War and Peace…
Good practices on Electric Mobility, in Portugal

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In spite of the title that leads us to think immediately about the author of the famous novel War and Peace, the subject of this article will not be Leo Tolstoy (1828-1910), but electrical mobility. Interestingly, the electric motor had a very important milestone in the era the famous writer lived: it was invented by William Sturgeon in 1832. By an irony of fate, Tolstoy ended up dying in a railway station at Astapovo…

As an introduction it is interesting to reflect on the differences between the genesis of the combustion engine and the electric motor. In fact, it was during the wars that the technology for internal combustion engines was developed, envisioning success in combat missions, while there was no particular concern with energy efficiency, since the aim was to move fast. In peacetime, the objectives turn out to be different and the motivations for improvement are focused on comfort, energy efficiency and the environment.

As it turns out every day, there are more and more initiatives towards greater energy efficiency, as well as a growing interest in environmentally sustainable solutions, as shown through the **good practices on electrical mobility, in Portugal**, that we present you today.

MOBI.E – National Electric Mobility Net

MOBI.E is an integrated charging system for electric vehicles, based on a universal and open-access platform that was developed at national level, in Portugal, as a pilot experience to promote sustainable mobility.

The development of the system started in 2008 with the research and groundwork for both the software and the hardware required for the MOBI.E deployment. For that purpose, a large partnership was created including public R&D Institutions, private technology companies and energy suppliers.

Most charging systems for electric vehicles developed so far, in other countries, have a local scope and are isolated from other similar initiatives. Therefore, a user from city "A" cannot use the charging system in the city "B". MOBI.E was designed to be implemented in a "system of systems approach", thus overcoming the lack of interconnection between different systems, regardless of their location.

To use the system a pre-paid MOBI.E Card is required. With this card it is possible to charge a car battery with electricity supplied by any retailer at any of the system's charging stations.

The MOBI.E system also enables the integrating of other services, such as tolling, parking, public transportation, or car sharing. This means that the MOBI.E Card can be used as a payment card for most of mobility issues.

Through the Mobility Intelligence Center (MIC), MOBI.E integrates all the information flows among the users and all the companies involved, acting as a Clearing House. This solution reduces transaction costs and avoids the duplication of systems.

The MOBI.E charging network is in operation. When concluded, the pilot network will have 1,300 normal charging points (charging a battery fully in 6-8 hours) in 25 municipalities and 50 quick charging points (charging a battery at 80% in 15-20 minutes), located in the most important motorways.

The first charging point was installed in June 2010 in Lisbon. Currently there are 548 charging stations in Lisbon and a total network of 700 stations is foreseen, in the future.

548 charging stations in Lisbon

The aim of the Portuguese electric mobility initiative is to position Portugal as a pioneering country in the development and adoption of new energy models for sustainable mobility.

Portuguese Postal Service – Electric bikes for sustainable mobility

CTT (the Portuguese Postal Service) is firmly committed to sustainable mobility and has been introducing less polluting vehicles in the mail distribution fleet. Currently, 7% of the total fleet (3061 vehicles) is composed by green vehicles (224), including hybrid vehicles, electric bicycles, electric scooters, four wheeled electric vehicles and conventional bicycles.

The most recent project was the acquisition of 150 electric bicycles, mostly for rounds previously made on foot, or for replacement of conventional motorcycles.

The 150 electric bicycles were produced by a Portuguese manufacturer (Órbita), according to the CTT requirements. The final prototype was defined

after field tests done in 2011 and 2012, in rural, mixed and urban areas, using imported models.

Given the dispersion of CTT post offices throughout the country, the manufacturer created a maintenance network at national level.

The delivery of the e-bikes to the Post Offices was preceded by optimization studies, defining the number and the characteristics of the rounds.

The process of allocating the e-bikes to the Post Offices got much involvement from the staff and the e-bikes ended up almost exclusively in urban or suburban areas.

For operation and management of the electric bikes project the following procedures were adopted:

- ✓ Training actions in each region were organised, including area managers and cascading down to the postman level, in every post office involved;

- ✓ A User's Guide was prepared focusing on key activities such as loading, driving, battery charge and maintenance;

- ✓ The e-bikes were included in the central Fleet Management System and their operational conditions are regularly checked.

✓ Batteries are charged on a daily basis (1 hour/day), in general after the round.

The adoption of electric bicycles increased the efficiency of mail delivery, contributed to the comfort and safety of mailmen/women, allowed for a reduction in investment and operational costs and had a very favourable environmental impact, eliminating the emission of 50 tons of carbon dioxide per year.

Average total daily mileage of the 150 e-bicycles is around 1,368 km, which is equivalent to a "Tour of Portugal".
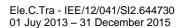
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Electric Taxis, In Lisbon

After the good results of a pilot experience with two electric taxis, the municipality of Lisbon will provide financial incentives to promote fleet renewal, towards electric mobility, during 2014.

The total amount of 60.000 euros will be distributed among ANTRAL and FPT (the two taxi associations operating in Lisbon) in order to support the acquisition of 20 new electric taxis, which will replace old internal combustion engine vehicles, having European standard equal or inferior to Euro 3. Antral and FPT will designate 20 taxi owners that will benefit from the subsidy and will commit to maintaining the electric vehicles service for a minimum of five years.

The electric taxis will contribute to reducing GHG emissions and noise pollution and their operation and maintenance costs are lower than those of conventional taxis.

Furthermore, circulating on a daily basis in Lisbon, the vehicles will have a favourable effect on mainstreaming of electric mobility. An information gathering system will be installed in the new taxis, that will allow to assess the environmental and economic impacts of the initiative, providing data about kilometres covered, fuel savings and reduction of GHG emissions.

In peacetime we need peace solutions. There is a strong commitment to electric mobility by the major automobile manufacturers, which is a clear sign that **electrical mobility is here to stay**.

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