

Particle physics

Florinda Boschetti has the lowdown on the MOLECULES project: where electromobility meets sharing services

In recent years the European Commission has increased its support of electromobility initiatives in cities and regions by giving a boost to the Electric Vehicles (EV) market and deployment of recharging points across the Union.

Although many acknowledge that electromobility holds the potential to tackle some of the environmental and economic challenges of our society, there is still a great need for coordination between the recharging infrastructure and the vehicle so as to achieve the integration of the EVs in the overall mobility scheme of a city in line with the cooperative and multi-modal basis approach sought by the EU.

A number of European projects are looking at these challenges: MOLECULES (Mobility based on electric connected vehicles in urban and interurban smart, clean, environments), a demonstration oriented project funded by the Competitiveness and Innovation Framework Programme (CIP) is one of them.

MOLECULAR BREAKDOWN

The main aim of MOLECULES is to foster the deployment and market uptake of electromobility mobility solutions in cities and regions across Europe through a set of ICT services that will help to achieve a consistent, integrated uptake of Smart Connected Electromobility (SCE) in the overall framework of an integrated, environmentally friendly, sustainable multimodal mobility system. The project kicked-off in January 2012, will run until the end of 2014 and will be piloting three large-scale test sites in Barcelona, Berlin and Grand Paris area.

In each site MOLECULES will offer people access to a wide range of vehicles (ie e-bicycles, e-motorcycles and e-cars) and will develop some common ICT services to best assist EV end-users and enhance their experience with electric-vehicles. Users will be guided through their e-mobility options to choose the best transportation means according to their mobility needs and to optimize travel costs, always with an attentive eye on their carbon footprint and pollution reduction. In particular:

- In Berlin, MOLECULES will integrate car-sharing schemes within traditional transport solutions to enhance the users experience with electric vehicles and to foster multi-modal mobility options.
- In Barcelona, MOLECULES will integrate three different



A micro-chip inserted in a sticker on your driver's licence can give you access to any DriveNow e-car sharing vehicle in Berlin

experiences: the sharing e-bikes schemes, the deployment of electric fleets for urban maintenance of public services and the offer of e-bikes and joint public mobility services to city visitors.

- The Grand Paris pilot will demonstrate that it is possible to integrate and complete the existing network transportation of an extended metropolitan area adding some environmental value with local car pooling, car sharing and intermodal experiences and, especially in Marne la Vallée, the cluster of the sustainable city of Grand Paris.

PILOT REQUIREMENTS AND USE CASES

MOLECULES addresses the challenge of EV integration by means of identifying a number of common ICT service categories among the three sites and integrating them on an open architecture enabling Smart Connected Electromobility (SCE). To achieve this ambitious goal, firstly MOLECULES has defined Pilot Requirements and Use Cases descriptions in the context of EU electromobility initiatives. Secondly, MOLECULES has classified use cases in five main categories, according to the main goal to be tested in the pilots. These categories are:

- EV sharing (SH): group-use cases mainly focussed on the interaction between users and EV sharing providers using MOLECULES platform. Different user profiles and EV types are taken into account.
- Fleet Management (FL): group-use cases that target EV fleet managers' point of view. Performance of EVs versus traditional Internal Combustion Engine (ICE) vehicles



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and charge optimization and environmental impact are addressed.

- Sharpooling (SP): group-use cases that merge e-carsharing experiences with carpooling.
- Incentives (IN): group-use cases that concentrate on the impact of incentives provided to EVs such as parking facilities and access granted to special areas and dedicated lanes within the city.
- Multimodal Mobility (MM): group composed by use cases that integrate EVs with other means of public transportation.

A use case may have particular instantiations in each pilot site. Not all use cases will be instantiated in the three pilot sites, but it is intended to have instances of each use case in at least two pilot sites.

ICT SERVICES AND THE MOLECULES PLATFORM

Once the use cases had been defined, the next task was to gather requirements that will define the MOLECULES platform. It should be kept in mind that the three pilot sites already have electromobility experiences and ICT-based mobility services in place, nevertheless diverse systems exist in each site. The platform will be built up on existing systems running in the three sites; and on defined transport policies and regulations. Since one of the goals of the project is to assure transferability, the requirements were defined and pilot site particularities overcome. However, for some

requirements addressing local regulations or specific implementations it was unavoidable to specify the pilot site where they apply.

The requirements have been gathered with an iterative methodology to favour the discussion between partners and the refining of all the requirements until an agreement was found. The set of requirements obtained addressed a wide variety of topics such as architectural principles or functionalities of each of the services developed to enhance electromobility.

The ICT services were divided into seven categories: Personal trip planning; Electric Vehicle sharing/pooling; Personal recharging advisor; Personal carbon footprint advisor; Electromobility billing support; Incentives to electromobility; and Network strategies. According to the specific context of each of the demonstration sites, MOLECULES will offer the public alternative electromobility modes of transportation supported by the selected ICT technologies.

These existing solutions, that could be different in each pilot site, will be integrated in a platform specially designed for that purpose: a MOLECULES platform, aiming at enabling interoperability of SCE with multiple transport and grid infrastructures.

Ms Alma Solar Calatayud, project coordinator at ETRA, says: “The coordination between the recharging infrastructure, the EV and the overall mobility schemes of a city or interurban road network is the key point of the project.” She emphasises that “MOLECULES will provide a centralized web-based tool supported on consistent, environmentally

friendly and sustainable Smart Connected Electromobility systems.”

THE MOLECULES PILOTS

In Grand Paris, MOPeasy (electric car sharing operator based in Grand Paris and partner in MOLECULES) have developed the car-sharing brand “monautopartage.fr” and have launched their service in Neuilly-sur-Seine jointly with Sodetrel, and in Marne-la-Vallée. This local solution is complementary with public transport: RATP and SNCF, but also with global solution like Autolib. The service is targeting companies and medium size cities, and is based on an innovative electric car-sharing scheme: the key management system is integrated in the charging point, the service operates autonomously and is available also in areas not covered by the telephone network.

Multimodality is at the centre of the Berlin pilot where the local car-sharing operator DriveNow is engaged in the project. DriveNow provides flexible car sharing services for people who occasionally want to enjoy the flexibility of a private car without owning it. The car can be picked up and left at any public parking lot in a predefined business area. Being station-independent this form of car sharing fosters urban multimodal mobility. MOLECULES Berlin will introduce multimodal and electro-mobility specific services such as a multimodal trip planner indicating time, costs and CO₂ footprints of different mobility modes and route options. This will be combined with reservation and booking of DriveNow e-cars, monitoring of the trip and the battery status and routing services to the available charging station nearby.

A new mobility service with e-motorbikes is being launched in Barcelona in June: Motit, 100 per cent electric motorbike sharing. In the early stage, GoingGreen will enable seven service areas in downtown Barcelona. In these



Motit electric motorbikes have an exclusive design created especially for sharing services in Barcelona. Each vehicle is equipped with a 7” screen with navigator system incorporated



areas users will be able to pick up and drop off their bikes wherever they want. Bikes can be booked via web or smart-phone or tablet, users can rent the scooter (and free helmet) by time or a distance. The bike is 100 per cent electric and it has a navigator that will guide you to your destination.

FACING THE CHALLENGES

Accessibility for all and efficient transit solutions are urban environmental challenges that have to be met whilst taking air quality and environmental protection into consideration at the same time. These three city-regions have taken on the challenge and are delivering top-notch mobility solutions. “Multimodality is an important element of the urban transportation strategy of Berlin to reduce the parking pressure in the inner city, to reduce the environmental impacts of motorized urban transport, to reduce the consumption of mineral oil and greenhouse gas emissions” says Hermann Blümel, head of Principle Affairs of Transport Policy at Berlin Senate Department for Urban Development. “New mobile communication devices offer a comfortable access to multimodal information services, which were not available up to now. Thus, multimodality will reach a new quality and will become a successful offer within the competition of urban transport options.”



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THE PROJECT

The MOLECULES consortium comprises 10 partners from five different European countries and is formed by experts in the field of mobility and transport, and stakeholders from the public and private sector.

MOLECULES is one of the four pilots launched by the European Commission in 2012 which are looking at integrated electromobility services, these are ICT4EVEU, MOBI.Europe, and smartCEM.

A dedicated LinkedIn group was created for networking <http://www.linkedin.com/groups/Smart-Connected-ElectroMobility-pilots-4414567/about>

A special Interest Session on the activities in the four pilots (SIS 09) Smarter traveling with electromobility / ICT for electromobility will take place at the ITS Congress in Dublin on Wednesday 5 June from 09:00-10:30 in the Wicklow Meeting Room 4.

