



MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA

2010-2015

Local Group Support:



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Managing Authority



TABLE OF CONTENTS

- 1. INTRODUCTION**
- 2. FRAMEWORK**
- 3. ELECTRIC MOBILITY MODEL**
 - 3.1. Model components
 - 3.2. Value chain (services)
 - 3.3. Actors
 - 3.4. Charging network
 - 3.5. Putting the pilot stage into effect
- 4. VISION**
- 5. CHARGING NETWORK**
 - 5.1. Sizing and location of charging points
 - 5.2. Charging network Maps and Tables
- 6. NETWORK IMPLEMENTATION PLAN**
- 7. INCENTIVE MEASURES**
- 8. COMMUNICATION PLAN**
 - 8.1. Framework
 - 8.2. Strategic Definitions
 - 8.3. Action plan
 - 8.4. Critical factors and recommendations
- 9. MONITORING PLAN**

[Annex I – Location of Pilot Stage Charging Areas](#)

All images used were taken from Google Earth and Google Maps - 2009

1. INTRODUCTION

Portugal intends to position itself as a trail-blazer as regards the adoption of new mobility models which are sustainable from an environmental perspective and which can optimize the rational use of electrical energy, taking advantage of generation from renewable sources and, finally which fit in with the working rhythm and development of cities.

The strategy adopted is based on four key areas: business model, infrastructure, incentives and communication; and electric vehicles.

As regards the business model, there is a commitment to defining and integrating several layers of electric mobility to which various actors correspond that each add specific value. Hence, the Mobi.E model will be based on an innovative information system which will allow the interaction of energy commercialisers, charging area operators and users of electric vehicles, as well as the entity managing the whole system.

In terms of infrastructure it is intended to create a wide-ranging network of charging areas nationwide. It was decided to launch a pilot network forthwith in 25 municipalities which will be complemented by 2015 and which allow the testing and validating of electric mobility solutions, creating a dynamic laboratory for trying out solutions nationwide.

As far as the incentives and communication are concerned, it is sought to create conditions to attract users to electric mobility, namely by way of an incentives package which sets it apart from other mobility modalities and also through a communication strategy focused on the benefits to users. Both the incentive measures and the communication plan will be carried out on a national and municipal basis.

Finally, it is intended to stimulate the electric vehicle market and promote the electrification of public vehicle fleets. This key area is mainly of a nationwide nature.

Self-evidently, the strategy has a materialization space in which the municipalities are important offshoots; hence, the 25 local governments which belong to the pilot network have assumed the drawing up of Municipal Plans for Electric Mobility (PMME) whose implementation horizon is between 2010 and 2015. This is the case of Beja too.

In the present context a Municipal Electric Mobility Plan is taken to mean a document setting out and scheduling the promotion, incentive and implementation actions re. electric mobility in the municipality, remaining consistent with the national guidelines and the specific local aspects, including the following content: Vision; charging network; Incentive measures; Communication plan; Network implementation plan; Monitoring plan.

The framework for drawing up the PMME was characterized by a great diversity of realities deriving from a universe of 25 municipalities of heterogeneous dimensions and nature, in addition to a timeframe available for carrying out the works limited to a mere three months. Furthermore, it is important to ensure the coherence of the national network which entailed a concern for homogeneity in terms of the methodological framework to be adopted as well as in the actual proposals to be included in each of the PMME. In this context, a pragmatic objective-oriented methodology was adopted in which the municipalities could benefit from the support of a public higher education institution, to be precise, Minho University.

The technical team appointed by the municipality of Beja to assume responsibility for drawing up the PMME put all its endeavours into this task, bearing out the high level of commitment of the Local Government view of the complexity and objective deadlines.

The present Municipal Electric Mobility Plan for the municipality of Beja is structured into nine chapters and an annex.

The first Chapter is the present introduction, followed by a "Framework" where a description is provided of the recent trajectory of electric mobility in Portugal, namely summarizing the most relevant framework legislation.

The third Chapter describes the "Electric Mobility model" in terms of its constituent part, value chain, actors, charging network and the operationalisation of the pilot stage.

The fourth chapter sets out the strategic vision for electric mobility.

The planning, sizing and location of the charging network of the municipality of Beja is shown in chapter 5. The respective implementation plan has been provided in chapter 6.

Chapter 7 is devoted to the portfolio of incentive measures to be adopted by the municipality of Beja for the promotion of electric mobility.

Chapters 8 and 9 include two plans of great importance for municipal strategy, to wit: Communication plan and monitoring plan.

2. FRAMEWORK

The National Energy Strategy approved by the Portuguese Government by way of Cabinet Resolution no.169 enacted on October 24th 2005, sets out the bases for energy policy in Portugal. In the context of its direction as regards energy efficiency, the National Action Plan for Energy Efficiency was subsequently approved – Portugal Efficiency 2005 – by Cabinet Resolution no.80 enacted on May 20th 2008.

This Plan encompasses a broad range of programmes and measures regarded as vital for Portugal to be able to achieve, and even surpass, the aims set out in the context of EC Directive 2006/32 issued by the European Parliament and Council on April 5th as regards efficiency in the final use of energy and energy services.

In the context of the implementation of the National Action Plan for Energy Efficiency it is intended to position the country as pioneering as regards the adoption of new models for mobility which are environmentally sustainable and which can exploit the relationship with the electric network and the integration with cities.

To this end, it is necessary to create conditions for massifying the electric vehicle, ensuring an infrastructure which is appropriate for the evolution in the no. of electric vehicles and the development of a service model which allows any citizen or organization access to each and every electric mobility solution supplied by any electric vehicle manufacturer.

To achieve these objectives it is necessary to carry out complex implementation and preparation work based on the definition of business and service models and concepts for the various parties concerned, on the definition of the appropriate legal and regulatory framework as well as on the development of technical solutions for the charging management system and points network.

In this context the following was approved by way of Cabinet Resolution no.20 enacted on February 20th 2009:

1 - To create the Electric Mobility Programme in Portugal whose objective is to introduce and massify use of the electric vehicle.

2 – To determine that the Electric Mobility Programme in Portugal should be run by a department in the context of the Ministry for the Economy and Innovation whose mission is based on the following essential objectives:

- a) Definition of the legal and regulatory framework appropriate for full implementation of the Electric Mobility Programme in Portugal;
- b) Definition of the implementation model for the Electric Mobility Programme in Portugal in its various constituent aspects, namely:
 - i) Definition of the service, business and implementation model;
 - ii) Definition of the pilot network and its industrial components;
 - iii) Definition of the management and coordination of the implementation of the Electric Mobility Programme in Portugal;
 - iv) Definition of the forms of financing;
 - v) Development of the technical solutions required to implement a points network and charging management system for electric vehicles.
- c) Definition of the work plan, activities and deadlines, the actors involved and responsibilities;
- d) Definition and implementation of the communication plan geared towards the different parts involved on the supply side and/or demand side in Portugal and abroad and promotion to potential investors.

By way of Cabinet Meeting no.81 enacted on September 7th 2009 the Government decided to set the strategic objectives of the Electric Mobility Programme, to define its basic underlying principles, to approve the Electric Mobility model, to establish the Programme stages, to define incentive measures for the adoption of electric mobility and to promote massification of the use of the electric vehicle.

As regards the strategic objectives of the Electric Mobility Programme the following priorities were established:

- a) To speed up the electric vehicle adoption process and allow the gradual conversion of the no. of cars;
- b) To incentivise the creation of attractive conditions for investment in Portugal of production and development activities for products related with electric mobility, promoting Portuguese innovations and technologies;
- c) To ensure the contribution to meeting the objectives of the Kyoto Protocol, promoting the use of renewal energies in mobility.

The basic principles underlying the Programme are the following:

- a) The electric mobility model will be particularly focused on users, ensuring fairness and universality for them as regards the access to charging, regardless of the commercialiser chosen and ensuring the technical interoperability conditions between the various vehicle models and brands, batteries and charging systems;
- b) The electric mobility market must ensure attractive conditions for the entry of various companies onto the market, promoting free competition;
- c) The use of energy from renewable energies will be prioritised, namely by taking advantage of the wind capacity in off peak periods, benefitting from the decentralised production mechanisms in urban environments and anticipating the integration with intelligent energy networks based on a bidirectionality rationale.

The Programme is undertaken over three stages, namely:

- a) A first stage, the "Pilot Stage" which is in progress and which will be extended until 2011 which includes the construction of a minimum experimental infrastructure for electric mobility nationwide, encompassing 25 municipalities and the main road axes which will allow charging solutions to be tested;
- b) A second stage called the "Growth Stage" which will start in 2012 and will entail the expansion of the experimental infrastructure with the adoption of tried and tested solutions from the previous stage, in particular in terms of the charging network;
- c) And a final stage, the "Consolidation Stage" which will start as soon as the demand for electric vehicles has attained a sustained level and, simultaneously, the conditions have been created for the introduction of a bidirectional charging system.

The main measures intended to incentivise the Electric Mobility Programme at the pilot stage and to promote the massification of the use of the electric vehicle deal with the following critical aspects:

- a) Subsidies to acquisition by private individuals of electric vehicles; the anticipated value is 5,000€ which may attain €6,500 should there be a simultaneously scrapping of an internal combustion vehicle assigned to the purchase of the first 5000 electric vehicles and it will be in force until late 2012;
- b) Annual acquisition of 20% of electric vehicles in central administration fleet renewal processes;
- c) Implementation of the experimental charging infrastructure, setting as goals the creation of 320 charging points in 2010 and 1350 in 2011;
- d) Implementation in Portugal of a research, development and testing platform for electric mobility management systems.

Finally, Statute Law no.39 enacted on April 26th 2010 regulates the organisation, access and exercising of electric mobility activities.

3. ELECTRIC MOBILITY MODEL

3.1 Model components

The Portuguese electric mobility model envisages and encompasses the following components:

Vehicles – mobility component which must be endowed with interaction capacities with the electrical network;

Batteries – components which store electrical energy and allow vehicle operation;

Charging points – infrastructure which allows the interface between the electrical network and the vehicles, charging their batteries;

Electricity Commercialiser for electric mobility – the agent legally qualified to this end;

Services (in addition to the basic charging service) – association of potential services like parking, financial solutions, vehicle and battery leasing;

Management system – carries out the management of various flows (information, energy and financial) associated with vehicle charging, ensuring the technological compatibility between the various infrastructures and electric mobility services and ensuring a national charging network accessible to any electric vehicle user.

3.2. Value chain (Services)

The value chain for electric mobility encompasses the following activity types to which services correspond:

- i) Network installation and maintenance which includes normal charging points (namely, slow) and rapid charging points;
- ii) Charging service – related with the making available of electricity to electric mobility as well as the necessary infrastructure operation;
- iii) Commercialisation of electricity which corresponds to the wholesale purchase and retail sale of electrical energy for supplying electric vehicle users with a view to charging the respective batteries at the charging points integrated in the electric mobility network;
- iv) Rendering of other services associated with electric mobility (parking, financing solutions, leasing vehicles and batteries etc.).

3.3. Actors

The model includes the following type of actors on the electric mobility market:

- i) **Charging point operators:** responsible for the installation, making available, operation and maintenance of charging points for public or private access, part of the electric mobility network;
- ii) **Electricity commercialisers for electric mobility:** responsible for the wholesale purchase and retail sale of electrical energy for supplying electric vehicle users with a view to charging the respective batteries at the charging points integrated in the electric mobility network;
- iii) **Electric mobility network operations manager:** carries out the management of various flows (information, energy and financial) associated with vehicle charging, ensuring the technological compatibility between the various infrastructures and electric mobility services and ensuring a national charging network accessible to any electric vehicle user.

3.4 Charging network

The main characteristics are presented of the national charging network for electric mobility:

- i) Type

The charging infrastructure for electric vehicles includes the following space types in terms of the accessibility thereof;

- **Public spaces for public access:** this includes the charging points available on the public highway and the public car parks run or otherwise by private entities;

- **Private spaces for public access:** this includes those places which are private but with public access, for example, the private car parks, shopping centres and service areas;

-**Private spaces for public access:** this includes parking spaces in residential garages (condominiums or private) and companies.

ii) Charging type

As regards the charging types to be provided these include:

-**Normal charging points** – generally located on the public highway and in public or private car parks or areas with public access in addition to those located in residences and in companies, allowing the complete charging of a battery typically in around eight hours;

-**Rapid charging points** – generally located at service stations along the main road systems and at other strategic locations allow charging in around twenty to thirty minutes.

iii) Electric Mobility Programme Stages

Three stages are foreseen, namely:

-Pilot stage

The pilot charging network is of an experimental nature and it seeks to validate service and business technological solutions so as to attract constructors for vehicle testing, different motorisations, means of storage and energy charging.

At this stage normal charging solutions are prioritised, ensuring access to multiple commercialisers of electricity for electric mobility.

-Growth stage and consolidation stage.

After the validation of solutions and models, the growth stage and consolidation stage will seek to respond to the different market demands, expanding network coverage and progressively integrating the bidirectionality trends associated with intelligent networks.

At these stages it is assumed that the **infrastructure** will have the capacity to integrate the various components, allowing the existence of an integrated charging infrastructure network nationwide.

With the emergence of intelligent networks and bidirectional charging technologies, it is envisaged that both at public spaces and at private spaces these adoptions will be adopted, thereby enabling not only the purchase but also the sale of electricity stored in the vehicle batteries.

3.5 Putting the pilot stage into effect

The pilot stage will be implemented between 2010 and 2012. It encompasses the installation of at least 1,350 normal charging points and 50 rapid charging points.

The normal charging points will be installed on a network of 25 municipalities which signed a protocol to this end with the Government in 2009.

The rapid charging points will be made available along the main road systems, particularly affecting the A1 and A2 motorways and at appropriate locations to be defined.

The 25 municipalities going to make up the pilot stage are: Almada, Aveiro, Beja, Braga, Bragança, Cascais, Castelo Branco, Coimbra, Évora, Faro, Guarda, Guimarães, Leiria, Lisbon, Loures, Portalegre, Oporto, Santarém, Setúbal, Sintra, Torres Vedras, Viana do Castelo, Vila Nova de Gaia, Vila Real and Viseu.

The planning and implementation of the experimental electric mobility infrastructure, foreseen at the pilot stage, require the drawing up of Municipal Plans for Electric Mobility (PMME).

The general objective of PMMEs is to create conditions for the implementation of a charging points network as well as speeding up the electric vehicle adoption process, creating conditions conducive to their use and promoting raising awareness and demonstration campaigns which disseminate the advantages thereof.

It is worth stressing that the PMME is not a mobility plan in the classic sense of the word. It is rather a plan to promote and incentivise electric mobility and it must necessarily fit in with the mobility plans and practices to be found in the municipality.

4. VISION

The Vision underlying the National Electric Mobility Programme is the positioning of Portugal as a trailblazer as regards the adoption of new mobility models which are sustainable from an environmental perspective and which can optimize the rational use of electrical energy, taking advantage of the energy produced from renewable sources.

At the territorial level of the municipalities, their cities aspire to be - and to be recognised – as more sustainable urban areas, unpolluted and with little noise, where individuals, families and companies can enjoy a lower mobility bill deriving from the possibility of adopting the electrical alternative.

This vision is shared by the municipalities adhering to the pilot stage, including Beja.

The vision stated is consistent with the national policies in place, to wit the following:

- National Energy Strategy and National Action Plan for Energy Efficiency (PNAEE);
- National Plan for Climate Alterations (PNAC);
- National Sustainable Development Strategy (ENDS);
- National Programme for the Territorial Organisation Policy (PNPOT);
- Strategic Transport Plan (PET).

5. CHARGING NETWORK

5.1 Sizing and location of charging points

The vehicle battery charging network will perhaps be the most visible element of the Municipal Plans for Electric Mobility. Its sizing is currently still an exploratory exercise since there is no historic data, the potential electric vehicle user profile has not been defined, there are no reliable projections of the availability of electric vehicles and, finally, it is not precisely known at what rate battery technology will evolve.

It is this backdrop which turns the project into an experimental exercise with a pilot stage to which those municipalities have signed up which wish to be at the vanguard.

A careful analysis of the international experiences both in Europe and the United States of America reveals that there is still no theoretical framework for the sizing of charging networks for electric vehicles. The known initiatives have systematically taken on an experimental or pilot nature and they seek to create the conditions to attract users to this new modality which is mobility, thereby improving the adoption curve. It is estimated that this will be the scenario until around 2015 and it may subsequently be possible to develop sizing and projection models based on demand-supply rationales.

From this perspective, it was decided to select an international pilot initiative based on which charging point coverage ratios could be adopted, making the necessary adaptations, namely in line with the motorisation rate.

The pilot charging network foreseen for Portugal has the specific aspect of assuming a national context, materialised by way of 25 municipal networks, setting it apart from the majority of international European initiatives which are focused on a single city. It was thus sought to adopt a multi-city initiative, having identified the ECOTALITY EV Project in the USA.

The EV Project is one of the most complete initiatives known for the provision of a charging network and for studying the electric mobility theme. It was created in August 2009 with a budget of over 200 million dollars, having benefitted from financing from the US Federal Government (U.S. Department of Energy) of around 100 million. In the context of this project, domestic and public charging points will be installed at 11 cities in 5 US states: Arizona (Phoenix and Tucson), Washington (Seattle), Oregon (Portland, Salem, Corvallis and Eugene), California (San Diego) and Tennessee (Nashville, Chattanooga and Knoxville).

One of the *EV Project* partners is Nissan which will supply 4700 Nissan Leaf electric vehicles. With the authorisation of the owners, the people responsible for the project will gather and analyse data to evaluate the efficiency of the new charging infrastructure. The collection stage will take 2 years after which there will be a year of analysis and conclusions so that in late 2013 the terms can be defined for launching electric mobility right across the US.

The *EV Project* envisages the installation of:

- 4,700 Level 2 charging points (slow charging at 220V, SCP) in residences;
- 6,250 Level 2 charging points (SCP) at public access locations;
- 260 Level 3 charging points (rapid charging, RCP).

For the purposes of determining the pilot project ratios, the residential points are not considered whose objective in the US study is merely to create charging monitoring stations. The ratio calculated is around 1.15 SCP/1000 inhab., constituting a ratio of 1 RCP to every 24 SCP.

In the Portuguese case, the network was sized for a horizon year of 2015. Hence, the population was projected for each of 25 municipalities of the national network for 2015, having applied the coverage ration calculated above, adjusted in line with motorisation rate differences.

For the municipality of Beja the projection for 2015 is as follows:

SCP – Slow charging points: 29 and RCP – Rapid charging points: 1

Total CP – 30

The national pilot stage, taking place between 2010 and 2012, is called the Mobi.E network and coordinated by the Electric Mobility Department (GAMEP). In the context of the definitions of Electric Mobility Programme, GAMEP awarded the municipality of Beja a total of 10 SCP of the Mobi.E network which will thus be the first in the total of 30 points projected for 2015.

In view of the pilot nature of the Mobi.E network, the supply-demand rationale is still not central yet. This is also the case for the purposes of locating the charging areas.

A common indicative framework was defined for charging point location principles so as to lend cohesion and homogeneity to the network. Two location levels were adopted as a methodology:

- **Macro level** whose objective is the assignment of the number of charging points (horizons 2012 and 2015) in the district territory, considering zones/boroughs/agglomerations. In this regard criteria such as the following were considered: political-strategic interest; road and dynamic infrastructure for circulation and parking; traffic generating poles; presence of centralities in terms of the equipment, services or business.
- **Micro level** whose goal is to define the specific location of the pilot stage charging areas (horizon 2012) inside the zones/boroughs/agglomerations. In this regard criteria such as the following were considered: central public highways; parking areas with public access; residential areas where private parking is scarce; commercial, service and leisure areas; business areas; taxi ranks (rapid charging point); possibility (in terms of physical space – area and volumetry) of associating other amenities with the other charging areas such as the installation of renewable energy micro-generation devices and advertising.

One issue raised is the charging of 2-wheeled electric vehicles. At this network planning stage it was decided to consider that these vehicles will have access (and requirements) similar to that of 4-wheeled vehicles, assuming that one normal parking space corresponds to two charging points for 2-wheeled vehicles. As soon as the market starts making available technological charging solutions dedicated to this type of vehicles, their insertion into the heart of the planning of the charging network may be reconsidered.

5.2. Charging network tables and maps

The application of location criteria in the municipality of Beja resulted in a series of tables and maps which are presented in this section and which have been described below:

- Public charging network 2010-12 (table);
- Charging area network 2010-12 (table);
- Charging point pilot network 2010-12 (table);
- Potential privately-run charging areas (table);
- Public charging network 2010-15(table);
- Charging area network 2010-15 (table);
- Public charging network 2010-12 (map);
- Charging area network 2010-12 (map);
- Charging point pilot network 2010-12 (map/satellite images)*;
- Potential privately-run charging areas (map);
- Public charging network 2010-15 (map);
- Charging area network 2010-15 (map).

*These maps have been provided in Annex I (Location of Pilot Stage Charging Areas).


MUNICIPAL PLAN FOR ELECTRIC MOBILITY



BEJA

2010-12

Public charging network 2010-12

			
City / Town / Area	P.C.L.	2 wheels	P.C.
Beja	10	4	10
Total	10	4	10

Charging areas network 2010-12

				
City / Town / Area	Code	Loding area	P.C.L.	P.C.R.
Beja			10	4
	BEJA-001	Praça da República	2	2
	BEJA-002	Parque de Estacionamento Miguel Fernandes	2	0
	BEJA-003	Parque de Estacionamento IPB	2	2
	BEJA-004	Parque de Estacionamento Beja Parque Hotel	2	0
	BEJA-005	Parque de Materiais Municipal	2	0


















MUNICIPAL PLAN FOR ELECTRIC MOBILITY



BEJA

2010-12

Pilot network of charge points 2010-12

City / Town / Area	Code	Loding area	P.C.L.	2 wheels
Beja	BEJA-001	    	2	2
		Name	Praça da República	
		Address	Praça da República	
		GPS	N38 0'56.69, W7 51'54.51	
Beja	BEJA-002	    	2	0
		Name	Parque de Estacionamento	
		Address	Avenida Miguel Fernandes	
		GPS	N38 0'54.04, W7 52'0.66	
Beja	BEJA-003	    	2	2
		Name	IPB	
		Address	Parque de Estacionamento IPB Rua Pedro Soares	
		GPS	N38 0'47.83, W7 52'21.23	
Beja	BEJA-004	    	2	0
		Name	Piscina Coberta	
		Address	Parque de Estacionamento Rua 1º de Maio	
		GPS	N38 0'39.10, W7 52'28.32	
Beja	BEJA-005	    	2	0
		Name	Parque de Materiais do Municipio	
		Address	Variante de Beja IP8. EN260	
		GPS	N38 1'35.63, W7 52'2.77	

MUNICIPAL PLAN FOR ELECTRIC MOBILITY








BEJA

2010-15

Public charging network 2010-15

 City / Town / Area	 P.C.L.	 P.C.R.	 P.C.
Beja	19	1	20
Beringel	2	0	2
São Matias	2	0	2
Nossa Senhora das Neves	2	0	2
Salvada	2	0	2
Albernoa	2	0	2
Total	29	1	30

Charging areas network 2010-15

 City / Town / Area	 Code	 Loding area	 P.C.L.	 P.C.R.
Beja			19	1
	BEJA-001	Praça da República	3	0
	BEJA-002	Parque de Estacionamento Miguel Fernandes	4	0
	BEJA-003	Parque de Estacionamento IPB	2	0
	BEJA-004	Parque de Estacionamento Beja Parque Hotel	2	0

	BEJA-005	Parque de Materiais Municipal	4	0
	BEJA-011	Casa da Cultura	4	0
	BEJA-012	Cooperativa Proletário Alentejana	0	1
Beringel				
	BERG -006	Largo do Rossio	2	0
São Matias				
	SMAT -007	Largo Central	2	0
Nossa Senhora das Neves				
	NSNV -008	Rua Catarina Eufémia	2	0
Salvada				
	SALV -009	Junta de Freguesia	2	0
Albernoa				
	ALBN -010	Largo da Liberdade	2	0

MUNICIPAL PLAN FOR ELECTRIC MOBILITY



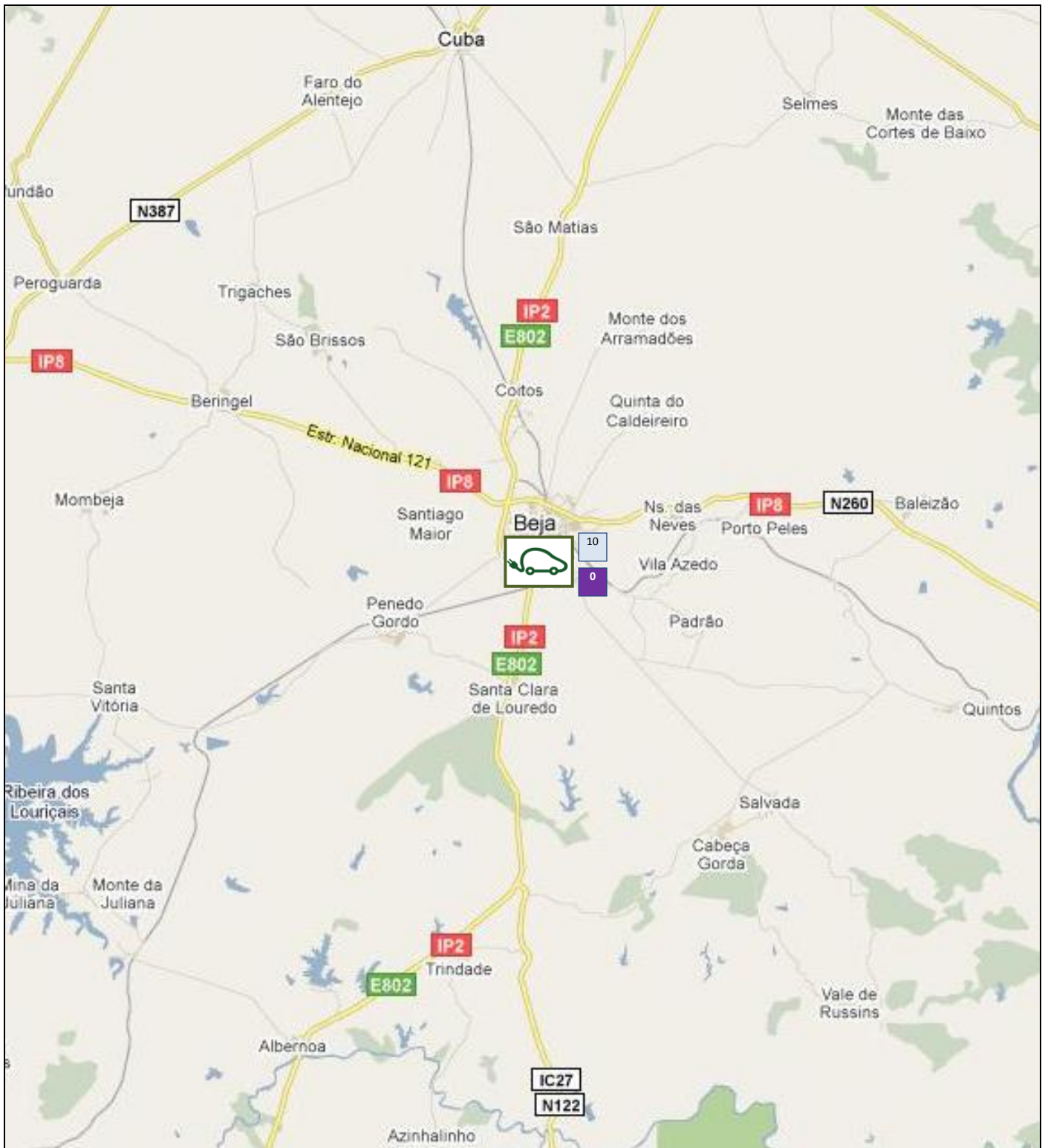
BEJA

2010-15

Pilot network of charge points 2010-15

City / Town / Area	Code	Loding area	P.C.L.	P.C.R.
Beja	BEJA-001	Nome Praça da República	3	0
		Endereço Praça da República		
		GPS N38 0'56.69, W7 51'54.51		
Beja	BEJA-002	Nome Parque de Estacionamento	4	0
		Endereço Avenida Miguel Fernandes		
		GPS N38 0'54.30, W7 51'59.94		
Beja	BEJA-003	Nome IPB	2	0
		Endereço Parque de Estacionamento IPB Rua 1º de Maio		
		GPS N38 0'47.15, W7 52'28.19		
Beja	BEJA-004	Nome Beja Parque Hotel	2	0
		Endereço Parque de Estacionamento Rua 1º de Maio		
		GPS N38 0'36.47, W7 52'25.08		
Beja	BEJA-005	Nome Parque de Materiais do Município	4	0
		Endereço Variante de Beja IP8. EN260		
		GPS N38 1'36.47, W7 52'1.09		

Beringel	BERG-006	Nome	Beringel	2	0
		Endereço	Largo do Rossio		
		GPS	N38 3'22.60, W7 59'6.79		
São Matias	SMAT-007	Nome	São Matias	2	0
		Endereço	Largo Central		
		GPS	N38 6'33.20, W7 51'23.53		
Nossa Senhora das Neves	NSNV-008	Nome	Nossa Senhora das Neves	2	0
		Endereço	Rua Catarina Eufémia		
		GPS	N38 1'18.30, W7 48'41.37		
Salvada	SALV-009	Nome	Junta de Freguesia	2	0
		Endereço	Praça 5 de Outubro		
		GPS	N37 56'6.21, W7 46'30.00		
Albernoa	ALBN-010	Nome	Albernoa	2	0
		Endereço	Largo da Liberdade		
		GPS	N37 51'40.28, W7 57'28.03		
Beja	BEJA-011	Nome	Casa da Cultura	4	0
		Endereço	Rua Luís de Camões		
		GPS	N38 0'39.97, W7 51'37.13		
Beja	BEJA-012	Nome	Cooperativa Proletário Alentejana	0	1
		Endereço	Largo dos Duques		
		GPS	N38 0'51.75, W7 51'43.54		



Public charging network 2010-12 – Municipal coverage



999

Slow charge points

999

Fast charge points

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -12



Charging areas - Beja 2010-12



AAA-999

City coverage

Charging area

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -12



Potential charging areas of private initiative – Beja



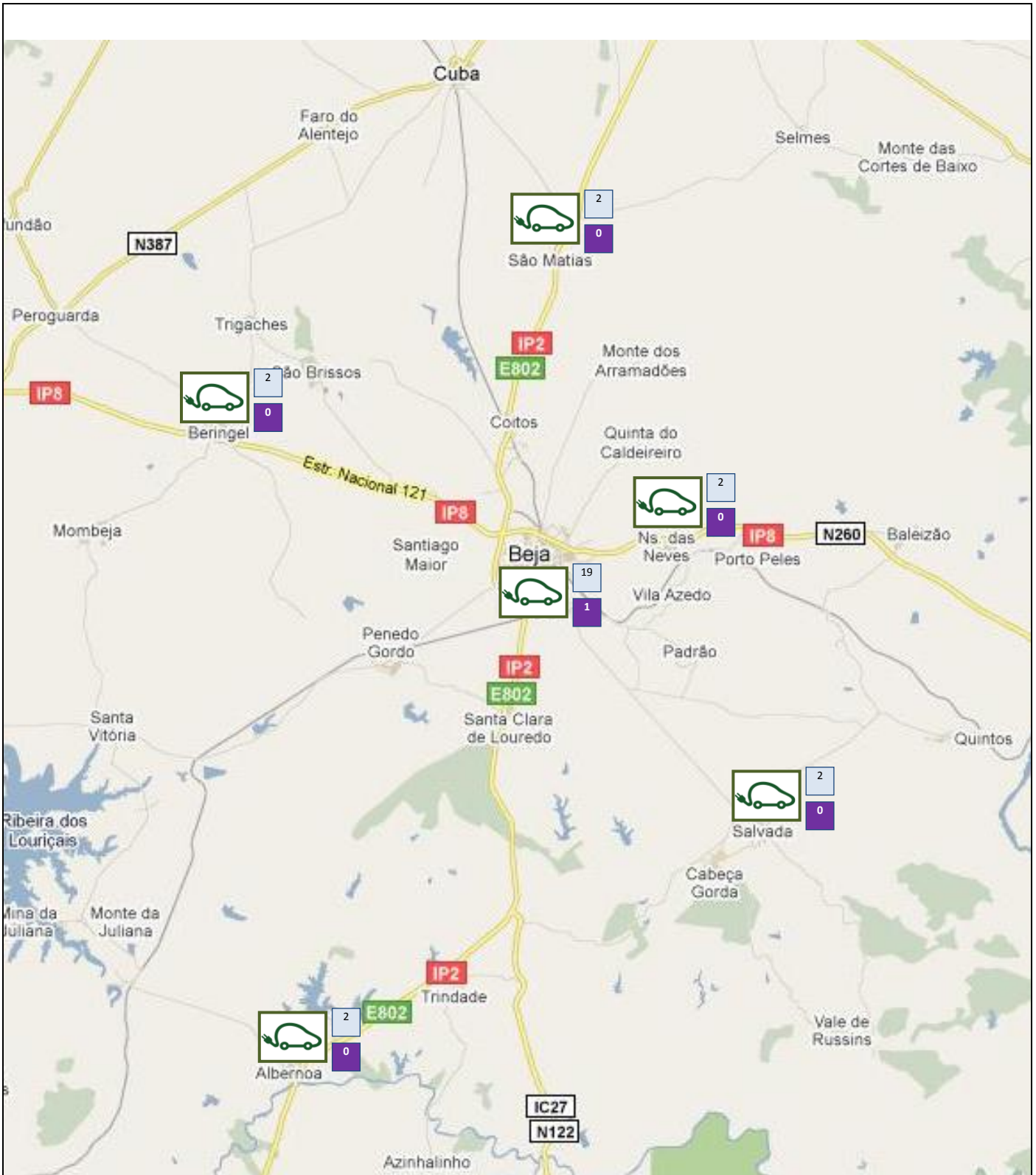
BEJA-p99

City coverage

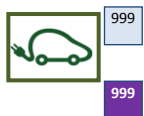
Charging area

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15



Public charging network 2010-15



Municipal coverage

Slow charge points

Fast charge points

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15



Public charging network 2010-15



Municipal coverage

City coverage

Charging area

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15



Public charging network 2010-15

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

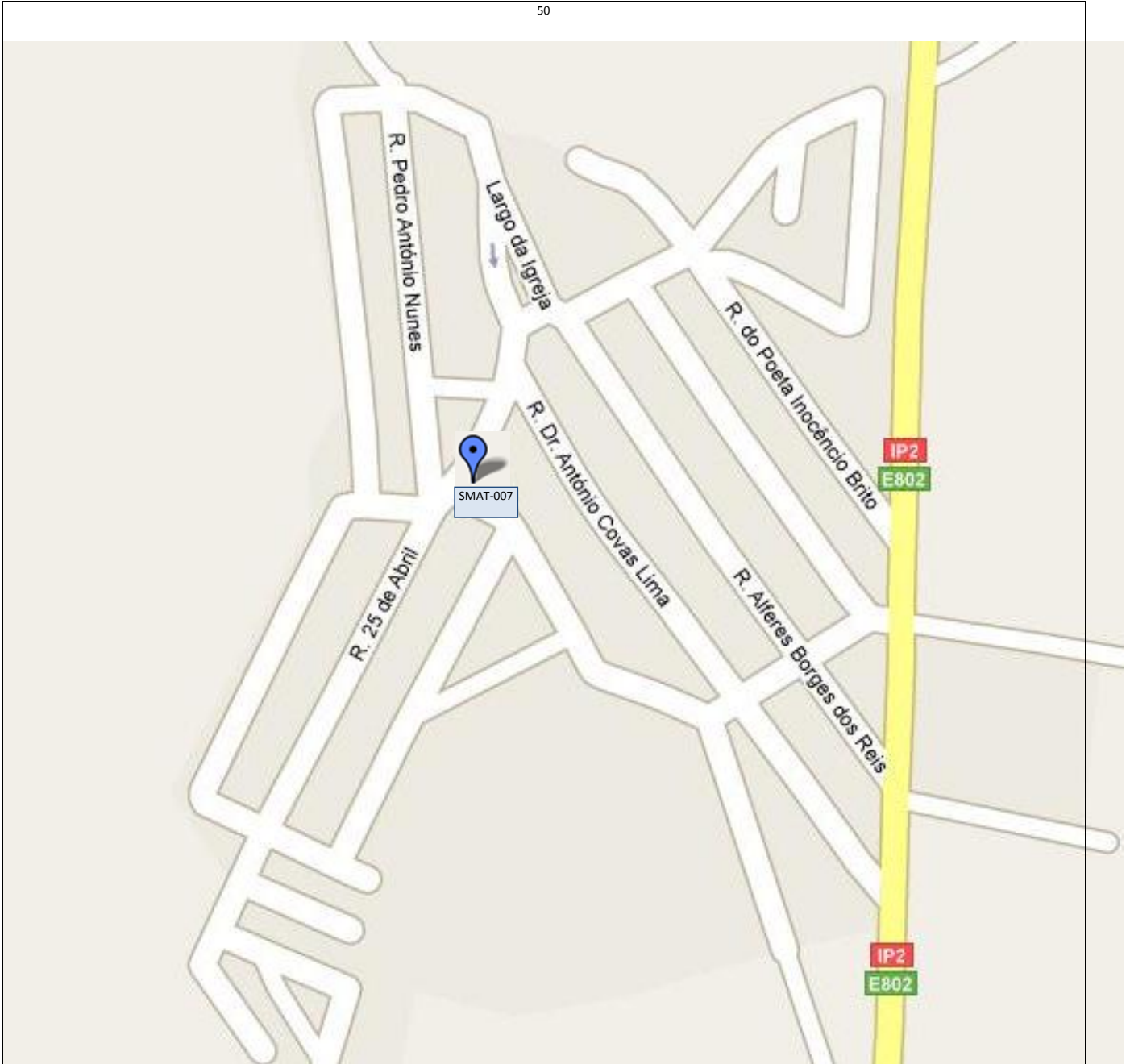
BEJA 2010 -15

Municipal coverage - **BERINGEL**



Slow charge points

Fast charge points



Public charging network 2010-15

Municipal coverage – **S. Matias**

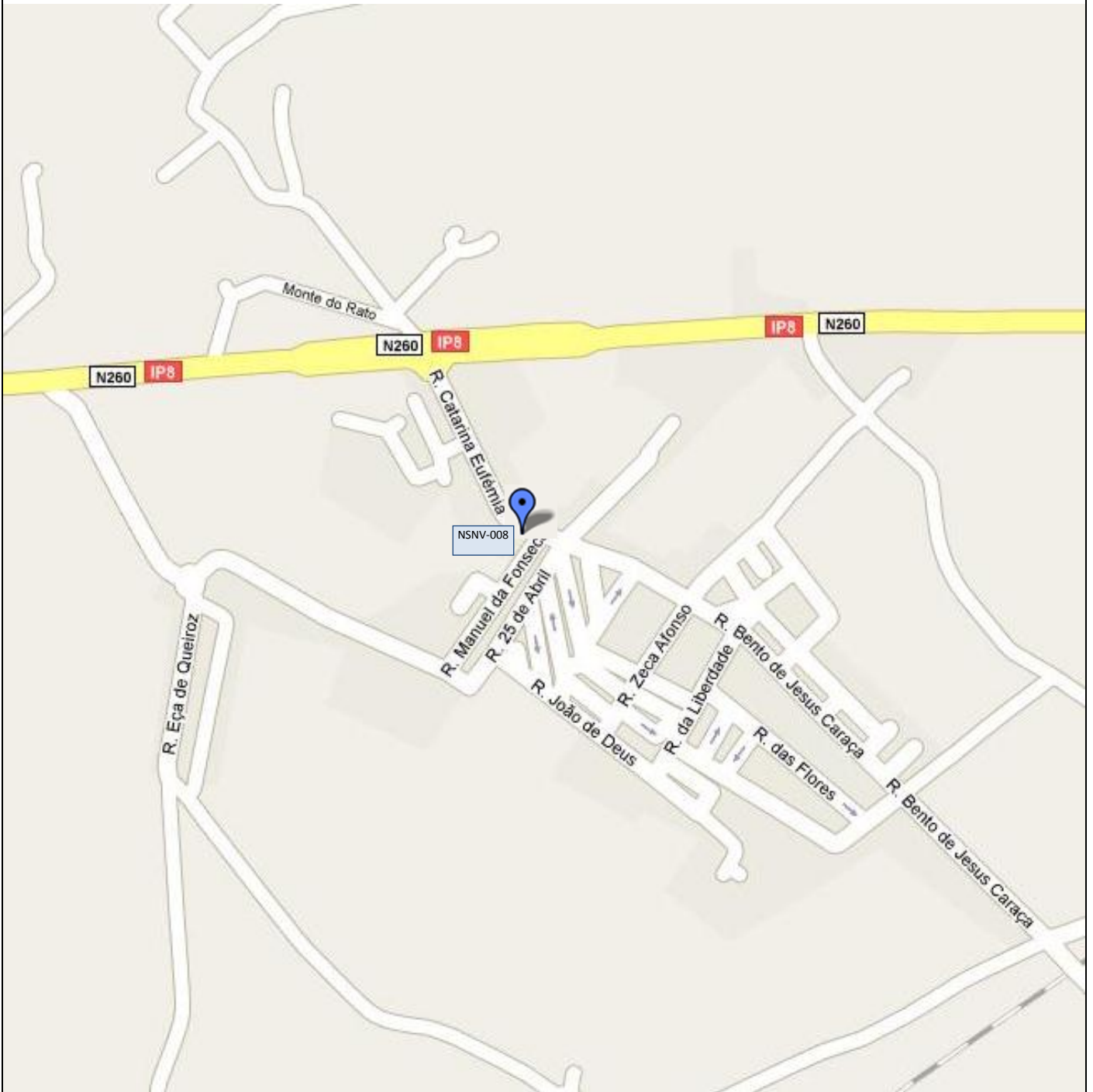
Slow charge points

Fast charge points



MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 - 15



Public charging network 2010-15

Municipal coverage - N.ª S.ª Neves



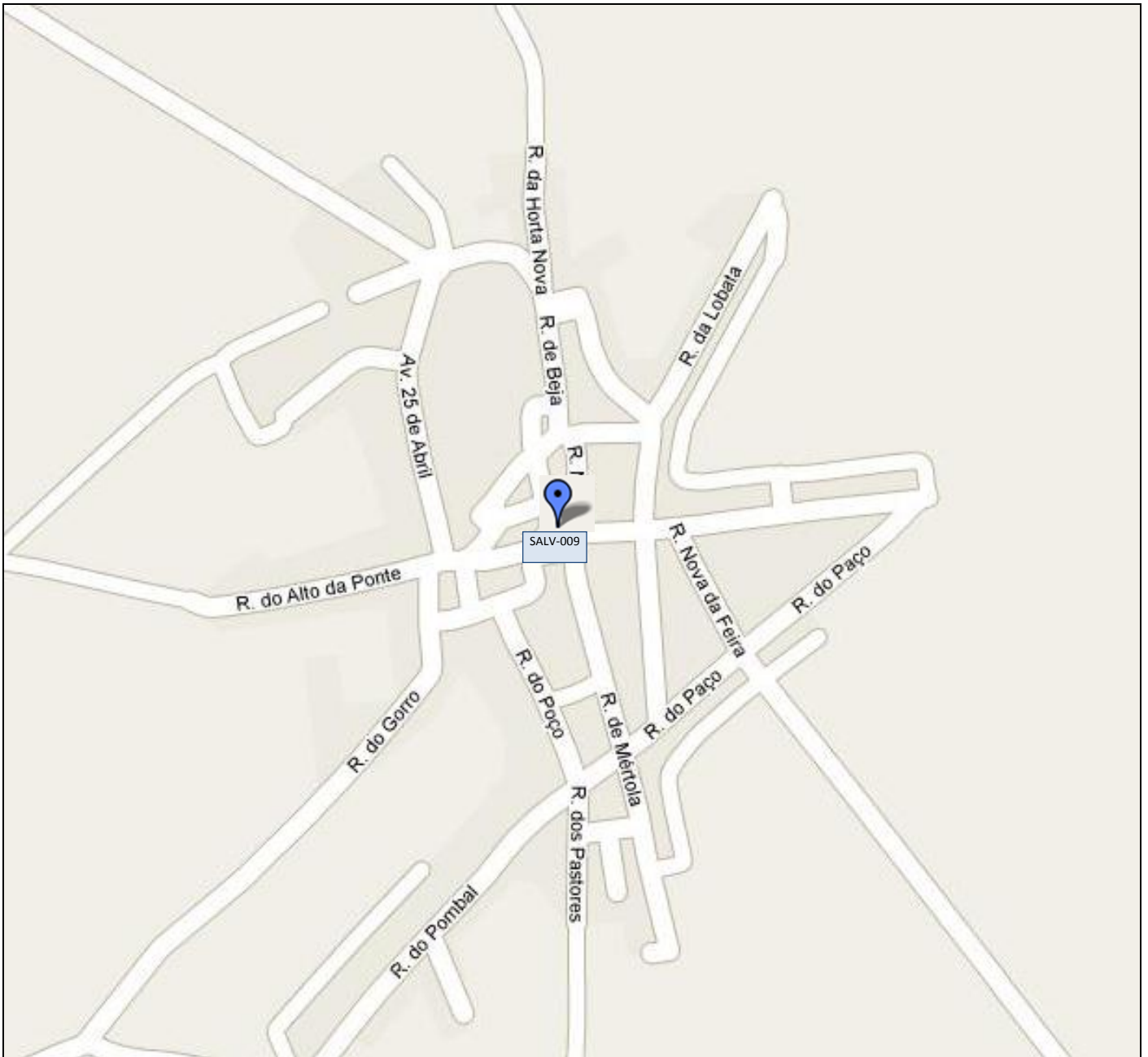
AAA-999

Slow charge points

Fast charge points

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15



Rede pública de carregamento 2010-15

Public charging network 2010-15

Municipal coverage - Salvada



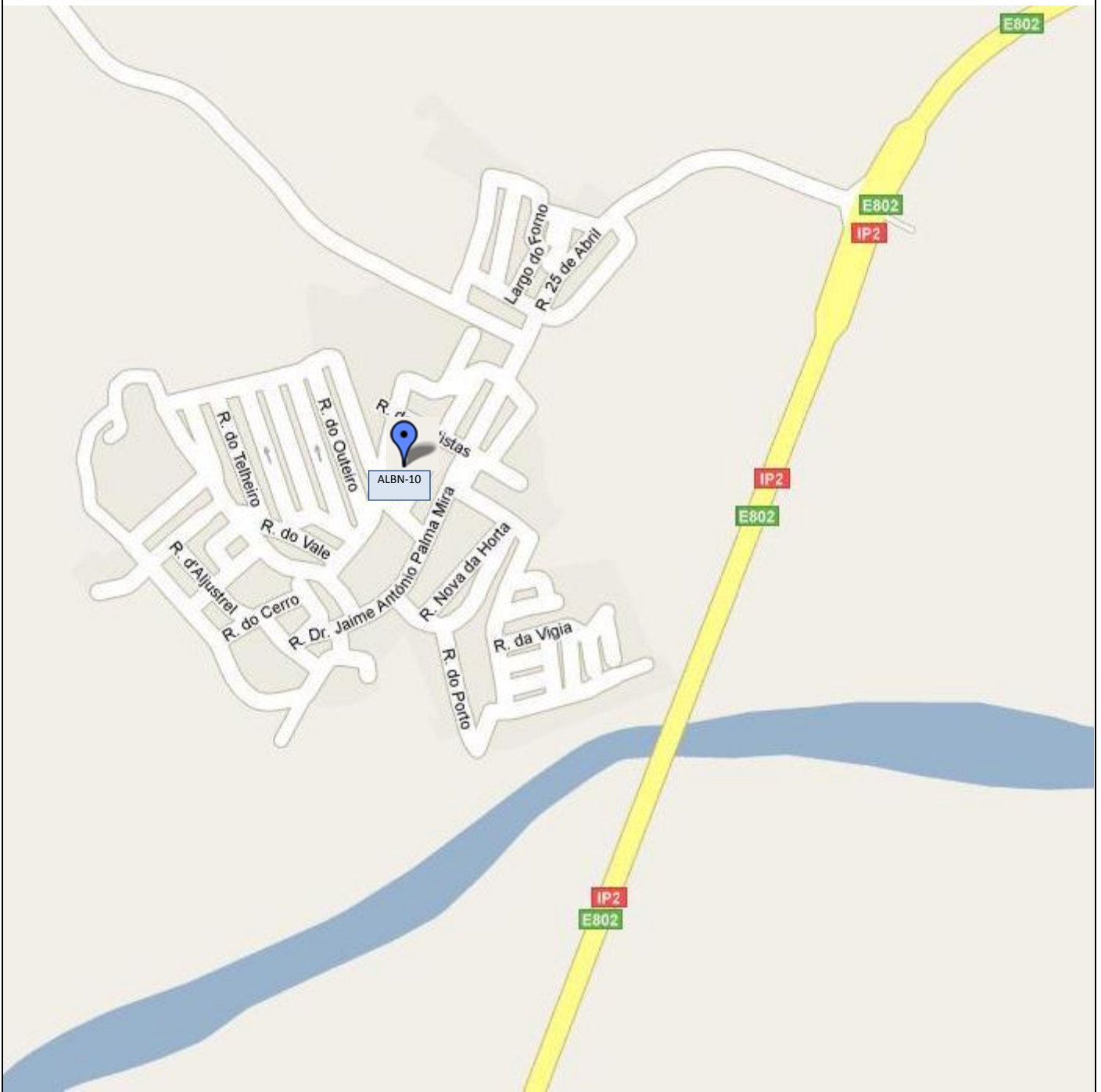
AAA-999

Slow charge points

Fast charge points

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15



Public charging network 2010-15

Municipal coverage - **Albernoa**



AAA-999

Slow charge points

Fast charge points

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA 2010 -15

6. NETWORK IMPLEMENTATION NETWORK

The Municipal Plans for Electric Mobility will have an implementation time horizon which starts in the second half of 2010 and continues to 2015.

The initial charging network implementation stage - corresponding to the pilot network and called the Mobi.E network – starts in 2010 and continues until late 2011 after which there will be an analysis period in 2012 and then a network expansion period will commence until 2015.

Subsequently, the implementation plan for the charging network in Beja is presented including:

- The identification of the different stages, number of charging points, promoter, implementation model and estimated Investment value.
- The implementation schedule during the 2010-15 period.

For the purposes of estimating investment, the following unit values were assumed which include the equipment and their installation:

- **Slow charging point: 3,000 €;**
- **Rapid charging point: 30,000 €.**

MUNICIPAL PLAN FOR ELECTRIC MOBILITY



BEJA

2010-15

IMPLEMENTATION PLAN FOR NETWORK CHARGING

Phase	Description			Promoter	Deployment model	Investment
		PCL	PCR			
I	MOBI.E	10	0	MOBI.E	central funding	30 K€
II	Expansion City of Beja	9	1	Municipal Company	Grant	57 K€
III	Expanding rural parishes I	4	0	City Hall	municipal investment	12 K€
IV	Expanding rural parishes II	6	0	City Hall	municipal investment	18 K€

2010 - 15	29	1		117 K€
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schedule | investment

Phase	2010	2011	2012	2013	2014	2015
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I	Time										
	Investment k €		15.0	15.0							
	PCL/ PCR		5/0	5/0							

II	Time										
	Investment k €				45.0	6.0	6.0				
	PCL/ PCR				5/1	2/0	2/0				

III	Time										
	Investment k €							6.0	6.0		

	PCL/ PCR										2/0	2/0		
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IV	Time													
	Investment k €												12.0	6.0
	PCL/ PCR												4/0	2/0

	Investment k €	15.0	15.0	45.0	12.0	12.0	18.0
	PCL/ PCR	6/0	5/0	4/1	4/0	4/0	6/0

7. INCENTIVE MEASURES

The National Electric Mobility Programme includes, from the outset, incentives of a fiscal nature which are applied to the acquisition of electric vehicles, others being expected at different levels. Self-evidently, these are advantages which will transversally benefit all national citizens, companies and institutions.

As regards the municipality of Beja, in addition to a charging network, the electric mobility promotion plan includes and incentives' programme so as to make the acquisition and use of electric vehicles attractive.

The proposed portfolio of incentive measures fits into a homogeneous, consistent framework in terms of the national network (resulting from the integration of the municipalities' networks), a crucial pre-requisite for the usability and readability of the system by the electric vehicle user. It is intended to avoid incentive schemes which differ greatly from municipality to municipality which could confuse the user and, in the final analysis, diminish project credibility.

This section presents the characterisation of the incentive measures to be adopted by the municipality of Beja.

MUNICIPAL PLAN FOR ELECTRIC MOBILITY	MOBIL.E ELECTRIC MOBILITY BEJA 2010-15
INCENTIVES' MEASURES	
Measure:	
Total or partial exemption from parking charge.	
Description:	
Duly identified electric vehicles may park freely without paying or, alternatively, only during some periods (partial exemption).	
Benefits (positive impact):	
A lower parking cost may contribute to the adoption of electric vehicles.	
Costs (negative impact):	
Loss of revenue in those cases where some paid parking spaces have to be removed.	

MOBI.E ELECTRIC MOBILITY

MUNICIPAL PLAN FOR ELECTRIC MOBILITY

BEJA

2010-15

INCENTIVES' MEASURES

Measure:

Fleet renovation programmes with electric vehicles.

Description:

The adoption of electric vehicles in the fleet renovation programmes for municipal companies and services. A percentage of electric vehicles is typically defined to be applied to the new acquisitions.

Benefits (positive impact):

Reduction in emissions of those pollutants associated with the transport system, having direct consequences on improving noise and air quality.

Reduction in the energy bill for municipal company fleets.

Dissemination and advertising of the use of the electric vehicle to public opinion and, in particular, municipal service employees.

Costs (negative impact):

Possible increase in investment in fleet renovation programmes owing to the higher cost of electric vehicles.

INCENTIVES' MEASURES

Measure:

Energy micro-generation at charging areas.

Description:

Electric vehicle charging may be an energy component deriving from micro-generation at charging areas. A space must thus be provided which allows the placement of micro-generation equipment (aerogenerators and photovoltaic panels). This equipment is intended to inject energy into the network, thereby contributing to a greater relative proportion of renewable sources in the total energy balance.

Benefits (positive impact):

This associates the use of electric vehicles with more general concepts of sustainable mobility.

Increase in impact, penetration and visibility of the use of the electric vehicle on the general public.

Reduction in the energy bill associated with use of the electric vehicle.

Costs (negative impact):

Cost associated with purchase and installation of energy micro-generation equipment (aerogenerators and photovoltaic panels).

In the case of wind farms there may also be an increase in the environmental noise caused at the location sites.

INCENTIVES' MEASURES

Measure:

Business models and equipment associated with the charging areas.

Description:

Possibility of associating other tradable services or products with the charging area (particularly rapid charging ones), including: advertising, vending machines, cyber cafés, minor retail trade, payshops, some municipal services, inter alia.

Benefits (positive impact):

Simultaneous implementation of various tasks of different, but complementary, natures. To increase the attractiveness of EV charging and, consequently, safety (avoid vandalism).

Charm offensive in the municipality on EV users, ensuring them a series of services which may have an exclusive nature with the possibility of attracting more users. Possibility of concession of these spaces.

Costs (negative impact):

Cost inherent in the creation and management of additional infrastructures.

Lack of space for placing urban furniture in public spaces.

8. COMMUNICATION PLAN

Electric mobility is a new reality and the awareness of the majority of potential users has not been raised sufficiently. Hence, in Portugal, as with the best international initiatives, communication plays a critical role in the dissemination of the advantages and benefits to society and to individuals by adhering to this mobility modality.

The Mobi.E brand was developed nationwide in the context of which communication campaigns will be launched. These initiatives are complemented by the communication plans on a municipal scale.

The Beja plan, presented in this section, is developed in three parts – Framework, Strategic Definitions and Plan – and is aimed at four target publics, namely:

- Citizens in general;
- Business community;
- School community including higher education;
- Influencers.

The set of actions is vast and the extent and duration of the proposals will be adapted in line with the costs involved and the budget availability. In this regard, the own resources of the municipality will be used whenever possible.

8.1. Framework

8.1.1. Assumptions

The present document represents a communication plan geared towards those municipalities which will take on the Mobi.E project - electric mobility – in the 2011/12 period.

The pioneering nature of the project, combined with the high sense of sustainability which characterises it, is highly orientative. The following pages enshrine a strategy based on the need to promote an absolutely innovative idea about mobility in cities which will entail major behavioural alterations.

Communication must envisage the natural resistance to change and, consequently, bear in mind the current degree of ignorance about this area and the potentially jarring effect upon first perception.

One route to follow would be to get a user segment on board as “**trend setters**”.

The implementation of this plan is aimed, in the final analysis, to contribute to the construction of an idea of “high intensity citizenship”, promoting corporate social responsibility, environmental sustainability and greater quality of life in cities.

8.1.2. Characterisation of Mobi.E

A new mobility model

The energy and environment are worldwide issues which require a global response.

Portugal has been adopting a leading stance in the rationalisation of electrical energy consumption and production, integrating renewable energies. Driven on by the great energy dependence on oil and the huge environmental impact resulting from the use of fossil fuels, the country is committed to new energy models for mobility which are aimed at improving the quality of life of cities.

Furthermore, the noise and atmospheric pollution levels associated with conventional vehicles with internal combustion engines frequently exceed the acceptable limits both in terms of the overall impact on the environment and in terms of the damage caused to people's health.

It is against this backdrop that the idea of introducing **electric vehicles** has come about.

How does it work?

The vehicles:

Several car manufacturers already develop models driven by electrical energy. As an incentive measure, the Portuguese State may guarantee benefits to consumers.

Charging areas:

Each municipality develops its charging point implementation plan. These may be located at public access points, public car parks, shopping centre car parks, hotels, airports, petrol stations and on the public highway. The norm will be charging in the individual garages of users.

How to power an electric vehicle:

During the night, using the energy produced in this lower consumption period – typically deriving from a renewable source – and by charging during day in accordance with the user's needs.

SLOW CHARGING: 6 – 8 Hours

RAPID CHARGING: 20 – 30 minutes

Form of payment:

A Mobi.E network card provides access to the charging points, deducting the charging value. This amount includes the electricity consumed and a payment for the charging service.

8.1.3. Relevant communication data

User benefits:

Rational

- More economical means of mobility;
- Does not alter car performance;
- Clean energy available at several points of the city and at home;
- State incentives to buy electric vehicles.

Emotional

- Ecological attitude;
- Being a trendsetter;
- Innovation, being “ahead of the pack”.

8.2. Strategic definitions

8.2.1 Communication Objectives

- To lend visibility and awareness to the Mobi.E and to everything the project entails, namely the electric vehicles and the system created for the respective use;
- To correctly inform the user;
- To involve influencers in the opinion-forming process;
- To promote changes in behaviour, fostering the move from ignorance to interest; from disinterest to signing up;
- To reduce/neutralise any jarring reactions;
- In the final analysis, to create the wish to sign up to the new mobility system.

8.2.2. Targets

Private users (citizens in general)

It is recommended to pay special attention to the age brackets 26 – 35 years old and the over 55's as the most willing to sign up.

It is a group which is concerned with the environment but also which sets great store by innovation and, in a certain way, wishes to be different and their car is an expression of this desire.,

To be precise, the 26-35 age bracket, also called “generation X”, is thought to influence consumer habits. For this segment icons revealing the conscience of their holders – ecological or social – have become more relevant than showing off brands (although they do not totally disregard them).

A prior qualitative study is recommended which will allow an understanding of the appetite of citizens from the municipality towards electric vehicles: degree of knowledge, advantages and disadvantages indicated, extent of appetite, difficulties raised are some of the issues.

Professional users (business community)

This concerns those responsible for companies with a need for fleets, companies in the car sector and business associations. For them, the communication must be very rational based on costs and the ease of the system.

A prior qualitative and quantitative study is recommended which characterises reality of the municipality. This study will allow information to be obtained supporting better local promotion; how many/which companies have a fleet, main purchase decision-making factors, knowledge/opinion about electric vehicles and the main concerns of fleet drivers are some of the issues.

School community

Students and teachers from various educational levels, from nursery to university, from the perspective of training publics. Also bear in mind that young people are currently opinion-forming influencers in the family context.

Schools, as educational places accommodating growing publics, are worthy of special mention. It should be stressed that we are dealing with diversified publics (in terms of age, social origin and degree of knowledge) and it is thus vital to think about initiatives which deal with these idiosyncrasies, seeking to capitalise on that which the students of the different educational levels do/don't know and do/don't do as regards mobility.

It is recommended to construct a data base including all the educational establishments in the municipality and the school principals as a support to communication actions.

Influencers

The relevant influencers in this context are:

- media bodies: local and national media, vital for conveying information about the project and the public opinion-forming process;
- *Trend setters*: local and national opinion leaders who may also play a role in opinion-forming: academics, journalists, businessmen and figures of note in the city.

8.2.3. Strategic axes

Identification

1. To ensure a strong, united identity everywhere. Each municipality contributes to the brand awareness by carrying out:
 - o The adoption of the Mobi.E brand and the slogan “energy that moves us”;
 - o The observation of Mobi.E graphic standards in all communication actions and supports.
2. To associate the Mobi.E brand with the brand logo of the municipality in all communication supports. Transfers sustainability and modernity attributes to the municipality.
3. To use specific signposting which facilitates recognition of the charging points and the specific charging parking sites: “reserved for electric vehicles”.

Communication

1. To segment the communication by publics, defining specific messages.
2. To create an integrated 360-degree communication system, combining online and offline communication.
3. To create synergies with local events and entities on the themes: citizenship, sustainability, the environment and territorial development.

8.2.4. Positioning

What is the desired perception?

Electric vehicles and the Mobi.E system are introducing a new mobility model into cities which is more rational and environmentally friendly and which contributes to more sustainable urban development.

8.3 Critical factors and recommendations

The communication plans to be promoted by the municipality must be intimately linked with the nationwide dissemination in terms of visual codes and contents. However, they must be developed in accordance with the idiosyncrasies of each city, never underplaying this aspect. Following this line of ideas, the present plan opens up a space for actions where the local actors are vital for the strategy.

The commercialisation of electric vehicles must have minimum attendance in the city or in the surrounding areas when the launch campaign starts, failing which it will engender disappointment after having created the appetite to experiment.

Along with the incentives foreseen by the State, the municipalities must also put their incentive measures into effect.

The consumer studies indicated are an important aid to decision-making as regards the development of the actions programme in terms of design and implementation.

