49th ASECAP DAYS

Decarbonizing Road Infrastructure : Challenges, Perspectives and Actions in Tough Economy

ASECAP DAYS
BRUSSELS 2022

Hotel Marriott Grand Place, Brussels

24 – 25 November 2022

ASECAP DAYS

BRUSSELS 2022

ALEATICA

Smart & Sustainable Infrastructure

Electric Road System
Dynamic Wireless Power Transfer

Charge by Travelling

High-capacity electric charging while driving on the road via contact-free dynamic inductance charging adapted to any type of vehicle

Presidente Dott. Bettoni

Società di Progetto

A35 Brebemi

ALEATICA
Smart & Sustainable Infrastructure

ASECAP DAYS
BRUSSELS 2022

Electric Road System

Dynamic Wireless Power Transfer

Charge by Travelling

High-capacity electric charging while driving on the road via contact-free dynamic inductance charging adapted to any type of vehicle

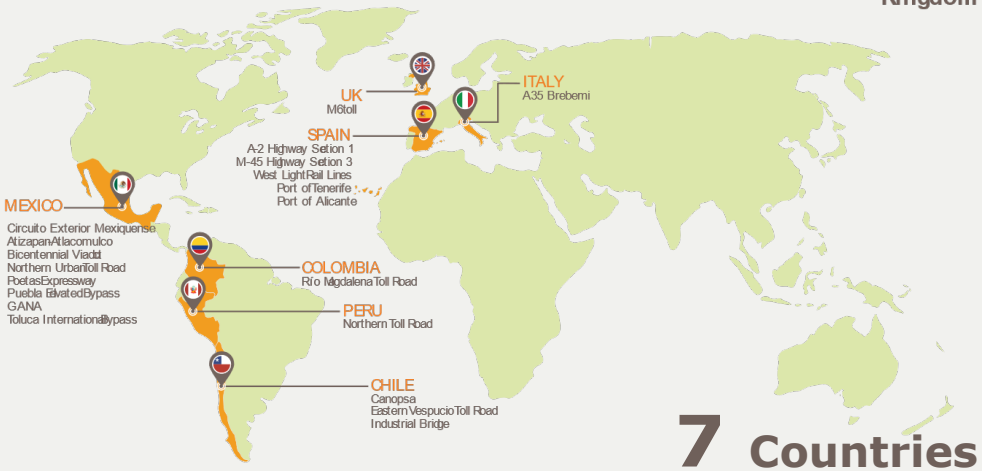
A smart, safe, sustainable mobility company

We are an exclusive transport infrastructure operator, which means we can focus purely on the design and operation of highways and other mobility assets in Europe and Latin America.

Aleatica is fully owned by **IFM Global Infrastructure** Fund, which is managed by **IFM Investors**, a pioneer in infrastructure investment.

Our operation has a unique geographic footprint.

Mexico | Peru | Colombia | Chile | Spain | Italy | United Kingdom



7 Countries

We anticipate transportation needs for the next 20 years.

We're working every day to improve quality of life for roadway passengers, employees, and the communities where we're present. We've developed technological projects for sustainable mobility and create alliances with organizations committed to caring for the environment.

353,337
million vehicles travel on **Aleatica** roads each year.

3,000
employees worldwide

€ 810 million
euros in net sales in 2021

€ 114.6 million
to be invested in the next 5 years in several projects focused on the safety of our employees, roadway passengers, and neighboring communities.

9 Urban highways
7 Interstate corridors
1,131.83 kilometers

2 Commercial ports
307,891 Annual Containers
47.3 hectares

1 Light Rail-Metro
6.8 million passengers annually

1 Airport
Potential capacity to transport
8 million passengers annually

* M6toll: Asset in process of integration into Aleatica's portfolio

Electric Road System

Dynamic Wireless Power Transfer

IVECO bus during testing

Electric Road System
Dynamic Wireless Power Transfer

ASECAP DAYS BRUSSELS 2022

Lines of work

1. A 1,050-meter asphalt ring fed with an electrical power of 1 MW.
2. 'Dynamic Wireless Power Transfer' technology applied to various ranges of electric vehicles.
3. Advanced 5G connectivity to guarantee the utmost road safety and V2I communications.
4. Optimizing the road surface to make it more durable and maintain the efficiency of the inductive charge.
5. Assessment of environmental benefits.

Phases of the project

Now the works is in progress for the e-certification

Electric Road System
Dynamic Wireless Power Transfer

ASECAP DAYS BRUSSELS 2022

Industrial partners

A35 Brebemi

- ERS system WPT — electreon
- Development and integration of the WPT system — STELLANTIS, IVECO, IVECO BUS
- Power, distribution, and ESS — ABB, Prysmian Group, FIAMM
- Asphalt — MAPEI
- Construction — PIZZAROTTI SINCE 1910
- Communications V2I — TIM

Research centres

- Power source and charging
- Materials & Environment
- Environment

POLITECNICO MILANO 1863 — **SYSTEMS:** Study of the power system, distribution, protection, and electromagnetic fields.

UNIVERSITÀ DI PARMA — **INFRASTRUCTURE:** Electromagnetic fields and their interaction with asphalt.

ROMA TRE UNIVERSITÀ DEGLI STUDI — **ENVIRONMENT**: estimate of impacts and benefits

Emergency services

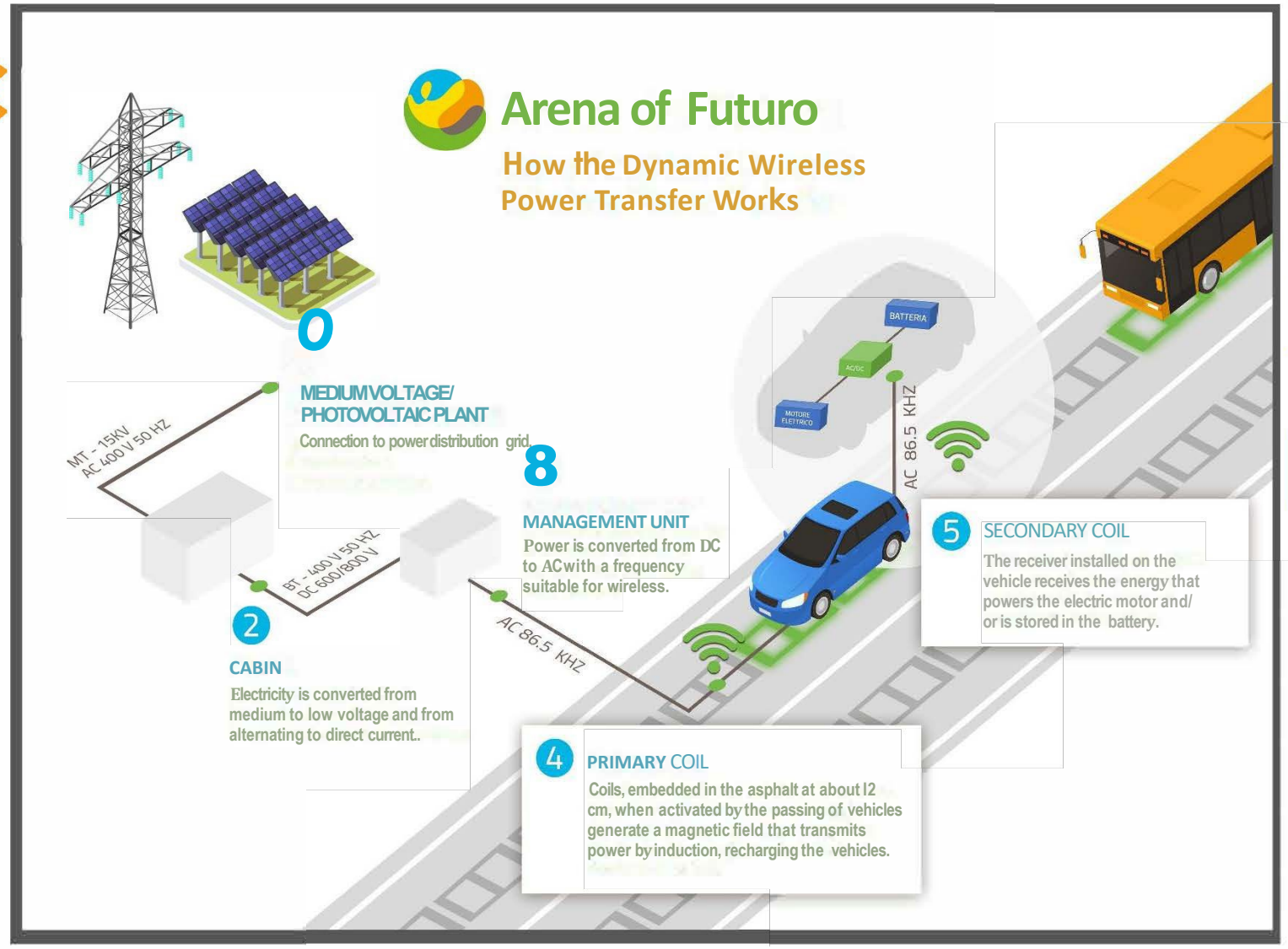
Polizia di Stato
State police

VIGILI DEL FUOCO CORPO NAZIONALE
Firemens

SAFETY: Emergency management

Electric Road System

Dynamic Wireless Power Transfer



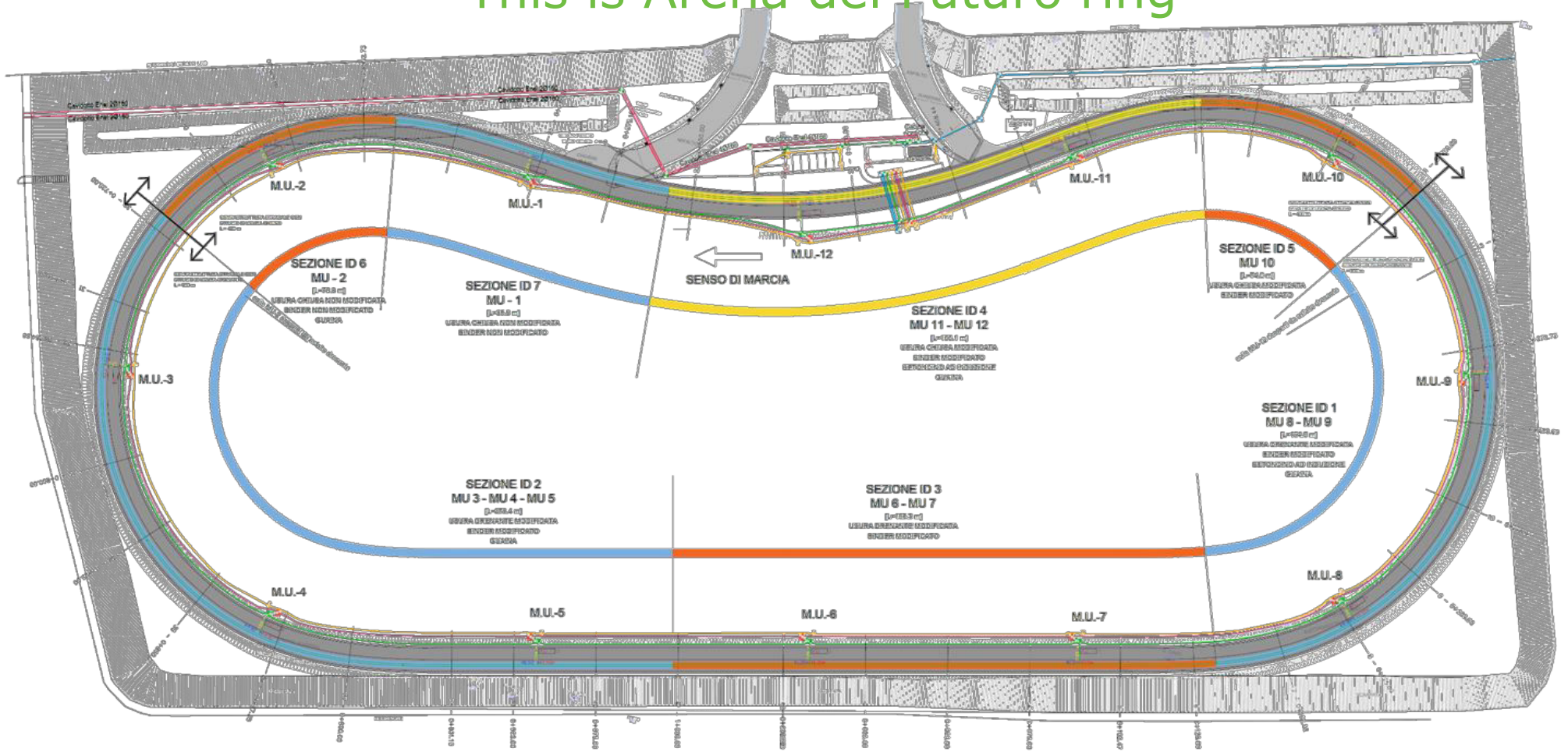
Vehicle	Speed [km/h]	Energy consumed per km [kWh]	Energy stored per km [kWh]
Car	70	0.16	0.35
Car	100	0.2	0.25
Bus	70	1.3	1.1
Bus	80	1.5	0.9
Truck	70	1.9	2.5
Truck	80	2.1	2.2

The efficiency of the system in terms of energy transferred from the network to the vehicle is expected to be about 88 [%].

Electric Road System
Dynamic Wireless Power Transfer

ASECAP DAYS BRUSSELS 2022

This is Arena del Futuro ring



THE PATH WAS DIVIDED INTO 7 SECTIONS OF DIFFERENT TYPES DEPENDING ON CONSTRUCTION DETAILS AND MATERIALS

EACH SECTION REFERS TO A DIFFERENT TYPE OF ROAD

THE GOAL WAS TO ANALYSE THE BEHAVIOUR OF THE SYSTEM IN TERMS OF EFFICIENCY ON VARIOUS TYPES OF ROAD NETWORKS

Electric Road System

Dynamic Wireless Power Transfer

Construction times and costs per km*

Some very important pratical date:

Time to install the systems **7 days**

Time for civil works **3 days**

\+ Start up

Cost from €/km **1.5–2 million**

*Typical section 4 km

Electric Road System

Analysis during the tests

ASECAP DAYS BRUSSELS 2022

INFRASTRUCTURE AND COMPONENTS

- DEVELOPMENT OF AN ELECTRICITY DISTRIBUTION ARCHITECTURE CAPABLE OF INTEGRATING LOCALLY PRODUCED RENEWABLE ENERGY WITH ENERGY FROM THE NATIONAL MAINS
- DEVELOPMENT OF MONITORING AND REMOTE CONTROL SYSTEMS USING DIGITAL PLATFORMS AND ANALYSIS OF THE ELECTROMAGNETIC FIELDS
- INTEGRATION OF THE TECHNOLOGY ON VEHICLES AND THE NECESSARY OPTIMIZATION FOR THE RELATED HOMOLOGATION
- MECHANICAL BEHAVIOUR OF THE ROAD SUBJECTED TO THE MAGNETIC FIELD

POLITECNICO MILANO 1863 UNIVERSITÀ DI PARMA

electreon ABB Prysmian Group MAPEI STELLANTIS IVECO IVECO BUS TIM PIZZAROTTI SINCE 1910

Electric Road System

Analysis during the tests

ASECAP DAYS BRUSSELS 2022

SAFETY - VERY IMPORTANT

- RISK PREVENTION AND PROTECTION MEASURES FOR BOTH THE INFRASTRUCTURE AND VEHICLES
- INTEGRATED SAFETY MANAGEMENT OF THE VEHICLE CHARGING INFRASTRUCTURE
- VEHICLE ASSISTANCE PROTOCOLS
- EMERGENCY INTERVENTION PROCEDURES
- STAFF TRAINING AND SHARING OF EMERGENCY PROCEDURES
- SIMULATIONS

Polizia di Stato

VIGILI DEL FUOCO CORPO NAZIONALE

POLITECNICO MILANO 1863

electreon ABB STELLANTIS IVECO IVECO BUS TIM

ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACTS WILL BE ANALYSED ON TWO DIFFERENT LEVELS:

A) ASSESSMENT OF ENVIRONMENTAL BENEFITS COMPARED TO THE CURRENT FLEET DRIVING ON TRADITIONAL MOTORWAYS

B) ASSESSMENT OF ENVIRONMENTAL BENEFITS WITH RESPECT TO PLUG-IN SYSTEMS

IN BOTH CASES, DIFFERENT EMISSIONS CONTRIBUTIONS WILL BE ANALYSED IN TERMS OF BOTH DIRECT AND INDIRECT EMISSIONS.

THE FOLLOWING WILL BE CONSIDERED

- **DIFFERENT CLASSES OF VEHICLES**
  - **FIAT 500 ECONOMY CAR …**
  - **IVECO INTERCITY BUS …**
- **DIFFERENT PROPULSION SYSTEMS:**
  - **INTERNAL COMBUSTION ENGINE (DIESEL, PETROL)**
  - **ELECTRIC ENGINE**

Electric Road System
Dynamic Wireless Power Transfer

ASECAP DAYS BRUSSELS 2022

Advantages

Facing an increase in demand:

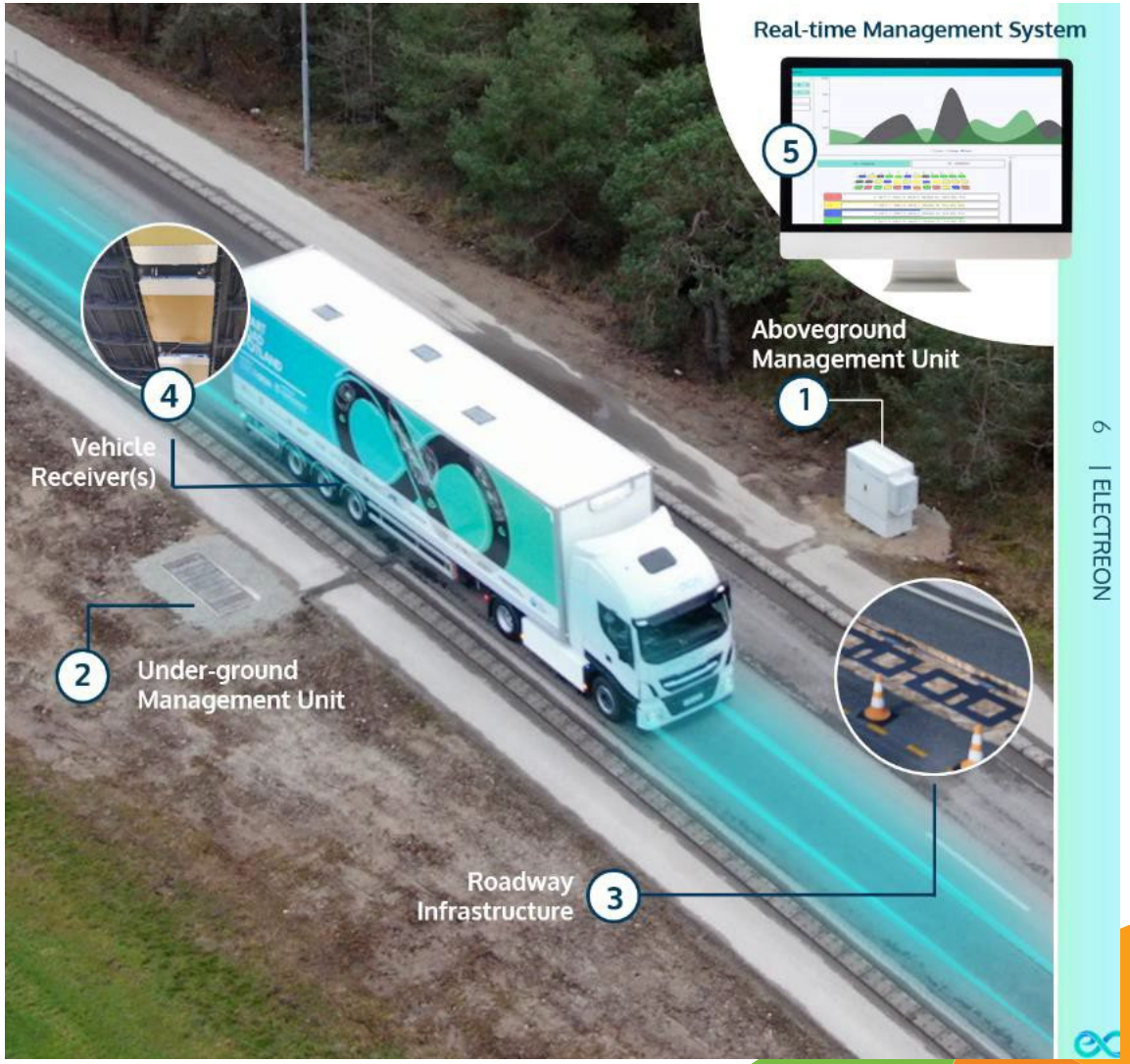
- Electric
- Components for batteries and battery chargers
- Battery charging and occupied space

The ERS system leads to:

- Solutions to the issue of space; it uses nearby areas on the road.
- Leads to a reduction of batteries in vehicles.

Opportunities:

- New activities that add value with profit margins for the different stakeholders.
- Defining and creating key roles in the nascent value chain tied to electrification of the road infrastructure.



CLICK HERE TO WATCH THE VIDEO

Dear, it is not easy to understand DWPT in a short time. Please refer to www.brebemi.it for more detailed information.

ASECAP DAYS

BRUSSELS 2022

THANK YOU FOR YOUR ATTENTION

A35 Brebemi