

*Measure title:* **Energy Saving Training**

*City:* **Vitoria-Gasteiz**    *Project:* **CiViTAS Modern**    *Measure number:* **04.04**

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## **0 Executive summary**

In Vitoria-Gasteiz, a city in which most non-pedestrian journeys are made by car, traffic is the second largest source of greenhouse gas emissions and one of the greatest environmental and social impacts into the urban living aspects.

Apart from that, Local Energy Plan and the Local Strategy against Climate Change Plan expect to cut down the CO<sub>2</sub> emissions of the transport sector.

Efficient driving contributes to achieve these objectives. Besides, traffic noise, accident risk and vehicles maintenance cost reductions are also improved. The course of eco-driving is a new way of leading the vehicle, which aims:

- A low consumption of fuel.
- A reduction of the environmental pollution.
- A major driving comfort.
- A decrease of risks on the road.

The objective of this measure is to educate all citizens of Vitoria-Gasteiz to take action for a cleaner and more energy efficient driving style. During the Modern Project, 1.000 citizens learn to drive their vehicles in an energy-efficient way enabling them to save 15% of the fuel compared to inefficient driving, which roughly means 270 tons of CO<sub>2</sub> reduced per year.

The courses consist on a theoretical part and a practical part with a maximum of 15 people per session. Every session lasts 4 hours and participants can choose to attend the course in the morning or evening schedules. The course is composed by different parts. Firstly each student drives in an urban circuit and the trainer puts down his fuel consumption. Secondly, there is an introduction on how to drive saving fuel. Finally, the student drives in the same urban circuit and his improvements are checked.

The impacts of implementation have been evaluated by comparing fuel consumption and vehicles speed between the first circuit and the second one. Additionally, by using that information it has been also estimated the related decrease in emissions. Finally, through a questionnaire to students it has been evaluated the acceptance of the measure.

The main results of the measure evaluation were:

- After 2012 edition, there have been 601 students attending the courses.
- It has been reduced the fuel consumption (-8,3%) after 2012 edition.
- It has been decreased the average speed (-2,5%) after 2012 edition.

The most important impact of this measure is the reduction of average speed of drivers. This is important to reduce accidents and to calm the traffic in the city and other impacts as noise.

The number of drivers attending the courses is over the half of expected. This is one of the risks of this kind of measures and the goal is not achieved despite the strong dissemination campaign to support the recruitment of people. However, the attendance is higher than previous edition of eco-driving courses.

The reduction of fuel consumption is lower than expected. However, if we compare this result with other studies or other eco-driving courses, the reduction of fuel consumption is similar to them.

It could be interesting to develop a control panel with students of last years, in order to know how the lessons learning are being carried out. It is an important measure to value the progressive attenuation of the learnt skills. Also, it could be interesting to offer testing electric vehicles to familiarize with them, and to compare results with standard cars.

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## **A Introduction**

### **A1 Objectives**

The measure objectives are:

(A) High level / longer term:

- To increase the use of alternative fuels and of clean and energy-efficient vehicles and to enhance their integration into the urban transport.
- To influence travel behaviour and modal choice through mobility management plans, marketing, communication, education and information campaigns.
- To develop safe and secure roads and infrastructure and means of travels.

(B) Strategic level:

- To improve the efficiency of transport system in the city, offering to the citizens eco-driving courses.
- To reduce energy consumption of transport due to a more efficient use of cars.
- To reduce environmental impacts of transport due to a more efficient use of cars.

(C) Measure level:

- (1) To train at least 1000 vehicle drivers, about 250 per year, in efficient driving techniques.
- (2) To reduce energy consumption of participants, achieving a decrease of 15% of fuel consumption.
- (3) To calm the traffic in the city due to a slower speed of driving after the eco-driving courses, achieving a decrease of speed up to 2%. This consequently reduces the impacts of traffic (noise, safety, etc.).

### **A2 Description**

The objective of this measure is to educate all citizens of Vitoria-Gasteiz to take action for a cleaner and more energy efficient driving style. During the Modern Project, 1.000 citizens learn to drive their vehicles in an energy-efficient way enabling them to save 15% of the fuel compared to inefficient driving, which roughly means 270 tons of CO2 reduced per year.

The aim of the measure is not only to teach 1.000 citizens energy-saving driving techniques but also to capture as much as possible citizen's attention over the matter, to create a debate over it during the 4 years of MODERN and beyond. Besides, it is expected that these educated citizens to spread the new learned energy-saving driving techniques among their relatives and friends. In this sense, the number of targeted courses is developed in four years (Figure A2.1):

<b>Year</b>	<b>Number of places offered</b>
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	<b>in the courses</b>
2009	240
2010	360
2011	255
2012	270
<b>TOTAL</b>	<b>1.125</b>

Figure A2.1: Places offered in the courses

The courses enrolment is only restricted to people with driving license, but not by other characteristics as gender, age, occupation, etc. In fact, students were very heterogeneous in every course edition.

Efficient driving contributes to the objectives of the Local Energy Plan and the Local Strategy against Climate Change to cut down the CO<sub>2</sub> emissions of the transport sector. Besides, traffic noise, accident risk and vehicles maintenance cost reductions are also expected. The course of efficient driving is a new way of leading the vehicle, which aims:

- A low consumption of fuel.
- A reduction of the environmental pollution.
- A major driving comfort.
- A decrease of risks on the road.



Figure A2.2: Car used in eco-driving courses

This driving is ruled by a series of simple and effective measures which try to take advantage of the possibilities that the technologies of the current cars engines offer.

Since most of the total emission of CO<sub>2</sub> is originated by the consumption that comes from the transport by road, it is a priority to use the car on the most efficient and rational way.

The principal advantages of this new driving style are:

- For the own driver:
  - Improves the comfort in the driving and diminishes the stress.
  - Reduces the risk and magnitude of the accidents.
- For the Vehicle fleet:
  - Economic saving of fuel.
  - Minor maintenance costs of the vehicle.
- Globally:
  - Reduction of urban pollution, improving the quality of the breathed air.
  - Reduction of CO2 emissions, diminishing the problems of atmosphere warming.
  - Energy saving, reducing the foreign energetic dependence.

The courses consist on a theoretical part and a practical part with a maximum of 15 people per session. Every session lasts 4 hours and participants can choose to attend the course in the morning or evening schedules. For the practical part, they are divided in 5 groups of 3 people accompanied all time by a monitor. Monitors are responsible of delivering the participants the necessary material to follow the course (manual, cards of information, etc.). One of the 5 monitors is responsible of the theoretical explanations corresponding to the applying of driving techniques.

The course is composed by different parts. Firstly each student drives in an urban circuit and the trainer puts down his fuel consumption. Secondly, there is an introduction on how to drive saving fuel. Finally, the student drives in the same urban circuit and his improvements are checked.

The session of 4 hours length develops on the following way:

**1.- Arrival of the participants to the classroom:** Properly identified monitors and the vehicles will be waiting for the participants at the entrance of the place where the course celebrates, in order to accompany them to the classroom.

Once there, monitors make a brief introduction to the participants about the content of the course, such as:

- Aims of the course.
- Advantages of energy-efficient driving.
- The driving tour where the car will circulate is explained (a distance not superior to 6 km). Each course gathers 15 people, which are divided in subgroups of 3 in order to distribute them in the 5 cars. (All vehicles are provided with a computer on board and all use diesel).
- Before getting in the cars, a card is delivered to each one of them to annotate their personal information, in order to check participants and receive the certificate of assistance and accomplishment of the course once it is completed.
- They are also warned to respect traffic rules and that responsibility of any traffic sanction incurred during the lesson will fall on them, as not respecting speed limits or the traffic lights, for example.



Figure A2.3: Lessons of eco-driving courses

Information cards are delivered by the monitors to be filled in by the participants personal data. This data is later used to fill the certificates of assistance and accomplishment of the course once it is successfully completed.

**2.- Driving the cars:** The monitors accompany the drivers on the cars (as we explained before, 3 drivers for car). Every participant drives the car in shifts for the circuit selected as they do it habitually. Logically the driver must keep in mind traffic signs during the tour and respect and obey the procedure of road safety.

Once the first driver completes the tour, they return to the starting point and before the following driver occupies his place the monitor annotates the following information that appears in the computer on board:

- Distance covered.
- Time needed to complete the whole tour.
- Average speed (km/h).
- Oil consumption (l/100).

All the cars are provided by a computer on board that is turn on to be show the information related to the consumptions and speed. (Like in to this below picture):



Figure A2.4: On-board computer used in eco-driving courses

This process is repeated with each of the assistants in the session.

**3.- Back to the classroom:** Once, every one concludes the tour, they return to the classroom where the monitor gives an hour lecture on the importance of the new driving technologies and the rules applying to them:

- Start the car.
- Beginning of the driving.
- Choice of the gear.
- The speedometer.
- Accomplishment of the changes of gear.
- The first gear.
- The long gears.
- The 5th gear.
- Progression of the gears.
- The brake and the reductions of gears.
- Changes of gears with automatic gearbox.
- Rational driving and anticipation.
- Panorama of the traffic situation.
- Safety distance.
- Traffic for the right lane.

Then, the practical aspects of driving are explained to the participants, such as:

- Driving in a certain gear.
- Traffic and speed.
- Sections with slopes (descending - rising).
- The curves.
- Driving in traffic jam.
- Incorporations and exits of the routes.
- Stops realized during the driving.
- Diverse obstacles to drawing lots in the driving (crossings, roundabouts, advancements, driving in parallel, detention, special manoeuvres).

Meanwhile, the monitors transfer to a program of EXCEL the results obtained by the participants.

**4.- New tour in the car:** Once the explanation is over, the drivers return again to the cars maintaining the same groups formed at the beginning of the class not to change significantly the driving conditions obtained in the first tour. They return to drive along the same route but applying the new driving skills and knowledge about the car engine technology learned in the class.

Once again, monitors take notes of the information appeared on the computer on board about each of the drivers. This tour finishes in the classroom area.

**5.- Already in the classroom:** The monitor shows all the assistants the results obtained in the first and second turn, indicating CO2 emission reductions and fuel savings obtained using the new driving techniques. Once this is over, monitors deliver the certificate of assistance of the course to all participants.

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## **B Measure implementation**

### **B1 Innovative aspects**

The innovative aspects of the measure are:

- **New conceptual approach, locally** – Besides the initiatives launched in order to reduce car usage in Vitoria-Gasteiz and to encourage upgrading to new cleaner transport technologies, this measure searches environmental improvements by acting on drivers' behaviour.
- **Targeting specific user groups, locally** – The measure focuses on private-car drivers, which are the main responsible for mobility impacts in our city. Therefore public economic resources are used more efficiently and there is no penalty for other citizens.

### **B2 Research and Technology Development**

In order to develop this measure, it is necessary to write a manual on energy saving techniques to distribute to citizens. It is ordered the design and edition of a manual reporting the techniques of an efficient driving, as well as a mechanical explanation of the vehicle, in a way that will be easily comprehensible why it is efficient to adopt another driving style. A specific image has been designed for this project. The manual is produced in both Basque Autonomy official languages, Basque and Spanish.

The outcome of the research development is the combination between this manual edition and eco-driving courses, which are a complement for the energy-efficient education.



*Figure B2.1: Eco-driving manual for cars*

This is the index of the Manual of Energy-Saving Driving developed in the context of this measure:

#### **1. Introduction to the efficient driving.**

##### **1.1.Preamble.**

## **1.2. Energetic consumption and environmental pollution: Energy is vital to survive, but it isn't infinite.**

### **1.3. Principal advantages of the efficient driving.**

Summary of chapter 1:

The objectives of Energy-Saving Driving are:

- Low consumption of fuel
- Reduction of environmental pollution
- Main comfort of driving
- Decrease of risks on the road.

Energy is necessary for the survival, however it is not infinite.

In the sector of the transport lots of fossil origin fuels are used. These fuels produce important broadcasts of CO<sub>2</sub> to the atmosphere and the increase of this gas is the cause of the earth's temperature raise, this at the same time being able to causes changes in meteorology or increasing the level of the seas.

The principal advantages of the economical driving are:

- The improvement in comfort: It's about avoiding sudden accelerations and brakes, by which the sounds coming from the engine can be deleted, maintain a constant average speed, but above all, it's a way of driving that avoids the stress produced by traffic, mainly in cities.
- The increase of security: As the principal efficient driving parameters saying:
  - A bigger security distance has to be maintained (increases the time to react)
  - A constant average speed has to be maintained (reduces the peak speed)
  - Drive with anticipation and prevision maintaining an adequate visual space.
- Less consumption having a special care in: the starting of the vehicle, the use of the accelerator, the use of the gear in a proper way, the anticipation in non-expected traffic situations. Besides a constant and adequate speed has to be tried to maintain in each situation to optimize that way the expense on the fuel.
- Less cost, since the reduction of consumption is associated to a minor cost of fuel and at the same time to a smaller cost in the maintenance of the vehicle. Following these driving techniques al the car's elements are submitted to a smaller effort compared to the traditional driving.
- Decrease of emissions, something directly related to the reduction of the consumption of the fuel. This decrease in emissions will avoid diseases associated to breathing difficulties, sight problems, cardiovascular diseases and migraines.

## **2. The car like machine of consumption**

### **2.1. The engine: relevant variables in the consumption.**

### **2.2. The fuel**

### **2.3. The transmission.**

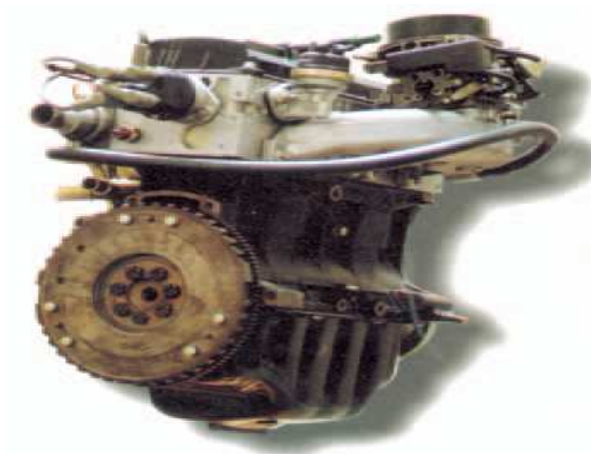
## **2.4. Energetic efficiency in the engine**

## **2.5. The resistances to the advance of the car.**

Summary of chapter 2:

The combustion engine of a car consumes the fuel send from the tank through a pump. In modern engines, the adjustment of the flow is done by the electronic control. It has to be taken into account that the fuel flow depends on how much power is requires from the engine. On the way of using the accelerator pedal and on the revolutions depends the „real consumption“, in litres of fuel per each 100 km.

The selection of a longer gear makes the car go in the same speed, but the engine works in fewer revolutions so that it consumes less.



*Figure B2.2: Car engine*

The less power is required usually the less consumption of fuel per litre in 100 Km will be.

The ralenti periods with a stopped car are an important cause of increasing the average urban consumption compared with the road use.

Each volume of consumed fuel generates a certain quantity of energy but only a little percentage of this energy gets by means of power and work to the axle of the wheels to drive or move the vehicle.

Duties of the gear box and clutch talk about their importance for the transmission of the energy produced in the engine to the wheel, which is the one that drives or moves the vehicle and this made by the gear box and the clutch.

### **3. During the driving.**

#### **3.1. General characteristics of the car.**

#### **3.2. Air conditioning.**

#### **3.3. Windows.**

#### **3.4. Preventive maintenance.**

Summary of chapter 3:

Difference between previous models of cars compared to more actual models and what it implies related to the saving of energy.

Different components of the cars are analysed and we will get to know how to use them properly to be able to obtain an efficient driving. Aspects such as the air-conditioning, the position of the windows, the maintenance, the load, etc. are analysed.



*Figure B2.3: Air-conditioning panel*

#### **4. Associate concepts and principals rules of the efficient driving.**

##### **4.1.Introduction.**

##### **4.2.The take-off.**

##### **4.3.Election of the gear of driving.**

##### **4.4.Rational driving and anticipation.**

Summary of chapter 4:

Here are provided the guide lines to select beginning from the best gear till the proper way of starting the car, as well as the way in which the changes should be done, taking into account the revolutions and if the car is diesel or gasoline (aspect that it's taken into account every moment, as it represents little variations concerning to attitudes).

#### **5. Practical aspects of the efficient driving.**

##### **5.1.To drive in a certain gear.**

##### **5.2.Traffic and speed.**

**5.3.Sections with slopes.****5.4.The curves.****5.5.Driving in traffic jam.****5.6.Incorporations and exits of the road.****5.7.Stops realized during the driving.****5.8.Obstacles to avoid in the driving.**

Summary of chapter 5:

Once in this point and using practical examples, participants are advised about how to drive appropriately in different situations they could find (like driving in a particular gear, how to behave in slopes, how to go on curves, driving in traffic-jams, incorporations and exits of the roads, stops realized during driving, etc.).

## B3 Situation before CIVITAS

In Vitoria-Gasteiz, a city in which most non-pedestrian journeys are made by car, traffic is the second largest source of greenhouse gas emissions and one of the urban living aspects that has the greatest environmental and social impact.

Aware of that problem and previous to the Modern Project, Vitoria-Gasteiz organised energy-saving driving courses to 188 people in 2006. Courses were given by RACVN teachers during 5 weekends in morning and afternoon shifts. However, only 149 citizens attended these courses due to the following facts: campaign to attract students resulted unsatisfactory, insufficient human resources for enrolment management and, finally, an excessive discouraging 100€ penalty for those who enrolled for the courses and finally did not appear.

The implementation of this measure is an opportunity for the City Council to provide the citizens with a bigger supply than usual, together with a strong dissemination campaign to support the recruitment of people interested in improving driving efficiency.

RACVN has widely experience teaching eco-driving courses around Euskadi. Figure B3.1 shows an example of courses done before CIVITAS in cities of Euskadi (Bilbao, San Sebastian, even Vitoria-Gasteiz). As it is shown, the fuel consumption reduction is around 10%-15% so the objective expected of this measure is -15%.

Year/Month	City	Number of places in the courses	Number of students	Fuel consumption reduction
2006/04	Bilbao	250	160	-14,76%
2006/05	Vitoria-Gasteiz	188	149	-14,67%
2006/09	Bilbao	225	192	-13,15%
2006/10	Bilbao	90	83	-12,11%
2006/11	Bilbao	135	131	-11,93%

2007/12	Vitoria-Gasteiz	45	22	-9,55%
2007/12	San Sebastian	15	6	
2007/12	Bilbao	188	188	

Figure B3.1: Places offered in the courses

## B4 Actual implementation of the measure

The measure is implemented in the following stages, which are repeated every year:

**Stage 1: Communication campaign** (October 2008 - April 2009; October 2009 - April 2010; October 2010 - April 2011; October 2011 - April 2012)

*As previously mentioned, low attendance of the courses is one of the highest risks. To face this problem, the communication campaign must be strong enough to reach and attract the major possible number of citizens to the courses. The campaign, combined with an efficient and flexible enrolment process managed by a technical secretariat, which will control enrolment database and some other issues that is forward described, lead to a complete attendance of the courses.*

*Once decided the Communication Campaign, it is necessary to choose the firm that is going to entrust the dinamization of the information. The work of the external company is coordinated with the one of the Press Department of the City Council. The Press Department of the City Council of Vitoria-Gasteiz summon the Press Conference and define the protocol of the communication. The external company designs a webpage which connects with the official page of Vitoria-Gasteiz, coordinate the Technical Secretary, support the image, etc.*

- *The Communication Company designs the web application with the following contents:*
  - *Information about energy efficient driving.*
  - *Information about the courses.*
  - *Applicants registration.*
  
- *The Communications Services of the City Council work in the following aspects:*
  - *Press release writing and press conference organization to announce the courses.*
  - *Press release reminders to the media during the teaching.*
  - *Invitations to the media to participate in the teaching.*
  - *Interviews and articles management.*
  - *Leaflets design and distribution.*
  - *Advertisements publication.*

*The course are advertised in local newspaper during some weeks, with information about its objectives and announcing the days and schedules of the course celebration.*

**Stage 2: Courses enrolment** (*April 2009 – June 2009; April 2010 – June 2010; April 2011 – June 2011; April 2012 – June 2012*)

*A specific form is developed so city drivers could apply to the course.*

*The subcontracted Communication Company also work as the Technical Secretariat of the courses, operating 3 weeks before the beginning of the courses.*

*Its functions are:*

- *Answering the phone calls of citizens interested in taking part in the courses.*
- *List of the enrolled students, assigning them the hour, date and place where they attend the course.*
- *Management of adds and deletes.*
- *Preparation of the waiting list.*
- *Coordination of the courses:*
  - *Contacting the monitors that accompany the groups of students.*
  - *Obtaining the suitable vehicles to accomplish the programmed tour.*
  - *Obtaining the results from the information obtained in each of the tours.*

**Stage 3: Lessons** (*June 2009; May 2010 and September 2010; May 2011; June 2012*)

*As it is explained before, the course is composed by different parts. Firstly each student drives in an urban circuit and the trainer puts down his fuel consumption. Secondly, there is a lesson on how to drive saving fuel. Finally, the student drives in the same urban circuit and his improvements are checked.*

*In this measure, the urban circuit where the students are driving is shown in Figure B4.1 (all streets in the circuit are urban streets, so the speed limit is 50 km/h):*



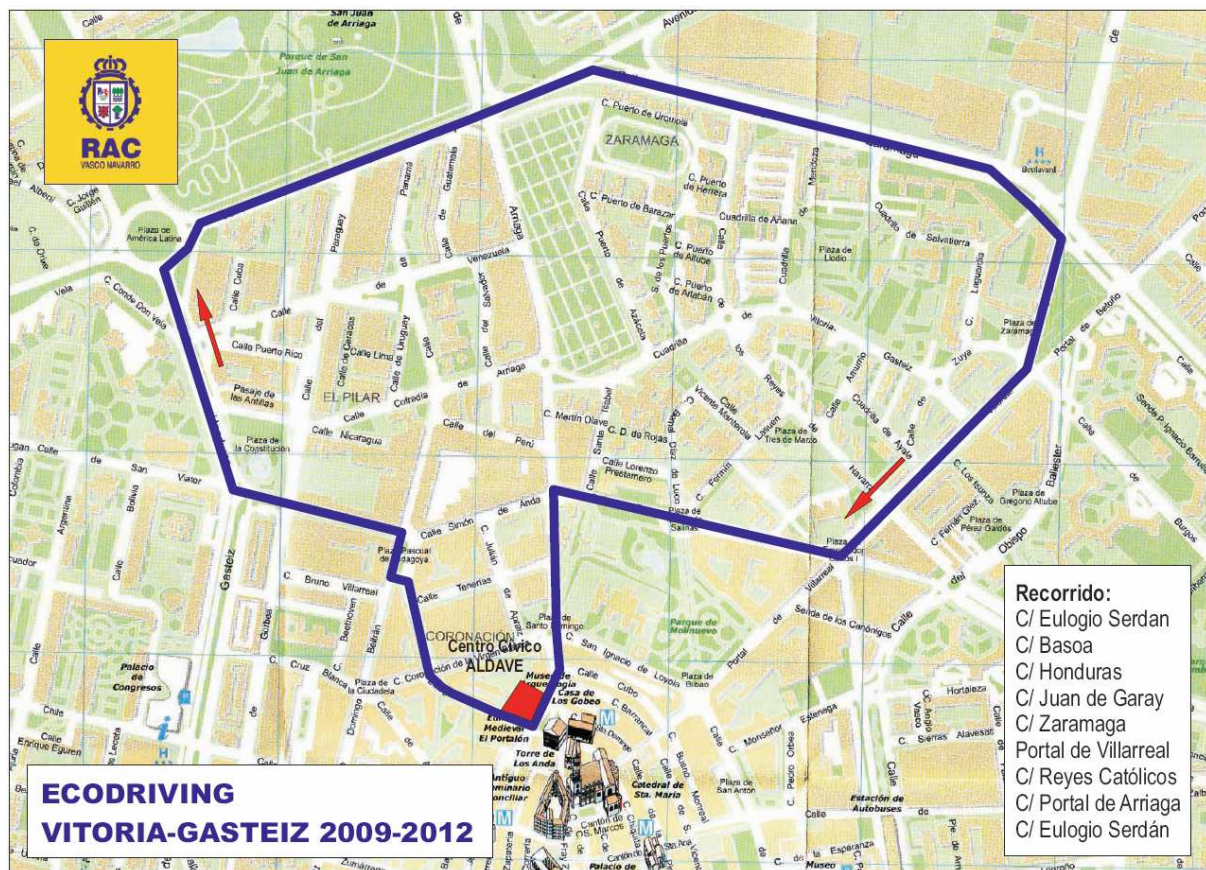


Figure B4.1: Circuit during the courses

The number of people attending the courses is showed below:

Year	Number of people attending the courses
2009	161
2010	182
2011	143
2012	115
<b>TOTAL</b>	<b>601</b>

Figure B4.1: People attending the courses

In 2011, there are 2 announcements: the first one in June 2010 and the second one in September 2010 (180 courses per summer).



**Stage 4: Feedback and conclusions** (*October 2009; October 2010; October 2011; October 2012*)

*At the end of the courses there is a report about the development of them. In this report the following paragraphs are reflected (example of the Index):*

*1.- Introduction: In this paragraph a presentation of the course is realized explaining how each of the meetings has developed, the number of participants, number of monitors, cars, technical means and possible incidents.*

*2.- Participants relation during all the meetings: In this paragraph the names off all participants must appear indicating the date they have been taking part.*

*3. - Results obtained: We can see all the participants with the results of the reductions of consumptions of fuel and of emissions of CO2.*

*4.- Surveys of satisfaction: The participants complete a small survey, to know what they think about these courses.*

*The questions are the following ones:*

- Degree of general satisfaction.*
- Degree of satisfaction in the theoretical classes.*
- Is it necessary to extend the practical classes?*
- Value de quality of the RACVN monitors.*
- Possibility of applying the techniques from now on.*
- Would you recommend the course to another person?*

*5.- Summary: In this part, we take the results of the average from different days and we relate them with the participants opinions.*

*6.- Conclusions: A brief commentary is included interpreting the results obtained by the participants, showing a squema with the average values for the whole courses.*

## **B5 Inter-relationships with other measures**

The measure is related to other measures as follows:

- Measure no. 03.04. Traffic light regulation for the new public transport network and superblocs model** – The new traffic lights regulation has either contributed to reduce fuel consumption, thanks to a reduction of stops and green waves in basic streets of city.
  - Measure no. 08.01. Information and traffic management systems** – Public transport priority on traffic lights will also improve clearly their fuel consumption efficiency.
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## C Evaluation – methodology and results

### C1 Measurement methodology

#### C1.1 Impacts and Indicators

No.	Impact	Indicator	Source	Date ex ante	Observations	Date ex post	Observations
5	Economy	Fuel consumption	On board vehicle information	May 2009 Sep 2010 May 2011 Jun 2012	Ex-ante data collection is obtained before the courses, and ex-post data collection is obtained after the courses (in the same day there are both ex-ante and ex-post values)	May 2009 Sep 2010 May 2011 Jun 2012	Ex-ante data collection is obtained before the courses, and ex-post data collection is obtained after the courses (in the same day there are both ex-ante and ex-post values)
8	Environment	CO2 emissions	On board vehicle information	May 2009 Sep 2010 May 2011 Jun 2012		May 2009 Sep 2010 May 2011 Jun 2012	
14	Society	Acceptance level	Students survey	May 2009 Sep 2010 May 2011 Jun 2012		May 2009 Sep 2010 May 2011 Jun 2012	
105	Society	Students of courses	Students survey	May 2009 Sep 2010 May 2011 Jun 2012		May 2009 Sep 2010 May 2011 Jun 2012	
23	Transport	Average vehicles speed	On board vehicle information	May 2009 Sep 2010 May 2011 Jun 2012		May 2009 Sep 2010 May 2011 Jun 2012	

Figure C1.1.1: Indicators

- **Indicator 5 (Fuel consumption)**

Unit: litres of fuel/100 km

Through the on board vehicle information of fuel consumption obtained before and after the courses, we can obtain the ex-ante and ex-post values of this indicator. The indicator is used to compare the variation of the user’s energy consumption per unit of transport activity before and after taking the training course.

- **Indicator 8 (CO2 emissions)**

Unit: tonnes of CO2/year

CO2 coming from the vehicles circulating through the city. It can be calculated through a formula of average emission (in grams per vehicle and kilometre) multiplied by the number of veh-km per year in the city done by student of saving training courses.

The indicators follow this formula:

$$A = B \times C$$

Where:

A = Yearly total emissions (tonnes of CO2)

B = Amount of kilometres done by students (km)

C = Average value of emissions per vehicle-km (tn/km)

In this case, the emission reduction can be measured with the average fuel reduction of the drivers that took the training because patrol consumption and gas emission have a really close direct relation. The difference between the emissions before and after the courses is the environmental impact of this measure.

- **Indicator 14** (*Acceptance level*)

Unit: %

It is submitted a survey to the students of the training to know if they are pleased or displeased with the course. The answer depends very much on the question, and in this case should be one close to "Are you satisfied with the course?". The other way to obtain the student's satisfaction degree is to measure it on a five-point scale (1 to 5), such as: very dissatisfied (1), somewhat dissatisfied (2), very satisfied (5), somewhat satisfied (4) and neither satisfied nor dissatisfied (3). The answer depends very much on the formulation of the question adopted. The question to be asked could be for instance "How do you rate the quality, the concepts learnt and the results of the energy-saving training?"

Finally, to calculate this indicator, it's used the proportion of students satisfied or very satisfied:

*1. Are you satisfied with the course? (1-5)*

- **Indicator 23** (*Average vehicle speed*)

Unit: %

In this case, we can also measure the average vehicle velocity of the students that took the course with another formula: If we know the length of the course circuit that the students have to do and the duration to cover it (on the first time before the training and on the second time after the training), we can obtain the ex-ante and ex-post average vehicle speed.

- **Indicator 105** (*Students of courses*)

Unit: number of students attending the courses

For this indicator, we can obtain the amount of students attending the courses every year through the courses enrolment.

## **C1.2 Establishing a Baseline**

The courses were imparted on 2, 3, 4, 5, 9, 10, 11 and June 12, 2009, from 9h.30 'to 13h.30' and from 15h.30 'to 19h.30 'to a total of 161 people. The trips have been conducted during these periods in five vehicles, specially equipped with on board navigator for establishing the speed, consumption, etc. It also conducted a survey of student's satisfaction, detailed in Annex 1. The measure results are obtained from on board navigator for indicators 5 and 8; and from a survey for the indicator 14.

- **Indicators 5 and 8** (*Fuel consumption and CO2 emissions*)

Through the on board vehicle navigator information it is of obtained the fuel consumption per 100 km before and after the courses. There are results for 4 editions of courses, in 2009, 2010, 2011 and 2012, and the values are different as the next table shows:

	Students	Average fuel consumption reduction (%)	Average speed reduction (%)	Acceptance level (%)
2009	161	-10,05%	-0,67%	77,76%
2010	182	-9,91%	-7,29%	78,99%
2011	143	-1,43%	-1,82%	83,64%
2012	115	-11,89%	1,56%	77,91%
<b>Total</b>	<b>601</b>	<b>-8,31%</b>	<b>-2,52%</b>	<b>79,56%</b>

Figure C1.2.1: Ex-ante calculations

The reduction of fuel consumption between ex-ante data and ex-post data are different in 2009, 2010, 2011 and 2012. The maximum difference is in 2012, and close to the value of 2009 and 2010. However, the reduction of speed in 2010 is the highest, and the acceptance level in 2011 is the highest. The results are calculated the average of all students in order to evaluate the indicators.

The emissions are calculated following the described formula, considering 15.000 km/year and the average emission of a car from a similar park fleet distribution that exists in the city of Madrid, that is 169,15 g/km.

The assumption of average value of emissions per vehicle-km is taken of Copert Report, by the European Commission. It is considered the standard distribution of the existing type of vehicles circulating in the city of Madrid. The next table shows this assumption.

This data is obtained from the data of city of Madrid due to this an assumption difficult to obtain for each city. A big city as Madrid provides specific and deep studies related to mobility that can be extrapolated to other similar cities. We consider that the characteristics related to social and economical level in Madrid and Vitoria-Gasteiz are similar, so the distribution fleet in Vitoria-Gasteiz can be assumed as the Madrid one.

	% vehicles	CO2 emission factors (g/km)
<b>Cars</b>	<b>89%</b>	<b>169,15</b>
Euro 0 gasoline	0,8%	289,95
Euro I gasoline	2,7%	202,21
Euro II gasoline	3,2%	194,48
Euro III gasoline	9,9%	181,24
Euro IV gasoline	10,1%	170,22
Euro 0 diesel	0,6%	192,03
Euro I diesel	1,2%	203,87
Euro II diesel	2,5%	190,72
Euro III diesel	18,7%	174,52
Euro IV diesel	39,2%	153,66

Figure C1.2.2: Ex-ante assumptions

The average fuel consumption in 2009 and 2010 for the baseline scenario are obtained from the official source IDAE (Diversification and Energy Saving Institute), that belongs to Industry

Ministry of Spain. The assumption is that the distribution of diesel oil and petrol vehicles is similar to park fleet in Madrid (70%/30%).

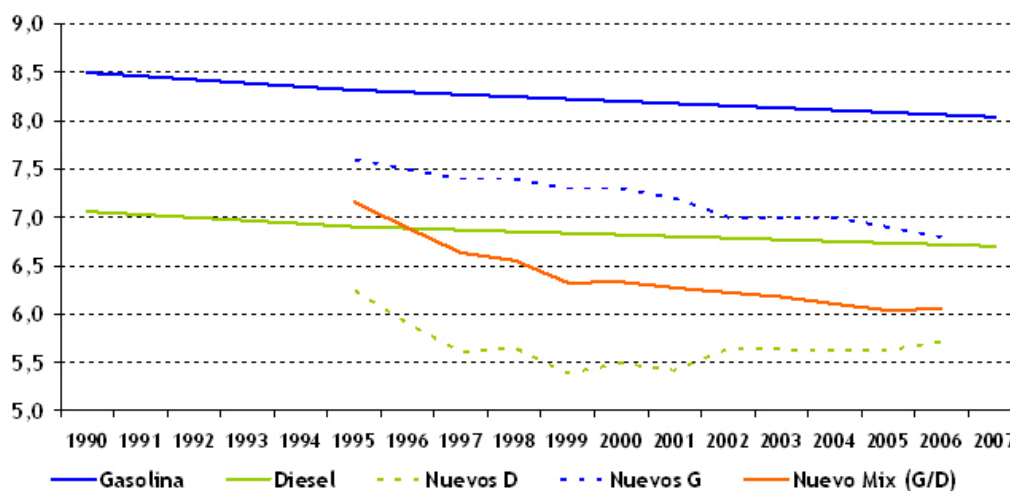


Figure C1.2.3: Historical evolution of fuel consumption

The results are the following:

	Students	Average fuel consumption reduction (%)	Ex-ante average fuel consumption (litres/100 km)	Ex-post average fuel consumption (litres/100 km)	Ex-ante average CO2 emissions (g/km)	Ex-post average CO2 emissions (grammes/km)	Ex-ante total CO2 emissions (tn)	Ex-post total CO2 emissions (tn)
2009	161	-10,05%	7,01	6,31	169,15	152,15	2,54	2,28
2010	182	-9,91%	6,99	6,30	169,15	152,39	2,54	2,29
2011	143	-1,43%	6,97	6,87	169,15	166,73	2,54	2,50
2012	115	-11,89%	6,94	6,12	169,15	149,03	2,54	2,24
<b>Total</b>	<b>601</b>	<b>-8,31%</b>	<b>6,98</b>	<b>6,40</b>	<b>169,15</b>	<b>155,10</b>	<b>2,54</b>	<b>2,33</b>

Figure C1.2.4: Ex-ante calculations

So, the results of baseline for each indicator are:

Before	before training
Fuel consumption (l/100 km)	6,98

Before	before training
CO2 emissions (tn)	2,54

Figure C1.2.5: Ex-ante indicator values

- **Indicator 14 (Acceptance level)**

The survey just asked about the acceptance level after the training, so there are not results for this indicator in the baseline scenario.

- **Indicator 23 (Average vehicle speed)**

We have obtained the difference between ex-ante and ex-post values. To this indicator, it is assumed the value 1=100% for the baseline scenario.

Before	before training
Average vehicle speed (%)	100,00%

Figure C1.2.6: Ex-ante indicator values

- Indicator 105 (Students of courses)**

For every year, we obtain the amount of students attending the courses and the difference with offered courses.

In 2009, it is offered 240 places and they are covered by 161 students. The dates of the courses are 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> y 12<sup>th</sup> of June 2009.

In 2010, it is offered 360 places (180 in May and 180 in September) and they are covered by 296 students (116 in May and 66 in September). The dates of the courses are 20<sup>th</sup>, 21<sup>st</sup>, 22<sup>nd</sup>, 23<sup>rd</sup>, 27<sup>th</sup>, 28<sup>th</sup> and 29<sup>th</sup> of May 2010, and 16<sup>th</sup>, 17<sup>th</sup>, 18<sup>th</sup>, 23<sup>rd</sup>, 24<sup>th</sup> and 25<sup>th</sup> of September 2010.

In 2011, it is offered 210 places and they are covered by 143 students. The dates of the courses are 26<sup>th</sup>, 27<sup>th</sup>, 28<sup>th</sup> and 29<sup>th</sup> of May 2011 and 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> of June 2011.

In 2012, it is offered 195 places and they are covered by 115 students. The dates of the courses are 14<sup>th</sup>, 15<sup>th</sup>, 16<sup>th</sup>, 17<sup>th</sup>, 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup> of June 2012.

	Students
2009	161
2010	182
2011	143
2012	115

Figure C1.2.7: Ex-ante indicator values

### C1.3 Building the Business-as-Usual scenario

- Indicator 5 (Fuel consumption)**

The average fuel consumption has been obtained from the official source IDAE (Diversification and Energy Saving Institute), that belong to Industry Ministry of Spain. The assumption is that the distribution of diesel oil and petrol vehicles is similar to park fleet in Madrid (70%/30%).

This source offers historical data since 1990 to 2007. In order to know the average fuel consumption in 2009, 2010 and next years, it has been used extrapolation from historical data.

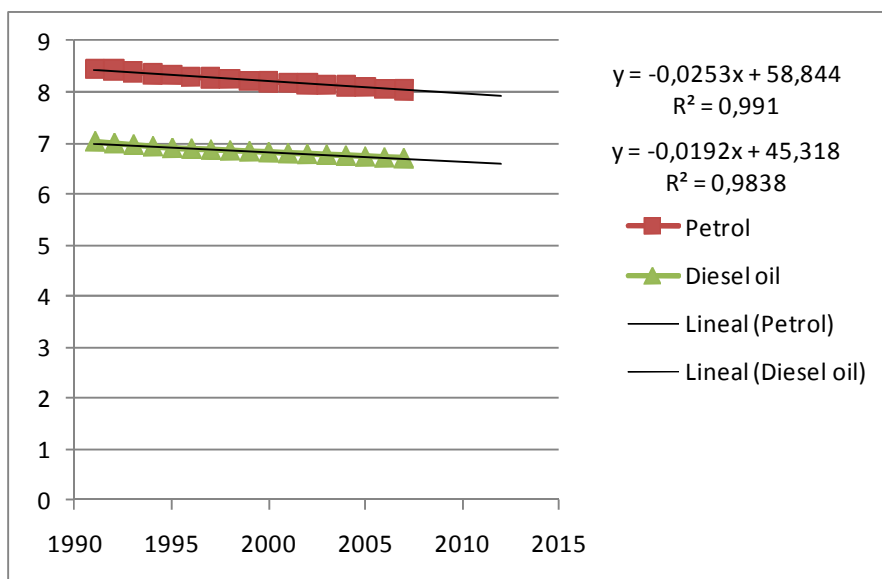


Figure C1.3.1: Historical and B-a-U evolution of fuel consumption

As the chart shows, average fuel consumption is decreasing due to the improvement on vehicles during the last years. The value of R2 is over 0,98 for petrol and diesel oil vehicles. The assumption is that the distribution of diesel oil and petrol vehicles is similar to park fleet in Madrid (70%/30%).

- Indicator 8 (CO2 emissions)**

The change in emissions of CO2/km is due to improvements in vehicles, so the impact of the courses is not considered for the Business-as-Usual scenario. The vehicle is the same before and after the course, so the value of this indicator is equal to the baseline situation.

Business-as-Usual	before training
CO2 emissions (tn)	2,54

Figure C1.3.2: B-a-U indicator value

- Indicator 14 (Acceptance level)**

The change in acceptance level of the measure is obtained after setting up the course. Therefore, if this measure wasn't implemented, the acceptance level would be as before. It is considered that there are no effects of other factors that have any influence on this indicator. In this case the Business-as-Usual scenario is equal to the baseline situation. However, the survey just asked about the acceptance level after the training, so there is not result for this indicator in the Business-as-Usual scenario.

- Indicator 23 (Average vehicle speed)**

The change in acceptance level of the measure is obtained after setting up the course. Therefore, if this measure wasn't implemented, the acceptance level would be as before. It is considered

that there are no effects of other factors that have any influence on this indicator. In this case the Business-as-Usual scenario is equal to the baseline situation.

<b>Business-as-Usual</b>	<b>before training</b>
Average vehicle speed (%)	100,00%

Figure C1.3.3: B-a-U indicator value

## C2 Measure results

The results are presented under subheadings corresponding to the areas used for indicators: economy, environment, transport and society.

### C2.1 Economy

Following the same methodology than the baseline, it has been obtained the results of the indicator. These are the results of indicator 5:

	Students	Average fuel consumption reduction (%)	Ex-ante average fuel consumption (litres/100 km)	Ex-post average fuel consumption (litres/100 km)	Ex-ante average CO2 emissions (g/km)	Ex-post average CO2 emissions (grammes/km)	Ex-ante total CO2 emissions (tn)	Ex-post total CO2 emissions (tn)
2009	161	-10,05%	7,01	6,31	169,15	152,15	2,54	2,28
2010	182	-9,91%	6,99	6,30	169,15	152,39	2,54	2,29
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2012	115	-11,89%	6,94	6,12	169,15	149,03	2,54	2,24
<b>Total</b>	<b>601</b>	<b>-8,31%</b>	<b>6,98</b>	<b>6,40</b>	<b>169,15</b>	<b>155,10</b>	<b>2,54</b>	<b>2,33</b>

Figure C2.1.1: Ex-post calculations

More detailed results are shown in Figure C2.1.2, with average, minimum reduction, maximum reduction and standard deviations for every year. In the Annex 2, Annex 3, Annex 4 and Annex 5 are shown the results of all students.

	2009
Average	-10,05%
Maximum reduction	29,63%
Minimum reduction	-39,60%
Standard deviation	12,97%

	2011
Average	-1,43%
Minimum reduction	26,79%
Maximum reduction	-24,69%
Standard deviation	9,88%

	2010
Average	-9,91%
Maximum reduction	26,51%
Minimum reduction	-44,32%
Standard deviation	10,94%

	2012
Average	-11,89%
Minimum reduction	12,07%
Maximum reduction	-45,92%
Standard deviation	13,21%

Figure C2.1.2: Ex-post calculations



These are the results of the indicator 5:

After	after training
Fuel consumption (l/100 km)	6,40

Figure C2.1.2: Ex-post indicator value

The table of results of the indicators is as follows.

Indicator	Before (before training)	B-a-U (after training)	After (after training)	Difference: After - Before		Difference: After - B-a-U	
5. Fuel consumption (l/100 km)	6,98	6,98	6,40	-0,58	-8,3%	-0,58	-8,3%

Figure C2.1.3: Economy results

The reduction of fuel consumption is lower than expected. If we compare this result with others studies, we can see as this value is low.

For example, in 2004 the UK's Driving Standards Agency carried out eco-driving trials by comparing drivers' fuel consumption over a given course before and after they received 2 hours of eco-driving training and the trials demonstrated average fuel savings of 8.5%.

Another study undertaken with the car panel of the Dutch Consumer Organisation in 2002, which consists of approximately 6,000 drivers, mostly private consumers and over the year-long duration of the study the ecodrivers consumed 7% less fuel per km than the non-ecodrivers.

In Spain, trials conducted by RACC in October 2003 demonstrated average fuel savings of 13.4% when drivers adopted eco-driving techniques.

## C2.2 Environment

In order to know the status of environmental indicators after the course, we have followed the methodology of baseline. These are the results of indicator 8:

	Students	Average fuel consumption reduction (%)	Ex-ante average fuel consumption (litres/100 km)	Ex-post average fuel consumption (litres/100 km)	Ex-ante average CO2 emissions (g/km)	Ex-post average CO2 emissions (grammes/km)	Ex-ante total CO2 emissions (tn)	Ex-post total CO2 emissions (tn)
2009	161	-10,05%	7,01	6,31	169,15	152,15	2,54	2,28
2010	182	-9,91%	6,99	6,30	169,15	152,39	2,54	2,29
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<b>Total</b>	<b>601</b>	<b>-8,31%</b>	<b>6,98</b>	<b>6,40</b>	<b>169,15</b>	<b>155,10</b>	<b>2,54</b>	<b>2,33</b>

Figure C2.2.1: Ex-post calculations

These are the results of the indicator 8:

After	after training
CO2 emissions (tn)	2,33

Figure C2.2.2: Ex-post indicator value

The table of results of the indicators is as follows.

Indicator	Before (before training)	B-a-U (after training)	After (after training)	Difference: After - Before		Difference: After - B-a-U	
8. CO2 emissions (tn)	2,54	2,54	2,33	-0,21	-8,3%	-0,21	-8,3%

Figure C2.2.3: Environment results

The reduction of CO2 emissions is related to fuel consumption. The decrease is lower than expected, in the same way of fuel consumption, but the reason could be an optimistic objective of reduction, based in previous experience in RACVN.

RACVN has widely experience teaching eco-driving courses around Euskadi (see Figure B3.1). In previous courses, the fuel consumption reduction was around 10%-15% so the objective expected of this measure is -15%.

### C2.3 Transport

In tests after the course, it has been observed speed is more or less maintained, despite the driving is less aggressive.

These are the results of the indicator 23:

After	after training
Average vehicle speed (%)	97,48%

Figure C2.3.1: Ex-post indicator value

The table of results of the indicator is as follows.

Indicator	Before (before training)	B-a-U (after training)	After (after training)	Difference: After - Before		Difference: After - B-a-U	
23. Average vehicle speed	100,00%	100,00%	97,48%	-	-2,5%	-	-2,5%

Figure C2.3.2: Transport results

Eco-driving training is important to reduce accidents. Towards the end of 2003, 91 delivery van drivers employed by Hamburger Wasserwerke (HW) received eco-driving training, and monitoring over the following 6 months demonstrated that accident rates fell by 40%.

### C2.4 Society

The number of students attending the courses is low despite the strong dissemination campaign to support the recruitment of people interested in improving driving efficiency. However, the attendance is higher than previous edition of eco-driving courses.

After	2012
Students of courses	601

Figure C2.4.1: Ex-post indicator value

The level of satisfaction with the courses is very high, reaching almost 85% of those who are satisfied or very satisfied.

After	after training
Acceptance level	82,78%

Figure C2.4.2: Ex-post indicator value

There is not results ex-ante from the survey for assessing the indicator 14.

The table of results of the indicator is as follows.

Indicator	Before (before training)	B-a-U (after training)	After (after training)	Difference: After - Before		Difference: After - B-a-U	
14. Acceptance level	0	0	79,56%	79,56%	-	79,56%	-
105. Students of courses	0	0	601	601	-	601,00	-

Figure C2.4.3: Society results

It is not achieved the objective of 1000 students in four years, but the acceptance level of students is very high.

### C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
1	To train at least 1000 city vehicle drivers, 250 per year, in efficient driving techniques. <i>After 2012 edition, there have been 601 students attending the courses.</i>	<b>*</b>
2	To reduce energy consumption of participants, achieving a decrease of 15% of fuel consumption. <i>It has been reduced the fuel consumption (-8,3%) after 2012 edition.</i>	<b>*</b>
3	To calm the traffic in the city due to a slower speed of driving after the eco-driving courses, achieving a decrease of speed up to 2%. This consequently reduces the impacts of traffic (noise, safety, etc.).	<b>***</b>

<i>It has been decreased the average speed (-2,5%) after 2012 edition.</i>	
<b>NA = Not Assessed    O = Not Achieved    * = Substantially achieved (at least 50%)</b> <b>** = Achieved in full            *** = Exceeded</b>	

Figure C3.1: Achievement of objectives

## C4 Up-scaling of results

The measure consists in 1000 eco-driving training courses, but these courses can be extended to more people in the city or even in the region or other towns. Knowledge obtain in this measure can be used to replicate in other editions of courses.

Up-scaling of results is very easy to calculate, that is, if for 601 students there are 0.21 tn CO2 of reduction, for 1200 students, there will be 0.42 tn CO2.

If all owners of vehicles of Vitoria-Gasteiz did the course the reduction of CO2 emissions would be 36 tonnes the first year after the course. In addition, it should assume a progressive attenuation of the learnt skills as a Ford Consumer Research of 2007 suggests.

For these calculations, it is assuming 437 veh/1000 hab data coming from Sustainable Mobility Plan of Vitoria-Gasteiz, and it is known that the population of Vitoria-Gasteiz in 2011 is around 240.000, that is 105.000 vehicles in the city. It is assumed, as before, that they cover 15.000 km/year.

## C5 Appraisal of evaluation approach

The influence on the mobility is affected different aspects to the city, for example the transport and traffic, reduction of the emissions, save in the consumption to the fuel, (economy, energy and environment) and the quality of life to the citizens (less noise in the city and less stress for the drivers).

In the original plan, this measure was a focused measure because it fits into the EU policy towards clean urban transport (five pillars of the EU Green Paper), because the expected impact on the transport system, environment, economy and society is very high, and because the possibility of carrying out a good Cost Benefit Analysis. However, during the evaluation process it was decided change measure 4.04 Energy saving training by measure 6.01 Pedestrian and bicycle lanes network as focused measure because the results of this measure were not being good and because the calculations for Cost Benefit Analysis were not easy.

Some of the indicators selected previously are eliminated or changed by others due to the decision of change the focused measure. This is the case of capital cost, average operating cost and benefits, CO, NOx and small particulate emission. In addition, other indicators are added as students of courses.

Other problems during the evaluation process are:

- For all indicators, the data (ex-ante and ex-post) are obtained before and after the course, so the impacts are immediate in the time. In order to calculate the global impact of measure, it is necessary to obtain the average value of each indicator by every student in different years. This particular situation is sometimes difficult to evaluate following the templates.
- The measure is not evaluate properly because the last edition of courses is in June 2012, after the deadline of MERT Item F. It would be necessary to extend the evaluation process.

## C6 Summary of evaluation results

The key results are as follows:

- **Key result 1** – The number of drivers attending the courses is about the half of expected. This is one of the risks of measure and the goal is not achieved despite the strong dissemination campaign to support the recruitment of people. However, the attendance is higher than previous edition of eco-driving courses.
- **Key result 2** – The reduction of fuel consumption is lower than expected. However, if we compare this result with other studies or other eco-driving courses, the reduction of fuel consumption is low as well but close to their impacts. So, probably the objective of reduction up to 15% is too optimistic.
- **Key result 3** – The most important impact of this measure is the reduction of average speed of drivers. This is important to reduce accidents and to calm the traffic in the city and other impacts as noise.

## **C7 Future activities relating to the measure**

It is planned to extend this measure to more drivers every year.

Apart from this, RACVN is currently studying to develop a control panel with students of last years, in order to know how the lessons learning are being carry out. It is an important measure to value the progressive attenuation of the learnt skills.

Even, it could be interesting to offer testing electric vehicles to familiarize with them, and to compare results with standard cars.

---

## D Process Evaluation Findings

### D1 Deviations from the original plan

The deviations from the original plan comprised:

- **Deviation 1** – After the first edition of the course (2009) and the low attendance, it was decided to increase the number of students in the next edition of course (2010). May and September were chosen as the months to develop the courses of edition 2010. In order to increase the number of participants, the places offered were 360. Also, it was offer courses on Saturday. In addition, it was also decided to use radio adverts to promote the courses within the citizens.
- **Deviation 2** – In the second edition (2010), there was a change of place for lessons because the previous one was closed on Saturday.
- **Deviation 3** – Also, in 2011 edition, there was a change of teachers of courses.

### D2 Barriers and drivers

#### D2.1 Barriers

##### Preparation phase

- **Involvement, communication** – Insufficient involvement or awareness of key stakeholders, insufficient consultation, involvement or awareness of citizens or users: This measure has not been publicized properly among the citizens, despite a strong information campaign based on press conferences, leaflets, posters, magazines, radio adds, etc. The result is having a low attendance to the courses.
- **Cultural** – Impeding cultural circumstances and life style patterns: People is not enough conscious of importance of sustainable mobility habits. The duration of course (4 hours) is still a resource more valued than savings due to a more efficient driving.

##### Implementation/Operation phase

- **Cultural** – Impeding cultural circumstances and life style patterns: The principal barrier that we have had is that the citizens having received the information and even being enrolled into the courses, but the day of celebration they do not come. This makes that in a course organized for 15 persons only 4 o 5 appear, concerning logically to the results obtained and to the duration of the class. It is quite difficult to control that all people who are enrolled into the course come the day of the training. In this sense, we are asking to be registered to notify their no attendance, and to offer their seat to other person of the waiting list.
- **Spatial** – No permission of construction, insufficient space: The duration of course (4 hours) makes difficult to compare the first trial and the second one, because the traffic conditions are different (for example freight logistics period, schools entrance, etc.).

#### D2.2 Drivers

##### Preparation phase

- **Problem related** – Pressure of the problem(s) causes great priority, shared sense of urgency among key stakeholders to sustainable mobility: The price of fuel and the economical situation made more attractive the courses. In all of students has been observed worry by the environment but, also interest to save money due to a reduction of fuel consumption.
- **Involvement, communication** – Constructive and open involvement of policy key stakeholders, constructive and open consultation and involvement of citizens or users: The communication campaign has been very powerful and it has been extended over the time. It is based on press conferences, leaflets, posters, magazines, radio adds, etc.

### Implementation/Operation phase

- **Organizational** – Constructive partnership arrangements, strong and clear leadership, highly motivated key measure persons, key measure persons as ‘local champions’: The know-how of RACVN imparting eco-driving courses is basic to ensure the success of measure.

## **D2.3 Activities**

### Preparation phase

- **Involvement, communication** – Consultation of target groups by workshop, conference, focus group, expert meeting, face-to-face interviews or questionnaires, telephone interviews or questionnaires or web based questionnaires, public awareness campaign about the sustainability problems to be solved, bringing together key stakeholders to discuss the sustainability problems to be solved (sharing different viewpoints), public awareness campaign about the measure through media activities, involvement of key stakeholders (politicians, etc.) in the measure: To prevent the pointed persons from coming what was done was to call them by telephone a few days before to confirm her assistance and, especially, wedges of radio to emit to give all the information. We have thought that deliver a deposit to be able to sign and then, after the course to return the money to them, but this would not work since from the beginning they would be less the persons than they would encourage to sign. Also we invite the journalists to come the first day of course in order that they saw at place the development of the course.
- **Problem related** – Thoroughly analyzing problems towards sustainable mobility to be solved, activities to explain the pressure of the problem, all activities towards sharing the sense of urgency among key stakeholders to sustainable mobility: It is put in valour the economical reason in the publicity, in order to make more interesting the courses.

## **D3 Participation**

### **D3.1 Measure Partners**

- **Measure partner 1** – RACVN: Automobile Royal Club of Euskadi and Navarra. Leading role. The RACVN was born with the aim of promoting, protecting and defending motorists, seeking partners for the greatest number of advantages and benefits, organizing and promoting tourism and auto races, competitions, exhibitions and other companies for the development of motorsports.
- **Measure partner 2** – AVG: Vitoria-Gasteiz City Council. Principle participant. The City Council manage the town located in the centre of the province of Álava. Its area is 276.81 km<sup>2</sup>.

Vitoria-Gasteiz has tripled its population in recent decades. The city participates in CiViTAS project in MODERN consortium. During 2012, it is European Green Capital.

- **Measure partner 3** – CEA: Environmental studies centre of Vitoria-Gasteiz City Council. Occasional participant. The CEA was born in the late eighties, with the aim of develop strategies of environmental training. They arose the first graduate program focused on environmental technician training. The action lines became more diversified progressively towards other specialties: GIS, remote sensing, environmental service to companies, evaluation of environmental impacts, etc. Also, CEA has promoted relations with university and research centres, taking shape in dissertations, publications and numerous collaborations in teaching, research, consultancy and project directions. Currently, CEA's mission is to ensure the sustainability of Vitoria-Gasteiz, promoting the sustainable development.

### D3.2 Stakeholders

The Sustainable Mobility Agreement was written and signed in 2007 by different social agents of the city of Vitoria-Gasteiz integrated in the Citizens' Forum on Sustainable Mobility (platform of citizen participation in mobility). This consensus document aims to define the framework for new patterns of mobility, and therefore, for a model city in which urban travels do not threaten to health or quality of life, urban environment or local economy development.

These agents involved in the Sustainable Mobility Agreement are stakeholder for this measure:

- **Stakeholder 1** – Government of City Council.
- **Stakeholder 2** – Local Parties in the city.
- **Stakeholder 3** – Technical Departments of City Council (Environment, Mobility, Urbanism, etc.).
- **Stakeholder 4** – Ombudsman or People Defender.
- **Stakeholder 5** – Taxi Association.
- **Stakeholder 6** – Residents Association.
- **Stakeholder 7** – Cyclists and Rollers Association.
- **Stakeholder 8** – Ecologist Association.
- **Stakeholder 9** – Students and Educational Association.
- **Stakeholder 10** – Transport and Technological Companies.

## D4 Recommendations

### D4.1 Measure replication

- **Goods results with low cost of implementation** – This measure has a low implementation cost and the obtained impacts are high. In addition, the cultural circumstances of each city make the impact of this measure is higher or lower. Therefore, this is a measure that can be applied in cities where drivers have an aggressive driving. In these cities larger decreases in fuel consumption and accidents can be achieved.
- **High private benefits but low public benefits** – The economic benefits are clear due to the fuel savings but these are private benefits to users of private vehicles, while the public positive



externalities such as emissions savings are much lower. The current economic situation may make these courses more attractive as the economic benefit to the driver is evident.

- **Synergies with other measures multiply the results** – Such measures should be part of an overall strategy for sustainable mobility and its impact depends on the implementation of other measures to discourage private car use. In this sense, this measure is part of the proposals of Sustainable Mobility Plan of Vitoria-Gasteiz, so that synergies are achieved between them and the impacts of them are multiplied. However, in Vitoria-Gasteiz it should have implemented more decisive measures to discourage car use as the extension of the zone of the regulated parking in streets.
- **Some aspects to improve** – As an example of areas for improvement, the information campaign should be improved. There have been offered places without assistance of students. It can be focused better the target drivers, for example, campaigns for young college students and others. In addition, the objectives of reducing fuel consumption should be more realistic, expecting improvements by 10% from baseline.

#### **D4.2 Process**

- **Encourage people to attending courses** - The communication campaign must insist more on the economic and responsibility problems of not attending the course after having been enrolled.
  - **Insist with the communication** - The campaign was not the best to announce these courses. It is necessary something more so that the citizens could hear and see more continuously the information of the courses. It is necessary to insist.
  - **Several costs due to unattending places** - Courses should be offered as a function of the expected demand for each of them, to avoid problems of organization and to reduce costs.
  - **Potential of courses in fuel price rising times** - The economic situation has become more attractive courses. This is an aspect that must be strengthened for new editions.
-

## ANNEX 1: SURVEY MODEL



Ayuntamiento de Vitoria-Gasteiz  
Vitoria-Gasteizko Udala

### GOGOBETETZEARI BURUZKO INKESTA ENCUESTA DE SATISFACCIÓN

#### ERAGINKORTASUNEZ GIDATZEKO IKASTAROAK CURSOS DE CONDUCCIÓN EFICIENTE

- ✓ **Oro har, gogobetetze maila**  
**Grado de satisfacción general**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ez nago batere pozik / Nada satisfecho  
5: Oso pozik / Muy satisfecho
  
- ✓ **Eskola teorikoa: gogobetetze maila**  
**Grado de satisfacción clase teórica**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ez nago batere pozik / Nada satisfecho  
5: Oso pozik / Muy satisfecho
  
- ✓ **Eskola praktikoa luzatu behar dela uste duzu?**  
**¿Cree necesario ampliar la clase práctica?**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ezerez beharrezkoa / Nada necesario  
5: Oso beharrezkoa / Muy necesario
  
- ✓ **Ebaluatu RACVeko irakasleen gaitasuna**  
**Valore la calidad de los instructores del RACVN**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ez nago batere pozik / Nada satisfecho  
5: Oso pozik / Muy satisfecho
  
- ✓ **Ikasitako teknikak erabilgarriak izango direla uste duzu?**  
**¿Cree posible la aplicación de las técnicas aprendidas durante el curso a partir de ahora?**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ez dira batere erabilgarri / Nada posible  
5: Oso erabilgarri / Muy posible
  
- ✓ **Gomendatuko zenioke ikastaroa lagun bati?**  
**¿Recomendaría el curso a un amigo/a?**  
Ebaluatu 1etik 5era / Valore del 1 al 5  
1: Ezerez gomendagarria / Nada recomendable  
5: Oso gomendagarria / Muy recomendable

## ANNEX 2: RESULTS (2009)

ALDAKETAK / VARIACIONES / CHANGES			
A. batez beste / V. media (%) / Speed Average	Kontsumoa / Consumo (%) / Consumption	CO <sub>2</sub> -aren gutxitzea / Reducción CO <sub>2</sub> (kg/100km) / CO <sub>2</sub> Reduction	ej.: Ahorro € anual conductor 40.000 Km/año / f.e.: Annual saving for a driver for 40.000 km/year
0,12	-10,53%	18,70	-320,00
0,06	-4,05%	17,60	-120,00
0,11	-9,52%	18,53	-320,00
0,05	-5,06%	17,77	-160,00
0,00	0,00%	16,92	0,00
0,00	0,00%	16,92	0,00
0,00	0,00%	16,92	0,00
0,10	-12,00%	18,94	-360,00
0,05	3,03%	16,40	80,00
-0,19	-10,00%	18,61	-280,00
0,00	-3,57%	17,52	-120,00
-0,08	-17,33%	19,85	-520,00
-0,09	-25,00%	21,14	-880,00
-0,16	2,53%	16,49	80,00
-0,08	-22,35%	20,70	-760,00
0,00	-8,00%	18,27	-240,00
-0,08	-7,69%	18,22	-240,00
-0,17	9,38%	15,33	240,00
-0,19	-23,71%	20,93	-920,00
-0,08	-20,24%	20,34	-680,00
-0,23	-2,50%	17,34	-80,00
-0,13	16,67%	14,10	480,00
0,05	-14,94%	19,44	-520,00
0,04	-21,67%	20,58	-520,00
0,14	-21,88%	20,62	-560,00
0,23	-28,38%	21,72	-840,00
0,12	-30,00%	21,99	-720,00
0,27	-13,11%	19,13	-320,00
0,00	4,35%	16,18	120,00
0,25	-16,67%	19,73	-480,00
0,29	-26,09%	21,33	-720,00

-0,14	-1,69%	17,20	-40,00
-0,14	0,00%	16,92	0,00
-0,11	0,00%	16,92	0,00
-0,21	-10,77%	18,74	-280,00
0,00	-9,72%	18,56	-280,00
-0,04	18,18%	13,84	480,00
-0,25	-5,17%	17,79	-120,00
0,00	-25,33%	21,20	-760,00
-0,19	-17,31%	19,84	-360,00
-0,18	-27,36%	21,54	-1160,00
-0,03	-30,00%	21,99	-1200,00
0,02	-2,67%	17,37	-80,00
0,25	-26,03%	21,32	-760,00
0,32	-18,84%	20,10	-520,00
0,00	-8,33%	18,32	-240,00
-0,17	10,45%	15,15	280,00
-0,06	-30,56%	22,08	-880,00
-0,01	-2,94%	17,41	-80,00
-0,04	-6,67%	18,04	-160,00
0,14	-21,88%	20,62	-560,00
-0,18	-6,67%	18,04	-160,00
-0,04	-27,03%	21,49	-800,00
0,09	-19,12%	20,15	-520,00
0,14	-23,68%	20,92	-720,00
-0,13	-7,81%	18,24	-200,00
-0,22	-8,47%	18,35	-200,00
-0,17	-3,08%	17,44	-80,00
-0,36	-10,34%	18,66	-240,00
-0,44	-11,32%	18,83	-240,00
-0,28	3,70%	16,29	80,00
-0,31	5,56%	15,98	120,00
-0,28	10,71%	15,10	240,00
-0,28	-2,47%	17,33	-80,00
-0,21	3,33%	16,35	80,00
-0,08	0,00%	16,92	0,00
-0,33	-29,89%	21,97	-1040,00
-0,40	-21,52%	20,55	-680,00
-0,32	-26,60%	21,41	-1000,00
0,23	-20,00%	20,30	-480,00
0,26	-30,77%	22,12	-800,00
0,00	-19,67%	20,24	-480,00
0,14	-29,17%	21,85	-840,00

0,08	-31,51%	22,24	-920,00
0,20	-12,86%	19,09	-360,00
0,00	-20,29%	20,35	-560,00
-0,02	-11,94%	18,93	-320,00
0,10	-4,69%	17,71	-120,00
0,12	-7,02%	18,10	-160,00
-0,11	-10,53%	18,70	-240,00
0,04	-4,92%	17,75	-120,00
0,04	-6,06%	17,94	-160,00
0,17	-8,62%	18,37	-200,00
0,00	-18,75%	20,09	-480,00
0,04	-6,06%	17,94	-160,00
-0,07	11,54%	14,96	240,00
-0,09	-18,42%	20,03	-560,00
-0,15	-10,94%	18,77	-280,00
0,04	-3,70%	17,54	-80,00
-0,04	-9,84%	18,58	-240,00
0,04	-4,55%	17,68	-120,00
0,09	-10,00%	18,61	-280,00
0,22	-18,46%	20,04	-480,00
0,12	-12,50%	19,03	-320,00
0,04	-13,89%	19,26	-400,00
0,00	-12,07%	18,96	-280,00
0,08	-27,94%	21,64	-760,00
-0,04	-6,90%	18,08	-160,00
0,00	5,00%	16,07	160,00
-0,12	-32,26%	22,37	-800,00
-0,14	-12,96%	19,11	-280,00
0,00	-20,59%	20,40	-560,00
-0,13	8,33%	15,51	200,00
0,08	-5,45%	17,84	-120,00
0,00	-4,69%	17,71	-120,00
0,04	-9,09%	18,45	-240,00
-0,15	-19,35%	20,19	-480,00
0,00	-18,75%	20,09	-480,00
0,04	-28,57%	21,75	-720,00
-0,12	3,45%	16,33	80,00
-0,12	1,61%	16,64	40,00
-0,11	18,97%	13,71	440,00
-0,08	-16,95%	19,78	-400,00
-0,08	-19,18%	20,16	-560,00
0,04	-6,67%	18,04	-160,00

-0,08	-9,84%	18,58	-240,00
-0,04	-8,20%	18,30	-200,00
0,22	-18,84%	20,10	-520,00
-0,08	-15,00%	19,45	-480,00
0,18	-20,00%	20,30	-680,00
0,21	-36,62%	23,11	-1040,00
0,04	-15,25%	19,50	-360,00
0,26	-20,97%	20,46	-520,00
-0,04	1,69%	16,63	40,00
0,00	0,00%	16,92	0,00
0,04	-8,70%	18,39	-240,00
0,27	-18,64%	20,07	-440,00
0,00	17,74%	13,91	440,00
0,00	1,30%	16,70	40,00
0,00	-4,23%	17,63	-120,00
-0,08	-16,22%	19,66	-480,00
-0,06	-2,90%	17,41	-80,00
0,05	-25,00%	21,14	-800,00
0,02	-14,29%	19,33	-440,00
0,23	-17,50%	19,88	-560,00
0,00	5,56%	15,98	160,00
0,11	-25,68%	21,26	-760,00
0,05	-14,29%	19,33	-360,00
0,05	14,29%	14,50	280,00
-0,22	-14,08%	19,30	-400,00
-0,13	19,67%	13,59	480,00
-0,04	29,63%	11,90	640,00
0,08	-13,79%	19,25	-320,00
0,27	-25,00%	21,14	-840,00
-0,04	-19,48%	20,21	-600,00
0,13	-6,90%	18,08	-160,00
0,08	-8,77%	18,40	-200,00
-0,31	21,05%	13,35	640,00
0,00	-9,78%	18,57	-360,00
-0,15	-11,48%	18,86	-280,00
-0,14	10,71%	15,10	240,00
-0,07	-8,06%	18,28	-200,00
-0,19	-12,86%	19,09	-360,00
-0,14	-24,29%	21,02	-680,00
0,13	-24,66%	21,09	-720,00
-0,21	-28,43%	21,72	-1160,00
-0,07	-38,68%	23,46	-1640,00

Measure title: **Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

-0,14	-39,60%	23,61	-1600,00
-0,08	6,06%	15,89	160,00
-0,04	0,00%	16,92	0,00
0,05	-15,38%	19,52	-480,00

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### ANNEX 3: RESULTS (2010)

ALDAKETAK / VARIACIONES / CHANGES			
A. batez beste / V. media (%) / Speed Average	Kontsumoa / Consumo (%) / Consumption	CO <sub>2</sub> -aren gutxitzea / Reducción CO <sub>2</sub> (kg/100km) / CO <sub>2</sub> Reduction	ej.:Ahorro € anual conductor 40.000 Km/año / f.e.: Annual saving for a driver for 40.000 km/year
0,00	8,91	-2,32	360,00
38,46	-9,40	2,84	-440,00
13,33	-7,06	1,55	-240,00
-5,56	1,10	-0,26	40,00
33,33	-9,68	2,32	-360,00
21,43	-10,00	2,32	-360,00
-10,00	-15,19	3,10	-480,00
-5,88	-25,32	5,16	-800,00
-10,53	-17,39	3,10	-480,00
-43,33	-16,00	3,10	-480,00
-15,00	-11,39	2,32	-360,00
-7,14	-15,91	1,81	-280,00
-15,00	-16,95	2,58	-400,00
9,68	-20,29	3,61	-560,00
-9,09	3,41	-5,68	120,00
-5,00	-8,00	-8,00	-240,00
0,00	-4,29	-2,32	-120,00
0,00	-2,86	-5,68	-80,00
11,11	-9,68	-5,68	-240,00
-15,00	-2,94	5,42	-120,00
-15,00	-11,27	1,03	-320,00
-5,00	-24,71	6,71	-840,00
5,88	-19,74	4,90	-600,00
-10,00	-9,52	0,00	-240,00
16,67	-12,31	-1,29	-320,00
0,00	-7,81	6,97	-200,00
-15,79	-5,48	6,19	-160,00
-11,11	-13,11	2,06	-320,00
-16,67	-2,94	0,52	-80,00
-10,53	-32,20	9,80	-1520,00
-22,73	-15,94	2,84	-440,00



13,64	-22,99	5,16	-800,00
-25,00	-1,18	0,26	-40,00
-18,18	1,59	-0,26	40,00
-30,43	-6,67	1,03	-160,00
-10,00	-18,69	5,16	-800,00
-100,00		21,41	-3320,00
5,88	-44,32	10,06	-1560,00
-15,00	1,59	-0,26	40,00
0,00	-7,25	1,29	-200,00
5,88	-19,51	4,13	-640,00
0,00	0,00	0,00	0,00
5,26	-15,73	3,61	-560,00
0,00	-21,69	4,64	-720,00
-10,00	-20,00	3,35	-520,00
-25,93	-32,00	6,19	-960,00
-10,00	-5,36	0,77	-120,00
22,22	-20,51	4,13	-640,00
-12,50	-33,33	6,19	-960,00
0,00	-10,26	2,06	-320,00
-22,73	-15,53	4,13	-640,00
0,00	-5,10	1,29	-200,00
19,05	-42,50	8,77	-1360,00
5,56	-13,86	3,61	-560,00
-4,76	-22,95	3,61	-560,00
-8,33	-34,62	6,97	-1080,00
0,00	-15,66	3,35	-520,00
-4,55	-21,05	3,10	-480,00
-4,76	-5,00	0,77	-120,00
-8,70	-11,76	2,06	-320,00
-8,33	-4,69	0,77	-120,00
4,76	-12,31	2,06	-320,00
-4,35	-4,48	0,77	-120,00
-9,09	-24,29	4,39	-680,00
0,00	-11,27	2,06	-320,00
-4,17	-16,87	3,61	-560,00
-5,00	-29,73	5,68	-880,00
-5,56	-15,79	2,32	-360,00
0,00	3,03	-0,52	80,00
-0,97	-8,75	1,81	-280,00
-10,53	-17,50	3,61	-560,00
0,00	-23,68	4,64	-720,00
-5,56	-14,86	2,84	-440,00

Measure title:

**Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

-6,52	-15,63	2,58	-400,00
-100,00		20,64	-3200,00
-9,09	-8,33	1,29	-213,33
-36,00	-16,88	3,35	-520,00
-25,00	-1,64	0,26	-40,00
-5,00	-18,31	3,35	-520,00
-30,00	9,68	-1,55	240,00
-31,92	15,00	-2,32	360,00
-42,86	15,15	-2,58	400,00
-14,29	-15,79	3,10	-480,00
-23,81	1,39	-0,26	40,00
0,00	-17,81	3,35	-520,00
-10,53	-4,41	0,77	-120,00
-13,64	1,72	-0,26	40,00
-17,65	0,00	0,00	0,00
-15,00	-10,45	1,81	-280,00
-20,80	-9,72	1,81	-280,00
38,46	-12,68	2,32	-360,00
0,00	-25,00	4,64	-720,00
4,76	1,41	-0,26	40,00
6,67	-12,31	2,06	-320,00
0,00	-25,00	4,64	-720,00
-27,20	1,59	-0,26	40,00
0,00	7,94	-1,29	200,00
-16,67	0,00	0,00	0,00
-11,06	-6,15	1,03	-160,00
-19,05	-17,19	2,84	-440,00
-24,00	1,79	-0,26	40,00
-17,39	-8,62	1,29	-200,00
4,35	-14,71	2,58	-400,00
-20,69	8,33	-1,29	200,00
-18,52	-4,69	0,77	-120,00
0,00	-1,59	0,26	-40,00
-5,56	4,62	-0,77	120,00
-13,04	-7,14	1,03	-160,00
0,00	0,00	0,00	0,00
21,05	3,85	-0,52	80,00
-25,00	-3,33	0,52	-80,00
11,11	-1,54	0,26	-40,00
0,00	-15,87	2,58	-400,00
0,00	3,17	-0,52	80,00
-4,55	-1,75	0,26	-40,00

Measure title:

**Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

-2,90	-4,23	0,77	-120,00
-11,11	-11,67	1,81	-280,00
58,33	-11,36	2,58	-400,00
-4,55	-13,51	2,58	-400,00
5,56	0,00	0,00	0,00
-5,26	-28,36	4,90	-760,00
-18,22	7,89	-1,55	240,00
-10,53	-4,55	0,77	-120,00
-9,18	5,13	-1,03	160,00
-17,89	-2,02	0,52	-80,00
-9,52	-18,46	3,10	-480,00
-5,26	-10,14	1,81	-280,00
-39,13	14,04	-2,06	320,00
-9,52	3,92	-0,52	80,00
-22,79	-6,90	1,55	-240,00
0,00	0,00	0,00	0,00
-26,32	8,64	-1,81	280,00
-10,00	-7,35	1,29	-200,00
10,50	0,00	0,00	0,00
-2,22	-6,58	1,29	-200,00
-8,70	-2,22	0,52	-80,00
-9,09	-7,58	1,29	-200,00
-6,48	-1,23	0,26	-40,00
-11,11	0,00	0,00	0,00
-26,09	-11,29	1,81	-280,00
5,97	-10,53	2,06	-320,00
9,52	-17,33	3,35	-520,00
5,88	-2,67	0,52	-80,00
-12,50	-11,54	1,55	-240,00
-11,01	-7,32	1,55	-240,00
-9,52	-10,71	1,55	-240,00
9,52	-19,18	3,61	-560,00
-9,09	7,35	-1,29	200,00
-7,52	-13,33	2,58	-400,00
-1,11	-10,45	1,81	-280,00
-14,29	0,00	0,00	0,00
-8,70	-1,79	0,26	-40,00
-4,76	-4,84	0,77	-120,00
-4,76	-1,47	0,26	-40,00
5,26	-3,57	0,52	-80,00
8,94	-7,79	1,55	-240,00
6,64	-1,54	0,26	-40,00

-10,00	4,84	-0,77	120,00
15,00	-7,94	1,29	-200,00
-15,00	-1,59	0,26	-40,00
-15,56	-14,77	3,35	-520,00
10,00	-19,35	3,10	-480,00
-24,82	-17,72	3,61	-560,00
13,64	-26,39	4,90	-760,00
0,00	-11,39	2,32	-360,00
-9,09	-18,33	2,84	-440,00
-14,29	-10,61	1,81	-280,00
-19,72	10,45	-1,81	280,00
-5,56	-6,15	1,03	-160,00
-14,29	3,45	-0,52	80,00
-34,62	-2,63	0,52	-80,00
-15,79	9,09	-1,55	240,00
-20,00	-5,08	0,77	-120,00
-15,00	8,93	-1,29	200,00
-24,07	-11,70	2,84	-440,00
1,80	-4,76	1,03	-160,00
-9,77	6,25	-1,29	200,00
-28,96	26,51	-5,68	880,00
-18,18	-2,74	0,52	-80,00
-13,04	-14,71	2,58	-400,00
-9,52	3,85	-0,52	80,00
-17,18	-12,50	2,32	-360,00



**ANNEX 4: RESULTS (2011)**

<b>ALDAKETAK / VARIACIONES / CHANGES</b>			
<b>A. batez beste / V. media (%) / Speed Average</b>	<b>Kontsumoa / Consumo (%) / Consumption</b>	<b>CO<sub>2</sub>-aren gutxitzea / Reducción CO<sub>2</sub> (kg/100km) / CO<sub>2</sub> Reduction</b>	<b>ej.:Ahorro € anual conductor 40.000 Km/año / f.e.: Annual saving for a driver for 40.000 km/year</b>
-26,14	23,08	-3,87	780,00
-18,94	14,67	-2,84	572,00
0,00	8,33	-1,29	260,00
-13,39	2,94	-0,52	104,00
-19,78	9,68	-1,55	312,00
-19,67	18,75	-3,10	624,00
-21,93	-2,41	0,52	-104,00
-17,59	16,22	-3,10	624,00
30,00	0,00	0,00	0,00
11,11	-9,86	1,81	-364,00
-22,41	-1,59	0,26	-52,00
-4,76	-9,09	1,55	-312,00
13,95	-6,25	1,03	-208,00
-7,48	-7,59	1,55	-312,00
-14,02	-7,35	1,29	-260,00
-20,19	12,50	-2,84	572,00
-19,47	0,00	0,00	0,00
0,00	6,49	-1,29	260,00
-4,17	-6,25	1,03	85,86
-8,37	-10,00	2,06	107,33
-2,26	-6,35	1,03	84,52
-3,49	-1,75	0,26	76,47
-9,18	9,09	-1,29	73,79
-20,98	5,08	-0,77	79,15
0,38	-12,50	2,32	96,60
-7,63	-3,41	0,77	118,06
-22,46	-6,67	1,29	100,62
13,81	-7,35	1,29	35,09
-3,61	-5,71	1,03	28,90
-10,77	8,62	-1,29	-29,93

Measure title: **Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

-4,35	-24,69	5,16	167,18
11,30	-13,33	2,58	77,40
4,17	-17,57	3,35	99,28
-4,35	-13,04	2,32	64,09
-5,13	26,79	-3,87	-86,69
-22,75	-8,22	1,55	-312,00
-2,16	1,25	-0,26	52,00
-26,44	15,25	-2,32	468,00
-23,76	6,82	-1,55	312,00
5,26	-5,88	1,29	-260,00
5,83	-6,41	1,29	-260,00
-20,37	7,06	-1,55	312,00
-37,04	6,49	-1,29	260,00
-8,94	-4,23	0,77	-156,00
-2,68	8,47	-1,29	260,00
3,97	1,47	-0,26	52,00
-6,71	-5,88	1,03	-208,00
1,18	-3,39	0,52	-104,00
-6,38	-10,61	1,81	-364,00
4,40	1,54	-0,26	52,00
0,44	-1,67	0,26	-52,00
2,43	-7,35	1,29	-260,00
-5,31	0,00	0,00	0,00
-4,35	-3,95	0,77	-156,00
-9,09	-7,23	1,55	-312,00
-4,17	-8,00	1,55	-312,00
-18,41	1,79	-0,26	52,00
-3,05	6,06	-1,03	208,00
-17,70	0,00	0,00	0,00
-19,26	3,12	-0,52	104,00
8,00	-5,62	1,29	-260,00
12,78	4,35	-0,77	156,00
-13,79	12,68	-2,32	468,00
31,69	-17,28	3,61	-728,00
26,67	-4,29	0,77	-156,00
-10,36	12,70	-2,06	416,00
-6,15	12,68	-2,32	468,00
-25,38	0,00	0,00	0,00
5,56	8,45	-1,55	312,00
-18,10	0,00	0,00	0,00
10,82	-9,64	2,06	-416,00
13,85	0,00	0,00	0,00

Measure title: **Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

9,00	-12,09	2,84	-572,00
-6,88	-4,55	0,77	-156,00
-20,63	9,09	-1,55	312,00
-19,92	7,59	-1,55	312,00
-19,37	2,63	-0,52	104,00
-11,11	1,23	-0,26	52,00
4,76	6,67	-1,03	208,00
9,80	12,50	-2,06	416,00
0,00	4,48	-0,77	156,00
-9,99	-3,53	0,77	-156,00
2,16	4,35	-0,77	156,00
0,43	-3,64	0,52	73,79
9,13	-7,95	1,81	118,06
13,95	-15,94	2,84	92,57
-15,38	-1,41	0,26	95,25
-7,49	0,00	0,00	89,89
0,00	-12,50	2,84	118,06
-18,82	-4,62	0,77	87,20
7,76	-10,14	1,81	92,57
-9,54	-5,17	0,77	77,81
26,32	-16,00	3,10	100,62
24,53	-7,25	1,29	92,57
4,23	-6,06	1,03	27,24
-20,69	-14,29	2,84	87,41
9,52	3,03	-0,52	-13,62
-8,59	20,00	-2,84	-62,44
5,79	-6,15	1,03	26,83
3,98	2,78	-0,52	-14,86
-7,11	-8,00	1,55	46,44
7,18	0,00	0,00	0,00
-7,49	-5,81	1,29	-260,00
-7,24	-16,25	3,35	-676,00
0,00	7,89	-1,55	312,00
-16,90	-6,06	1,03	-208,00
9,22	0,00	0,00	0,00
-2,63	8,89	-2,06	416,00
-0,47	-8,70	1,55	-312,00
12,20	-17,28	3,61	-728,00
-5,26	8,33	-1,55	312,00
0,00	1,56	-0,26	52,00
-5,24	-6,25	1,03	-208,00
-10,00	10,00	-2,06	416,00

-5,26	8,33	-1,55	312,00
0,00	7,89	-1,55	312,00
-0,79	-14,29	2,58	-520,00
16,67	-5,56	1,03	-208,00
12,33	0,00	0,00	0,00
-20,45	15,63	-2,58	520,00
12,78	-6,98	1,55	-312,00
-0,43	-18,18	3,61	-728,00
-1,22	15,94	-2,84	572,00
42,63	-10,59	2,32	-468,00
34,74	-15,12	3,35	-676,00
39,68	-20,55	3,87	-780,00
8,33	-14,29	2,58	-520,00
1,14	15,63	-2,58	520,00
19,05	-9,64	2,06	-416,00
21,89	0,00	0,00	0,00
10,87	-22,73	5,16	-1040,00
5,00	-6,10	1,29	-260,00
5,79	-13,25	2,84	-572,00
9,52	-14,47	2,84	-572,00
2,98	-9,86	1,81	-364,00
-1,81	-9,09	1,55	-312,00
0,39	-1,52	0,26	-52,00
19,79	-14,06	2,32	-468,00
5,00	-1,49	0,26	-52,00
3,49	-12,86	2,32	-468,00
-4,17	-5,63	1,03	-208,00



## ANNEX 5: RESULTS (2012)

ALDAKETAK / VARIACIONES / CHANGES (DIESEL)			
A.batez beste- V.media (%)- Speed Average	Kontsumoa/Consumo(%)/Consumption	CO <sub>2</sub> -aren gutxitzea/Reducción CO <sub>2</sub> (kg/100km)/CO <sub>2</sub> Reduction	ej.:Ahorro € anual conductor 40.000 Km/año/f.e.:Annual saving for a driver for 40.000 km/year
7,69	-18,75	4,64	-993,60
-14,29	-2,38	0,52	-110,40
0,00	-23,16	5,68	-1214,40
0,00	0,00	0,00	0,00
21,43	-12,82	2,58	-552,00
20,00	-14,81	3,10	-662,40
15,38	-21,19	5,93	-1440,00
21,43	-24,04	5,93	-1440,00
35,71	-24,00	5,69	-1382,40
5,88	-36,36	9,48	-2304,00
6,67	-32,99	7,58	-1843,20
-9,52	-18,81	4,50	-1094,40
20,00	-22,22	5,21	-1267,20
-15,00	-9,47	2,13	-518,40
6,67	-10,94	-3,10	-386,40
6,25	-1,57	-7,02	-44,16
-39,29	-9,38	-1,03	-331,20
11,11	-5,26	-4,03	-230,40
11,11	-7,89	-0,71	-345,60
27,78	-13,41	0,00	-607,20
22,22	-8,79	4,27	-441,60
53,33	-17,78	4,03	-883,20
13,33	-34,34	8,77	-1876,80
11,11	-45,92	11,61	-2484,00
-9,52	-17,28	3,61	-772,80
11,11	-43,37	9,29	-1987,20
-15,00	0,00	0,00	0,00
17,65	-14,89	3,32	-806,40
0,00	-44,26	12,80	-2065,10
-15,79	-40,52	11,14	-1937,05
-4,76	-2,86	0,47	-115,20

Measure title: **Energy saving training**

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Project: **CiViTAS Modern**

Measure number: **04.04**

-13,04	-19,48	3,56	-864,00
-5,00	-8,47	1,29	-276,00
16,67	-23,44	3,87	-828,00
26,32	-18,57	3,35	-717,60
19,05	-10,00	1,55	-331,20
14,29	-5,77	0,77	-165,60
10,53	-27,52	7,11	-1728,00
40,00	-36,36	9,48	-2304,00
10,00	-26,73	6,40	-1555,20
-9,09	-6,41	1,19	-288,00
42,86	-14,61	3,08	-748,80
11,76	-18,92	3,32	-806,40
0,00	-10,45	1,66	-403,20
11,11	-18,28	4,39	-938,40
0,00	-32,05	6,45	-1380,00
20,00	-4,76	0,77	-165,60
0,00	-38,46	10,67	-2592,00
11,11	11,59	-1,90	460,80
4,35	-11,54	2,13	-518,40
-14,29	-9,38	1,55	-331,20
5,00	-12,50	2,06	-441,60
-19,05	-12,66	2,37	-576,00
-4,17	-5,88	0,95	-230,40
11,76	-13,16	2,37	-576,00
-5,00	-15,24	3,79	-921,60
0,00	-41,82	5,93	-1869,77
-4,35	-16,22	5,16	-671,35
4,55	-36,36	9,48	-2304,00
19,05	-41,82	10,90	-2649,60
9,09	-16,22	2,84	-691,20
-9,52	-12,50	2,06	-441,60
5,56	-15,15	2,58	-552,00
5,26	-7,02	1,03	-220,80
4,76	-42,86	9,29	-1987,20
11,76	-12,28	1,81	-386,40
-12,50	4,08	-0,52	110,40
-5,56	-15,38	2,58	-552,00
20,00	-20,34	3,10	-662,40
-10,00	-22,39	3,87	-828,00
4,55	-2,13	0,26	-69,29
0,00	-5,88	1,03	-217,55
11,11	-17,14	3,10	-444,75

0,00	-23,81	3,87	-893,71
0,00	-32,10	6,71	-1435,20
-23,33	-3,45	0,52	-110,40
-10,00	-5,77	0,77	-165,60
-11,11	-37,80	8,00	-1711,20
-20,00	11,32	-1,55	331,20
18,75	-8,06	1,29	-276,00
-16,67	-7,41	1,03	-220,80
-38,89	-14,75	2,32	-496,80
-4,55	-10,45	1,81	-386,40
11,76	-33,33	7,22	-1545,60
17,65	-3,33	0,52	-110,40
-8,70	-4,84	0,77	-165,60
-15,00	3,51	-0,52	110,40
0,00	-5,36	0,77	-165,60
0,00	3,12	-0,52	110,40
-9,52	-17,24	2,58	-552,00
-13,04	-24,69	5,16	-1104,00
-8,70	-6,67	1,03	-220,80
-10,00	-22,54	4,13	-883,20
-8,70	-3,39	0,52	-110,40
4,76	-17,11	3,35	-717,60
0,00	5,08	-0,77	165,60
22,22	-5,56	0,77	-165,60
-8,33	-11,54	1,55	-331,20
-4,76	-5,88	0,77	-165,60
-4,55	-5,36	0,77	-165,60
8,33	-14,49	2,58	-552,00
0,00	-14,75	2,32	-496,80
-16,00	1,67	-0,26	55,20
-4,55	8,77	-1,29	276,00
4,17	-3,85	0,52	-110,40
-8,33	8,57	-1,55	331,20
-10,71	-11,32	1,55	-331,20
-4,35	12,07	-1,81	386,40
-12,50	-17,46	2,84	-607,20
9,52	3,51	-0,52	110,40
8,70	-1,79	0,26	-55,20
4,55	-20,00	3,10	-662,40
-7,69	-25,93	3,61	-772,80
-4,17	-5,66	0,77	-165,60
4,00	0,00	0,00	0,00

Measure title: **Energy saving training**

City: **Vitoria-Gasteiz**

Project: **CiViTAS Modern**

Measure number: **04.04**

