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**INTELLIGENT ENERGY EUROPE**  
**Promotion & Dissemination Projects**

**Electric City Transport – Ele.C.Tra**

[www.electraproject.eu](http://www.electraproject.eu)

**Publishable Final Report**

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Electric City Transport – Ele.C.Tra.

**Abstract:**

The publishable report is the hallmark of the project and it is the main document to inform your target groups and the wider public about achievements. It is result-oriented, presenting results, lessons learnt, impacts achieved and helping to convince potential followers or supporters to engage in similar actions.

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## 1 Executive summary

The Ele.C.Tra project tested an innovative model, in order to give useful solutions to accessibility needs of citizens and city users (commuters, tourists,...) that cannot be fully solved by local public transport systems. For this reason, the project foresaw 3 pilot actions carried out in Genoa, Florence and Barcelona, with some similar characteristics and high scooters use (Genoa, for example, is the second Italian city for the number of motorvehicles circulating<sup>1</sup>). The tested model by experimentation phase has been made suitable for an easy transfer to other countries and cities with different characteristics. The pilot actions included a supply of 480 electric e-light vehicles, overtaking the planned target of 300, and full model start-up (at least one incentive/facilitation, communication tools,...).

The overall objective of the project Ele.C.Tra was to promote a new urban mobility model, characterized by:

- a standard structure with common characteristics for all project cities, suitable to transfer to further cities or regions and develop innovative means of transport, mainly e-mobility;
- specific characteristics, suitable for every city involved, in terms of demand mobility flows, network of local buses, tramlines or undergrounds, citizens' and tourists' needs.

The main success stories belong to the three pilots which took big efforts but ended with good overall results and very interesting hints for the follower cities.

Mobility is a very complex sector and it is linked to people behaviours and habits: even implementing different approaches, the three cities had to find proper ways to encourage the use of e-light vehicles and sharing systems.

To ensure a concrete result the Administrations decided to put a lot of different measures in place so that different target users could have been involved and interested in the action: from the numerous incentives opportunities to the communication and dissemination, the involvement of many stakeholders with agreements or the municipal fleet examples, several actions contributed to the overall result ensuring the continuity of the action also after the project end. In particular:

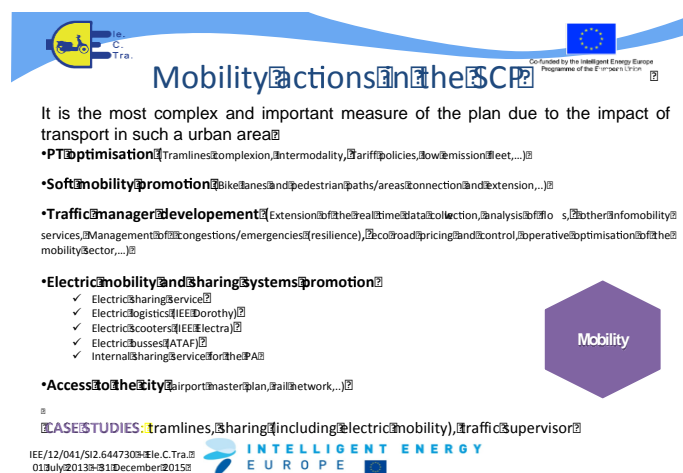
- Agreements with stakeholders, signing 78 agreements with vehicle and recharging stations providers, users and PAs and public stakeholders;
- Incentives, implementing 10 actions in the 3 pilot cities to encourage the use of e-light vehicles;
- Promotion and dissemination: the main targets of the Electra action are the users and promotion and dissemination activities play a very important role in convincing citizens to change their habits.

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<sup>1</sup> Motorcycle motorization rate (veh/100 inhabitants); Euromobility on ACI-Italian Automobile Club and ISTAT data (2012).

- A set of best practices tested in the three cities has been collected and a detailed description including framework conditions, main features of the action and results achieved is provided for each of the good practices. The different measures have been implemented at least in one of the pilots obtaining good results that can be replicated in other cities. For example:

- Genoa – Mobility management;
- Genoa – Incentives/facilitations in the e- mobility field;
- Genoa – A strong e-operators/stakeholders involvement;
- Florence - The charging network;
- Florence - LTZ regulation;
- Florence - Internal electric sharing system;
- Florence - APPs and GIS tools;
- Florence - Tender for a new electric sharing system;
- Barcelona – COOLTRA sharing system;
- Barcelona – e-motorvehicles for the Urban Police.



**Mobility Actions in the SCP**

It is the most complex and important measure of the plan due to the impact of transport in such a urban area

- **PT Optimisation** (Tramlines, Complexion, Intermodality, Tariff policies, Low emission fleet, ...)
- **Soft mobility promotion** (Bike lanes and pedestrian paths/areas, connection and extension, ...)
- **Traffic manager development** (Extension of the real time data collection, analysis of flows, other information services, Management of congestions/emergencies, resilience), Eco road pricing and control, operative optimisation of the mobility sector, ...)
- **Electric mobility and sharing systems promotion**
  - ✓ Electric sharing service
  - ✓ Electric logistics (EE Dorothy)
  - ✓ Electric scooters (EE Electra)
  - ✓ Electric buses (ATAF)
  - ✓ Internal sharing service for the PA
- **Access to the city** (airport master plan, rail network, ...)

**CASE STUDIES:** tramlines, sharing (including electric mobility), traffic supervisor

IEE /12/041/512.6447308/ Ele.C.Tra. 01 July 2013 to 31 December 2015

INTELLIGENT ENERGY EUROPE

## 2 Introduction: background and objectives

European regions are characterized by an increase of air pollution due to private road traffic. In fact, in many European countries transports are the first producers of particulate named PM10, that causes human health problems, and nitrogen oxides. For example in Italy, transports produce about 45% of PM10 national emissions and 65% of nitrogen oxides emissions.

The problems of urban congestion and shortage car parking involve an increase of scooters and motorcycles modal share. This process is greater in cities characterized by mild climate. At a glance, why the project focuses on scooters technology?

- because this technology has now reached a high level technological development, with relevant applications in the electric mobility;
- because scooters modal share increases, enhanced to the growth of fuel prices;
- because scooters are very used in the Southern European cities, as the pilot cities involved (Genoa, Florence and Barcelona).

In this light, the core concept of the Ele.C.Tra project was that it is possible to reduce pollution due to passenger transport and improve quality of life by promoting a new sustainable urban mobility model. The project enabled:

- to increase the electric light vehicles use in urban areas, through a wide offer of services for city users (short sharing, hiring, buying), in order to achieve by 2020 a modal electric share of about 1% of regular daily trips (= about 4.700 daily trips in an urban area with 1 million inhabitants). As far as the Ele.C.Tra model

has been developed jointly with other urban electric transport means, the project estimated a further car modal share reduction equal to 5%;

- to raise citizens' and tourists' awareness by the sign of several agreements with different stakeholders and to change their daily behaviours and to promote sustainable user-friendly activities by at least 100 electric light vehicles in every city. In this way, it has been possible to achieve a total decrease of more than 90 tons/year of CO<sub>2</sub> in the 3 pilot cities;
- to modernize the urban two-wheeled vehicle fleet where motorcycles and scooters are very used (e.g. in the European cities with mild climate), carrying out the bases and requirements in order to achieve by 2020 that at least 10% of traditional motorcycle urban fleet could be replaced with electric light vehicles;
- to raise the awareness of public bodies, touristic and mobility stakeholders, like local transports operators but also associations, tour operators, universities and firms, in order to develop other innovative transport means (e.g. electric buses, low impact cars,...) in 3 of the most populated urban areas in Southern Europe;
- to define and test an innovative model aimed at the development of sustainable mobility, to give consistent solutions to accessibility needs of citizens that cannot be fully solved by public transport, in 3 EU cities with an high scooters use. In fact, the 3 project pilots involved about 5.2 million European inhabitants (cities of Genoa, Florence and Barcelona);
- to carry out a project structure and identify elements to transfer the Ele.C.Tra model to other European cities, by involving in the project a further 7 urban areas that have relevant growth trends (Murcia, Zagreb, Skopje, East Attica area, Bukovina region with Suceava Municipality, Malta islands and Lisbon with a total of 11.1 millions of inhabitants);
- to increase investments made by European stakeholders in sustainable transport, in terms of electric light vehicles. The Ele.C.Tra tests allowed to achieve 480 e-light vehicles, with an estimated value of € ~3 million, and approximately 9,000 new electric two-wheeled vehicles by 2020, due to the wide Ele.C.Tra partnership that involve 10 European urban areas;
- to promote a new mobility system suitable for tourists too. In this way, it will be possible to develop touristic flows in the areas involved, characterized by a huge artistic and cultural heritage, some of which are UNESCO World Heritage Site.



Moreover, the Ele.C.Tra project presented strong links with governance elements. In fact, it is based on a governance model that provides the direct stakeholders and users involvement through the e-light vehicles supplier searching without financial funding by the EU, potential sponsors to promote e-scooter system and a set of services and facilitations for the users.

In operative terms, the project promotes innovative system for using e-light vehicles by citizens for daily trips and occasional trips, without actual issues due to cars use (road traffic, parking...). In this way, citizens are addressed more towards the long rent (e.g. 1 year) while tourists are more interested in short sharing (e.g. for one day or one week).

Finally, the strategic objective was to promote and extend the Ele.C.Tra actions to further member states or other countries to realise a new urban sustainable model by:

1. accelerating the modernization of the urban two-wheeled vehicles, especially where motorcycles and scooters are very used;
2. developing new skills of local/regional/national authorities to promote new model and extend it to other transport means;
3. enhancing the urban intermodality model, through the promotion of parking system (e.g. park & ride), the public transport timetables optimization and sharing and/or pooling systems, not only about scooters;
4. reducing atmospheric pollution, in accordance with the Energy Efficiency Plan 2011, to reach the 2050 vision, characterized by resource efficient, low carbon economy, energy independence and security of supply. The project estimates in the year 2020 a reduction of 14.000 tons of CO<sub>2</sub> per year, equal to 1.100 hectares of forest, for a metropolitan area with 1 million of inhabitants. In addition, the project included further reductions due to sustainable and innovative energy use linked to sharing services, like solar panels and other.

### 3 Applied approach and methodology

The project was articulated with five macro streams of activities throughout **30 months** of work actions, of which 15 for the test in Genoa and 12 for the trials in Florence and Barcelona (approx. from the fall 2014), which allowed the following **key outputs and results**:

1. a **standard database for every area** about current mobility situation (demand, infrastructural network, citizen's needs, touristic flows, etc.), which will be available at the end of ante-operam analysis;
2. the **model executive project**, synthesized in a final Report, in order to extend the Ele.C.Tra model to other Europeans countries (transferability model);
3. the **Operative plan of the e-light vehicles services**, coordinating with innovative energy production systems;
4. the **pilot actions**, in the cities of Genoa, Florence and Barcelona;
5. the **feasibility studies** to extend in the Ele.C.Tra model to the other project cities (Murcia, Zagreb, East Attica, Skopje, Suceava, Lisbon and La Valletta in Malta).

All deliverables of the project and the set of tools, information and documents useful to the external subjects in order to extend the model in other cities and areas, named "EleCTra kit", are available on the **project website** <http://www.electraproject.eu/>, which

will be updated also beyond the end of the project lifetime.

Regarding the weaknesses detected in the e-light vehicle model, although the differences in the local frameworks and starting points, some common issues have been detected in all the three pilots even if they have been faced with different approaches. For example there was the general inertia of people who prefer private ownership to the sharing system. Another critical point regarded safeness: the user friendliness of the vehicles, their controlled use in bus tracks or in pedestrian areas, the helmets storage are only some of the problems faced.

From the PAs point of view, delays, recovered during the actions, have been created by issues of all partners in the definition of the agreement model and in the signature of the agreements. The most relevant difficulty was represented by the innovative approach of the procedure used in order to guarantee the best ways for the promotion and develop of e-scooter market, for the definition of the schemes/models of the agreements and publication. They have required a careful sharing with stakeholders and a series of unusual administrative procedures in order to get the Municipality Decision able to create the legal, administrative and technical assumptions for the agreement signatures.

The dissemination and promotion activities were very important tasks for the project. In this light, Ele.C.Tra addressed **European citizens, tourists** and **public bodies** to take part in changing daily behaviour to promote sustainable mobility in urban areas.

Finally, the Ele.C.Tra project wanted to raise awareness of public stakeholders to enhance sustainable actions, started with e-scooter sharing, by a new urban accessibility model in order to promote interchange parking, bike paths and public transports use. Stakeholders have been involved through specific agreements committing them in supporting the project with dedicated services and targets.

The Area Mobility Management offices succeeded in promoting the action to other neighbouring municipalities (mainly in the metropolitan area around the three pilot cities) as well as big companies with a high potential in terms of employees and fleets.

Common citizens have been addressed through different kind of events (conferences, road shows, public meetings,...) and targeted communication through media (radio, TV, social networks, web,...) and dissemination materials (gadgets, brochures,...).

The effort to maintain and monitor the communication mechanisms with all the involved target groups turned out to be higher than expected and initially planned. The novel concept of electric mobility as an alternative pattern of sustainable urban mobility urged the partners, especially from the non-pilot cities, to get activated in additional events and promotional activities than planned (more press releases, advertisements, participation in events, etc.). The target groups located in the non-pilot cities are well informed about the EleCTra model and the difficulties the pilot cities faced and are prepared to apply their own electromobility model as soon as they find the suitable resources.

## 4 Results and findings and impacts achieved

Despite the initial difficulties and the great effort for the creation of a strong and useful network to promote the e-light vehicle mobility in the all 10 European urban areas involved, the project reached very satisfying results, which are highlighted in the table below. Further details are available in the deliverables on the project website.



Performance indicator	Planned Target	Actual achievement	Comment on performance
No. of agreements of mobility managers with e-light vehicle suppliers	16, of which: 9 for pilot cities and 7 for non-pilot ones	29, of which: 20 for pilot cities and 9 for non-pilot ones	Although the initial critical issues about administrative procedures and subjects' involvement, the number of EV providers involved is large and effective also for the continuation of the e-mobility promotion actions.
No. of agreements of mobility managers with stakeholders	29, of which: 15 for pilot cities and 14 for non-pilot ones	49, of which: 27 for pilot cities and 22 for non-pilot ones	Although the initial critical issues, the number of different subjects involved is large and effective also for the continuation of the e-mobility promotion actions.
No. of the e-light vehicles offered by the wide range of the EleCTra services (long renting, short sharing, buying after a test period, etc and so not only for the sharing system in the strict meaning)	300 in 3 pilot actions (100 per city)	482	The total number of e-light vehicles offered and made available by the project stakeholders and partners has been reached and overtaken. <ul style="list-style-type: none"> <li>• GENOA: 85 sold<sup>2</sup> + 26 available for rent<sup>3</sup></li> <li>• FLORENCE: 131 sold + 100 sharing</li> <li>• BARCELONA: 140</li> </ul>
No. of the e-light vehicles offered by the wide range of the EleCTra services in 3 non-pilot cities.	At least 300 (at least in 3 non-pilot cities)	324 by the end of 2015; 587 by the end of 2016; ~3.150 by the end of 2020	The involvement of the non-pilot was very successful, despite the very different characteristic and needs of each context. <ul style="list-style-type: none"> <li>• LISBON: 163 by the end of 2015; 231 by 2016 and 580 by 2020;</li> <li>• MURCIA: 49 by the end of 2015, 119 by 2016 and 1.179 by 2020;</li> <li>• ZAGREB: 75 by the end of 2015; 200 by 2016; ~700 by 2020 (+ public fleet renewal + possible implementation of</li> </ul>

<sup>2</sup> Electric light vehicles sold in Genoa from July 2013 to 31st October 2015 (some vehicles have been sold in Genoa but the license plate registration has taken place in another Italian city).

<sup>3</sup> In the first half of 2015, when there was the highest availability of e-light vehicles for rent in Genoa

Performance indicator	Planned Target	Actual achievement	Comment on performance
			sharing systems); <ul style="list-style-type: none"> <li>• SKOPJE: already existing: 5 e-scooters (and 5 e-bikes for city administration, 10 e-bikes for the city rent-a-bike system, including 250 ordinary bikes) and 12 light e-vehicles for tourists (sightseeing tour in the city centre). Of course the City plans to expand this range of offered services.</li> <li>• SUCEAVA: 0 by 2016; 18 EVs by 2017 (and 10 e-bikes by 2017);</li> <li>• MALTA: 20 e-scooters sold in 2015; estimations indicate that at least 576 e-scooters are expected to be sold up to 2020 (12 e-scooters/month x 48 months). Moreover, this figure is expected to go up if other favourable measures being contemplated by the Government are introduced to reach the objectives of the new e-mobility national plan for Malta;</li> <li>• EAST ATTICA: 0 by 2016; 3 scooters &amp; 1 light e-vehicle per municipality of East Attica (13 municipalities): 39 scooters &amp; 13 light e-vehicles by 2020 + 30 scooters for 30 brands of Hellenic Post Agency located in East Attica by 2020.</li> </ul>
No. of new electric charging point for e-light vehicles in the pilot cities.	No quantified target	296	The indicator was added in order to strengthen the effectiveness of the project actions in the cities involved and to ease the EV use. <ul style="list-style-type: none"> <li>• GENOA: 7</li> <li>• FLORENCE: 264, of which 91 for municipal fleet</li> <li>• BARCELONA: 49</li> </ul>
no. of facilitation tools/services for	No quantified target	10	The indicator was added in order to

Performance indicator	Planned Target	Actual achievement	Comment on performance
users and for each pilot city in order to promote the EleCTra benefits			strengthen the effectiveness of the project actions in the cities involved and to ease the EV use. <ul style="list-style-type: none"> <li>• GENOA: 2 (+2 Italian)</li> <li>• FLORENCE: 6 (+2 Italian)</li> <li>• BARCELONA: 2 (+2 Spanish)</li> </ul>
utilisation rate of the EleCTra e-light vehicles in each pilot	No quantified target	~ 5.3 million per year	The indicator was added in order to monitor the project results in a more appropriate way. <ul style="list-style-type: none"> <li>• GENOA: 343,378 during the Electra project period</li> <li>• FLORENCE: ~4 million per year</li> <li>• BARCELONA: ~1 million per year</li> </ul>
No. of associated partner cities/areas interested in the model within the project lifetime	5	15, of which 1 involved in January 2016	<ul style="list-style-type: none"> <li>• Italy: Rapallo and Scandicci;</li> <li>• Portugal: Parques de Sintra</li> <li>• Spain: Viladecans, L'Hospitalet de Llobregat and, in January 2016, Santa Coloma de Gramenet;</li> <li>• Croatia: Ivanic-Grad, Sisak, Varaždin and City of Bjelovar</li> <li>• Malta: Xaghra, Island of Gozo, Rabat, Local Councils' Association and Fondazzjoni Temi Zammit (public-equivalent foundation, because it is also made up of public entities, including municipalities). In addition, MIEMA has involved 3 subjects (not public bodies) for the adoption of the EleCTra model (Urban Lab Coop, Sixteen Limited, Creolabs).</li> </ul>
No. of <sup>o</sup> non- partner cities/areas starting the model application INDIRECT IMPACT	2	2 (Rapallo and Scandicci)	In these cities the model application has already started. The Municipality of Scandicci is interested in testing Sharen'go Service. Moreover, several Municipalities in the metropolitan area of Florence are increasing

Performance indicator	Planned Target	Actual achievement	Comment on performance
			<p>their own e-charging vehicle network, following the best practice of the Florentine city. In this light, the sharing service already implemented in Florence can be enlarged.</p> <p>In particular, Rapallo signed an Electra agreement with a local commercial operator, GMC Solar Solutions, which offers economic discounts for the users of e-charging services.</p>
No. of planned promotion events during the EleCTra tests	No quantified target	16	<ul style="list-style-type: none"> <li>• GENOA: 8</li> <li>• FLORENCE: 6</li> <li>• BARCELONA: 2</li> </ul>
No. of reports/publications referring to Ele.C.Tra. studies	120, of which: <ul style="list-style-type: none"> <li>• e-articles (5x10 PPs)</li> <li>• press releases (5x10 PPs)</li> <li>• advertisements in print newspaper (2x10 PPs)</li> </ul>	131	The project has overcome the initial targets. <ul style="list-style-type: none"> <li>• 50 e-articles</li> <li>• 58 press releases</li> <li>• 23 advertisements in print newspaper.</li> </ul>
No. of events/meetings referring to Ele.C.Tra. results	28, of which: <ul style="list-style-type: none"> <li>• NSG meetings (2x8 countries)</li> <li>• Regional events (1x10 PPs)</li> <li>• Launching event (1)</li> <li>• Closing conference (1)</li> </ul>	47	The project has overcome the initial targets. <ul style="list-style-type: none"> <li>• 16 NSG meetings</li> <li>• 29 regional events</li> <li>• 1 Launching events</li> <li>• 1 Closing Conference</li> </ul>
No. of websites linked to official EleCTra website	30	167	The project has overcome the initial targets. <ul style="list-style-type: none"> <li>• GENOA: 16</li> <li>• FLORENCE: 11</li> <li>• BARCELONA: 13</li> <li>• LISBON: 9</li> <li>• MURCIA: 23</li> <li>• MALTA: 3</li> </ul>

Performance indicator	Planned Target	Actual achievement	Comment on performance
			<ul style="list-style-type: none"> <li>• ZAGREB: 14</li> <li>• SKOPJE: 15</li> <li>• SUCEAVA: 15</li> <li>• EAST ATTICA: 48</li> </ul>
No. of subjects involved in the mobility networking (of which No. of involved Mobility Managers of firms, public bodies, etc.) DIRECT IMPACT	100	715 (of which 317 Mobility Managers)	<p>The project has overcome the initial targets.</p> <ul style="list-style-type: none"> <li>• GENOA: 150 (of which 23 Mobility Managers)</li> <li>• FIRENZE: 25</li> <li>• BCNE: 35</li> <li>• LISBON: 80</li> <li>• MURCIA: 80 (15)</li> <li>• MALTA: 50 (20)</li> <li>• ZAGREB: 116 (57)</li> <li>• SKOPJE: 35 (15)</li> <li>• SUCEAVA: 95 (10)</li> <li>• EAST ATTICA: 49 (37)</li> </ul>
No. of subjects involved in National Support Groups	300, of which: <ul style="list-style-type: none"> <li>• 60 for each pilot countries Italy and Spain;</li> <li>• 30 for each non-pilot country</li> </ul>	611	<p>The indicator has been reached and overtaken to the double amount of expected number.</p> <ul style="list-style-type: none"> <li>• ITALY: 164</li> <li>• SPAIN: 109</li> <li>• PORTUGAL: 87</li> <li>• MALTA: 55</li> <li>• CROATIA: 36</li> <li>• FYROM: 47</li> <li>• ROMANIA: 55</li> <li>• GREECE: 58</li> </ul>
No of reduced tons of CO2 per year	90 (30 for each pilot city)	~272 t/y	<p>The indicator has been reached and overtaken.</p> <ul style="list-style-type: none"> <li>• GENOA: ~10 t/y reduced thanks to e-light vehicles (starting from the tons reduced during the entire duration of the project, equal to 16.52)</li> <li>• FLORENCE: 200 t/y</li> <li>• BARCELONA: 62.7 t/y</li> </ul>

Performance indicator	Planned Target	Actual achievement	Comment on performance
			<p>Only the pilot city of Genoa has reached a lower target because it only concerns the e-light vehicles sold (85). Moreover, it is necessary to take into account the fact that Genoa's citizen are not so open to innovative technologies and the actions were developed starting from scratch.</p> <p>In this light, we can consider the result a likewise good result.</p>
No. of litres of fuel saved per year	75,000 (25,000 litres for each pilot city)	145,285	<p>The indicator has been reached and overtaken.</p> <p>Regarding Genoa, see above.</p> <ul style="list-style-type: none"> <li>• GENOA: ~10,000 (starting from the litres saved during the entire duration of the project, equal to 15,285)</li> <li>• FLORENCE: 99,500 l/y</li> <li>• BARCELONA: 35,785 l/y</li> </ul>

#### 4.1 The implementation phase results

The carrying out of the actions planned in the three implementation phases in the pilot cities (Genoa, Florence and Barcelona) were finalized to facilitate the e-light vehicles services used by any kind of city user (citizens, commuters and tourists), starting with the adoption of the template and the signature of the agreements and the implementation of facilitations/incentives for users:

1. In Genoa the pilot test started on the 1st of August 2014 thanks to the first facilitation in place consisting in the access of e-vehicles in the urban limited traffic zone (Municipal Decision 2014-130);
2. In Florence the starting date is the 3rd of November 2014 due to the first agreement signed. The main facilitation consisted in the improvement of the charging network allowing the free charging of light electric vehicles;
3. Barcelona started together with Florence, encouraging users through the creation of new public car parks with the 2% of the spaces reserved for electric vehicles (park and charge).

Mobility is a very complex sector and it is linked to people behaviours and habits and even implementing different approaches, the three cities had to find proper ways to encourage the use of e-light vehicles and sharing systems obtaining concrete results in a relatively short pilot period of one year; to ensure a concrete result the Administrations decided to put a lot of different measures in place so that different target users could have been involved and interested in the action: from the numerous incentives opportunities to the communication and dissemination, the involvement of many stakeholders with agreements or the municipal fleet examples, several actions contributed to the overall result ensuring the continuity of the action also after the project end.

Common problems in city traffic had been translated into possible leverages for e-light vehicles diffusion: admission to restricted areas, free parking, etc. have been used to promote the use of e-vehicles in all the three cities together with other specific measures tailored to the different situations.

During the service executive planning activity, aimed at pushing private companies to provide e-light vehicles services in each city involved in the project, four categories of subjects had to be involved:

- offer - vehicle providers;
- infrastructure – recharging stations providers;
- demand – fleets and users;
- institutional – PAs and public stakeholders.

The main expected output consisted in finding possible multipliers who could provide facilities/special conditions for users, involve private fleets and promote the project.

To all those subjects an official agreement, to be signed with the local partner, has been offered to commit them to the project objectives and targets.

The stakeholders commitments for all the cities involved (pilot and non-pilot) was satisfying and several agreements have been signed in each partner city (best case Genoa and Florence with more than 15 agreements each and a good cooperation among the signatories network).

The Service monitoring, to verify service parameters during the implementation phase (a quantitative analysis that has been accompanied by a qualitative analysis about the satisfaction of the people through post-operam surveys) consisted in delivering a “technical monitoring report”: every 3 months pilot cities were asked to update it, to verify the test effectiveness and modify parameters or elements during the experimentation period. Within this context an exchange process has been pursued: Florence municipality supported the dialog among the 3 pilot partners confronting themselves on technical data, discussing and exchanging experiences through the use of several means as call conferences, technical feedbacks, data and information sharing, etc. From the exchange experiences derived a calibration of service parameters.

Then, in addition to the short technical evaluation template delivered every 3 month from the pilot test start, a final publishable report was drawn up, including a description of the three pilot actions and an assessment of the dynamic process of the implementation during the test period, highlighting best practices and results and pointing out obstacles and weaknesses.

The goal of the evaluation was to analyse the institutional, political, cultural, organisational, financial and legal frameworks in the implementation itself in order to identify factors of and barriers to a successful outcome of the model and how to overcome obstacles.

On May 4, 2015 the Municipality of Florence has been able to publish the public notice to carry out a free flowing sharing service in the City of Florence. After the conclusion of the tendering procedure, Share’ngo has been selected offering e-light quadricycles for a max of 200 units (100 in 2015, 200 from 2016). The main features of the tender have been made available.

The main targets of the Electra action are the users: promotion and dissemination activities play a very important role in convincing citizens to change their habits. Different kind of events have been organized in each pilot city to involve a wide public to spread information about services, incentives and technologies available:

1. 10 regional/national events in Genoa (among which Smart Week and European Mobility Week events), two road shows and a dedicated web portal (mobilitypoint.it)
2. 2400 contacts in the mailing list, one city tour, a local and one international (IEVC) conferences in Florence
3. several fairs and events in Barcelona with a powerful campaign on social networks (800 contacts on Facebook and 1000 on twitter) and on the website (900 visits per day)

To enhance the non-pilot cities involvement, the project actions included a visit to Genoa implementation test, in the final part of the annual testing period (September 2015), in order to train the non-pilot partners about the e-mobility actions and issues, allowing them to decide on the development of e-scooter systems in their own cities. In this light, a working paper with comments and feedback by non-pilot partners was fulfilled.



Hereafter a table summarising the project indicators achieved during the implementation phase.

	GENOA	BARCELONA	FLORENCE
Agreements with suppliers (>3)	5	3	12
Agreements with stakeholders (>5)	11	5	11
Facilitations in place	2 + 2national	1+1+2	6 + 2national
E-scooters sold/ shared in the period	85 sold + 26 for rent	110 Coltra rental +30 police	131 sold + 100 (200 in 2016) shared
Charging points	7	49	173 public + 91 for the PA's + 2 Telecom
Utilization rate (km travelled)	343,378	1,548,993	5,700,000
CO2 savings per year (>30 t/y)	16.52	44.7 + 18	200
Fuel savings per year (>25.000l/y)	8,584	23,610 + 12,175	95,000

Ele.C.Tra actions and results can be considered just one step (the first or a further one depending on the starting situation) in the three city policies about e-mobility. What the project intended to set up is an action, which can go ahead after the project lifetime, multiplying the results in the next years thanks to the stakeholders and citizens strong involvement and to the decision makers commitment. The three pilot cities provided their programs for the next period and the expected further results induced by Electra.

EleCTra project highlighted several issues concerning the promotion and enhancement of the urban e-mobility, such as:

- It is essential to develop and focus actions on all e-light vehicles and not only scooters, also in accordance with the relevant EU legislation. In this light, it is necessary taking into account 2002/24/EU directive, where all e-light vehicles including scooters are classified L1-L2-L3-L4-L5-L6).
- Regarding e-light vehicles the concept of "sharing" has not to be strictly interpreted but it can include a wide offer of different services which better suit to different framework conditions. This aspect also in accordance with the survey results, which highlighted the general inertia of people to the sharing system concerning light vehicles.
- It is essential to consider and enhance the involvement of all stakeholders in the field of e-mobility in each country involved, developing what already carried out by e-vehicles and energy suppliers and taking into account the different market conditions.
- In order to increase the effectiveness of the solutions planned, each action must be tailor-made for each urban context. In this light, the solutions adopted by the pilots to solve implementation problems were different and still need time to assess the results: the limitation of the traffic of private vehicles in central zones is the most common option, the promotion of the rental service as a first step against the ownership has been also used in all the pilots, etc. Also parking management is a good tool that can be easily exploited to promote the switch to a

more favourable mobility even if cities are always suffering from parking shortage and it becomes more and more difficult to reserve some areas even for sustainable issues.

- Another important point is the recharging infrastructure: to boost the market of e-vehicles and to support e-sharing it would be easier to have a recharging network available but the current technologies also offers other ways, such as the removable batteries. The three cities adopted different policies: Florence invested a lot on a public interoperable network, Genoa decided to support the creation of private recharging stations while Barcelona decided to try to implement a sharing system with no need of spread recharging infrastructure. Finally, the recharging points are linked to other important aspects like the critical mass reached and the area served: a self-sustainable sharing system ought to reach enough users and this happens only if it is extended to a proper area.

#### 4.2 The transferability

Transferability to non-pilot and non-partner areas was an essential part of the project actions, in order to make self-sustainable the results achieved also in other external cities. In this light, the actions were implemented the following main goals:

- carrying out of a strong and wide network of external cities interested in the follow up of the EleCTra model. In particular, 15 public bodies (of which 1 in January 2016, after the end of the project) signed a letter of support in order to adopt the model in their own territories. In addition, five of them have already implemented concrete measures to promote e-mobility in general and e-light vehicle diffusion in particular;
- replication plan developed by the WP leader with T Bridge support includes guidelines and recommendations, available tools and a long term plan for expansion beyond the pilot city areas;
- “EleCTra kit”, the set of documents and tools made available for any external subjects interested in the project results, can be an useful way to ease the diffusion of actions for the EV users. In particular, the kit includes:
  - The Model Executive planning Report and the Replication Plan with details about HOW, WHEN, WHO, WHAT to be done;
  - Model of agreements with stakeholders (one per category)
  - Mailing lists of the supporter groups in the 8 countries involved (Italy, Spain, Portugal, Malta, Croatia, Former Yugoslav Republic of Macedonia, Greece and Romania).

In order to analyse the trial results and so increase the effectiveness of the concrete measures also in other external ares, a post-operam survey campaign was conducted in pilot cities. the main results obtained can be synthetized as follows.

	<b>Barcelona</b>	<b>Florence</b>	<b>Genova</b>
<b>Method of conducting surveys</b>	<ul style="list-style-type: none"> <li>• social media</li> <li>• direct contact</li> <li>• face to face surveys</li> </ul>	Interviews - mixed methodology Computer-Assisted Telephone Interviewing and	<ul style="list-style-type: none"> <li>• personal interviews;</li> <li>• web-based platform for collecting on-line questionnaires</li> </ul>

	Barcelona	Florence	Genova
		Computer Assisted Web Interviewing	
<b>Period for the survey</b>	October and November	20th to 30th October 2015	7 <sup>th</sup> of November and the 1 <sup>st</sup> of December 2015
<b>Number of surveys</b>	279	860 interviews	211 customized interviews; 391 on-line questionnaires
<b>Gender prevalence</b>	Males – 59% Females – 41%	Males – 59,3% Females – 40,7%	Males – 32,5% Females – 37,5%
<b>Age group</b>	Predominantly 36 to 55 years	Predominantly 36 to 55 years	Predominantly 36 to 55 years
<b>Main concerns</b>	<ul style="list-style-type: none"> <li>• high acquisition costs</li> <li>• issues related with charging time and autonomy of the battery</li> </ul>	<ul style="list-style-type: none"> <li>• vehicle range</li> <li>• Recharging time too long</li> <li>• Cost of the vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• cost of the vehicle</li> <li>• rental cost</li> </ul>
<b>Main benefits</b>	<ul style="list-style-type: none"> <li>• environmental impact</li> <li>• noise reduction</li> </ul>	the environmental aspect	<ul style="list-style-type: none"> <li>• the environmental aspect</li> <li>• lower refuelling costs</li> </ul>
<b>Willingness to use sharing services and e-mobility in general</b>	43% of the respondents would be interested in a scooter sharing system	strong tendency to the future use of such a service	Despite the undoubted advantages attributed to electric vehicles and the moderate increase of e-mobility, 37.0% declared they were not willing to use the sharing services that are currently active in Genoa.
<b>additional promotional activities</b>	Needed, as not many people are aware about any incentives	Considered desirable	necessary

As is visible from the above table, the most promising city is Florence, whereas Barcelona would need to put some more effort into promotional activities and communication, as not many people are aware about there being any incentives for the purchase of electric vehicles. Finally, regarding Genoa and despite the considerable efforts made by the Municipality during the trial period to achieve the objectives of diffusion and promotion of electric mobility (the 9.8% of respondents said they had participated in events or other events organized on electric vehicles), the willingness to use sharing services is not so spread. This fact might also be read in light of a typical characteristics of the Italian: the possession/ownership are viewed as a plus which is difficult to give up.

Finally, the transferability phase provided the fulfilment of the Calibration Report, which included:

- comparison between test results and aims planned;
- solutions to optimize the model and to resolve problems and issues in future implementation of the actions in the current pilot cities but also both non-pilot and external cities. The identification of solutions was fulfilled including the related critical issues and also improvable and positive aspects achieved in the project.

The first activity concerns the main parameters check, to compare results achieved with those planned, provided the non-pilot cities with a clear landscape of the model issues, clarifying the results and the critical points (and their solution, if possible) in non-pilot contexts.

In the phase of the identification of the solutions, the involvement of non-pilot cities has been very strong to provide the WP leader and the technical support with useful feedbacks to deliver the Calibration Report including.

Finally, Feasibility Studies for non-pilot cities, Non-pilot city Plans and the training for non-pilot and other interested cities were implemented. The Non-pilot training course on how to set up e-scooter sharing systems, wrapping up all lessons learned during the project and finalised by the development of a feasibility study for each of the non-pilot cities has been organised in Rafina (June 2015) with the participation of more local stakeholders.

In the Feasibility studies and non-pilot operative plans, the different types of e-light vehicle sharing models were taken into account, discussing the different ownership models and incentives for users such as the possibility to buy the e-scooter at the end of the renting period. The plans paid special attention towards methods to attract sponsors and e-scooter suppliers, with or without support from local authorities.

All non-pilot cities started the implementation of the Ele.C.Tra model during the last part of the project in different ways and on the basis of their Non-pilot city Plans, by identifying operative steps and stakeholders to be involved and outlining and developing actions for the applications in the next years. In particular:

1. **Zagreb:** During the previous years, there were many incentives on electromobility on the local and regional levels, which resulted in an increase of the number of e-vehicles. As these activities have been successful, which has resulted in many people acquiring e-vehicles even without grants. Considering this, it is expected that the number of e-vehicles will show a constant growth pattern – app. 1,425 are expected to be in circulation by 2025. This projection does not include the vehicles in the sharing system. The implementation of the sharing system depends on the supply and demand as well as on stakeholders. The Non-pilot city Plan outlines the activities planned as per the Gantt chart. The said chart shows that the planned implementation of the sharing system would take approximately two years. Further promotional actions in the electromobility field have been planned for the upcoming period, through various conferences and stakeholder involvement events such as the Zagreb energy weeks. Further actions on improving infrastructure are also implemented by way of other projects in duration – such an approach has already resulted in the construction of three fast charging stations (in December last).
2. Thanks to the participation of **Murcia** in the Electra project, the local council has been able to involve key actors on electric mobility field in the city. There are 2 electric scooter suppliers in the city that have offered special conditions and incentives to foster the use e-scooters in the city as part of their commitments signed in the cooperation agreement with the Murcia city council. Besides there

are other actions that have been carried out at present such as the installation of 5 ev-charging stations making use of the existing sharing stations of MUyBICI (the public bicycle sharing system in Murcia). Moreover, there have been many e-mobility promoting events during the lifetime of the project that have raised people's awareness on sustainable mobility and the city council and its stakeholders have provided the ground to boost electromobility in Murcia. Now by means of the EleCTra kit and thanks to the Murcia feasibility study for the implementation of an e-scooter sharing system, the business model for that kind of system has been defined taking into account the particularities of Murcia scenario. In that line, Murcia will extend its EV-charging stations network to provide the proper support for e-vehicle users. In addition, the Municipality is studying the initiative to allow e-vehicles' users to park for free in regulated car park areas among other actions.

3. The Municipality of **Lisbon**, the capital city of Portugal, is firmly committed to reduce air pollution and considers the promotion of electric mobility as a strategic objective. In this line, Electra contributed to gather relevant stakeholders leveraging efforts towards sustainable mobility. Original events were organised (or co-organised), such as 11 eco-concerts in which the electric vehicle users could charge their cars and motorcycles and were entitled to free tickets, the first NSG "a different revolution" meeting, the Scooter Day, in the scope of the European Mobility Week, the second NSG "try first, comment after" organised in the scope of the National Meeting of Electric Vehicles (in this meeting was achieved the Iberian record of 199 EV altogether), and finally the Closing Conference "to e or not to e, that is the question...of e-mobility". During this conference, it was publicly announced the launching of the Portuguese Electric Vehicles Users Association. The creation of this Association was encouraged by the Ele.C.tra team since the beginning of the project and this is a good example of how the project initiatives will remain beyond its duration. Last, but not least, an associated partner – Parques de Sintra Monte da Lua, the public company responsible for the management of the Cultural Landscape of Sintra, a World Heritage Site classified by UNESCO – is interested in analysing and assessing the Ele.C.Tra model, in order to its possible application in the territory under its management. The territory under the company management is the second major tourism attraction pole in the Great Lisbon Area, spread in an area of 960 hectares, plus a Buffer Zone of about 3,640 hectares, receiving more than 2 million tourists per year.
4. The City of **Skopje** has recognized the significant benefits of electromobility as an important component of sustainable urban mobility and is currently substituting its own vehicle fleet with electric vehicles and will continue to actively support electromobility in the future. The City of Skopje plans to expand the range of offered light e-vehicle services in the future, share the Ele.C.Tra model and promote electromobility continuously. Furthermore, communication and advertising activities are out of great importance in order to raise awareness of changing daily behaviours to promote sustainable user-friendly activities and develop innovative transport means (e.g. electric vehicles, low impact cars, etc.). Among some of the future activities will be:

- further dissemination of the light e-vehicles sharing system and electromobility in general;
  - introduction of incentives for e-scooter users, such as special discounts, no local or pollution taxes, reserved parking, etc. ;
  - development of the appropriate infrastructure;
  - focusing on safety and environmental protection.
5. In the non-pilot area of **Suceava**, during the project several promotion and dissemination events were organized, such as the National Support Group Meetings, the regional and Cluster meetings and the Local support group meeting for Electric Vehicles in Urban Europe (EVUE) project. Important actions are planned for the period 2016 – 2020:
- To finalize the implementation of the project Electromobility – Electric Vehicles for a green municipality, started on 30th of July 2015, with the deadline in 29th of July 2017. The project is financed under the Swiss-Romanian Cooperation Programme and the key activities include the purchasing of 11 electric cars, 2 electric vans, 1 electric road sweeper and 1 electric tanker. These will be supported by 14 standard and 14 fast charging points and 56 parking spaces for electric vehicles. In addition 10 electric bikes and docking stations (including photovoltaic panels) will be introduced.
  - To Realize the Feasibility Study on electric public transport by 2017 and submit an application under the Regional Operational Programme to buy 40 electric buses for a green public transport in Suceava by 2020.
6. Environmental awareness and the familiarization with the concept of electromobility was significantly improved during the project’s lifetime in **East Attica**. This was achieved via several events, the “EleCTra visits Universities” campaign and promotional material. The national regulations along with the socio-economic situation of Greece did not favour the implementation of electromobility up to the end of 2015. As soon as the financial and political situation in Greece is stabilised and the public sector re-considers the electromobility matter, AVMap will be close to all the interested parties and try to find financial resources directly from EU projects. Furthermore, the electromobility web-GIS platform ([maps.electraproject.eu](http://maps.electraproject.eu)), includes the area of East Attica and it will be expanded in the future both regarding datasets and areas that covers. Despite the socioeconomic dramatic changes and political instability in Greece, the development of electromobility in East Attica in the following 5 -year scenario is feasible. In the suggested scenario the 13 Municipalities of East Attica in cooperation with local Hellenic Post offices will rent long-term e-scooter and light e-vehicles. In the next phase the Municipalities will try to find the funds under the National Strategic Reference Framework Programme 2014-2020 in order to purchase light electric vehicles, e-scooters and charging points. Municipalities with other local bodies and the support of AVMap will proceed to the necessary charging network in both public and private places, e.g. in the area of Rafina Port Authority. The next steps of this scenario include the development of the web-based platform and the smart phone application for the management of electromobility. The platform will help the municipalities to manage their electric

fleet and the public (residents and tourists) who will want to hire a vehicle/scooter in East Attica.

7. Within the local context, MIEMA organised in **Malta** a number of events and participated in others held by third parties to raise awareness and convey the results and outcomes of the project. Throughout these activities, MIEMA reached out to the local community and stakeholders, involving transport managers, private companies as well as policymakers and obtaining valuable feedback on the transport situation in Malta and the way by which light electric transport can improve local conditions. On the other hand, MIEMA staff were invited to participate in the Malta Mobility Managers Meeting and the conferences organised by the transport ministry for the DemoEV project or other events. This gave MIEMA the opportunity to propose Ele.C.Tra's transport model to several mobility managers and the transport authorities. As a result, MIEMA took part in the discussions on the technical and geographic issues on the setting up of the electric charging points and infrastructure, which was uploaded on to the Ele.C.Tra mobile app. Thanks to the events already organised in the framework of the project, the NSG created and the agreements and letters of support signed, the cooperation between MIEMA and the local subjects will continue in the future, in accordance with the development actions for the e-mobility in Malta. In this light, MIEMA has already signed additional letters of support with local stakeholders (Fondazzjoni Temi Zammit, Sixteen Limited, Creolabs).

Moreover, the Ele.C.Tra project was given exposure on different print (newspapers), electronic (websites) and broadcast media. The transport modes proposed by the project were discussed in a series of radio programmes on sustainable transport. Through these communication activities, MIEMA put forward suggestions for the design of appropriate incentive schemes which were eventually approved and included in the national annual budget estimates for transport. These schemes included measures such as financial support for people interested in purchasing a new electric bike or quad bike, or the removal of the need for a separate driving licence for light transport modes like scooters with low power engines, for drivers who have a licence B (for motor vehicles). Other mobility managers also introduced measures proposed by MIEMA, as in the case of the new University of Malta scheme allocating reserved parking to students taking up car pooling

MIEMA has therefore managed to influence the national policymakers, leading to the introduction of new transport regulations and financial incentives in favour of light mobility measures that reduce congestion and greenhouse gas emissions. These are reflected in Malta's National Electromobility Action Plan that has recently been drawn up. The most significant improvement consists of the measure whereby light e-vehicles can be driven without a driving licence, as from the 1st of January, 2016. This change in legislation has already increased the number of light e-vehicles on Maltese roads. Figures collected directly from e-scooter importers show that, in view of new bookings and enquires on these vehicles, the vendors expect purchases to increase to 12 monthly, as from the beginning of 2016. This highlights a significant increase when compared to the equivalent figures for 2015, when only 20 electric scooters (2 per month) had

been sold. These estimates indicate that at least 576 e-scooters are expected to be sold up to 2020 (12 e-scooters/month x 48 months). This figure is expected to go up if other favourable measures being contemplated by the Government are introduced to reach the objectives of the e-mobility plan.

## 5 Conclusions and recommendations

The fruitful work among the EleCTra partners and the useful actions implemented in the framework of the project leave a very large set of tools, documents and outputs, which can be easily used by other external cities or stakeholders interested in the model adoption or, in general, in the spread of e-mobility. In particular, the project has already involved 15 “associated partners” that are improving the EV mobility in their own areas.

In this light, the project leaves the “EleCTra kit” that includes the model of agreements for all the kinds of subjects to be involved, the contact lists of the stakeholders in 8 European countries (Italy, Spain, Portugal, Malta, Croatia, FYROM, Greece and Romania), the qualitative and quantitative results obtained during the test in 3 different cities (Genoa, Florence and Barcelona), the list of calibration actions to tune the e-mobility tests, the operative plan for external cities to implement the model with Gantt charts, timelines, etc.

It is also interesting to highlight that In the framework of the FP7 project STEEP, a participated strategic plan (“FOR A SMART, INCLUSIVE, INNOVATIVE AND SUSTAINABLE FLORENCE”) has recently been adopted (October 2015) whose targets summarise all the efforts and the policies the administration has already or is going to adopt in the very next future (COP21 - 2030) towards 2050. Another important thing to stress is the methodology followed to develop those ambitious objectives: the Smart city plan has been developed with a co-productive approach, involving stakeholders at every level and citizens in the decision making process.



The promotion of the sharing modality and the switch to electric vehicles will continue to 2050 where the last targets have been decided.

The main critical issues tackled by the project and the consequent solutions adopted allow other subjects interested to enhance their own possible experimentations. Particularly, it is possible to recommend the followings:

- people need time to adapt to two big changes, related to electric engines and sharing system which ought to substitute the vehicles property. Solutions:
  - economic incentives for the private fleet renewal, also using public funding;
  - public fleet renewal, raising the citizens’ awareness of e-mobility;
  - economic incentives to allow sharing private operators to keep low the prices, mainly for short periods
  - non-financial incentives to promote the use of e-vehicles (impacts are weaker and it is more difficult to obtain results, mainly in short terms), such as: access for EVs to limited traffic zones, reserved parking;
  - raise citizens’ and providers’ awareness of technological solutions that it is useful to use and adopt;



- too often cities and urban areas have not an adequate e-charging network for e-light vehicles. It is possible to reduce this issues by:
  - new charging points, mainly involving private subjects;
  - promotion of sharing systems, with no need of spread recharging infrastructure;
  - promotion of the commercialisation of e-light vehicles with removable batteries (already on the market);
- to carry out the tasks concerning the involvement of the local, national and international stakeholders already during the initial phases of the e-mobility model adoption, in order to allow the outlining of the better solutions for their own context;
- a sharing service can be useful and effective if specific conditions can be implemented, such as:
  - the organization of the service in a proper area, covering the entire city or town. In this way, the system can have the critical mass of demand in order to be sustainable;
  - the implementation of a free-flow service, defining an area enough large to be appealing;
  - service areas should include also peripheral, hill areas or with a lower public transport accessibility, where competitors are lacking provisions and where users would find sharing services more valuable.
- some aspects can be improved in order to increase the friendliness of EVs for citizens both shared and owned. For example:
  - GPS navigation devices;
  - e-charging points reserved for e-light vehicles and easy to use;
- the use of bus tracks by e-light vehicles is a facilitation not really effective and it can create problems in terms of safety.