

## IN MALAGA, ENDESA, ALSTOM AND MANSEL TEST A CUTTING-EDGE SYSTEM FOR CHARGING ELECTRIC BUSES THROUGH A CHARGER INTEGRATED INTO THE GROUND

- *The technology, developed by Alstom and based on catenary-free tram systems, charges vehicles at regular stops at the end of the line, thereby increasing their range without modifying their routes, capacity or operating times.*
- *The project includes adaptation of an electric bus, installation of a quick-charge system integrated into the ground at the last stop on the line, as well as implementation of advanced monitoring technologies in the electric grid.*
- *Thus, the city of Malaga is strengthening its commitment to sustainable transit, becoming both a showcase and a world-class testing lab.*

**Malaga, 24 September 2019** – In Malaga, Endesa, Alstom and Mansel, in collaboration with the local government and the University of Malaga, have launched the world's first prototype of a quick-charge system integrated into the ground for electric buses.

The project, known as PALOMA (Prototype for Alternative Operation of Mobility Assets), includes adaptation of a 100% electric bus and installation of a 200-kW rapid-charging system installed in the ground at the last stop on the line, as well as the electric infrastructure necessary for smart charging that minimises impact on the electric grid (an automated transformer centre equipped with advanced high- and low-tension monitoring technologies).

The project has the backing of the Malaga City Council, the Ministry of Economy and Competitiveness and the University of Malaga. It has also be co-financed with funds from the European Regional Development Fund (ERDF) through the Centre for the Development of Industrial Technology's INTERCONECTA programme.

The project is adapting the L line of urban EMT buses, which provide service to the University of Malaga and stops at various spots on the Teatinos campus. The charging system has been installed near the School of Industrial Engineering (on Calle Doctor Ortiz Ramos) and the necessary electrical infrastructure has been put into place.



## **World-class testing lab**

Malaga is becoming the first-ever real-world lab to implement this technology, which was developed by Alstom based on catenary-free ground-charging systems for trams. The electric bus will run on Malaga's L line, showcasing the advantages and usefulness of a new charging system that:

- Enables buses to quickly charge at stops. This increases electric buses' range, efficiency and capacity relative to buses that can only plug in at charging stations at the end of the day. This greatly increases the bus's range without changing operating times, thanks to rapid charging.
- Is integrated into the asphalt, which means it can be easily incorporated into the urban landscape without any height restrictions for vehicles.
- Utilises ground-based charging and so will not affect local residents in the same way that pantograph-based charging from the roof of the bus would. This also means the system will not be a visual obstruction.
- Charges through contact, which increases the system's speed and efficiency.
- Is an open technology, which can be installed and integrated into any model of bus without altering the minimum ground clearance.

Periodic charging increases electric buses' range, efficiency and capacity relative to buses that can only plug in at charging stations at the end of the day. The goal is to double the bus's range without changing operating times, increasing the profitability of the fleet of electric buses. This system, which is compatible with any kind of electric vehicle, also reduces the number of batteries and their weight, thereby cutting costs and maintaining the same transportation capacity.

Not to mention, this technology could also be installed in operator sheds as an alternative to the current charging systems. Since it's an automated charging systems that works for many voltages, it facilitates more efficient energy management in whole fleets of electric buses.

Thus, Malaga is strengthening its commitment to sustainable transit, once again becoming both a shop window and a world-class testing lab. The launch of this project will include a 100% electric urban bus that will be completely wireless; it will be able to cover its entire route with energy provided through this system, a development that marks a qualitative leap in terms profitability for this kind of transit.

## **Smart charging**

This experience is only the latest in a series of innovative developments by Endesa in the Living Lab Smartcity Malaga, where several technologies for the smart networks of the future are being tested and endorsed.

This new charging system will be integrated into Endesa's electric distribution grid through one of the most advanced smart transformer centres in Spain. This centre will be able to monitor all of its operations in real time, enabling analysis of the integration of these new sustainable transit devices, thereby minimising their impact on the electric grid. It will also make it possible to study how it complements other energy resources throughout the city whose presence will increase in the short-term, such as the systems for demand management, renewable energy production and power storage in batteries.

For these particular studies on grid impact, through Endesa, the consortium is relying on support from the Advanced Technical Faculty of Industrial Engineers through its electrical engineering department.



### **Testing Malaga's urban transport grid**

In the coming months, the Malaga transit company, EMT, will conduct real-life test on the L line within the confined of the University of Malaga's Teatinos campus. Two electric buses fitted with the necessary technology for real-time charging during their regular operations will take alternating shifts, though the bus from the PALOMA project will be the one in service most of the time.

The L line offers service from 7:30 a.m. to 9:30 p.m., a total of 14 hours. No electric bus currently available from any of manufacturer's catalogue offers this kind of range, which means that operators periodically have to pull the electric buses from service and return them to their charging sheds. This is precisely the handicap that the PALOMA project solves, offering a potentially definitive solution for electric public-transit vehicles.

The L line begins at the intersection of Avenida Pasteur and Jiménez Fraud (near the Medical, Telecommunications, Computer Science and Clinical Hospital hubs) and covers a route that cuts through the new campus, providing service to the Polytechnical, Business Management and Health Sciences Schools. The charging centre is located in front of the Polytechnical School.

### **Technology from tram systems**

This technology is known as SRS (Static Recharging Solution), an innovative approach to electric charging through contact with the ground, which is based on tram technology already tested and approved by various international bodies.

It is based on Alstom's ground-feed systems, though it features specific adaptations and developments for road vehicles. While the original technology charges trams as they operate, the SRS solution charges the vehicle when it is at a stop. The bus, which is fitted with batteries, charges through contact with a conductor rail located in the earth, through charging pads in the bottom of the vehicle. The system is activated through telecommunication signals that buses send when they reach the charging point.

The system is 100% safe, with tested, compact technology that is compatible with any make of vehicle, marking a qualitative leap in terms profitability for this kind of transit.

This project has the backing of the Malaga City Council, the Ministry of Economy and Competitiveness and the University of Malaga. It has also received funding from the European Union through ERDF and CDTI (the Centre for the Development of Industrial Technology).