# Parma: "la petite capitale" where trolleybus wires tradition with modernity

Parma, with it's 400.000 inhabitants (180.000 in the city center and about 220.000 living in the province) is an elegant city placed in the middle of the Po Valley, in the north east of Italy, where there's a refined atmosphere that can only be breathed in a ‚petite capitale'. Its centre rich of art, parks and treasures from different ages, is a very welcoming place for tourists and citizens.

Yet Parma is not only the city itself, the monuments or the tradition in music and culture. Parma also includes the province, that gave birth to Giuseppe Verdi and to a flourishing lyrycal and theatrical tradition.

The territory is rich of infinite funds, with a varied landscape that stretches from the Po river to the Appenines' crest, with small villages rich of history and liveliness, castles, medieval parish churches and theatres spread in the countryside.

Parma is also the capital of the Food Valley and is siege of primary industrial factories such as Barilla and is also renowned for the production of the Parmigiano Cheese and Parma ham.

## *Trolleybus in Parma*

Tep s.p.a. is the public transport company of Parma since 1948. Parma owns a trolleybus network of about 20 Km, used with 34 vehicles on 4 lines. There are 133 bus stops and the distance between these stops is ca. 250 meters. Tep carries about 7.500.000 passengers per year and is one of the twelve Italian companies still using trolleybuses. Unlike other cities, Parma has invested in the trolleybus fleet and is extending it's network.

Trolleybus is aimed to become one of the most important actors on the routes with the highest density of traffic, creating an environmentally sustainable and energy efficient alternative to car use.

CENTRAL EUROPE COOPERATING FOR SUCCESS

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# *Main activities in Trolley*

## Optimising Energy use

TEP is going to purchase 9 new trolleybuses to be equipped with supercapacitors within the Trolley project. The kinetic energy recovery system (KERS) of supercapacitors installed and tested on a small fleet of trolleybuses will optimize the energy use by 25%.

The proposed investment is a real technology highlight in on-board storage and recovery of energy. The planned super capacitors ("supercaps") in Parma are enhanced versions that are able to store a reasonable amount of energy. In addition, they are able to recover energy while the vehicle is braking and release it again when it is accelerating. Recharging takes only three to five minutes and is therefore suitable for urban traffic situations in Central Europe. Another highlight of this technology is their lifetime: about one million charge-discharge cycles, since they are functioning on no chemical but on a physical process.

This pilot investment makes use of braking energy that often remains unused and the test results will influence the Central European trolleybus market being the basis for other decision-makers whether to take-up these devices in their fleet.


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