

# FACTSHEET MADRID



## Demonstration City | Madrid - Spain

### Cutting-edge technology for smart charging

Given that by the end of 2020, Madrid will have 93 e-buses running in the city, measures to provide adequate and efficient charging will be needed. Five inductive charging points have already been implemented in the city and the buses to be purchased during 2019 will have the capability of off-board opportunity charging. Thus, the pilot will focus on the following measures:

- 1) Development of software to monitor and control the power network for charging stations and e-buses, maximizing bus availability and operational efficiency.
- 2) Purchase and installation of 2 (two) inverted pantographs for opportunity charging with a modular design offering charging power of 150kW, 300kW, 450kW and 600kW, enabling charging times of 3-6 minutes using a low-cost and low-weight interface on the roof of the bus.

These will be the first inverted pantographs installed in the city. Besides increasing the power and thus the speed of each charge, the smart and wireless characteristics of this equipment, will increase the efficiency and safety of the charging process.

### Cutting-edge Technology for Smart Charging

#### The approach/ innovative aspect

- Cutting-edge smart charging technologies that will support the uptake of e-buses in the city by enabling charging times of 3-6 minutes using a low-cost and low weight interface on the roof of the bus
- Development of software that will monitor and control the power network for the charging stations, and thus assist in the maximization of bus availability and operational efficiency



#### Activities

- Development of software to monitor and control the power network for charging stations and e-buses (SOL + MaaS App)
- Inverted pantographs for opportunity charging with modular design offering charging power of 150 kW, 300 kW, 450 kW and 600kW
- Business model development for e-taxis and e-car sharing
- Formulation of realistic medium and long-term bus fleet electrification plan
- Research and formulation of regulations necessary for zero emission zones

Demonstration actions and support teams			
	10 e-buses	2 inverted pantographs for e-buses	SOL+ MaaS app