

CiViTAS
Cleaner and better transport in cities

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Measure Evaluation Results

FUN 1.2 – Electric and hybrid vehicles

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Executive Summary

The goals of the measure 'Electric and Hybrid Vehicles' were to promote energy-efficient vehicles in Funchal by organizing city-wide public campaigns, by implementing a rental service of electric scooters and electric bicycles and by introducing a Green parking meter tariff for electric and hybrid vehicles. This measure was related to the MIMOSA measure FUN 1.1, through which the Municipality of Funchal and the public transport operator acquired cleaner vehicles to reduce emissions from automobile fleet.

The measure was implemented in three fields of activities:

Field A: Electronic bicycles and scooters rental services (2009 – 2011) A status quo study was conducted to assess the currently available technology in this field and defined the appropriate locations for the implementation. Based on this study, the terms of references for the tender were developed. Between June and September 2009 a campaign was organized to raise companies' interest to take part into the tender process for the implementation of rental services. Unfortunately, no offer was submitted. The municipality organized face-to-face meetings with selected companies to identify the necessary improvements to integrate in the terms of reference and launched a second tender procedure in December 2010. The second tender was no more successful than the first due to the lack of financial resources. The municipality continued to search investors and prepared a third tender process. Due to the deep financial crisis which affected strongly the economic situation of Portugal, the plan of implementing an electronic bicycles and scooters rental service was abandoned in August 2011.

Field B: Green parking meter tariff for hybrid and electronic vehicles (since October 2008) In order to foster the use of more sustainable vehicles, the Municipality of Funchal designed an attractive Green parking meter tariff for hybrid and electric vehicles owners who receive a 50% discount on the original tariff. Two preliminary studies were conducted to determine the most appropriate ticketing system for implementation in Funchal – a rechargeable card system was chosen – and to select strategic locations for pilot projects (ten streets were selected). In October 2009, the proposal for the implementation of the Green tariff was officially approved by the Municipality Executive Department. Since January 2010, an information campaign was launched to inform car owners on the Green tariff and raise awareness of the benefit of using hybrid and electric cars.

Field C: Public event for the promotion of non-pollutant vehicles (since June 2009) To raise citizens' awareness of the benefits of using energy efficient vehicles, several public events were organized. In June 2009, a conference, entitled "More efficient and less pollutant hybrid vehicles in a healthier city", was initiated by the Municipality addressed to citizens and companies. Since September 2009, the Mobility Week took place yearly to promote electric vehicles (segways, bicycles, cars). Conferences were addressed to private companies which have interests in electric vehicles and playful activities were organized to raise public interest for electric vehicles. The Expo-Energies was an additional yearly event, launched in July 2010, which promoted electric vehicles through several public events and activities. A private company offered a new service called "City Bubbles" addressed to tourists who want an interactive visit of the city on board a 100% environmentally friendly vehicle.

The main goal of this measure was the implementation of the rental service, a totally innovative service in the Region. Therefore, the measure was selected as a **focused measure**. The initial evaluation approach was essentially based on the rental services, in which the majority of indicators were related to the rental service. However the failure of the implementation of the services implied an in-depth restructuring of the evaluation approach with more focus on the impact of the implementation of the Green tariff based on data

collection, surveys and a phone interview with the subscribers to the service. The impact of public events was assessed using the indicator that quantifies sales of less polluting vehicles over the 4 years of the project.

The following **key-results** came out of the evaluation. Since January 2010, the green tariff has been used over 800 times. Interestingly enough, just the first semester of 2012 generated more uses than the total of the previous two years, which proves the increasing interest in the green tariff which surely is related to a greater use of hybrid and electric vehicles circulating in the city. The Municipality believes it is important to boost the availability of current automobile parking for less polluting vehicles. So to enhance the acquisition of these vehicles, the City plans to extend the green tariff to four large parking lots. The major barrier encountered in the implementation of this tariff is the lack of support for acquisition of such vehicles, so it is also necessary to extend this incentive to car parks. To evaluate the impact of the campaign, the number of energy efficient vehicles purchased in 2009 and in 2012 was compared: In 2012, 15 hybrid vehicles were purchased compared with two in 2009. Despite the difficulty to link directly the increase of electric vehicles purchases to the impact of the campaign, it can be assumed that the intensive promotion contributed largely to raise companies' interest for energy-efficient business vehicles. Citizens showed large interest for the several activities organized during the campaigns. This was especially noticed during the expo-energies and the mobility week in which thousands of citizens attended.

The financial crisis which strongly affected Portugal was **the main barrier** for the implementation of the electric vehicles rental service. Indeed, the lack of public funds did not permit the implementation a public rental service and the high investments risks discouraged private companies to develop this innovative service in this difficult financial context.

The effort that the Regional Government is currently undertaking through the deployment of rechargeable stations throughout the Island proved to be **a driver** in increasing the number of non-pollutant vehicles circulating in the Region. Additionally, issues related to sustainable mobility are becoming part of the political agenda. The measure also contributed to the adhesion to the Covenant of Mayors, which in the long term will contribute to also consolidate MIMOSA goals.

In this process, **we learned** that despite the fact that several companies, at different times, have shown interest and were available to manage the service, that is not enough. It is also crucial that the city can develop a partnership to explore the service in different forms. Despite the failure, this was an important measure for the transportation system around the city. It is intended that this service is implemented in future, as this measure is considered very useful in the city according to surveys.

The promising results of the implementation of the Green tariff, as an innovative service in Funchal, encourage the municipality to continue the promotion of more efficient-energy vehicles.

A Introduction

A1 Objectives

The measure objectives are:

(A) High level / longer term:

- Reduction of pollutants and noise emissions;
- Improvement of quality of life where the measure will be implemented, mainly in the historical city centre;

(B) Strategic level:

- Widen up greener mobility options in the city;
- Integration between modes: cycle, electric scooter, public and private transport means.

(C) Measure level:

- Increase the number of "green" vehicles circulating in the city at the end of the project;
- Increase the intermodality between public transport and clean private transport means.

A2 Description

The main goal of this measure is to promote and aware citizens to acquire less pollutant and more energetic efficient vehicles. So, this measure includes the development of three main components: the implementation of a rental service of electric scooter and electric bicycle, the implementation of a green tariff, a service that provides a 50% discount for electric/hybrid vehicle drivers, and the promotion of less pollutant vehicles, through several awareness campaigns.

Regarding the rental service for scooter and electric bikes, the Description of Work initially established the acquisition of 6 electric scooters with funds from CIVITAS, and an application for funds from the European Regional Development Fund program, which was not successful given that in the year 2009/2010 funds were not financed for such projects. This situation, coupled with the financial unavailability, led to some changes in the process. Throughout the project, there were several companies that demonstrated an availability to explore this type of service. Thus, the City launched a tender process in 2010, in which the Municipality did not received any proposals. In 2011, a new tender process was launched and again no proposals were made to exploit the service.

Additionally, Portugal went into a deep financial crisis, considered the main reason for the failure of the rental service implementation.

However, this measure was positive, regarding the implementation of a tariff to encourage the use of cleaner vehicles (both hybrid and electric) in which the City has developed a new scheme entitled "Green Tariff". This fee was implemented in 2010, and benefits all owners of less pollutant vehicles with a 50% discount in the parking meter network.

We also implemented several promotional campaigns and dissemination of this type of automobile technology, through conferences, exhibitions, pamphlets, communication and dissemination to the media on the website and facebook page.

B Measure implementation

B1 Innovative aspects

The city of Funchal has a very steep terrain with slopes, characteristics that determine and limit the practice of cycling. Thus, in order to overcome physical barriers as well as promote its use, an innovative aspect of this measure was to implement a rental service of electric bicycles and scooters, nonexistent at local and regional level. The integration of electric bikes and electric scooters for hire services in European cities is unusual, but a necessary condition in Funchal.

With this service, the city hoped to promote the use of clean vehicles and encourage citizens as well as tourists to reduce private car use. Apart from the revenues generated through the rental services, the reduction of private car use would result in health benefits for citizens in terms of pollution and noise.

Despite the failure to implement the rental service, this measure helped to promote and encourage a greater use of hybrid and electric vehicles, boosted by applying a green tariff, which is a 50% discount on parking at parking meters in certain spots. This tariff is used in order to encourage the use of less polluting vehicles and more efficient.

The innovative aspects of the measure were, according to the DoW:

- **New mode of transport (city level)** – Refers to the implementation of an electric bicycle and scooter rental service, unique in Funchal and Madeira, that contribute, not only to a reduction of pollution, but also to a promotion and increase of non-pollutant vehicles..
- **New physical infrastructure solutions (city level)** – **This measure was also intended, by implementing the rental service, establishing points of transfer between modes of transport.**
- **Use of new technology (city and regional level)** – The technology used in these types of vehicles is state of the art. Therefore, its implementation in the Region would be innovative.
- **New mobility policy instrument (city level)** - New parking management approach has benefit those who use non pollutant vehicles and encourage the use of greener vehicles, while increasing the awareness of the population for a cleaner attitude towards transport. Therefore a 50% discount for those who own less pollutant vehicles has been granted.

B2 Research and Technology Development

The RTD process included both vehicles and the rental service research. Due to Funchal topography, it was necessary to find the most suitable technology, namely the vehicles. The first research that was carried on by the Municipality concerned the type of vehicles that should be used. Therefore, 30 vehicles were identified, ranging from electric scooters to bicycles, segways and small four wheel vehicles. The most suitable vehicles were those which required a minimum potency of 2500w, due to the hilly areas of Funchal, such as the Bereco model. This document also included the most suitable locations to implement the rental points.

This research also includes the study of all technological solutions implemented in other European cities, as well as establishing contacts with these cities in order to analyze the requisites required to implement this type of rental service. These requisites contributed to elaborate the tender process. .

From this study, it became apparent that the rental service should not only be aimed towards local citizens, since the use of bicycle is extremely low in Funchal, but also to tourists, which

have different mobility habits. Some aspects of the study played an important role in establishing the tender process guidelines.

The proposal to implement the rental service considered 4 rental points, scattered throughout the city. The choices for the rental service points followed a strategic pattern, such as the proximity of services and commercial activities, in order to maximize the use of mobility. The location for the implementation offers an excellent proximity, regarding the public transport, allowing a better articulation of the two modes of transportation.



Map 1 – Selection of places for the rental service implementation

Local 1 – Localized in the City Centre, this place offers proximity, regarding the main administrative services, commerce centre and leisure zones, namely gardens and the promenade near the ocean.

Another positive factor is that the fact that it offers the best access conditions to all public transport lines.

Local 2 – The place was selected, due to the proximity of the city’s cable railway, and the urban service’s public transport terminal.

Local 3 – The selection of this area followed the same logic of the previous spaces, which is to expand the service in an important arterial road marked by tourism and services.

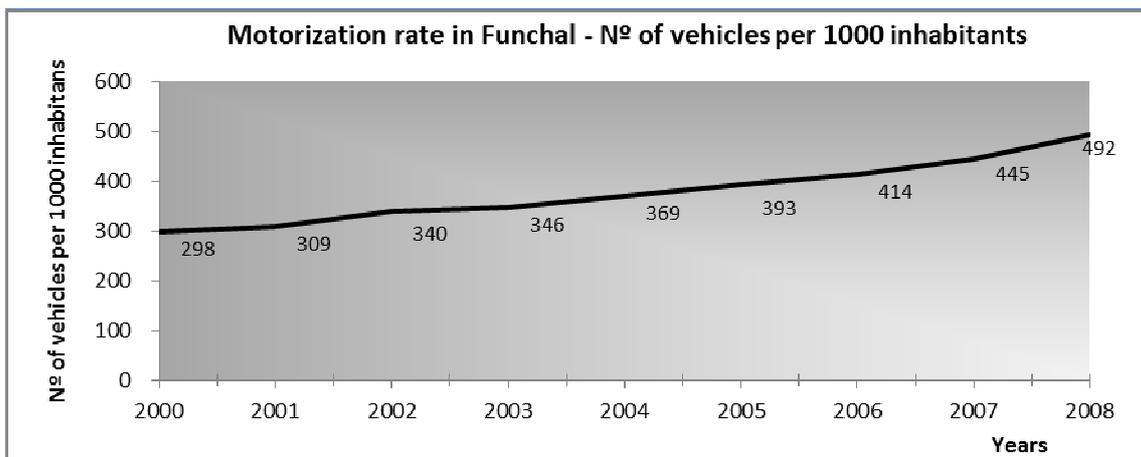
Local 4 – Strategic proximity regarding the bicycle track, and shopping centre. Furthermore, this area is the main urban area that concentrates the most hotels in Funchal.

As for the green tariff, some research was also conducted, namely the study of the best way to implement a green fee in the city parking meters in order to stimulate the acquisition and use of less pollutant vehicles. The study also refers to some of the more technical aspects such as the introduction of a new card that allows the access to the discount. Additionally, the study also focused on control features and the locations.

This whole process of research also contributed for the development of promotional campaigns for cleaner vehicles, undertaken throughout the project.

B3 Situation before CIVITAS

Madeira’s Island has been showing, in the last decades, a significant increase in the number of vehicles. This trend is accompanied by an increase in terms of pollution, noise, overcrowdings and traffic collisions. Of the whole island, Funchal is the city with the biggest motorization rate. In 2008, for example, the motorization rate in Funchal, according to the Portuguese Insurances Institute was 492 vehicles per 1000 inhabitants.



Graph 1 – Motorization rate in Funchal

As for the acquisition of hybrid and electric cars in Funchal, the purchase of these vehicles prior to CIVITAS has been very weak, since before CIVITAS, there were no real policies to encourage the use of hybrid/electric vehicles. During 2004 and 2007, only 5 hybrid vehicles were sold. However, in more recent years, especially between 2008 and 2010 the purchase of these vehicles increased, in 45 vehicles. In 2010, the number of hybrid vehicles sold reached a peak (27 vehicles). However, in the last years, the number of sales has decreased due to economic reasons. No parking facility in the City of Funchal discriminate positively electric cars or hybrids. Thus, the creation of the Green Tariff, as well as encouraging the purchase of such vehicles, also aims to raise awareness among managers of public car parks for the importance of creating conditions. The only electric vehicle that can be rented in the city of Funchal are segways for tourist tours with a guide.

B4 Actual implementation of the measure

This measure refers to three components: bike rental service, the green tariff implementation and the promotion of non pollutant vehicles through the execution of several promotional events among the population.

The following text depicts in detail the various implementation stages of this measure:

A - Rental service

Stage 1: Study of the best technical solution for rental service (*concluded at January 2010*) – In this stage, a study was conducted which referred to all existing technology, it's features and the definition of the areas in which the rental service would be implemented. This study served as the basis to establish some of the specification guidelines for the tender process.

The definition for the implementation, regarding the rental service followed a strategic pattern, such as the proximity of services and commerce, in order to maximize the use of this new mobility concept. The rental service was planned to be implemented in several places, serving both inhabitants and tourists needs.

Stage 2: Divulcation campaign for the rental service (*June to September of 2009*) – Before launching the tender process for the first time, there was a media campaign aimed to attract the interest of several companies towards subscribing to this service.

Stage 3: Tender process for the implementation of an electric bicycle and electric scooter rental service. (*October 2009 – September 2010*) – Refers to the development of the public procurement procedure, including legal and technical requirements. As noted above, this procedure has not received proposals for implementation.

Stage 4: Auscultation process (*November 2010 to December 2010*) – Following the lack of applications, the Municipality appointed several individual meetings with the potential companies in order to gather information about the lack of proposals.

Stage 5: Tender process launch (2nd procedure) (*December 2010 to May 2011*) – Following the consultation process, a second tender process was launched, with some adjustments such as the increase in the exploitation term from 5 to 8 years, increase of the implementation within 3 months to 6 months and decrease in the income threshold from 5% to 2%. These adjustments were made in order to make the tender process more appealing for potential companies. The adjustments were needed to cope with the barriers stated by the companies contacted in the first round, including: economic crisis which reduces the availability of company budgets for ancillary services; company difficulties in getting bank financing; and too short period to test the service before subscription;

Despite the new terms, the Municipality failed to receive any applications again. This was due to higher interest rates and little interest from banks to finance.

Stage 6: Preparation of a third tender process (*June 2011 to August 2011*) – After the launch of the second contest, and due to the appearance of two new investors interested in exploring the service, the Municipality began working on a third contest. However, this was never launched due to political decision. In addition, 2011 was a particular difficult year for Portugal, due to serious financial difficulties, in which the country had to ask for external support. In this context of crisis there was a sharp drop in new investments due to contingency situations that currently is happening in Portugal.

B - Green Tariff

In order to foster the use of more sustainable vehicles, Funchal's Municipality created a regulation with the intent of applying a special tariff, regarding the parking of hybrid and electric vehicles.

Designated Green tariff, this tariff reduces the tax in 50% in public paid parking places, for electric and hybrid vehicles. All residents and non residents in Funchal can enjoy this discount, as long as they own an electric or hybrid vehicle.

Stage 1: Study of the places for implementation of Green tariff (*May, 2009*) – Currently, the parking policy in Funchal is managed through a tariff system. This system consists of a tariff that is controlled by 4 zones with parking limitations (such as parking time), in which the costs are aggravated in the central areas. Therefore, 10 streets were selected, included in 4 zones, namely in the city center and in the western part of the city, in which the green tariff was implemented.

The following map shows the location of the streets in which the green tariff was implemented. In the future, the Municipality expects to expand this tariff to all zones.



Map 2 - Streets covered by the Green Tariff

Stage 2: Definition of legal and technical requirements for the implementation of green tariff (October 2008 to October 2009) – At this stage, we studied the required technical terms necessary for the implementation of a special tariff for hybrid and electric vehicles in the current parking payment equipment. So, it was necessary to adapt the equipments to the Green Tariff. Therefore, research was conducted in order to find the appropriate system to integrate the tariff.

Therefore, it was established that the Green Tariff would be accessed through the use of a rechargeable card. Once inserted in the parking meter, the card allows the access to the green tariff. After selecting the estimated parking time and respective amount, the subscriber has to press the green button, in which the respective parking ticket will be issued.

The service users, in a first stage, make a registration in the Municipality, which is given to them an identification card, as shown in the picture. Following the subscription, the users acquire the rechargeable card to use in the parking meters owned by the company who explores them, in a concession regime.



Image 1 - Example of the green tariff tag used by subscribers

The inspection will be made by associating the parking title “Green fare” and the authorization card that shows that the vehicle is allowed to access the tariff.

Stage 3: Green tariff approval (October, 2009) – The proposal for the 50% discount tax, towards the parking of less pollutant vehicles in the city was approved by the Municipality Executive. There was a redefinition of the municipal tax table, approved at a Municipal Assembly meeting (the deliberative organ responsible for the table tax management) on September, 25, 2009.

Following this approval, changes were made to the municipal parking regulation and taxes for these types of vehicles. The decision was then officially published as a public notice (nº 1037/2009) in “Diário da República” (October, 2, 2009).

Stage 4: Green Fare divulgation and communication campaign (January, 2010 – beyond MIMOSA)

An information campaign about the green fare was developed, with the display of an outdoor advertisement in one of the city areas with great visibility. The advertisement was strategically placed near a shopping centre and above the entrance of an access tunnel in the city centre, with a significant traffic volume.

The implementation of the fare was also published by regional newspapers, in order to raise awareness regarding electric and hybrid technology. Besides the outdoor advertisement and the publicity in the newspaper, several posters and leaflets were produced and distributed in the city.

This service has been continuously promoted by the Municipality in all Civitas events (orienteering events, vehicles exhibition, conferences, European Mobility Week, Expo-Energies, among other).



Image 2 - Green Tariff promotional banner



Image 3 - Green Tariff promotional leaflets

Information about the Green fare was also published in the Municipality's site and facebook. The Green Fare benefits were also divulged among the people that comprise a data base in which they receive information about the CIVITAS MIMOSA Project.

C- Non-pollutant vehicles related events (June 2009 – Beyond MIMOSA)

a) "More efficient and less pollutant vehicles in a healthier city" conference (June 2009)

Through this measure, workshops and conferences were made. In June, 2009, the Municipality organized a conference entitled "More efficient and less pollutant hybrid vehicles in a healthier city" in which two vehicles were put in exhibition, namely a Honda Insight and a Toyota Prius.

This event was marked by a strong attendance, especially



Image 4 - Hybrid vehicles public display

by company managers. The main objective of this conference was raising awareness of the population and companies towards the importance of hybrid vehicles as a more environmentally friendly alternative to the conventional car.

During this event, Civitas Mimosa Project was promoted through the distribution of leaflets and informational panels.

b) Mobility Week (September 2009, 2010, 2011 and 2012)

During the 2009, 2010, 2011 and 2012 Mobility Week, Funchal’s Municipality promoted an exhibition of electric vehicles. This exhibition consisted of segways, bicycles, and electric vehicles. The exhibition took place in one of the most important venues in the City. These events marked the realization of several conferences; including “Electric vehicles, the future today!” in which several companies displayed their existent technologies, and their benefits. The target group for this conference consisted of private companies that use a fleet.

During Mobility Week 2011, the Municipality carried on a contest entitled “Efficient Mobility”, in which an electric bicycle was raffled among the participants that answered a quiz about mobility in Funchal. This event also served to promote electric vehicles among the population.



Images 5,6 and 7 – Various Electric vehicles display during Mobility Week

c) Expo-Energies (July, 2010, 2011 and 2012)

These types of vehicles were displayed also during the events “Expo energies” that were promoted by Funchal’s Municipality that usually takes place between days 2-5, June. So far, CIVITAS MIMOSA has participated in three editions of Expo-Madeira that were marked by the realization of several activities, such as workshops, exhibitions with roll-ups containing information about the CIVITAS MIMOSA Project, cinema exhibitions, conferences, exhibition of solar powered vehicles, electric vehicles, etc. Therefore, the main highlights were the demonstrative sessions and the sustainable vehicles exhibition (hybrid, electric vehicles and segways).



Image 8, 9 and 10 - Activities carried on during Expo-Energies

d) Implementation of a rental service by a company

Although the service was not implemented, there is now a company that acquired 10 electric vehicles (Renault Twizy) and implemented a rental service. This situation, somehow, compensates for the non-implementation of the rental service.

This service, called "City Bubbles" was born of a gap in the market in offering a new mobility solution with no pollution for tourists while providing a view of Funchal, through interactive tours.



Image 11: City Bubbles

The City Bubbles are 100% environmentally friendly that can take up to two passengers. Additionally, they have an onboard computer with GPS, which provides information of historical, artistic, gastronomic and commercial info anywhere in Funchal in several languages, functioning as authentic personal guides and specialized.

Currently, the City Bubbles operates a total of ten vehicles, but will be strengthened by the end of the year, with five more units.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

Measure 1.1. – Sustainable Fleet measure, carried on by Horários do Funchal, the urban public transport operator. This measure promotes the inclusion of less pollutant vehicles in both Horários do Funchal and the Municipality's fleet. Horários do Funchal purchased 3 hybrid vehicles, while the Municipality purchased one hybrid vehicle. Horários do Funchal had also to launch a tender process to purchase hybrid or electric busses, but the proposals received didn't suit the technical requirements. This company, along with others has even subscribed to the green tariff.

Bicycle lane - This measure is also directly linked to the bicycle lane project that is currently being developed by the Municipality. The city of Funchal is the first city to implement a bike path at a regional level. The first stage was concluded at the end of 2009. This is a very ambitious project for the city, in a way that it supposed to promote the use of the bicycle as a mode of transport.

Electric Mobility Project - The Regional Government, through its subsidiary, the local electricity company, has implemented in several public places, in 2010/2011, five electric vehicle charging stations in the region, including in Funchal. Under this initiative the electricity company acquired four electric vehicles (Mitsubishi Miev) that are used not only for their services, but can also be used by those who are interested in testing the vehicle in an urban environment. This marks effective and successful collaboration between the Regional & National Government as well as CIVITAS MIMOSA team.

C Impact Evaluation Findings

C1 Measurement methodology

C1.1 Impacts and Indicators

Table C1.1: Indicators.

No.	Impact	Indicator	Data used	Baseline data
1	Rental Service Potential usefulness	Rental Service Potential usefulness (POINTER core indicator – no. 13)	PT Operator and the Municipality have collected this data through a survey	Collected in July, 2010 and in July 2011. In 2010 the sample size was 679 while in 2011, the sample size was 584. The surveys were carried on using the aleatory process and mostly face-to-face. The target group covered a wide range of people, ranging from students to elderly people and company representatives.
2	Operating Revenues	Total operating revenue of parking spots in Green Tariff area (City specific indicator)	Data provided by the company that exploits the Green Tariff service	Collected in November, 2011 and in April 2012. This information was obtained by the company that exploits the service.
3	Green vehicles demand	No. of parking access to green vehicles facilities (city specific indicator)	Data provided by the company that exploits Green Tariff service	Collected in November 2011 and in June of 2012. This information was obtained by the company that exploits the service.
4	Green tariff usefulness	Acceptance level (city specific indicator)	Data collected through a survey carried on during the Expo-Madeira event	Collected in July, 2010 and in July 2011. In 2010 the sample size was 624 while in 2011, the sample size was 510. The surveys were carried on using the aleatory process and mostly face-to-face. The target group covered a wide range of people, ranging from students to elderly people and company representatives.
5	Quality of service	Perception of quality of service Awareness level (city specific indicator)	Information collected by the Municipality through a survey aimed towards all subscribers	Collected in November 2011 and in June of 2012. The target group was the green tariff users, namely 12 people. The survey was conducted telephonically.
6	Public Awareness	Number of events and news on	Information collected by the Municipality,	Collected in July, 2010 and in July 2011. Three main local newspapers were browsed

		electric/hybrid vehicle issues in regional press. Awareness level (city specific indicator)		frequently.
7	Transport System	Regional purchase of electrical/hybrid cars (city specific indicator)	Data provided by all Regional Companies selling hybrid/electric cars	Collected in several occasions, namely in 2009, 2010, 2011. In June of 2012, this information was updated.

Throughout CIVITAS lifespan, we have been made some adjustments to the *Initial Assessment Plan*. To make up for the rental service non-implementation, two indicators were added related to the green tariff (green tariff usefulness and quality of service) to evaluate the perception about this service, which has already been implemented. As for the rental service indicators, they have been dropped, since it was not implemented, and therefore, we were unable to assess any kind of analysis.

The following text describes in detail the indicators:

- **Indicator 1** (*Rental Service Potential usefulness*) – Despite the fact that the rental service was not implemented, a survey was conducted to assess the potential usefulness. This indicator is related to strategic level (B), objective 1.
- **Indicator 2** (*Operating revenues*) – Related to the Green Tariff, this indicator refers to the operating revenues of the Green Tariff. The data collection was provided by the company that currently explores this service. This data was requested in two periods and is directly related to measure level (C), objective 1.
- **Indicator 3** (*Green vehicles demand*) – This indicator refers to the green tariff demand, namely the number of hybrid/electric cars that park in the reserved parking facilities. This indicator is related to measure level (C), objective 1.
- **Indicator 4** (*Green Tariff awareness level*) – This indicator refers to the number of people that considers the green tariff useful. The data for this indicator was gathered in the Expo-Madeira event, in July 2010 and 2011. This indicator is related to strategic level (B), objective 1.
- **Indicator 5** (*Quality of service*) – While not a core indicator, this variable was gathered through a small survey carried on among the green tariff subscribers. This indicator is related to strategic level (B), objective 1.
- **Indicator 6** (*Public awareness*) – As the title suggests, this indicator relates to the number of events and news published about the measure. These events were collected in the regional press (Diário de Notícias, Jornal da Madeira, Diário da Cidade). This indicator is related to strategic level (B), objective 1.
- **Indicator 7** (*Transport system*) – As the title suggests, this indicator relates to the number of hybrid/electric cars that were sold in the Region. Is related to strategic level (B), objective 1.

Indicators 1 and 4 were collected through a survey carried on during one of the most important regional events (Expo-Madeira) in 2010 and 2011 with a sample size of 624 and 510 respectively. The Expo-Madeira is an event in which local companies from all sectors of activity, display their products/services. The sample size is composed of common citizens, company employees and students.

List of potential effects that were not accessed

As it was referred in the previous chapters, one of the components of this measure was not achieved. Due to this, the evaluation process had to be severely readjusted. The table below lists the indicators that had to be dropped.

Table C1.2: List of potential effects that were not accessed

Impacts categor	Indicator	How does it impact	Why it was not accessed
1	Operating revenues	Total operating revenue of rental services	The rental service has not been implemented
2	Investment costs	Investment costs , of all unmovable equipment and movable equipment	
3	Operating costs	Electricity costs with the rented scooters/bicycles, per Km	
4	Energy Consumption	Energy consumption with the rented scooters/bycycles per km	
5	Emissions	NO2 emission levels per km	
6	Emissions	CO emission levels per km	
7	Emissions	PM10 emission levels per km	
9	Employment	Overall number of jobs provided by installation of the rental service	
10	Increased usage of electric vehicles	No. of scooter and bicycles rents per year (core indicator)	

C1.2 Establishing a Baseline

No.	Indicator	Baseline data
1	Potential usefulness	There is no prior data
2	Operating revenues	There is no prior data
3	Green demand vehicles	There is no prior data
4	Green usefulness tariff	There is no prior data
5	Quality of service	There is no prior data

6	Public awareness	There is no prior data
7	Transport system	5 vehicles were sold during 2004 and 2007

C1.3 Building the Business-as-Usual scenario

Since the measure is innovative, a BAU analysis is not applicable for most indicators, since there is no data before MIMOSA, and therefore it is impossible to establish any scenarios. Nevertheless, a BAU analysis was assessed for indicator 7. As for the indicator 6, there might have been some articles published, but they were not collected.

Nº	Indicator	BAU assumptions
1	Potential usefulness	The rental service was not implemented, therefore a BAU analysis was impossible to assess.
2	Operating revenues	No baseline data prior to the implementation.
3	Green vehicles demand	The BaU is zero, because without implementation, there would not have been created the parking facilities for these type of vehicles.
4	Green tariff usefulness	No baseline data prior to the implementation.
5	Quality of service	No baseline data prior to the implementation.
6	Public awareness	No baseline data prior to the implementation.
7	Transport system	The data rely on the number of sales before CIVITAS

C2 Measure results

C2.1 Economy

2 - Operating revenues of Green Tariff

The implementation of green tariff was carried out in Funchal. The network of parking meters in the city involves a total of 236 locations. These places are grouped into certain rate categories, respectively yellow, red, green and brown, and as we move away from the city core, the hourly cost decreases and the parking time limit increases. The table below expresses the normal tariff and the green tariff prices.



Map 3 – Green tariff locations and respective areas

Zone	Details	Normal price (per hour)	Green tariff price (per hour)
Yellow	Located in the city core, near the most important administrative buildings	1,76 €	0,88 €
Green	Located near the city core	1,19 €	0,60 €
Red	Located near the touristic area, near hotels	0,63 €	0,32 €
Brown	Located in the western part of the city, in a dense commercial area	0,45 €	0,23 €

Table 1 – Description of parking meter zones and prices

The table below shows the values of fare collection green between January of 2010 and June of 2012. Since the beginning of the service, the company that explores this service has managed to collect 265,90 €. Despite the fact that in 2010, the total revenues were only of 18,80 €, in 2011, this value increased significantly, reaching 159,95 €. The most recent data collected, namely the revenues for the first semester of 2012 were 87,15 €.

Zone	2010	2011	2012 (until June)
Yellow Zone	11,60 €	129,50 €	63,45 €
Green Zone	7,10 €	28,50 €	22,30 €
Red Zone	0,00 €	0,00 €	0,00 €
Brown Zone	0,10 €	1,95 €	1,40 €

Table 2 - Green Tariff revenues

Although the charge is low, there is some growth, which has to do with the increased number of hybrid and electric vehicles in Funchal. It's worth mentioning that the vehicles of some public entities, including the Municipality and local authorities do not pay the parking meters, so they don't contribute for the revenues. The figures above must also be examined carefully, since some hybrid vehicle belongs to the companies, which have their own parks in

the city (public transport local operator, Electricity Company, Funchal Municipality, and others). For economic reasons (the crisis that the country and the region is passing), the number of sales of new cars dropped sharply between 2008 and 2011 which had negative effects on the sale of electric and hybrid vehicles, whose purchase price is even higher than that of conventional vehicles.

The distribution of revenues is directly related to the type of subscribers. Since most of the subscribers are either private companies located in the city centre or citizens that works in the city centre, they usually park their car near their place of work. Meanwhile, these subscribers use the service occasionally, reason that explains the weak use of the service.

C2.2 Energy

Not applicable

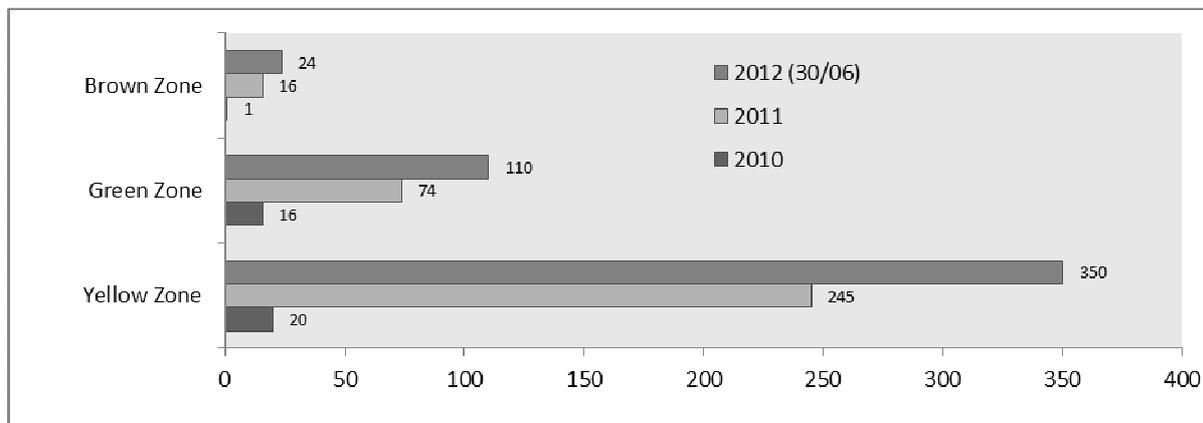
C2.3 Environment

Not applicable

C2.4 Transport

3 - Green Tariff demand

During the first year of its implementation, 12 people subscribed the service. The green tariff was only used 37 times. However, in 2011, the number of uses increased, namely in the yellow zone (45 users), totalizing 335 uses. In 2012, the demand increased a lot. Only during the first semester, the number of uses surpassed both totals of 2010 and 2011, which is a positive sign that reveals that the green tariff is being used more often.



Graph 2 - Number of hybrid/electric car uses

From the three zones, the brown one had less uses. Since the majority of the users work in the City Centre, the most sought areas are the green and yellow zones, which are nearest to their job places.

7 - Regional purchase of electrical/hybrid cars

In preparing the various scenarios it was taken into account the number of hybrid and electric vehicles sold in Madeira between 2005 (the first year that registered sales of these vehicles) and 2011. For 2012, 15 vehicles were sold.

The following table refers to the number of hybrid/electric vehicles sold in the Region. Previous to CIVITAS, only 5 hybrid vehicles were sold. During CIVITAS, the number of sales increased significantly, reaching its peak in 2010, in which 27 vehicles were sold. Despite the fact that it was not possible to assess the direct influence that MIMOSA had in this increase, a survey conducted in 2009 (with a sample size of 17 companies, for measure 1.1 –

Sustainable Fleet) revealed the following: 93,7% of the respondents stated that they would be willing to change their private vehicles to a hybrid/electric vehicle. The table also shows that the buyers are more inclined to purchase hybrid cars than electric. This has to do with the lack of electric recharge stations in the island, which is being gradually expanding, thanks to the “Electric Mobility” Project.

Type	Year									Total
	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Hybrids	-	2	2	1	5	12	27	4	6	59
Electric	-	-	-	-	-	-	-	2	9	11

Table 3 - Number of hybrid/electric cars sold in the Region

In 2010, the Portuguese government, under its incentive program for the purchase of electric vehicles, has promoted the following measures:

- Financial Incentives for the purchase of electric vehicles;
- Creation of public charging stations for vehicles;
- Campaigns to promote electric vehicle;

The aim of these measures was extremely ambitious, even in a scenario of strong economic growth which was not the case. The government predicted that the Portuguese fleet of cars would reach 20% of electric vehicles in 2020, which means more than 1 million electric vehicles. Soon, it was realized that the goal was far from being reached. Today, with the economic crisis and the price of the electric vehicle, the number of electric vehicles sold is marginal. Next, we present three scenarios of possible developments for the sale of electric cars (and hybrids) 2020.

The forecast sales of hybrid and electric vehicles is important for the city because it can create privileged conditions for this type of vehicles, including expanding the Green Tariff, and promoting the implementation of rechargeable stations. The scenarios that are presented are important for decision making. The table also shows a significant decrease in 2011, and a slight increase in 2012. The reduction of sales can be justified by external factors mainly, the impact of the European crisis, and the implementation of the financial adjustment plan for Portugal and for Madeira Region, which caused a social instability and decreased the purchase power of consumers. Additionally, the price of gasoline keeps rising. Due to these factors, its very difficult to predict the evolution of hybrid and electric cars in Funchal. Nevertheless, we took in consideration three possible scenarios: a base scenario which is the one that is more likely to happen; an optimistic, where the introduction of electric vehicles is greater than the expected one; and a moderate optimistic, in which the adoption of hybrid/electric vehicles is in between of what is expected in relation to the baseline.

Scenario 1 – Base scenario

In this scenario, we assume that the introduction of technology will be done slowly, with an annual growth rate of only 25%, using 2012 as the year base. This scenario is explained by the following:

- Great reluctance in adopting electric vehicles by the consumers, due to economic constraints (low purchasing power and high costs) and technological (low battery life, few rechargeable electric stations)
- Economic recession that may extend beyond 2013, with the consequent social instability and decrease in the purchasing power of consumers in Portugal

- Reduction in fiscal incentives and the promotion of electric vehicles;

Scenario 2 – Moderately optimistic

It is assumed that there is an annual growth in sales of electric/hybrid vehicles by 50% in 2020 compared to 2012 figures. The factors that might lead to this are:

- Lower prices in batteries;
- Increase in fuel prices;
- European targets for CO2 emissions 2020.

It is expected that the technology evolution inherent to electric mobility will suffer further developments since the second half of this decade, particularly in terms of the capacity of lithium ion batteries, which will certainly boost the sales of these type of vehicles. It is likely that the production costs will eventually decrease purchase price, which will make the electric vehicle a more accessible product for the consumer.

Currently, the fuel prices are undergoing through constant fluctuations in international markets due to wars and social instability in producing countries. For these reasons, it is expected that fuel prices are likely to increase in coming years, making cars with internal combustion engines less desirable;

It is unknown what will be the policy that the new government will adopt, which it is assumed that the move towards electric mobility will remain but will lose some of prominence given by the previous government. However, its important to note that there are European targets to achieve the reduction emissions of CO2 until 2020, which could generate the creation of additional programs to reinforce the electric mobility.

Scenario 3 – Optimistic

It is assumed that there is a 75% annual growth in sales of electric vehicles by 2020 compared to 2012 figures. For this trend, several factors might contribute, such as the continued increase in fuel prices and creation of tax incentives and promotion of hybrid and electric vehicles.

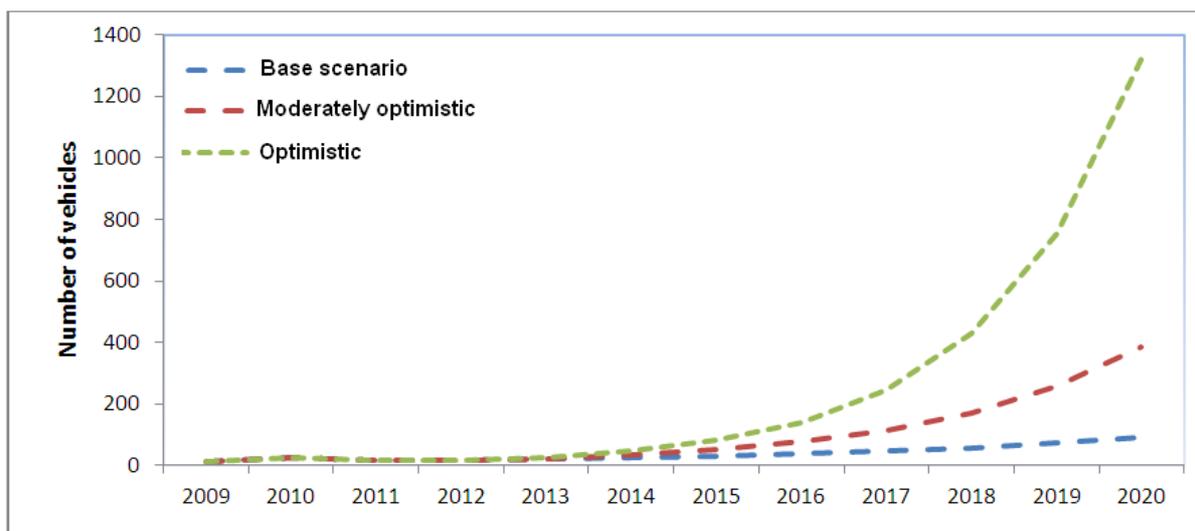
It is assumed as possible, that the adoption of electric technology may be more favorable than assumed in the other scenarios.

Basically, the contributing factors for this scenario are:

- Continued increase in fuel prices that according to some press articles, it can contribute to a raise in electric/hybrid vehicles sales;
- Economic growth in line with that found elsewhere in Europe with the completion of the foreign aid program which Portugal joined in 2011 and whose term of expected duration is three years;
- Reinforcement of tax incentives to purchase these type of vehicles;

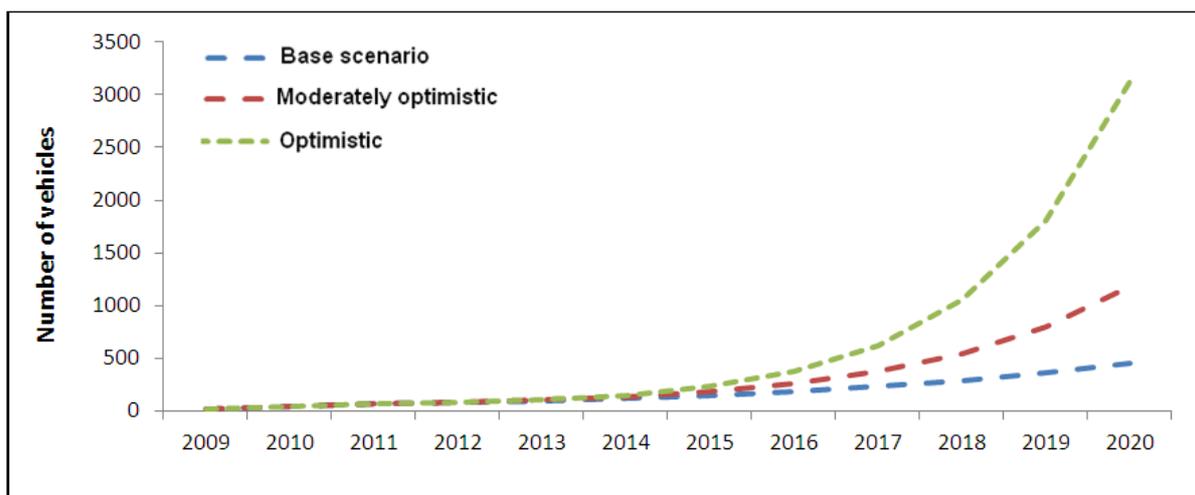
In order to better understand the differences in annual sales according to each scenario, the following graph presents a comparison of the evolution of the three cases described above.

Since all indicators suggest that the economic crisis is overcome in 2014 and there is a technological change, lower prices for electric and hybrid vehicles, it seems expectable that the number of electric and hybrid vehicles sold in 2014 could be equal to those that were sold in 2008. Thus, we take as moderately optimistic a scenario that assumes an annual growth of 75%



Graph 3 - BAU scenario – Number of hybrid/electric vehicles sales per year

The graph below shows the cumulative number of vehicles (not considered scrapping, given the young age of the fleet).



Graph 4 - BAU scenario – Number of hybrid/electric vehicles sales per year (cumulative)

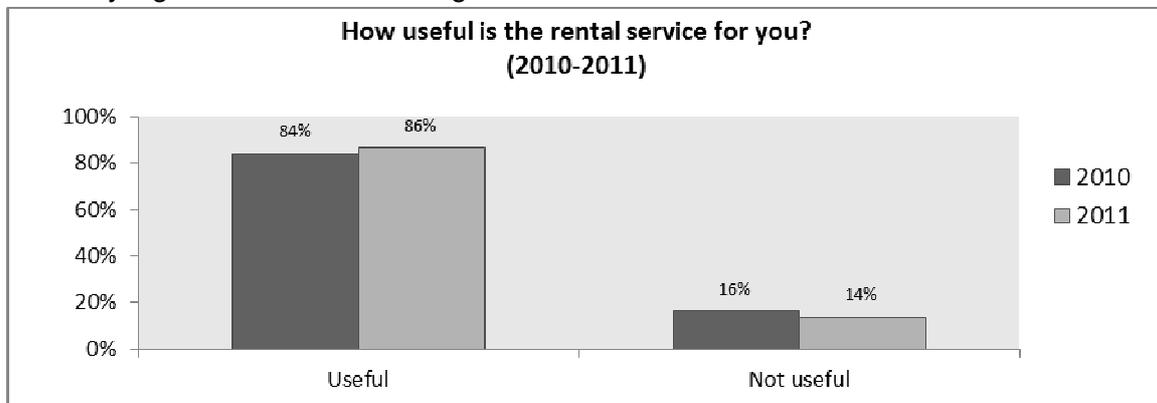
C2.5 Society

1. Rental service potential usefulness

In order to evaluate the importance given by citizens, regarding the rental service, a survey was conducted in 2010 (679 people were questioned). The result shows in 2010, 83,9% considers the service useful. One year later, the same question was asked towards all Expo-Madeira visitors (sample size of 584). Although the tendency remained the same, both results shows that in the two measurement years, the majority of people considered the rental service implementation useful. A significance test was not applied for this indicator, since the results are so similar. We have 2 categories, so the number of degrees of freedom is 1. For the table, for a significance level of 0.05, the critical value is: 3.84. Since $2,68 < 3.84$,

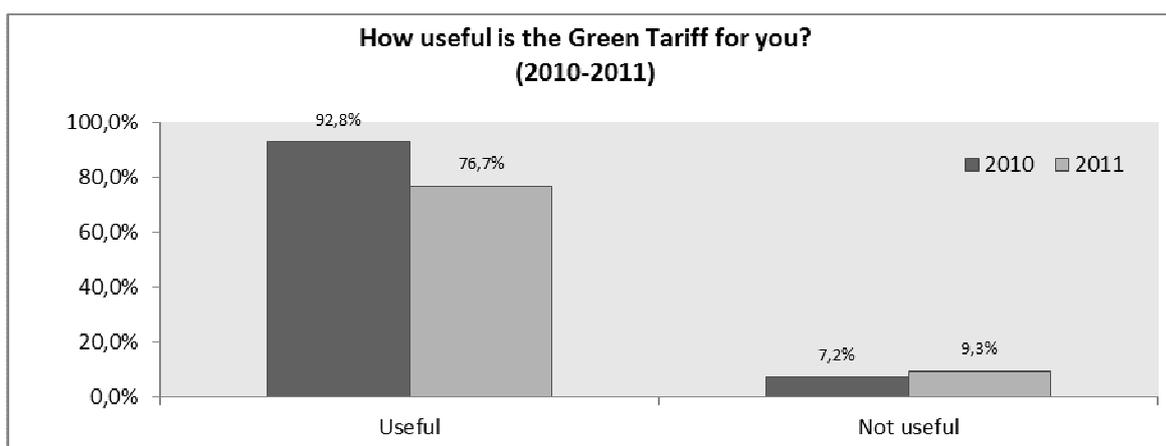
then we cannot reject the hypothesis that there is no change of opinion about the usefulness of the rental service between 2010 and 2011

This means that there are no changes between the two years, hence the differences are not statistically significant to a level of significance of 05.



Graph 5 - How useful is the rental service?2. Green tariff usefulness

The majority of the people that answered the survey welcomed the implementation of the green tariff, considering it very useful (92,8 in 2010). The survey conducted in 2011 revealed the same trend, although with a decrease in the percentage of people who perceived the green tariff as very useful. Economic factors might be an explaining factor for this, since in 2010, people were more eager on buying an electric/hybrid vehicle. In 2011, with the economic crisis, and the subsequent lack of purchasing power, sales in electric vehicles dropped significantly, therefore, people are not as available as they used to be for acquiring an electric/hybrid vehicle. As a consequent, people no longer consider the measure important. We have 2 categories, so the number of degrees of freedom is 1. For the table, for a significance level of 0.05, the critical value is: 3.84. As $11.2 > 3.84$, then we can reject the hypothesis that there is no change of opinion about the usefulness of green tariff between 2010 and 2011.



Graph 6 - How useful is the green tariff?

4. Public awareness – Number of events and news on electric/hybrid vehicles issues

During CIVITAS project, many articles were published on local press, in the main regional newspapers reporting about electric and hybrid vehicles. The table below resumes the number of events and related news that were published during CIVITAS lifespan.

Event	Name	Goal	Date	Press articles
Mobility Week 2009	Electric/hybrid vehicles exhibition	Promote the benefits of less pollutant vehicles	16/21-09-2009	4
	Bicycle track launch (1st phase)	Launch the 1st phase of the bicycle track	19-09-2009	5
	"Electric vehicles, the future today!" conference	Aware citizens for the importance of sustainable mobility	17-09-2009	4
Green Tariff	Press conference	Promote the green tariff service	19-07-2009;16-09-2009;01-01-2010;12-01-2010	4
Expo-Energies	Electric/hybrid vehicles exhibition	Promote the benefits of less pollutant vehicles	02/05-06-2010; 02/14-06-2011; 29-04-2012	7
Mobility Week 2010	Electric/hybrid vehicles exhibition	Promote the benefits of less pollutant vehicles	16/21-09-2010	4
Mobility Week 2011	Electric/hybrid vehicles exhibition	Promote the benefits of less pollutant vehicles	16/21-09-2011	4
	Contest "Efficient Mobility"	Promote the benefits of electric bicycles	21-09-2011	4
Mobility Week 2012	Electric/hybrid vehicles exhibition	Promote the benefits of less pollutant vehicles	16/21-09-2012	3
Conference	"More efficient and less pollutant vehicles in a more healthier city" conference	Technical presentation of hybrid vehicles	19/23-06-2009	3
Rental service	Rental service divulgation	Inform potential bidders explorer in the service, as well as raise awareness to use this.	11/20/21/27/28-07-2010; 09-03-2011;05-06-2011;	9
Rental service	Press conference (1st launch)	Divulge, among the population the launch for the rental service exploration	21/28-07-2010	3
Total				54

Table 4 - Number of events and news on electric/hybrid vehicles

During MIMOSA, 54 articles were published on regional press. Before MIMOSA, media research was carried out to assess the number of articles that were published. While the media did not release any article focusing on electric vehicles, it can be assumed that MIMOSA contributed largely to promote non pollutant vehicles among not only Funchal citizens, but also to the whole Regional population, since the press has a widespread circulation.

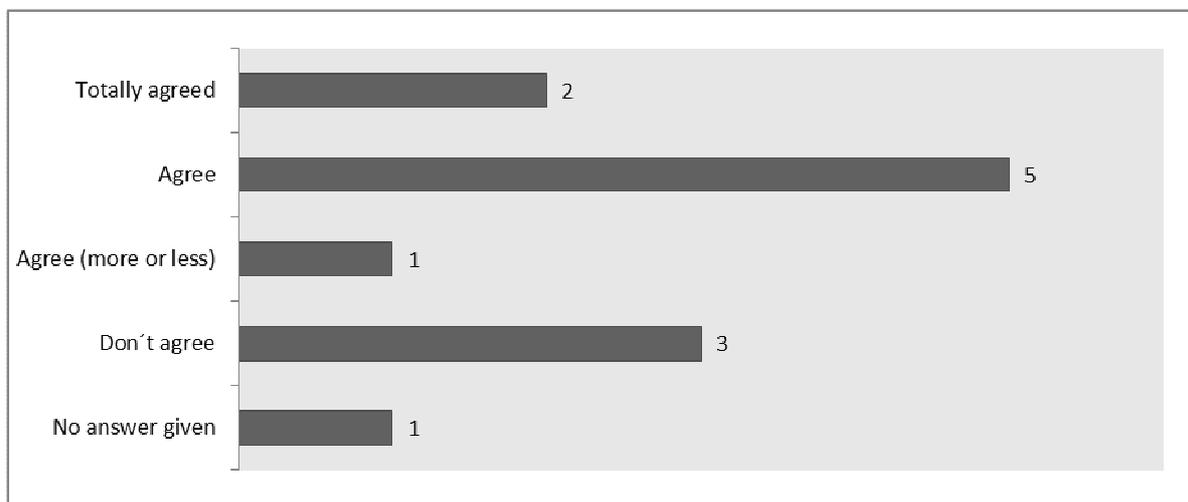
5. Green tariff - quality of service

To assess the green tariff quality, a specific survey was aimed towards all 12 users that subscribed the service. This survey was conducted In November 2011. The questions used were:

- a) Were you aware of the green tariff prior to acquiring your vehicle?
- b) Where did you heard about green tariff?
- c) Did sustainable mobility policies influenced somehow in purchasing a sustainable vehicle?
- d) Are you satisfied with green tariff?
- e) Did green tariff play an important role in acquiring your vehicle?
- f) In your opinion, should the green tariff be expanded to other streets in the city? Which ones?

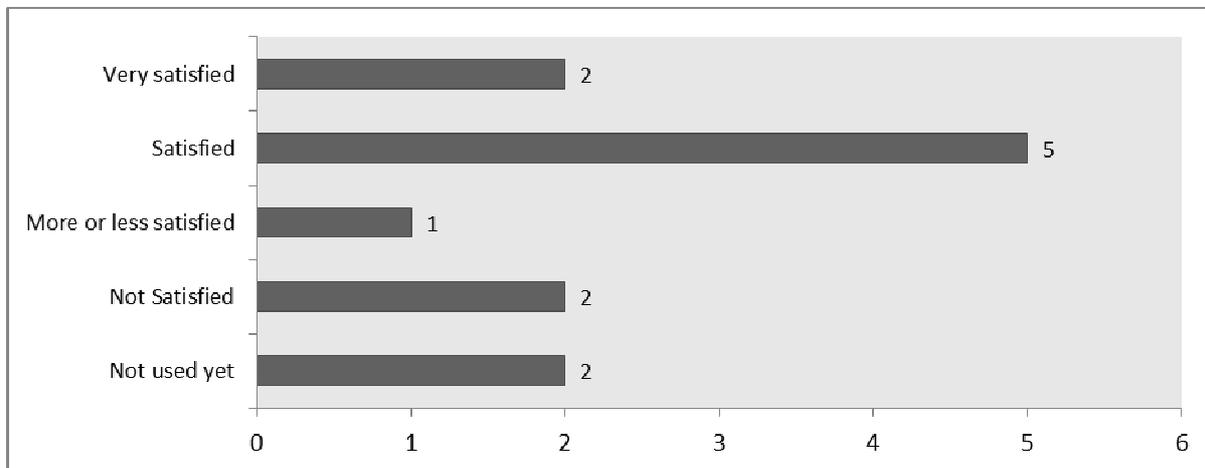
As for question a, the results were equal, namely that 6 people were familiar with green tariff before they acquired their vehicles. The other 6 users were not familiar with the service.

As for question b, The majority of the users heard about the green tariff through a communication campaign that the Municipality carried out. Other users stated that they heard about green tariff in the press or through SEP (the company that manages the service). When asked if the sustainable policies carried out by the Municipality were determinant to buy an electric/hybrid vehicle, most users were in agreement.



Graph 7 - The policies carried on by the Municipality were determinant for you to purchase a hybrid/electric vehicle? (Question c)

As for the level of satisfaction, the following graph shows that most subscribers are satisfied with Green Tariff.



Graph 8 - What is your level of satisfaction?

To assess a possible influence of the green tariff, we asked the subscribers (only the 6 users who already were familiar to this service) if the green tariff contributed somehow in purchasing an electric/hybrid vehicle. Ranging from 1-5 (in which 5 means that it was highly influential), most users (4) answered 2, which proves that the policies were important in a certain degree the purchase of these type of vehicles. When asked if the green tariff should be expanded to other streets in the city, all users answered “yes”. Most users (6) stated that the green tariff should be expanded to the whole city. The remaining users consider that this service should be expanded to the city centre. In general, while the results show a reasonable acceptance, most subscribers feels that the green tariff is still too geographically restricted.

For these questions, only 12 people answered, so the results are not statistically valid but show a positive trend.

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	Objective: Widen up greener mobility options in the city; Result: 856 uses of the hybrid/electric vehicles specific outdoor parking facilities (2010-May 2012);	(*)
2	Objective - Increase the number of "green" vehicles circulating in the city at the end of the project; Result – Since 2008, 50 hybrid and 2 electric vehicles were sold, in which 2010 was the year that most hybrid vehicles were sold.	*
3	Objective - Improvement of satisfaction with transport systems, namely the scooter/bicycle electric rental service.	NA
NA = Not Assessed O = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full *** = Exceeded		

It is extremely difficult to quantify the objectives of this measure. The non-implementation of the rental service increased the difficulty of the already difficult process of evaluating this measure. In the last review of the DOW we still thought it was possible to implement and evaluate the rental service, but the contingencies that arose during the project made it difficult to achieve this goal. The financial difficulties currently affects both official bodies or private entities, inhibit new investments as well as the risk to implement at this stage, a service of this nature and this high risk reasons alone explain the failure of the measure.

The variable results established in the initial DoW suffered changes, since most of them referred to the rental service. Since it was not implemented, the quantifiable objectives refers to the Green Tariff, namely its acceptance, and its demand. The other quantifiable achievement refers to the number of “green” vehicles circulating in the Region. Following the rental service drop, it was necessary to readjust all the evaluation indicators towards the green tariff.

Economic barriers were imposed to citizens due to the financial crisis, and prevented the acquisition of more ecological vehicles, but there was an increase in the number of sales of hybrid and electric vehicles from the date of implementation of the CIVITAS project. It's hard to quantify whether this peak was due to the project, but everything leads us to believe that these results are due to efforts made by the Municipality to promote hybrid and electric technology. Note that prior of CIVITAS, these technologies were virtually nonexistent at local and regional level, being unknown to the majority of citizens, so that the project played an important role in disseminating the same, and as the surveys showed, 5 users have purchased vehicles hybrid due to the contact they made during the CIVITAS campaigns.

Inform, disseminate and promote technologies and cleaner cars that are efficiently energetic is also one of the major objectives of this measure and the results show that these goals were achieved, which was found by an increase in the sales of these type of vehicles from 2010, and by the appearance of many more models and brands in the regional market in the year 2011/2012.

C4 Up-scaling of results

The first survey conducted confirmed the usefulness given by participants towards this measure. However, despite the optimistic results, the rental service was not implemented, and although an increase has been noticed in the number of electric/hybrid vehicles circulating in the Region, there is still a lack of tradition in using these vehicles. While MIMOSA played an important role in its promotion, the current economic situation in Portugal and the subsequent lack of purchasing power led to a decrease in the number of sales. The green tariff, on the other hand, according to a survey conducted among all the subscribers considers that the service should be expanded to other locations outside Funchal's boundaries, which also implies that the users are willing to use it more often in the future.

Additionally, the Municipality will continue to participate in events such as the European Mobility Week and organize local events, such as the Expo-Energies and other mobility-related events to promote electric and hybrid vehicles, which have created some buzz in the press concerning sustainable mobility. This measure, such as the whole project itself have been very important in promoting not only energy efficiency in transports but also in other fields such as public lighting systems, in which has been gradually changed to a more

sustainable technology. Not taking in consideration external factors such as the economic crisis that the country is currently facing, all indicators and survey results suggests an optimistic scenario like the BaU presented above.

C5 Appraisal of evaluation approach

The implementation of this measure made us realize that it is not only through promotion campaigns that we can change habits of the population, especially if this change of habits implies higher costs. To foster the interest of the people, through such campaigns is important, but its important to demonstrate to citizens the benefits of that collective change.

The financial incentive for the purchase of electric and hybrid vehicles on one hand, and penalizing the use of more polluting vehicles, on the other hand, have been crucial. The deviations from the original plan have hampered a successful implementation of the evaluation activities. While the green tariff was successfully launched, the focus of this measure has not been achieved, and failed to show its potential effect on intermodality. Therefore the only impact that was only possible to assess refers to the Green Tariff also also surveys that relied on public opinion about the measure. As stated before, this was due to the lack of applications to the tender process that was launched twice, a a result of the bad financial crisis that the country is going through. As a result, several indicators had to be dropped since the rental service was not implemented. Most indicators refered to energy, environment and even employment that led to a cut in the evaluation process.

Therefore, the evaluation process had to be adjusted and more oriented towards the green tariff. Despite the changes, the survey approach was considered the most suitable one to find out how respondents perceive the green tariff. The results obtained showed a strong cultural barrier, despite the optimistic results.

C6 Summary of evaluation results

The key results are as:

- **Uses of the hybrid/electric vehicles specific outdoor parking facilities per year** – Until now, the green tariff has been used 856 times by 12 users; as of September 2012, 8 more vehicles were included in the database, that will contribute to further promote the Green Tariff.
- **Improvement of satisfaction with transport systems** – According to both surveys conducted during the Expo-Madeira to assess the level of usefulness of the green tariff, despite the decrease, most participants still considers the service useful/very useful.
- **Increase the number of “green” vehicles circulating in the city at the end of the project** - Since 2008, 50 hybrid and 2 electric vehicles were sold, in which 2010 was the year that most hybrid vehicles were sold; Although in recent years the sales drop significantly, due to the economic crisis, it is expected that the sales might increase again in the upcoming years.
- **Mobility management** – Of a total of 12 users, 5 green tariff subscribers considers that the Municipality policies have been determinant in the purchase of green vehicles.

C7 Future activities relating to the measure

It is still a goal for the Municipality to implement a rental service for less pollutant vehicles in the city. A new solution will have to be found to overcome the barriers that currently exists. This could mean that the city should make a financial investment in partnerships with a private company, or another solution that meets the required requisites.

The surveys clearly demonstrated that citizens consider to be very useful to have this additional transport offer in the city. Besides this fact, we also noticed an increase in the number of cruise passengers that passes through Funchal, in which is also important to offer this way of transport for tourism.

Expand the application of green tariff to all city streets is also a future intention of the Municipality. Besides this, it is also intended to include this tariff in 4 public parking places that are owned by the Municipality, in order to increase the number of hybrid and electric vehicles.

The future activities related with this measure also concerns the execution of communicational campaigns through events such as Expo-Energies 2012 and the European Mobility week 2012, in which we will continue the divulgation and promotion of less pollutant vehicles.

Due to the strong promotion campaign of hybrid and electric vehicles, the existence of the green tariff and the availability of the Municipality to create more incentives for the use of such vehicles, a company recently expressed the intention to acquire 10 electric vehicles (Renault Twizy) to be rented to visitors. The idea is that tourists can use these vehicles in their normal travel routes or drive them according to a pre-defined circuit since these vehicles are equipped with an onboard computer with GPS technology, providing information of historical, artistic, gastronomic and shopping anywhere in the city of Funchal.

The city is developing a renovation project of five spots for city parking, to be carried out in the next 3 years. In this renewal is expected that in each parking spot it will be possible to charge the batteries.

D Process Evaluation Findings

D.1 Deviations from the original plan

The deviations from the original plan comprised:

Acquisition of electric vehicles – There was a deviation in DoW regarding the purchase of electric scooters, since the rental service and the related indicators have been dropped. The DOW predicts the acquisition of 6 electric scooters and battery charges, however due to the interest showed by the private parties in managing the service and the impossibility of the Municipality in exploring it, this acquisition was eliminated in the 2nd amendment. The Municipality was supposed to lease the area for the service and the company that would exploit the service should acquire the equipment.

Rental service implementation – Despite the launch of two tendering processes, no one applied. Nevertheless, and once again, since new companies reveal interest in exploring the service, the Municipality prepared a third contest with changes suggested by companies. In February, 2012, new rounds of consultation were carried out with the companies to inform them of the legal requirements necessary for the installation of the rental service as well as the terms of reference required to explore the service. However, in late February/March, the stakeholder feedback was contradictory. Some inputs suggested by some companies were not in agreement with other companies. For Example, one input stated that the system

should work six days a week, while others stated that they would only compete if the system worked seven days a week. Another example was that a competitor wanted to orient the service for the tourism sector only, while the other wanted to expand the business to local residents. In March/April 2012, given the limitations of credit to private enterprises, almost all the interested parties requested that the Municipality co-fund investment by allocating a significant amount of money to start the business and to manage the service.

In April/May, no competitor was available to compete in a tender process partly in part due to the requirements provided by the Municipality and mainly because the investment risks are high due to the uncertainty of its viability, at a time when the country is going through a severe economic crisis and banks are not financing these sort of investments.

D.2 Barriers and drivers

D.2.1 Barriers

Overall barriers

9 – Financial barrier

- **Economic Crisis** – The economic crisis hampered the whole rental service process, since the investment costs were too risky for the companies interested.

3 – Culture barrier

- **Difficulties in the assessment** – Despite the optimistic results obtained in the surveys, it is difficult to really assess how really citizens are really committed in changing their mobility habits.

Preparation phase

11 – Spatial barrier

- **Lack of infrastructures** – Short bicycle lane and the geographical conditions in the city is quite restrictive for a conventional bike, reasons that explains the choice of a rental service.

7 – Planning barrier

- **Technical difficulties** – Difficulties in defining the technical requirements necessities for the development of the tender procedure.

Implementation phase

9 – Financial barrier

- **Lack of investment** – The tender process for the rental service exploration failed to attract investors. This is due to the financial crisis that the Country is facing right now. The companies consider the investment too risky. Additionally the costs become high.
- **Adherence to green tariff** – Due to the fact that the prices of hybrid and electric cars are still high, the acquisition of such vehicles is still marginal.

D.2.2 Drivers

Overall Drivers

9 – Financial driver

- **Innovation** – Prior to CIVITAS, there has not been a policy in providing discounts to those who park hybrid/electric vehicles in the city parcometer network. Thanks to CIVITAS, for the first time in the city, a discount was created specifically for owners of electric/hybrid vehicles. The green tariff service, which already have 12 subscribers, is expected to grow in the future years, when citizens starts using more often this type of technology.

Preparation phase

10 – technological driver

- **Technological adaptation of the parking meters to the green tariff** – The implementation of the green tariff was relatively easy in the current adaptation of the parking meters.

Operation phase

1 – Political/strategic driver

- **Governmental effort** – Regional Government is currently establishing rechargeable stations throughout the Island. This can prove to be crucial in increasing the number of non-pollutant vehicles circulating in the Region.

Implementation phase

1 – Political/strategic driver

- **Political involvement** – A vision of sustainability for the coming years are part of the political agenda. In this sense, the politicians involved in the dissemination and promotion of ecological technologies.

D.2.3 Activities

Overall Drivers

9 – Financial activities

- **Launch of a second tender for the rental service** – In order to enhance the implementation of the rental service, the requisites of the first tender procedure were amended to make the investment more attractive.

Preparation phase

10 – technological activities

- **Specific geographic conditions** – Due to the geographical conditions, it was necessary to conduct a market survey to find out the most suitable solutions in terms of technology for Funchal.

7 – Planning activities

- **Adjustment to customers' needs** – in order to understand the potential company's needs, several contacts were made to readjust the specifications to the companies needs.
- **Technical research** – Market analysis to determine the requisites needed to implement the measure.

7 – Involvement, communication activities

- **Auscultation process** – Consultation of stakeholders after the first contest in order to discuss the problems that led to failure.

1 – Political/strategic driver activities

- **Political involvement** – This measure had the commitment and motivation of policy-makers that participated in the communication of the measure, as well as in the search and development of solutions to overcome the barriers found.

Implementation phase

7 – Positional activities

- **Covenant of mayors** – The goals of this measure are contemplated in the Sustainable Energy Action Plan for 2011, combined with other strategic actions.

1 – Political/strategic driver activities

- **Political involvement** – The actions of policy-makers contributed to facilitate the communication process of the measure, in its various aspects.

D.3 Participation

D.3.1. Measure Partners

- **Measure partner 1:** Municipality of Funchal: Leader in the development of the measure and primarily responsible for all activities.
- **Measure partner 2:** Horários do Funchal – This partner had not an active role in this measure, although it supported the development of the measure with knowledge and expertise.
- **Measure partner 3:** Madeira Tecnopolo – This partner does not have an active role in this measure, however supported its development, contributing for knowledge and expertise.

D.3.2 Stakeholders

- **SEP (Sociedade de Exploração de Parques de Estacionamento):** SEP is responsible for the management of several parking lots and the parking meters. They currently explore the green tariff and are responsible for the parking meters maintenance.

D.4 Recommendations

D.4.1 Recommendations: measure replication

The city of Funchal has no tradition of using the bicycle as a mode of transport, in which there isn't a network to support the use of this type of transport. In 2009, the city started a policy of encouraging this practice, with the launch of the first bike path. The difficulties inherent in steep terrain, narrow streets and lack of space are the main constraints in the promotion of cycling. These are the reasons why the city wanted the implementation of a rental service with bicycles and electric scooters, vehicles capable of overcoming the existing barriers.

Taking in account the experience obtained with this measure and to the cities that have similar characteristics to Funchal, the lessons learned have taught us that the operation of this type of service can not fall only on private, but it is also important that this service, being of public interest, it is essential that the Municipality and the Regional Government can also play a key role in the process.

To implement measures such as this, it is recommended that during the planning stage, we have to accurately assess the barriers that may oppose good measure success. In the case of Funchal, the economic crisis that we are experiencing was not properly considered, given the fact that this was not a potential risk.

Regarding the implementation of a tariff to encourage the use of electric and hybrid vehicles, this is an easy measure that can be easily replicated.

In the case of the green tariff, it proved to be an important action for sustainability, in which it stimulated the market for sales of such vehicles, although in a very contained way, however it is considered that this was due to the commitment of the city to increase the number of ecological vehicles in the future years.

The recommendation for the implementation of this incentive is to inform citizens. The communication tools that were used for this purpose were the media, facebook, conferences and exhibitions focusing new technology.

The financial costs are essentially the adaptation of parking meters to this new rate, which are essentially human resources and promotional costs.

The technical requirements for the application are mainly informatic that only requires a reprogramming equipment (in this case the parking meters) and human resources for the development of campaigns.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- **Involvement of other stakeholders** - The green tariff can play a very important role in promoting sustainable vehicles in the city. Nevertheless it is important to establish a good strategy in order to involve all sort of entities that deal with parking issues, such as car concessionaires, private companies that manages parking lots, and hotels. This process can lead to improve the service.
- **Contact with other cities** – Although the rental service was not implemented, defining the requirements for the bike system implied the establishment of meetings with other cities, since they already have a bike rental system. Therefore, it is convenient that other cities should establish contacts with more experienced cities in managing this type of bike schemes.