
  - ✓ Rear
  - ✓ Above wheel arch (both sides)

240 kW by liquid cooled plug

- ✓ Developed together with Phoenix
- ✓ Liquid cooled plug and cable

300 kW by OPPCHARGE

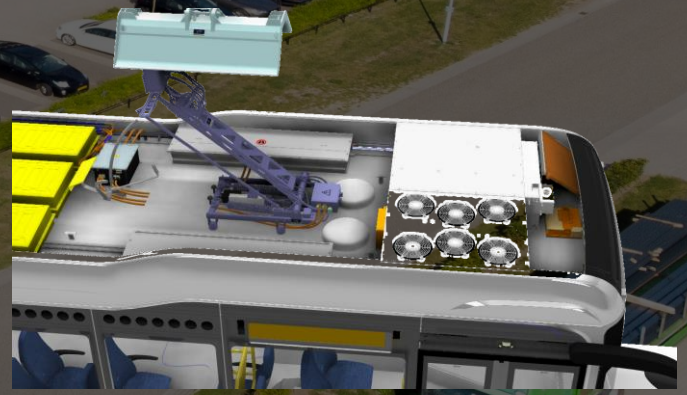
- ✓ Most suitable solution for opportunity charging
- ✓ Standard in Scandinavia and compatible with other OEM's

300 kW by Roof Mounted Pantograph

- ✓ Automatic charging at depot possible
- ✓ Expensive pantograph and expensive infrastructure

OPP CHARGE

ROOF MOUNTED PANTOGRAPH



Technical Capabilities – Charging

DEPOT CHARGER

- Ebusco offers a standard depot charger (plug-in).
- Based on normal operation the minimum capacity demanded is 60 kW,
- Ebusco offers the possibility to upscale this to 120 kW.
- With the general 120 kW charger the battery packs can be fully charged in little over 3 hours.

CAPACITY

- Charge capacity of the depot chargers are 60 kW, 80 kW, 100 kW and 120 kW, resulting in a charge capacity per minute of 1 kWh/min till 2 Wh/min. resulting in the best battery life cycle.

DOUBLE PLUG

- Ebusco can also provide a charger with two plugs.
- Buses can be charged with full capacity (120 kW) with one plug, or two buses on the same charger with 2 x 60 kW.

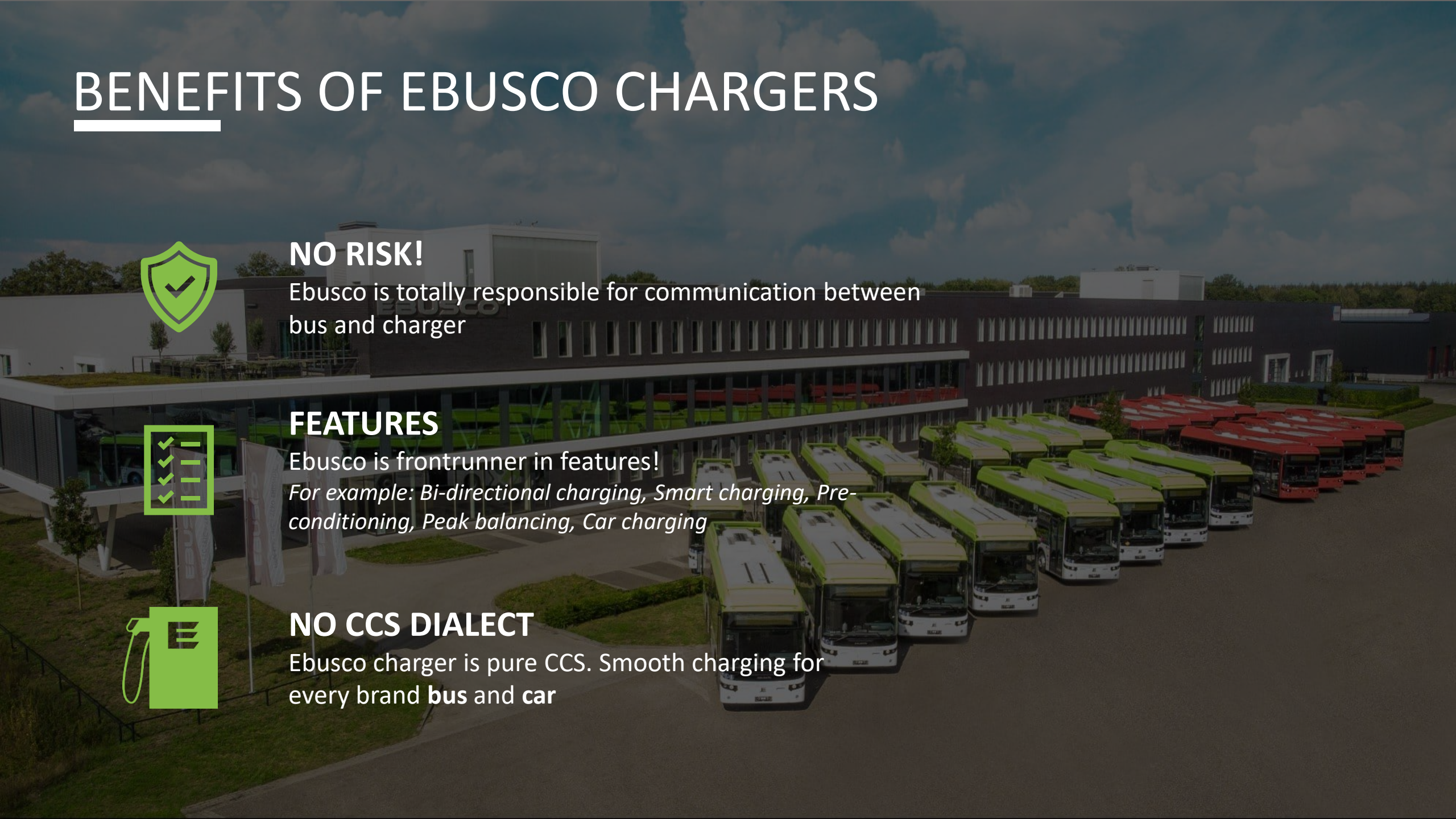
100 kW	150 kW
170 A	250 A

800	mm	WIDTH
1200	mm	HEIGHT
500	mm	DEPTH

HARSH CONDITIONS

THE DEPOT CHARGER CAN HANDLE HARSH SUMMER CONDITIONS AND SUPPLIES EFFICIENT HEAT DISTRIBUTION.

BENEFITS OF EBUSCO CHARGERS



NO RISK!

Ebusco is totally responsible for communication between bus and charger

FEATURES

Ebusco is frontrunner in features!

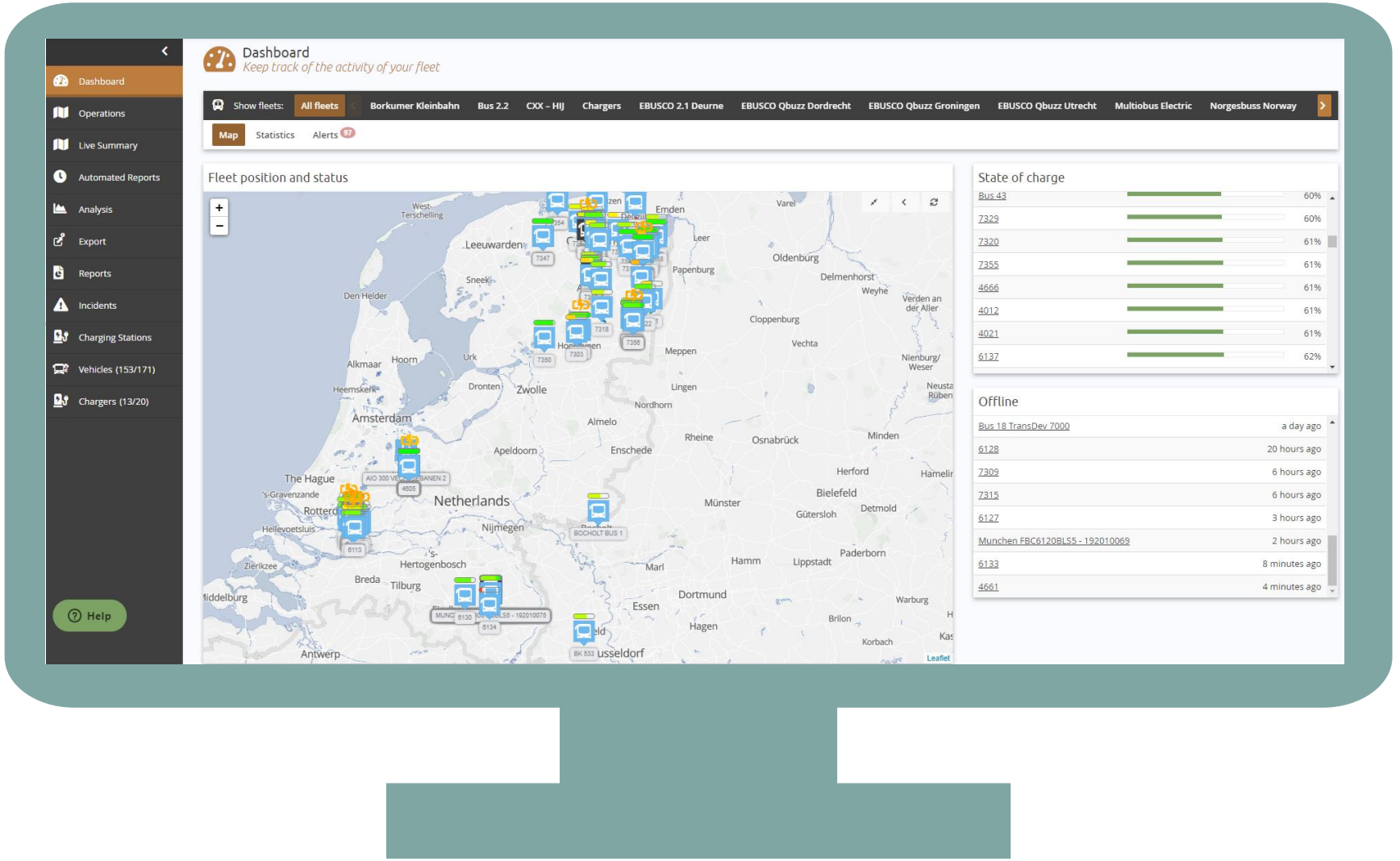
For example: Bi-directional charging, Smart charging, Pre-conditioning, Peak balancing, Car charging

NO CCS DIALECT

Ebusco charger is pure CCS. Smooth charging for every brand **bus** and **car**

MONITORING

Real-time monitoring system for all buses.



TECHNICAL CAPABILITIES – ENERGY STORAGE SOLUTION

BATTERY CAPACITY

BRUTO CAPACITY		*NET CAPACITY*	
2903 kWh	BOL	2613 kWh	BOL
2322 kWh	EOL	2091 kWh	EOL

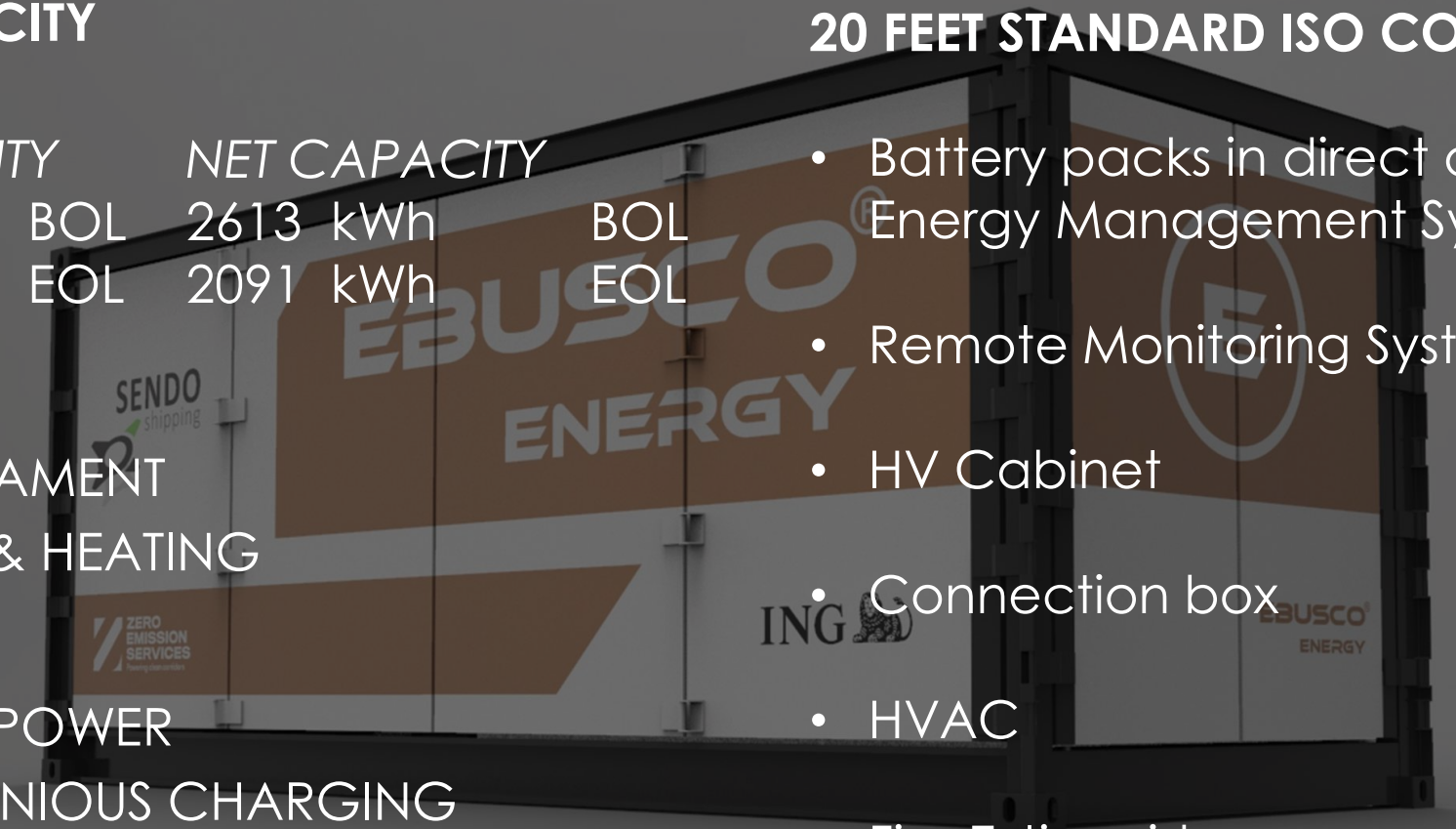
THERMAL MANAMENT

AIR COOLING & HEATING

MAX CHARGE POWER

1 MW CONTINIOUS CHARGING

1 MW CONTINIOUS DISCHARGING



20 FEET STANDARD ISO CONTAINER

- Battery packs in direct accessible racks Energy Management System
- Remote Monitoring System (Ebusco Live)
- HV Cabinet
- Connection box
- HVAC
- Fire Extinguisher

GREEN DEPOT

DEPOT

Green depot

Renewable energy & self-sufficient

CHARGING

Supply and installation

Supply and installation of charging infrastructure. One contact for bus and charger.

WORKSHOP

Outsourcing maintenance

Untill 15 years of full maintenance and service by Ebusco. Workshop at depot.

GREEN DEPOT

Location determination
Best location for minimum empty kilometres.
Permits management

Renewable energy
Self-sufficient by solar power and storage.
All buses on green energy

Installation & maintenance
Lean & mean set-up and design.
Small footprint for urban areas.
Guarantee to use depot for >15 years

SMART CHARGING

Optimum grid connection
Reduce amount of grid connection and save investment at start.

Installation & project management
Grid connection, civil works, cabling, installation and commissioning by Ebusco.

New business models
Car charging during off-peak hours.
Bi-directional charging for grid balancing.
Optimum tariffs at spot market.

SLIM WORKSHOP

Workshop on depot
Reduces amount of necessary space due to less maintenance activities.

Predictive maintenance
By use of real-time online monitoring, resulting in higher uptime.

Training to personnel
Personnel of workshop will receive additional training on high voltage parts and detailed software applications.

OUR DEPLOYMENTS

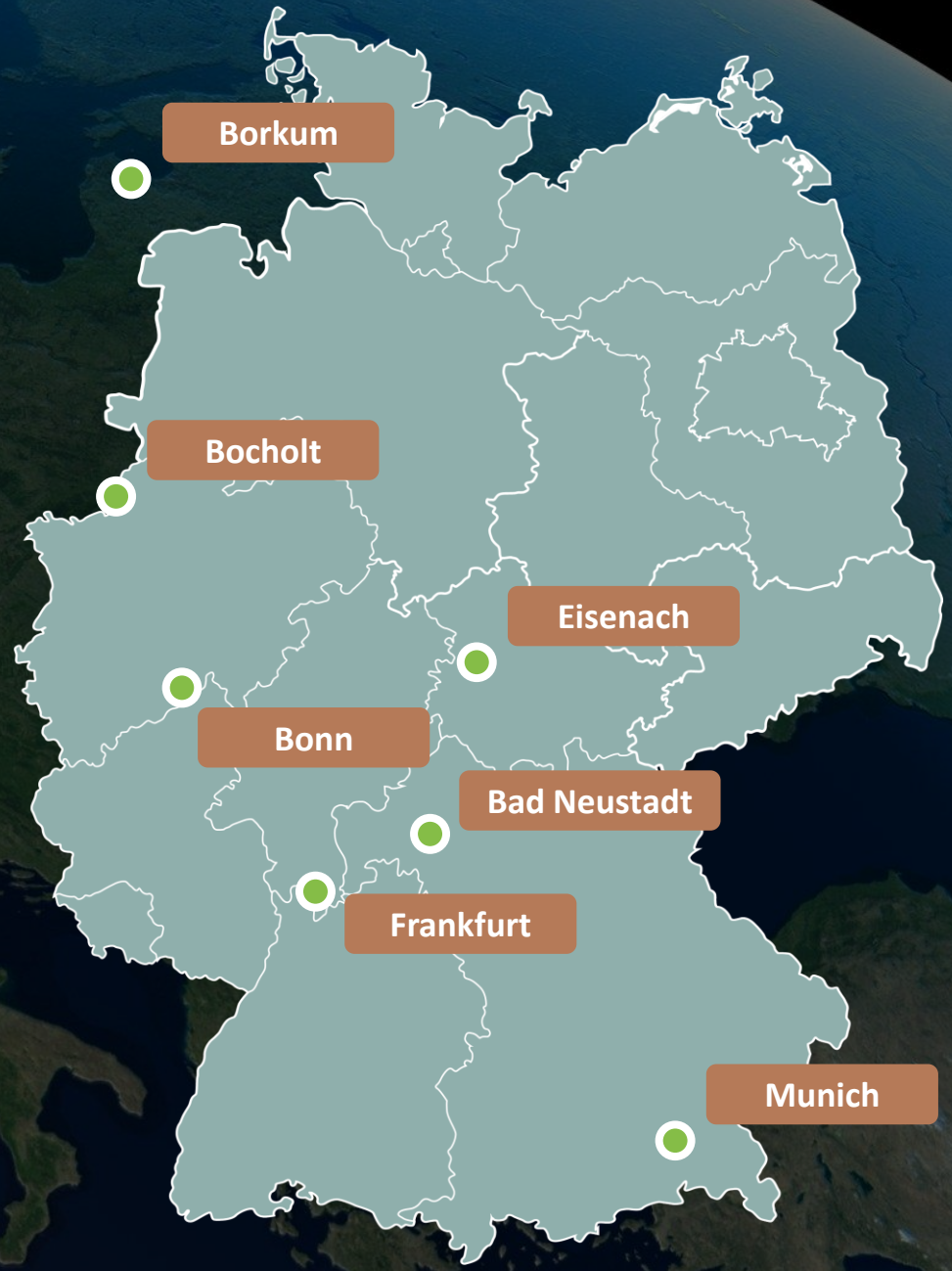
NETHERLANDS

# of buses	Operator	City
10	Qbuzz	Utrecht
20	Qbuzz	Utrecht
37	Qbuzz	Dordrecht
60	Qbuzz	Groningen
45	Transdev	Haarlem
111	Transdev	Amsterdam
39	Transdev	Hilversum

OUR DEPLOYMENTS

GERMANY

# of buses	Operator	City
4	SWB	Bonn
1	DB	Bocholt
2	WM	Eisenach
22	SWM	Munich
23	Transdev	Frankfurt
2	BK	Borkum
1	SWBN	Bad Neustadt



OUR DEPLOYMENTS

REST OF EUROPE

# of buses	Operator	City
4	Transdev	Paris
12	Multiobus	Tienen
5	Norgesbuss	Stavanger
3	Postauto	Saas-Free

Thank You

AMSTERDAM – THE NETHERLANDS

111 buses

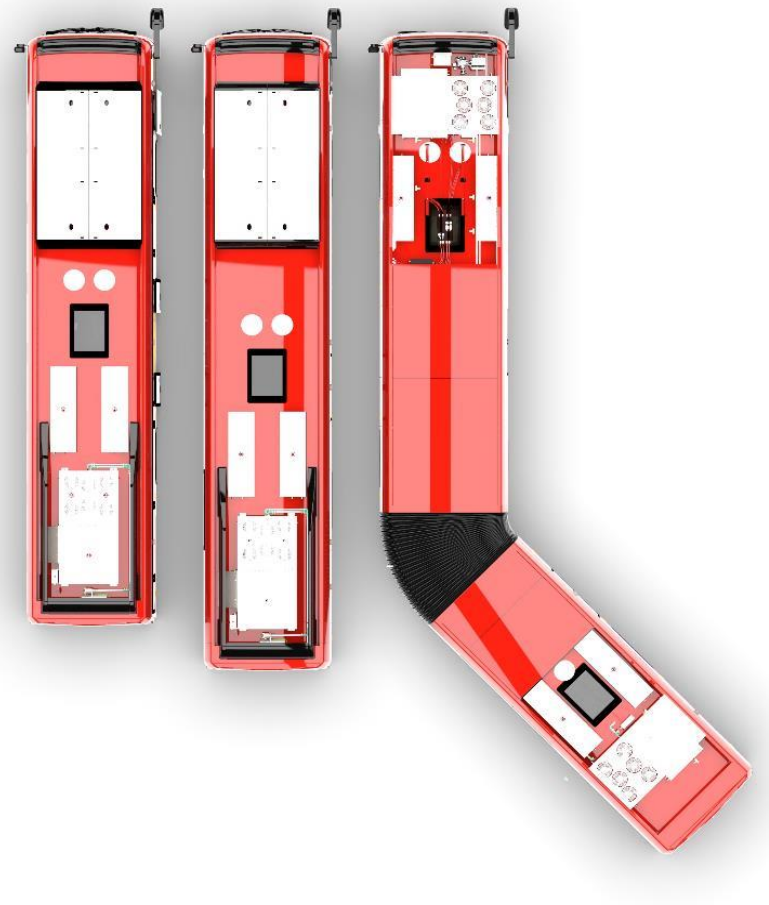
Ebusco 2.2 LE 120

Ebusco 2.2 LE 129

Ebusco 2.2 LE 180

240 kW Plug-in

240 kW Roof pantograph



Region Operation

One of the biggest implementations in Europe

GRONINGEN – THE NETHERLANDS

60 buses

Ebusco 2.2 LE 120

100 kW Plug-in

Region Operation

One of the biggest implementations of Europe

HAARLEM – THE NETHERLANDS

45 buses

Ebusco 2.2 LE 120

120 kW Plug-in

Region Operation

Replacement of Gas buses

HILVERSUM – THE NETHERLANDS

39 buses

Ebusco 3.0 LE 120

240 kW Plug-in

Region Operation

Transdev launching customer of batch Ebusco 3.0

DORDRECHT – THE NETHERLANDS

37 buses

Ebusco 2.2 LF 120

50 kW	Plug-in
300 kW	Reversed pantograph

City Operation

Whole city is electrified!

2nd city in Europe!

UTRECHT – THE NETHERLANDS

20 buses

Ebusco 2.2 LE 120

120 kW Plug-in

Region Operation

Repeating order after succes in city operation

MUNICH – GERMANY

12 buses

Ebusco 2.2 LF 120

Ebusco 3.0 LF 120

50 kW Plug-in

City Operation

Stadtwerke Munich is innovation partner of Ebusco

UTRECHT – THE NETHERLANDS

10 buses

Ebusco 2.1 LF 120

75 kW Plug-in

150kW Reversed pantograph

City Operation

Line 1 is fully electrified

TIENEN – BELGIUM

12 buses

Ebusco 2.1 LF 120

Ebusco 2.2 LE 120

120 kW Plug-in

300 kW OPPCHARGE

Region Operation

Repeat order of operator. One of the first electric buses in Belgium!