UNIVERSITÀ DEGLI STUDI DI PADOVA
TERRITORIO E SISTEMI AGRO-FORESTALI

Master Science Course Forest and Environmental Science

Willingness to Pay of tourists for CO_2 offsetting; a survey for the organization of a Green Fund in the Euganean Hills area

Supervisor
Prof. Davide Matteo Pettenella
Assistant supervisor
Dott. Lucio Brotto

Student
Rudi Pramparo
Matricola n. 1013231

ACADEMIC YEAR 2012/2013

INDEX

GRAPHS INDEX

TABLES INDEX

ABSTRACT

Among the instruments to reduce climate change Green Funds (GF) to support offsetting investments are assuming an increasing importance. Usually GF operate on a large scale, but in this thesis we decided to focus on the potential development of a GF on a local scale: the Euganean Thermal Basin. It has an extension of 92.67 Km^2 and it groups the municipalities of Galzignano Terme, Battaglia Terme, Teolo, Abano Terme and Montegrotto Terme. These municipalities were selected due to their high tourist activity (615,829 tourist in the year 2012) and their potential willingness to pay for a GF implementation.

A semi-structured questionnaire was proposed to the tourists. The questions were structured with the aim to understand the willingness to pay of the tourists for the CO_2 emissions that were produced during the round trip to reach Montegrotto or Abano Terme. 200 questionnaires were collected, 117 of them had positive response to the question of the willingness to pay. Four main characteristics were analyzed in the questionnaire: country of origin, age, education and mean of transport. It was assumed an hypothesis about a relation between these variables and the willingness to offset. From data analysis this dependence emerged, but only for the mean of transport it was confirmed with the Chi square statistical analysis. Among offsetting different alternatives, forest and "no preference" were the more selected choices. The main functions associated to the offsetting investment selected by the tourists were the landscape enhancement, the hydro-geological risk protection and the biodiversity enhancement. All these three choices should be considered during the offsetting process.

In addition to these characteristics other indicators were computed, the more interesting are the average CO_2 emissions and the average willingness to pay: respectively 0.112 t/CO_2 and 4.31 €/person. Taking into consideration this last value and the annual tourist arrivals, it can be inferred that the potential size of the Green Fund is 2,070,294 €. This amount is enough to start the offsetting projects and at the same time to make some relevant investment in the Euganean Thermal Basin. Moreover, with this kind of projects, it could be expected to enhance the attractiveness of the tourist offer of the Thermal Basin, at least for that relevant component of the tourists that is more sensible to environmental issues.

RIASSUNTO

I Fondi Verdi (FV) sono uno dei meccanismi adottati da molti stati per far fronte ai cambiamenti climatici che in questi ultimi decenni si sono intensificati. Solitamente vengono presi in considerazione progetti di grandi dimensioni ma, in questo lavoro di tesi, abbiamo pensato di applicare lo stesso concetto ad un'area più ristretta: il Bacino Termale Euganeo. Si estende per 92.67 Km^2 e comprende i comuni di Galzignano Terme, Battaglia Terme, Teolo, Abano Terme e Montegrotto Terme. Sono state scelte queste località per i grandi afflussi turistici (nel 2012 615,829 arrivi) e le potenzialità progettuali.

Attraverso questionari semi strutturati ai turisti, è stata chiesta la loro disponibilità a pagare per le emissioni di CO_2 prodotte durante il viaggio di andata e ritorno da casa ad Abano o Montegrotto, le sedi delle interviste. Sono stati raccolti 200 questionari, 117 dei quali hanno avuto risposta positiva alla domanda che riguardava la volontà o meno di compensare. Dai questionari sono state analizzate quattro caratteristiche principali: la provenienza, l'età, l'educazione e il mezzo di trasporto utilizzato, assumendo che avrebbero potuto influenzare la disponibilità a compensare. Dall'analisi dei dati è emersa questa influenza, che però non è poi stata confermata dall'analisi statistica del Chi quadro, tranne che per il mezzo di trasporto. Tra le modalità di compensazione più scelte dai turisti è emerso che la forestazione e "nessuna preferenza sono state le prime due scelte. In parallelo a queste preferenze, il miglioramento del paesaggio, la protezione dal rischio idrogeologico e il miglioramento della biodiversità sono le principali funzioni che il progetto di compensazione dovrebbe avere.

Oltre all'analisi di queste due caratteristiche sono stati calcolati anche altri indicatori, tra i più interessanti ricordiamo le emissioni medie di CO_2 e la compensazione media a pagare per una persona, rispettivamente pari a 0.112 t/CO_2 a 4.31€. Da quest'ultimo dato, in riferimento agli arrivi annui, è stato ricavato l'ammontare economico potenziale per il FV, equivalente a 2,070,294€. Questa somma di denaro sarebbe sufficiente per l'avvio dei progetti atti alla compensazione delle emissioni di CO_2 dei turisti e allo stesso tempo al miglioramento del Bacino Termale Euganeo, fornendo in questo modo un ambiente adatto alla contiuità del FV e al constante miglioramento del Bacino stesso. Inoltre, con questo tipo di progetti, i turisti più sensibili alle tematiche ambientali potrebbero vedere nel Bacino Euganeo una nuova meta, inducendo così un turismo più sostenibile.

INTRODUCTION

In this last decades the CO_2 has been increased reaching levels ever registered. This change is caused by humans that, from the industrial revolution, are burning exceptional amounts of fossil fuels. This has been caused an unnatural increase of the global temperature. This behavior is leading also to other environmental problems, usually called Climate Change. Governments of developed and developing countries are working together to achieve a common target of temperature reduction of 2°C. The main action adopted to fight Climate Change is the Kyoto Protocol, it envelops 186 countries. In addition to the Protocol there are a lot of other instruments as for example to improve the countries energy efficiency, to improve renewable sources and the introduction of offsetting funds or green funds.
In this thesis these kind of funds will be treat and it will be provide the feasibility of the creation of a local fund.

The aim of this thesis work is to understand the willingness to pay for CO_2 travel emissions of the Italian and foreign tourists that arrive in the Euganean Basin for their holidays. The money collected will be transferred in a Green Fund (GF) that will manage projects aimed to offset the CO_2 travel emissions of the tourists. The GF can be funded also by local stakeholders, hotel owners and private citizens that have a higher liability to the environment and want to offset their pollutant emissions. The offsetting is on a voluntary base.
We decided to work on a local scale to be sure that the projects that will be established with the GF remain inside a limited area and so to enhance its environmental and economic values of the area itself. The Euganean basin covers an area of 92.67 Km^2 and it embraces five municipalities. People that offset can appreciate that the money spent is producing something visible and good. Local projects are particularly important for the tourists, because they will be more willing to offset their emissions and they also will be more motivated to come again, if they can observe how the project is proceeding during the holyday periods through the years. They will be also the most important source of financial resources for the GF. The two other source of funds for the GF, as already said will be:

. The hotel owners that should play a fundamental role, if we think about the emissions that they generate. In addition they could reach a higher visibility adopting the green marketing and so attracting a greater number of tourists. The Euganean basin could be selected also by tourists more sensible to the environmental subjects,

- The stakeholders will not play an economic role, but they could work on the structure of governance of the GF, providing structures, personnel and knowledge. In this way they will be part of a project that improve the surrounding areas, achieving visibility.

The role of stakeholders and hotel owners in the creation of the GF, is analyzed more in detail in another thesis (Volpin, 2012).

This thesis is organized in five chapters:

- Chapter 1: this chapter introduces the needed background that is necessary to understand the work that it is done in the following pages. It is described how the situation of this subject is on a global scale, then describes how the Green Fund works and finally the thesis' objective is described.
- Chapter 2: in this chapter it is described in detail the surface extension, municipalities, tourist arrivals (for the year 2010) of the Euganean Basin with the aim to explain the background in which the work is integrated,
- Chapter 3: this chapter explains why it was selected the questionnaire method to understand the willingness to pay of the tourists and describes it in each point. Moreover this chapter talks about the interview method, why it was selected the tourist office and in which way the questionnaires are provided,
- Chapter 4: the results chapter, it provides the outcomes of the 202 interviews providing a framework as much complete as possible in order to understand the feasibility of the project inside the Euganean Basin,
- Chapter 5: Conclusions. With all the information available, an answer provided to the aim of the thesis and so understanding the feasibility of the establishment of the GF.

1 BACKGROUND

The Intergovernmental Panel on Climate Change (IPCC) defines Climate Change (CC) as a "change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer" (Bernstein et al., 2007). These changes are referred to the climate over time and they vary due to natural variability or as a result of human activities.

The constitutive document of the United Nations Framework Convention on Climate Change (UNFCCC) provides a different definition of CC with respect IPCC and it says that CC "alters the composition of the global atmosphere and is in addition to natural climate variability observed over comparable time periods" (UNFCCC, 1992). During the twentieth century the global surface temperature rose of 0.74°C and at higher northern latitudes the increasing was greater (almost twice the global average rate in the past 100 years) (Bernstein et al., 2007). This trend is due to a massive release of Green House Gasses (GHGs) into the atmosphere caused by fossil fuels burning. The main GHG is the CO_2 that is continuously increasing, in 2011 it reached 390.48ppm and in June of this year there were 395.97ppm with an increment of 2.39ppm during the year 2012 (http://www.esrl.noaa.gov/gmd/ccgg/trends/global.html#global_data). Beyond CO_2, other gasses contribute to the rise of the global temperature, they are (UNFCCC, 1998):

- methane (CH_4),
- Nitrous oxide (N_{20}),
- Hydrofluorocarbons (HFC_s),
- Perfluorocarbons (PFC_s),
- Sulfur hexafluoride (SF_6).

Climate Change has consequences for all spheres of existence on our planet. It either impacts on–or is impacted by–global issues, including poverty, economic development, population growth, sustainable development and resource management. It is not surprising, then, that solutions come from all disciplines and fields of research and development (http://unfccc.int/2860.php).

On 9 May 1992, in Rio de Janeiro the UNFCCC was adopted. It was the first legal and binding international instrument working on CC. Yearly the countries involved in the Convention participate to the Conference of the Parties (COP).

The Kyoto Protocol (KP) was adopted in Kyoto, Japan, on 11 December 1997 and it entered into force on 16 February 2005. It is the implemental instrument of the UNFCCC and it is considered an international treaty. It takes a long time to start because it was necessary the ratification of all the 55

countries, they represent the 55% of total CO_2 emissions with respect 1990 (base year). Countries that ratified the KP (industrialized countries and countries with economies in transition) are committed to reduce their CO_2 emissions within defined values identified by the Protocol.
Under the principle of "common but differentiated responsibilities" the emission reduction target was 8% with respect base year for the European Union (EU) member states and there was also a specific reduction for each country. Italy, for the first commitment period, had to reduce its emissions of 6.5% (http://ec.europa.eu/clima/policies/g-gas/kyoto/index_en.htm).

In Doha, Qatar, on 8 December 2012 the Doha Amendment to the Kyoto Protocol was adopted. This launched the second commitment period, that started on 1 January 2013 and it will end in 2020 (http://unfccc.int/2860.php). In the second period the EU member states are committed to reduce their emissions of 20% with respect base year.

1.1 Carbon markets of CO_2

1.1.1 Institutional carbon market of CO_2

Countries that has ratified the KP are called Annex I countries. In order to reach their targets there are different options. Some of them occurs within national boundaries, they are described in article 3 of the KP (Land use, Land-use Change and Forestry – LULUCF) and the others are market instruments, called flexible mechanisms. The primary sector plays a fundamental role in the implementation of article 3 that is aimed to reduce GHGs emissions. It is subdivided in article 3.3 and 3.4.
Article 3.3 regards afforestation, reforestation, deforestation activities and all stable changes connected to the land use change. All the activities aimed to absorb carbon dioxide created between January 1990 and December 2012 are compulsorily accounted to reach the KP targets.
Article 3.4 of the KP regards voluntary activities aimed to forest management, agriculture management and revegetation. All the operations of the article 3.4 have to be human-induced in order to be accounted in the KP targets and they must refer to 1990. There is a limit or "cap" of CO_2 that can be accounted for forest management but it has to be still defined for agriculture management (Brotto et al., 2010).

The flexible mechanisms will take place abroad the national boundaries, in a develop or in a developing country. They are:

- Clean Development Mechanism (CDM) are defined by article 12 of the KP. These projects occur in Developing Countries to achieve sustainable development and to assist Annex I countries to achieve compliance with their targets. CDM produces Certified Emission Reduction units (CER),
- Joint Implementation (JI) are defined by article 6 of the KP. These projects are carried out between Annex I countries and Emission Reduction Units (ERUs) are produced,
- International Emission Trading (ET) as defined in article 17 of the KP, allows countries that have emission units in excess to sell carbon credits to the countries that are not able to reach their target.

One carbon credit is equal to one tonne of CO_2, corresponding in value to one unit of ERUs, CER and Removal Units (RMU) that can be traded in the ET. RMU are generated in activities connected to land use, land-use change and forestry (LULUCF).

1.1.2 Voluntary carbon market of CO_2

The voluntary carbon market was developed in consideration to the fact that farms, private citizens and many other private and public actors wanted to offset their own emissions of CO_2. This offsetting need derives from the awareness that also a single person, or a single farm, can do something to enhance the environment in which they live. With the increasing of the consciousness of the consumers, the carbon offset for a product is becoming an important instrument of marketing and competitiveness (it is called green marketing).

Several voluntary carbon markets were born in order to satisfy this demand and to trade carbon credits, the Chicago Climate Exchange (CCX) is one of them. The second and most adopted platform aimed to exchange carbon credits is the Over the Counter (OTC) and for both CCX and OTC the credits generated are called Verified Emission Reductions (VERs). The members of the CCX had to reduce their CO_2 emissions of 6% until 2012 (with respect target of 1998-2001). In this way if a member emits more CO_2 he has to buy carbon credits in order to respect his target and on the other hand it is possible to sell them. External actors can also apply to the CCX but only after a control by a third independent organism. In 2011 the CCX was closed and was launched the Chicago Climate Exchange Offset Registry Program to register VERs based on a comprehensive set of established protocols. Participants interested in acquiring registered offsets may apply to become a CCX Registry Account Holder (https://www.theice.com/ccx.jhtml).

The OTC works in another way, it doesn't have any CO_2 reduction commitments for its clients and the figure of the carbon brokers is introduced. They are the middlemen between sellers and buyers

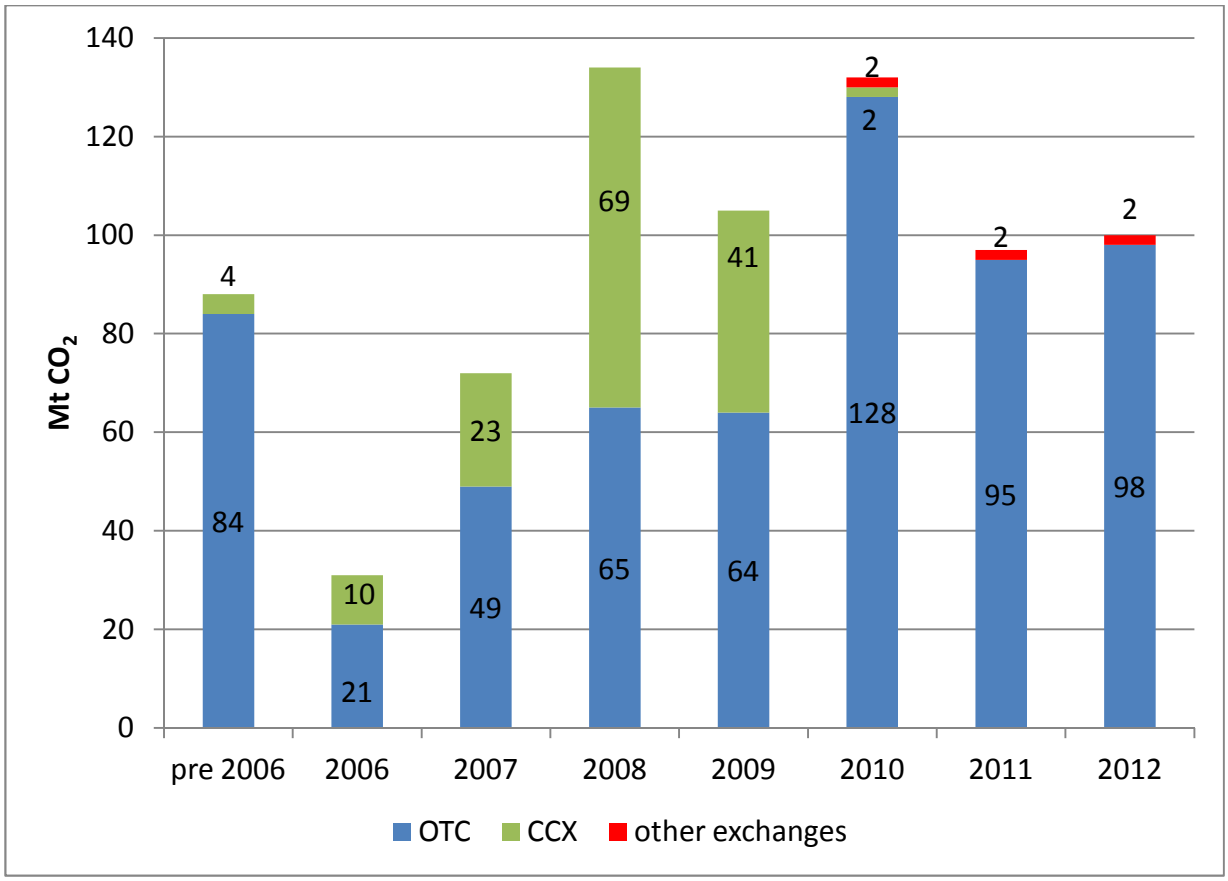
of carbon credits (Brotto et al., 2010). In this mechanism the farms and the private citizens can reach their green marketing or ethical aims.

Following the principles of "providers get" and "polluters pay" it is important to remember that in the voluntary carbon market the primary sector, and in particularly the forest one, can play a fundamental role providing important environmental benefits. In addition investments in the forest sector, with respect investments in improving energy efficiency, provide a quick response to the costumers because these kind of investments are more understandable.

The forest projects must have the following characteristics in order to be reliable:

- they have to be human induced and verifiable (additionality),
- the effect of carbon sequestration must be maintained even if fires or other events occurs (permanence),
- avoid collateral behaviors connected with the offsetting investments (leakage).

Below the transactions of all the voluntary carbon markets updated on 2012 (Graph 1.1) and the values (Table 1.1) are represented:



Graph 1.1 Exchanges in the voluntary carbon markets (Peters-Stanley, Yin, Castillo, Gonzalez, & Goldstein, 2013)

Table 1.1 Historical transaction volumes, all voluntary carbon markets (Peters-Stanley et al., 2013)

	Volume ($MtCO_2e$)		Value ($ Million)		Average Price (Volume-Weighted $/tCO2e)	
	2011	**2012**	**2011**	**2012**	**2011**	**2012**
Voluntary Offsets Contracted Over the-Counter	93	98.5	572	515.7	6.2	5.9
Voluntary Offsets Traded on an Exchange	2	2.3	4.2	6.3	-	-
Historical Transactions Tracked and Added in 2012	1.8	-	10.9	-	-	-
Voluntary Carbon Markets Total	**97**	**101**	**586.5**	**523**	**6.2**	**5.9**

1.2 Offsetting: definition and procedures

The creation of a project or any other activity usually produces negative collateral effects. They can be the improved environmental impacts or, more generally speaking, the global environmental deterioration. In this last decades there is an increasing awareness of the environmental protection and nature conservation and so a lot of activities have been taken place (see the adoption of the KP; or the application of the BBOP[1]; or the wetlands mitigation banking[2] and other activities) but, of course, they are in conflict with economic goals. In this context, the environmental assessment has emerged and its main role is to seeks to avoid environmental impacts, to enhance positive effects. The goal of the environmental assessment is to produce actions aimed to the reduction and the mitigation for negative environmental impacts, preventing them from happening or keeping those that do occur within acceptable levels.

Mitigation "aims at the avoidance and reduction of project related impacts that may be connected with previous policies, plans or programmes" (Rajvanshi, 2005). Moreover Mitigation is defined by the European Union (EU) in Directive 85/337/EC as "measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects" (European Union, 1985). Finally a particular important definition of mitigation in the context of the European Wildlife Sites was provided and it is defined on Article 6 of the Habitats Directive: mitigation is defined as all those "measures at minimizing or even negating the negative impact of a plan or project, during or after its completion" (European Commission, 2000a).

[1] BBOP means Business and Biodiversity Offsets Programme. For more info see: http://bbop.forest-trends.org/
[2] See: http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm

All the actions that occurs after the mitigation measures are called compensation measures and they offset for the residual, unavoidable harm caused by a development project. They are defined as measures aimed “to replace lost or adversely impacted environmental values that should have similar functions equaling existing environmental values” (Rajvanshi, 2005). Another definition is given by Cowell (2000) that explains the environmental compensation “as the provision of positive environmental measures to correct, balance or otherwise atone for the loss of environmental resources”. Offsetting can also produce new or additional opportunities for environment and biodiversity conservation or may result in improved and better management of resources. Compensation measures can be applied directly on the site project and the actions considered are for example restoration of natural areas in an urban context, where original conditions cannot be restored. There are also measures applied off-site and they involve the creation of new habitat in a third part (outside the project) to offset the damage produced.
In the following scheme the complete steps of mitigation and compensation are represented.

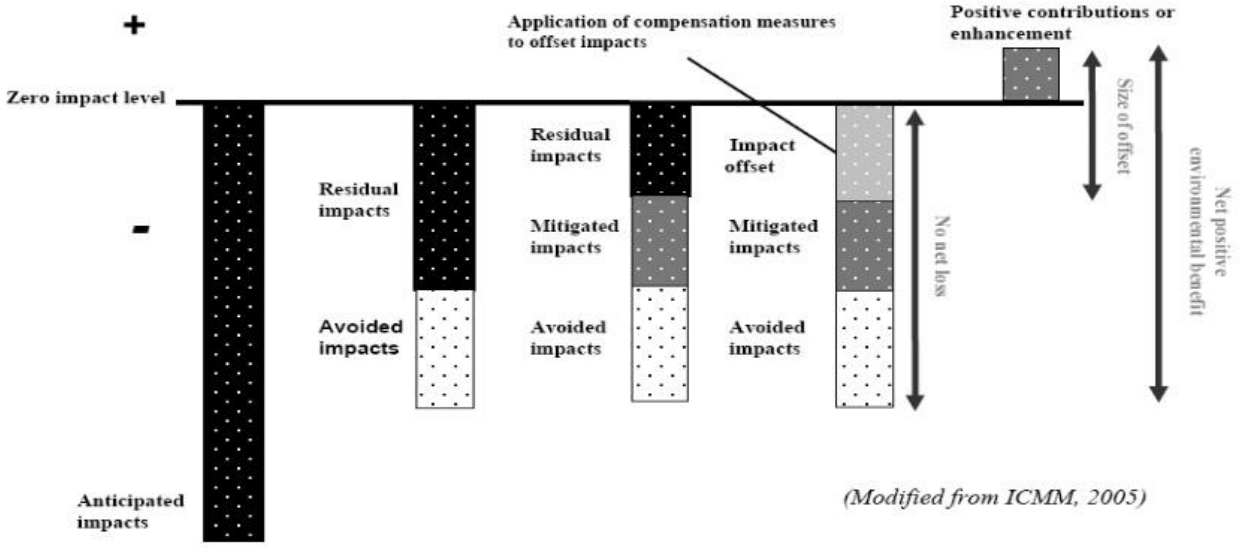


Table 1.2 Mitigation and compensation procedures (Rajvanshi, 2005)

Compensation or offsetting is the last step in the mitigation hierarchy, the others are: avoid, minimize and rectify.

1. Avoiding represents the cheapest and most effective form of impact mitigation, these measures could include identification of alternatives, sensitive design, environmentally sustainable technology and so on. It offers the greatest benefit of avoiding impacts early in the planning cycle,
2. Reduction or minimization measures are aimed to limit the degree, extent, magnitude, or duration of adverse impacts. It means the application of measures for preventing pollution,

mitigation of physical disturbances, the installation of physical barriers and so on. Minimization measures are applicable only in an advanced phase of the developing project,

3. Remedy are those measures that attempts to repair, reinstate, restore and rehabilitate with the goal of keeping the pre-development characteristics of the site intact. Actions undertaken are native ecosystem restoration, re-seeding of grassland or forest land after it has been worked, restoration of damaged hydrological functions and others. These measures can be applied only during the end phase of the project.

1.2.1 The polluter pays principle

The Polluter Pays Principle (PPP) was introduced by the Organization for Economic Co-operation and Development (OECD) during the Council of 26 May 1972 on Guiding Principles Concerning International Economic aspects of Environmental Policies. The PPP is defined as "the principle to be used for allocating the costs of pollution prevention and control" (OECD, 1989) and the principle "should not only cover damage to persons and goods and contamination of sites, but also damage to nature, especially to those natural resources that are important from a point of view of conservation of biological diversity" (European Commission, 2000). Moreover, the PPP "means that the polluter should bear the expenses of carrying out the pollution prevention and control measures introduced by public authorities in Member countries, to ensure that the environment is in an acceptable state" (OECD, 1989). So, explained in another way "if polluters need to pay for damage caused, they will cut back pollution up to the point where the marginal cost of abatement exceeds the compensation avoided" (European Commission, 2000).

All these definitions are intended to feel economic actors responsible for the possible negative effects of their operation on the environment. In addition with the whole society the actors should consider the environment as a "public good" and take care of it. This awareness could result in an increased level of prevention and precaution (European Commission, 2000).

The PPP can be implemented with environmental taxes, in order to commit polluters to pay for their polluting activities. If well designed, environmental taxes could deliver improvements in the environmental policy.

The following three examples are reported in order to explain in a better way the polluter pays principle: the first is the wetland mitigation banking[3], a stream offset programme driven by compliance to the Clean Water Act in the United States. The second is the Regional Fund "Fondo

[3] http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm

Regionale Aree Verdi[4]" funded by the Lombardia region and the third is the "Green Climate Fund[5]" (GCF) promoted by the Conference of the Parties.

. **US wetland mitigation banking**

The concept of wetland mitigation banking was introduced in 1972 with the adoption of the Clean Water Act (U.S. Environmental Protection Agency, 2002). Basically it creates an economic incentive for restoring, creating, enhancing and/or preserving wetlands. After following the mitigation hierarchy, applicants filing for permits to drain, fill, or dredge a wetland may offset their impact. Offsets must be located within the same watershed as the impact. The number of credits generated by a restoration is related to the area of wetland and/or the functional value of the wetland. Frequently the number of credits available for sale is less than the number of acres restored. Mitigation is expected to take place before the impact on the wetland occurs, nonetheless credits are released to the bank sponsor over a period of a few years after the wetland is planned and authorized, and before 5 years of project monitoring concludes. To secure the long-term success of the mitigation bank, a performance bond and contingency security are required to cover construction and 5 year post construction monitoring of wetland quality and function. Long term management of the site must be guaranteed by the bank sponsor and the credits generated must ensure that the wetland functions will be guaranteed to endure to perpetuity. The total yearly dollar volume it is estimated to be around 1.3 – 2.2 billion dollars (http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?section=biodiversity_market&page_name=uswet_market).

. **"Fondo Regionale Aree Verdi" of Lombardia Region**

The Lombardia Region has established the "Fondo Regionale Aree Verdi" with the article 43, regional law 12/2005. The fund is based on three principles:

- "Polluter pays principle",
- The application of a "purpose tax". Money collected will be used for offsetting actions,
- Increase municipalities' liability to the soil loss problem.

Aim of the fund is proper the reduction of the soil loss that is caused by edification. The reduction will be obtained through the institution of an environmental tax for buildings constructed in areas

[4] http://www.territorio.regione.lombardia.it/cs/Satellite?c=Redazionale_P&childpagename=DG_Territorio%2FDetail&cid=1213349137882&packedargs=NoSlotForSitePlan%3Dtrue%26menu-to-render%3D1213277392476&pagename=DG_TERRWrapper

[5] http://gcfund.net/home.html

designed to agriculture. The tax value will be up to the municipalities and it will ranges between 1.5% and 5%. From 12 September 2009 the municipalities had to claim the money from the tax.
The fund will be funded from:

- money coming from regional resources,
- money collected with the payment of the environmental tax, obtained from municipalities committed[6] to pay it and from municipalities that pay the tax voluntarily,
- other resources.

Recipients of the fund will be the municipalities alone, and jointly with provinces, mountain communities, land owners. The manager of the fund is Finlombardia and the money is delivered through a competitive call.
The projects will be aimed to:

- create an ecological network,
- enhance green areas and improve naturalness of local parks of over municipality interest[7],
- enhance forest heritage.

. **Green Climate Fund**

The sixteenth session of the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change took place from 29 November to 10 December 2010, in Cancun, Mexico. Several points were discussed during the conference and they were agreed by the Parties. Some of the most important are listed below (http://unfccc.int/key_steps/cancun_agreements/items/6132.php):

- to commit to a maximum temperature rise of 2 degree Celsius above pre-industrial levels, and to consider lowering that maximum to 1.5 degrees in the near future,
- to make fully operational by the 2012 a technology mechanism to boost the innovation, development and spread of the new climate-friendly technologies,
- to establish a Green Climate Fund (GCF) to provide financing the projects, programmes, policies and other activities in developing countries via thematic funding windows,
- on the Cancun Adaptation Framework, which included setting up an Adaptation Committee to promote the implementation of stronger, cohesive action on adaptation.

The GCF was agreed during the 2011 COP in Durban (South Africa). It was created to reduce CO_2 emissions of developing countries. The aim is to help them to develop their economies in a correct

[6] Municipalities committed to pay the environmental tax are: municipalities inside integrated programmes with a regional interest, regional parks and national park and main municipalities (comuni capoluogo di provincia)
[7] PLIS: Parchi Locali di Interesse Sovracomunale

and more aware way, avoiding as much as possible the climate change. Yearly, it will be provided to the fund a certain amount of money that it is estimated to reach 100 billion dollars per year to the 2020 (http://www.cooperazioneallosviluppo.esteri.it/pdgcs/italiano/speciali/Durban/Fondi.htm). The activities considered are mitigation and adaptation projects, programmes and policies. The GCF relies on some important points and principles. They are:

- transparency,
- accountability,
- efficiency, effectiveness,
- involvement of institutions and stakeholders,
- balance the allocation of the resources of the GCF between adaptation and mitigation activities.

The concept of the GCF can be also applied on a local scale. For this reason it is possible to think to a Green Fund (GF) as a fund that can be established in the Euganean basin area. The GF can be implemented in order to offset CO_2 emissions of the tourists and hotel owners. All the money collected will fund it. The points and principles highlighted above are very important also in the institution of a local GF.

2 THE STUDY AREA: THE EUGANEAN THERMAL BASIN

2.1 Euganean basin municipalities

Five municipalities set up the Euganean thermal basin; Battaglia Terme, Galzignano Terme, Montegrotto Terme, Teolo and Abano Terme. They cover a surface of 92.67 km^2. The thermal water of the municipalities is known from ancient times for its peculiar characteristics of curative properties. In Figure 2.1 the location of the municipalities is presented.

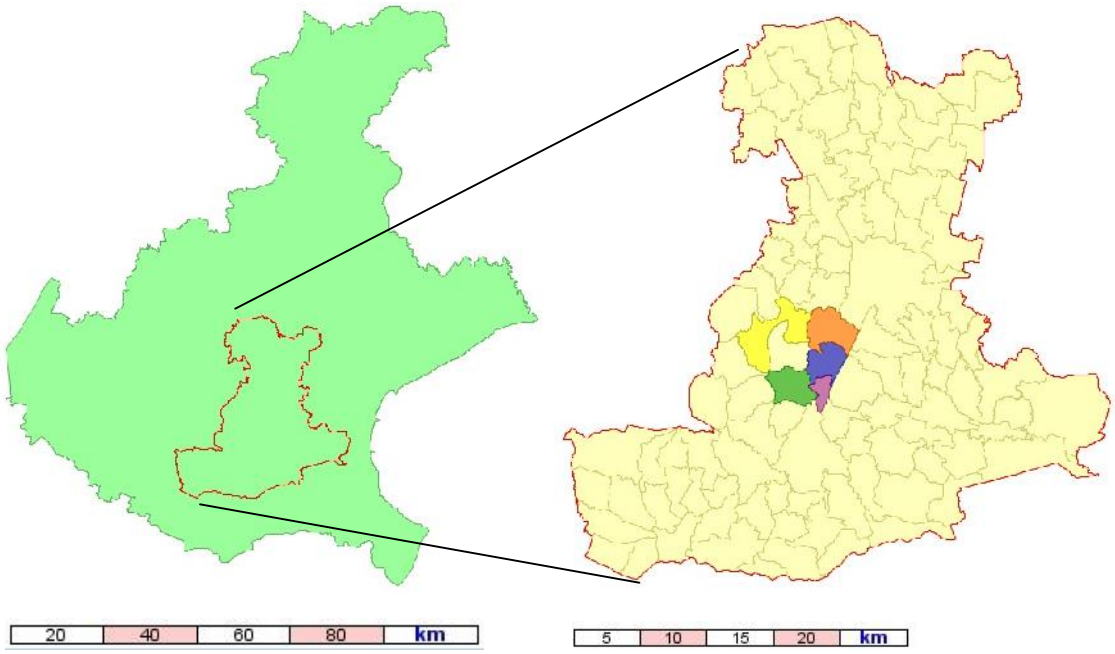


Figure 2.1 Geographical identification of the Padua province and, on the right. the Euganean basin

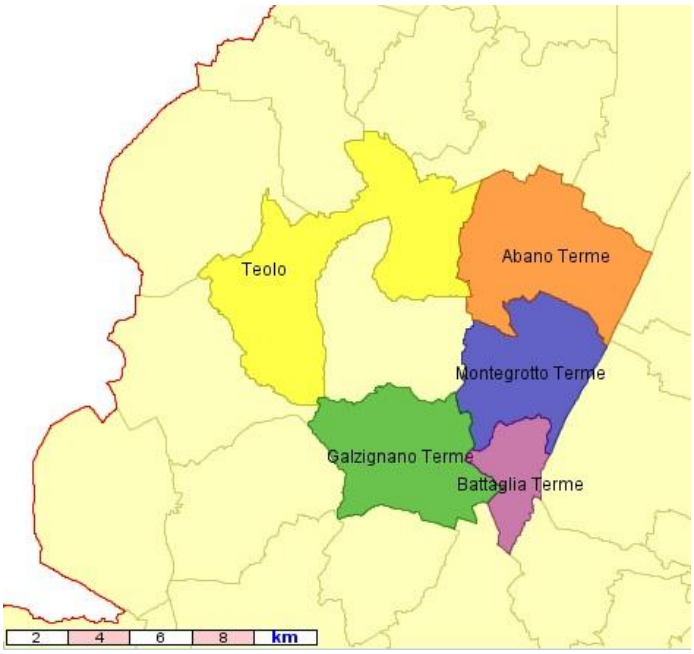


Figure 2.2 Identification of the five municipalities of the Euganean basin

Abano Terme and Montegrotto Terme are the two municipalities where I conducted my interviews to the tourists and in the following paragraph I am going to describe them in a detailed way.

Abano Terme is a Municipality of 19,308 inhabitants located 10 km southwest of Padua in the Veneto Region. Its average height is 14 m a.s.l. and it is the second more extended municipality of the Euganean basin with an extension of 21.57 km^2. It is located along the northeast edge of Euganean Hills and it is the most important center of thermal baths of Europe and one of the most important all around the world (http://www.abanoterme.net/benessere-alle-terme.html).

Montegrotto Terme municipality has 11,073 inhabitants, it is located to the east of Padua and at 30 km from Venice. Its extension is 15.35 km^2 with an average height of 11m a.s.l.. Montegrotto, as all the municipalities of the Euganean basin, is famous for the thermal water and its benefits; it is an annual tourist destination.

In Table 2.1 the inhabitants of the five municipalities and their respective surface extensions are reported.

Municipality	Inhabitants	Surface (km^2)
Abano Terme	19308	21.57
Montegrotto Terme	11073	15.35
Teolo	8868	31.3
Galzignano Terme	4411	18.17
Battaglia Terme	3937	6.28
tot	**47597**	**92.67**

Table 2.1 Inhabitants and surface of the municipalities of the Euganean basin

2.1.1 Regional Park of Euganean Hills

Abano, with 14 other municipalities, is part of the Regional Park of Euganean Hills established in 1989 (regional law 10.10.1989, no. 38). The extension is 18,694 ha and the municipalities are totally or partly inside the Park. It includes the highest relieves of the Po Valley, the Venda hill is the highest of them with 601 m.

Main aims of the Park are environmental protection and promotion of the agriculture. Due to good hydro–geological conditions, the Park is very fertile and is a resource for the local economies.

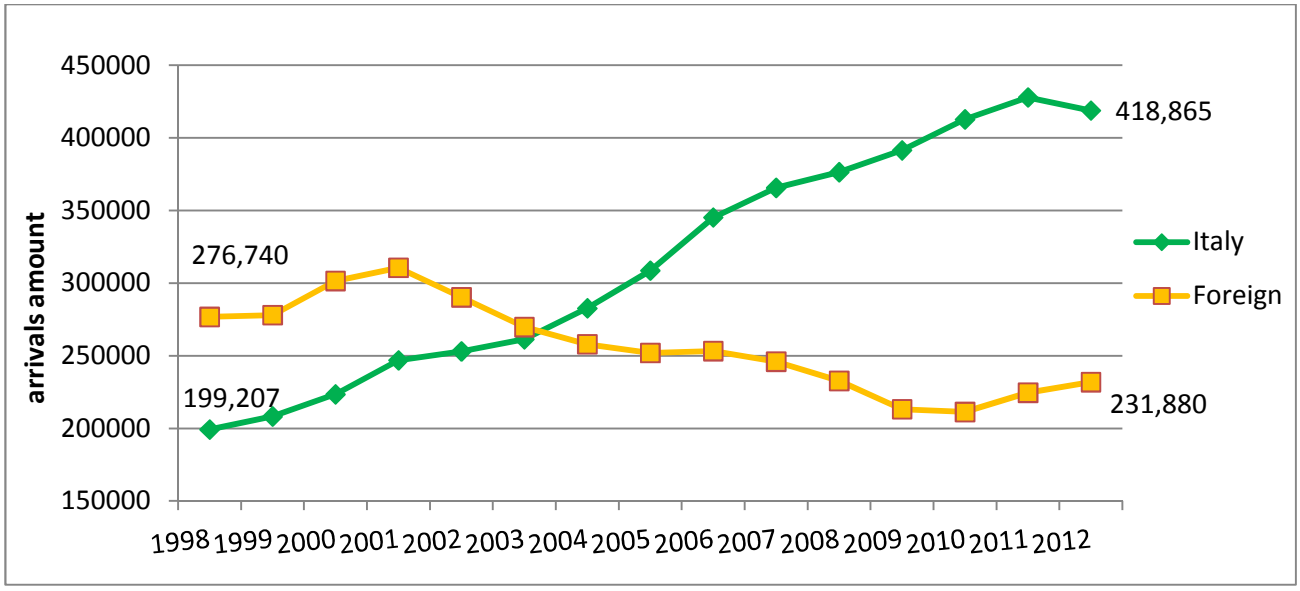
The Park has two other very important points that makes this area suitable for my study and for the establishment of the green fund. It has obtained the European Charter for Sustainable Tourism and it is part of the Natura 2000 network.

The European Charter was obtained on 25 October 2012; it is a certification that should allow a better management of protected areas in order to have a more sustainable and responsible tourism. Objective of the Charter is the protection of natural and cultural heritage, continuous improving of the tourism management keeping in mind the environmental protection and the needs of the local population.

The regional Park is also under the Natura 2000 network, as mentioned above, and it is listed in the Birds Directive; in particular the Park is partly covered by Special Protection Areas (SPAs). It is identified with the code “IT3260017 Colli Euganei-Monte Lozzo-Monte Ricco”. The surface covered by SPAs is 13,698.76 ha and represents 73.3% of the total surface of the Park.

2.2 Annual tourist arrivals

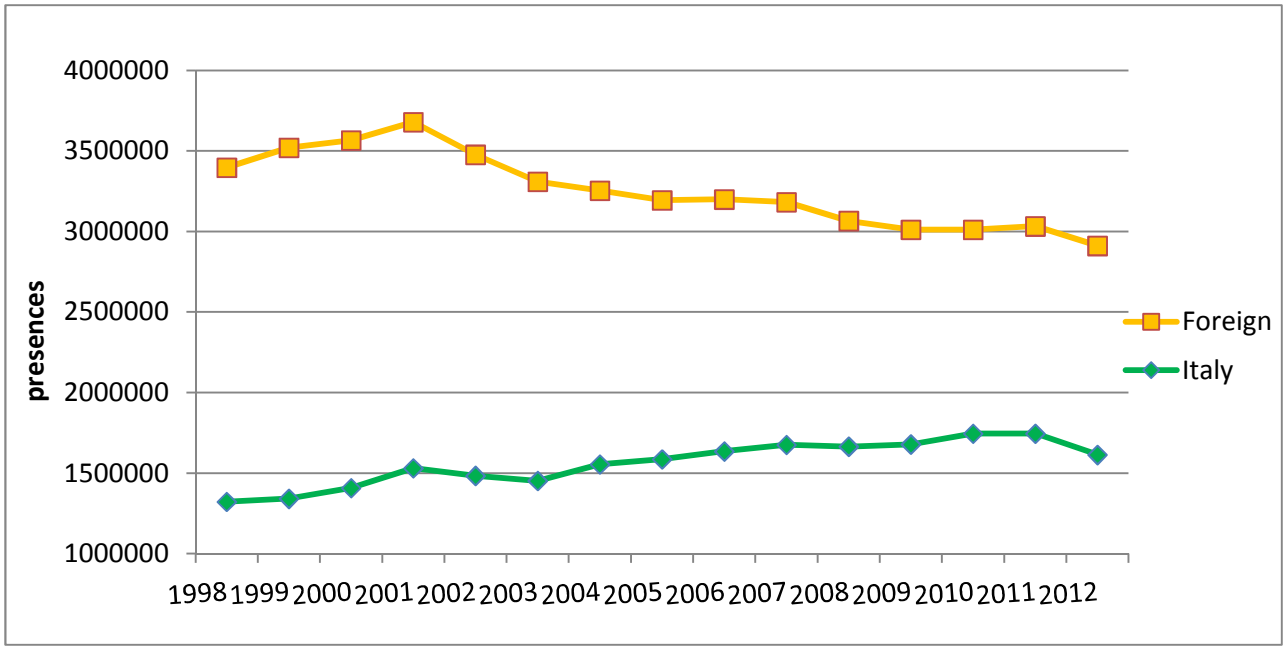
In the following paragraph annual and monthly arrivals[8] of tourists in the thermal basin, considering the nationality, are reported. In my analysis I will focus more on the year 2010, which is the base year adopted for the comparison of the results obtained from the interviews. I will also examine the historical series of arrivals to understand how the tourism has changed in the last decades. The period considered ranges between 1998 and 2012 and considers the Euganean District.



Graph 2.1 Arrivals in the Euganean district. source: http://statistica.regione.veneto.it/banche_dati_economia_turismo.jsp

Arrivals during fifteen years have encountered a strong variation (Graph 2.1). For the Italian tourists there is a steady increase; for foreign tourists, instead, the number of arrivals was decreasing during the last years; only after 2010 it begin to increase. In the Graph below the presences[9] during the period considered are reported; the behavior of Italian and foreign tourists is the same with respect than the Graph of arrivals.

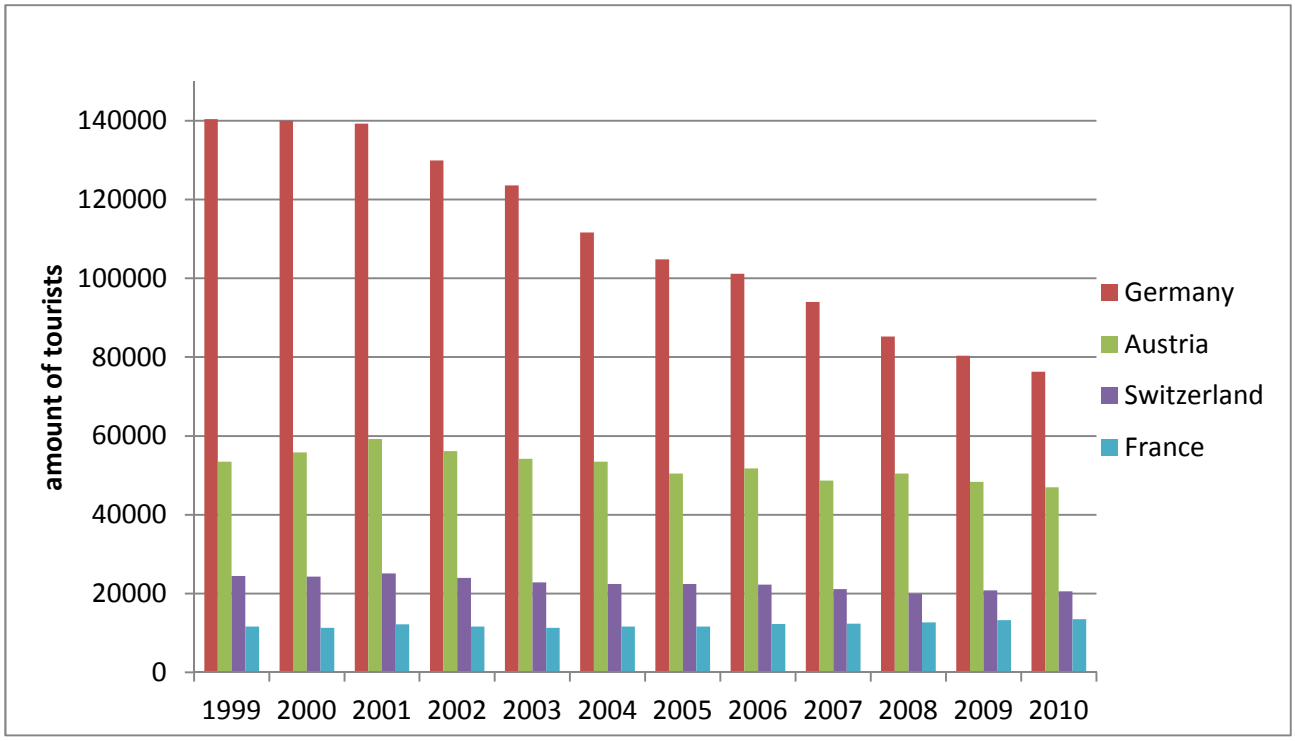
[8] Arrival: is considered the number of tourists that arrive in a touristic place in a considered period of time
[9] Presence: is the number of nights spent by the tourist in a touristic structure



Graph 2.2 Presences in the thermal basin during the period 19998-2012

Graph 2.3 provides a first overview of arrivals during the period 1999-2010 and it considers the four main origin countries for the foreign tourists that come to the thermal basin. They are: Germany, Austria, Switzerland and France. German tourists are predominant during the years, even if for the years 2008, 2009 and 2010 there is a strong decrease, probably due to the global crisis. Anyway there are still a lot of tourists who come to the thermal basin and for year 2010 arrival values are:

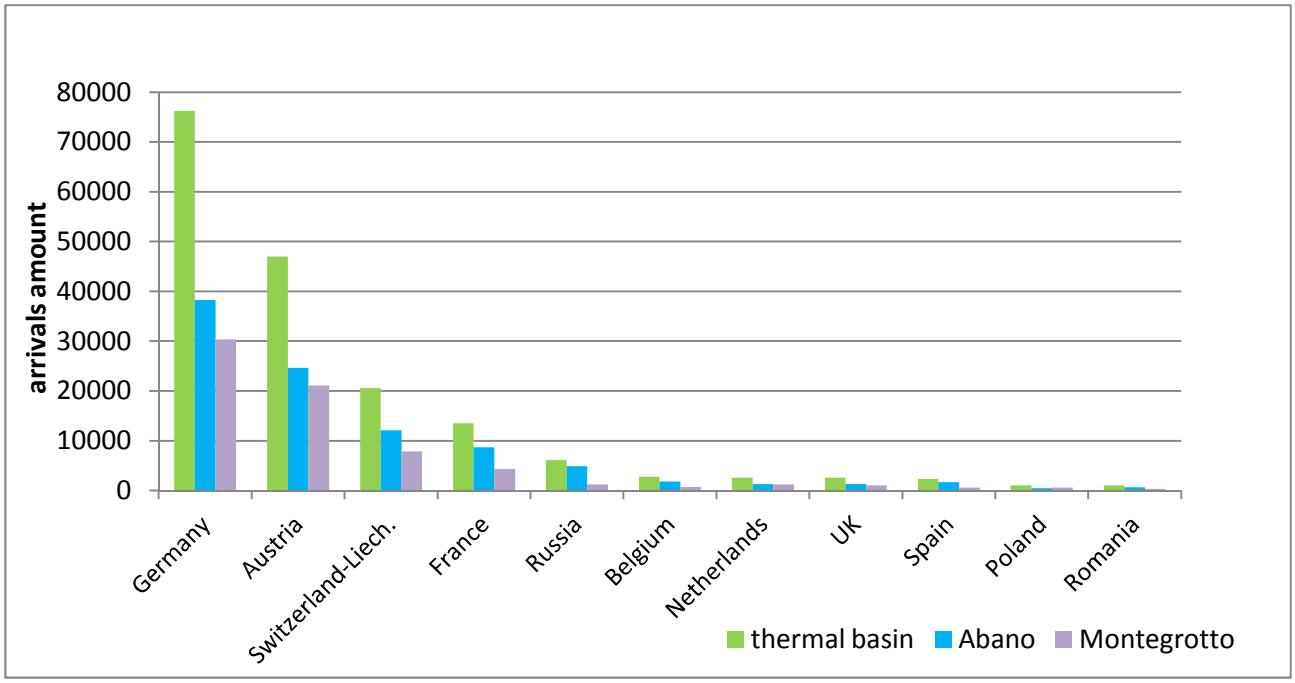
- Germany 76,271,
- Austria 46,997,
- Switzerland 20,598,
- France 13,530.



Graph 2.3 Tourist arrivals considering years ranging between 1999 and 2010 for the main countries in the thermal basin

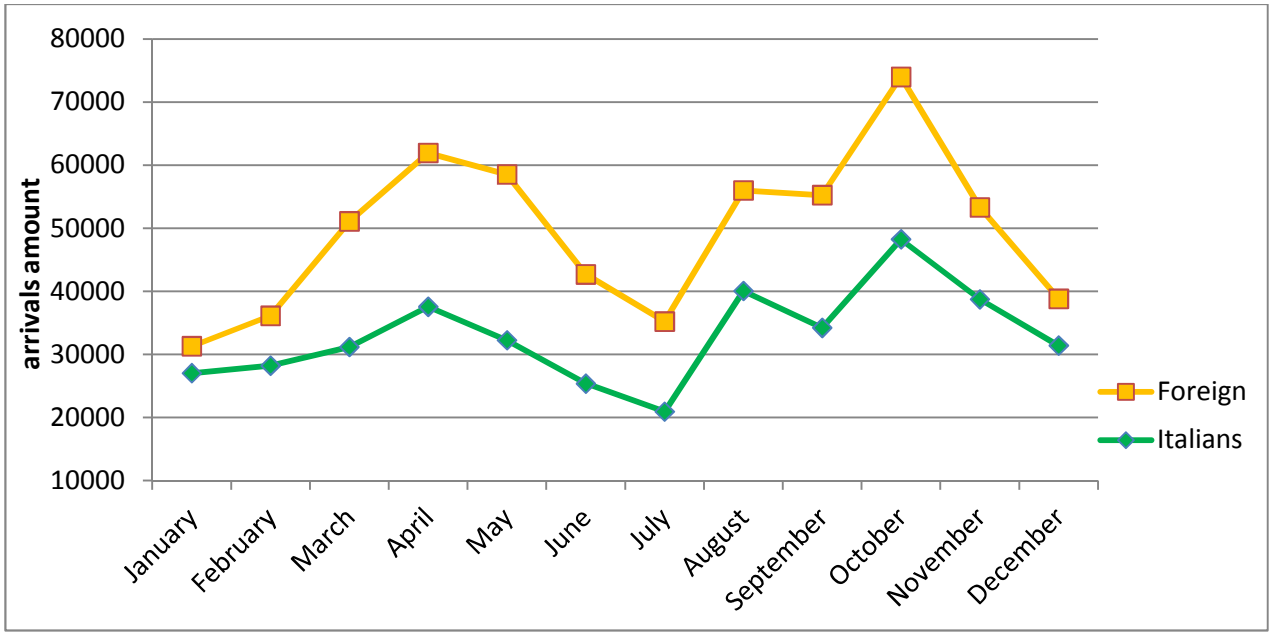
In Graph 2.4 foreign arrivals are considered, with distinction of nationality and only for the year 2010.

I have also analyzed three different areas, one wider and two smaller: the thermal basin and the municipalities of Abano and Montegrotto Terme, because they are the most visited and also their touristic offices were the headquarters of the interviews.



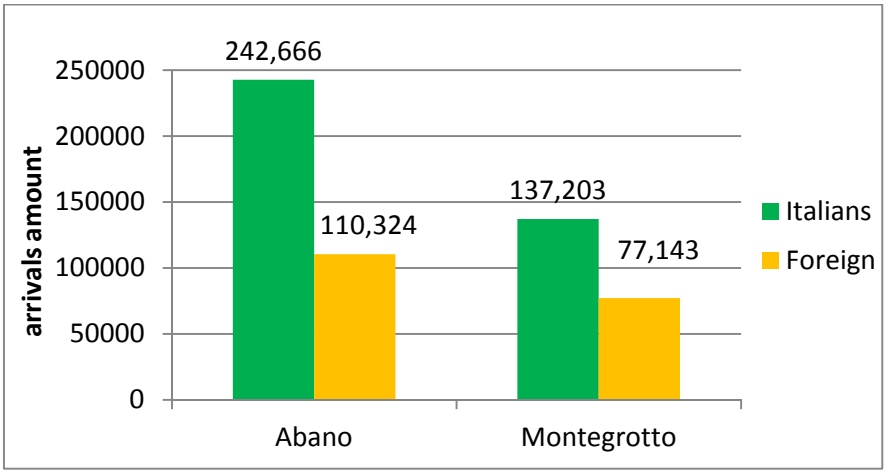
Graph 2.4 Tourist arrivals considering the country and the thermal basin for the year 2010

In the following Graphs arrivals of the tourists for the year 2010 and for each month are considered. Graph 2.5 represents monthly arrivals of Italian and foreign tourists, without the specification of the country of origin, for the year 2010. Total arrivals are 594,246; 395,140 of them are from Italy and the others 199,106 from other countries. There are two peaks of arrivals during the year and one period of very low tourist movement. This period occurs between the months of June and July, the first peak is between March-May and the second between August-October. For this reason I decided to do the interviews during these two periods.

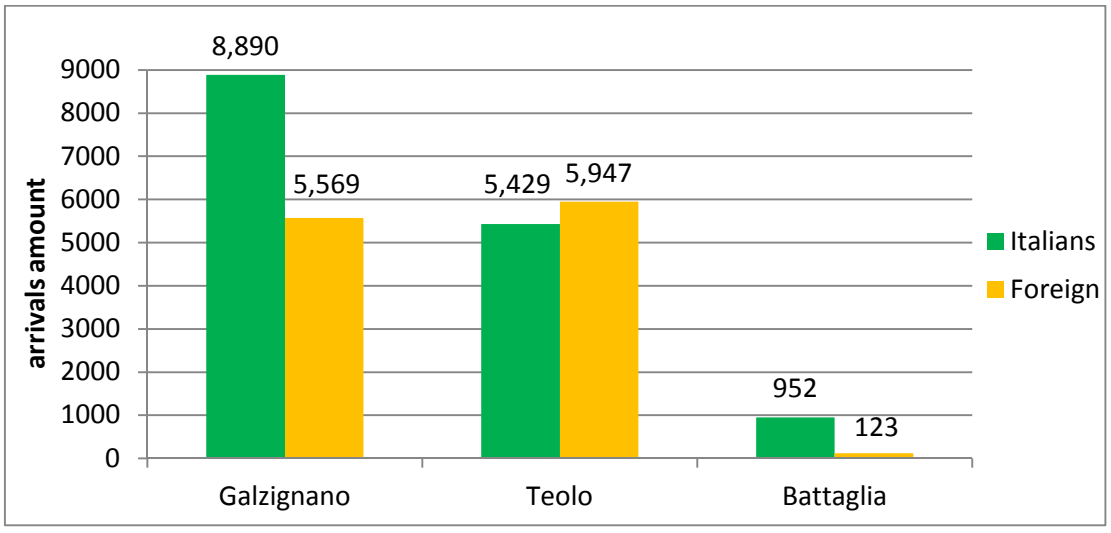


Graph 2.5 Italians and foreign monthly tourist arrivals for the thermal basin for the year 2010

In Graph 2.6 values of tourist arrivals considering the two main municipalities are represented, just to understand how many tourists choose that location for their holidays instead the other municipalities of the thermal basin. We can also see that Abano and Montegrotto are predominant with respect Galzignano Teolo and Battaglia Terme. Total amount of tourists for Abano is 352,990 and for Montegrotto is 214,346 that are bigger than the other three, that all together reach 26,910 tourists arrivals.



Graph 2.6 Tourists arrivals for Abano and Montegrotto for the year 2010



Graph 2.7 Tourist arrivals for Galzignano Teolo and Battaglia Terme for the year 2010

3 MATERIALS AND METHODS

3.1 Questionnaire

The present work is a part of a wider analysis on the willingness to pay for the emissions of CO_2 in the tourist compartment of Euganean Basin. The analysis regards tourists, hotel managers and other stakeholders. This part of the work is focused on tourists and the computation of their willingness to pay. This value was evaluated through a survey based on a semi-structured questionnaire proposed to the tourists visiting the tourist offices of Abano and Montegrotto Terme. The questionnaire is an useful tool because it provide the possibility to collect as much information as possible, both general and specific. Moreover, the collected data are easily to process in order to study them. The questionnaire is composed of multiple choice questions and it requires just 5 minutes to fill it, this means that tourists might be more willing to fill it.

We decided to select the Euganean Basin area due to its great number of tourist arrivals, that were 615,829 for the year 2012; 216,436 of them were foreign and 399,393 Italians (Azienda Turismo Padova Terme Euganee, 2012).

3.1.1 Questionnaire design

The first problem in the questionnaire design was how to measure the correct emissions of CO_2 for each interviewed tourist.

At the beginning we thought to consider the emissions produced during the entire holiday period. This was impossible because there were too many variables to take into consideration, indeed we should had considered all the CO_2 produced, including, for example, the emissions caused by air conditioning and all the local trips by cars. That kind of CO_2 emissions computation was too complex for the purpose of our study and we decided to calculate only the emissions produced during the roundtrip between home and Abano or Montegrotto.

The second step of the work was to decide the questions; they should be comprehensible and statistically reliable. In order to achieve the statistic reliability, we decide to use the arrivals of 2010 as a comparison. When we were planning the work we considered to use the data of 2010 to decided how many people from each country to interview, in order to avoid any problem with statistical reliability and to follow a clear pattern. So for example if in 2010 the percentage of tourist from Germany was 42%, we should had the same percentage of questionnaire compiled from Germans.

After the first attempts, we realized that it was quite impossible to follow that pattern, so we interviewed as many people as possible. Even adopting this strategy, during the data analysis with Excel, we find out that arrivals are anyway in line with the arrivals of the 2010.

3.1.2 Questionnaire description

The questionnaire is organized into seven parts (the questionnaire can be consulted in Annex III), each one with a specific aim: explain what we do, what is and where it is possible do carbon offsetting, specific information from the tourist. The questionnaire is anonymous.
The questions are with multiple answers choice in order to have the most reliable output possible. We also give to the tourist the possibility to find out which is the best option for him/her through different possibilities.

The first part is the introduction, in which it is explained what is carbon offsetting, how it works, the global situation about this topics, and finally what is our target. This part is needed in order to introduce the subject to the tourist so he/she can decide to fill or not the questionnaire.

In the second part we asks to the tourist some general information: country of origin, age (Table 3.1), education (Table 3.2) and so on, in order to achieve a consistent number of data to describe who is the average tourist and who is more willing to offset and who is not.

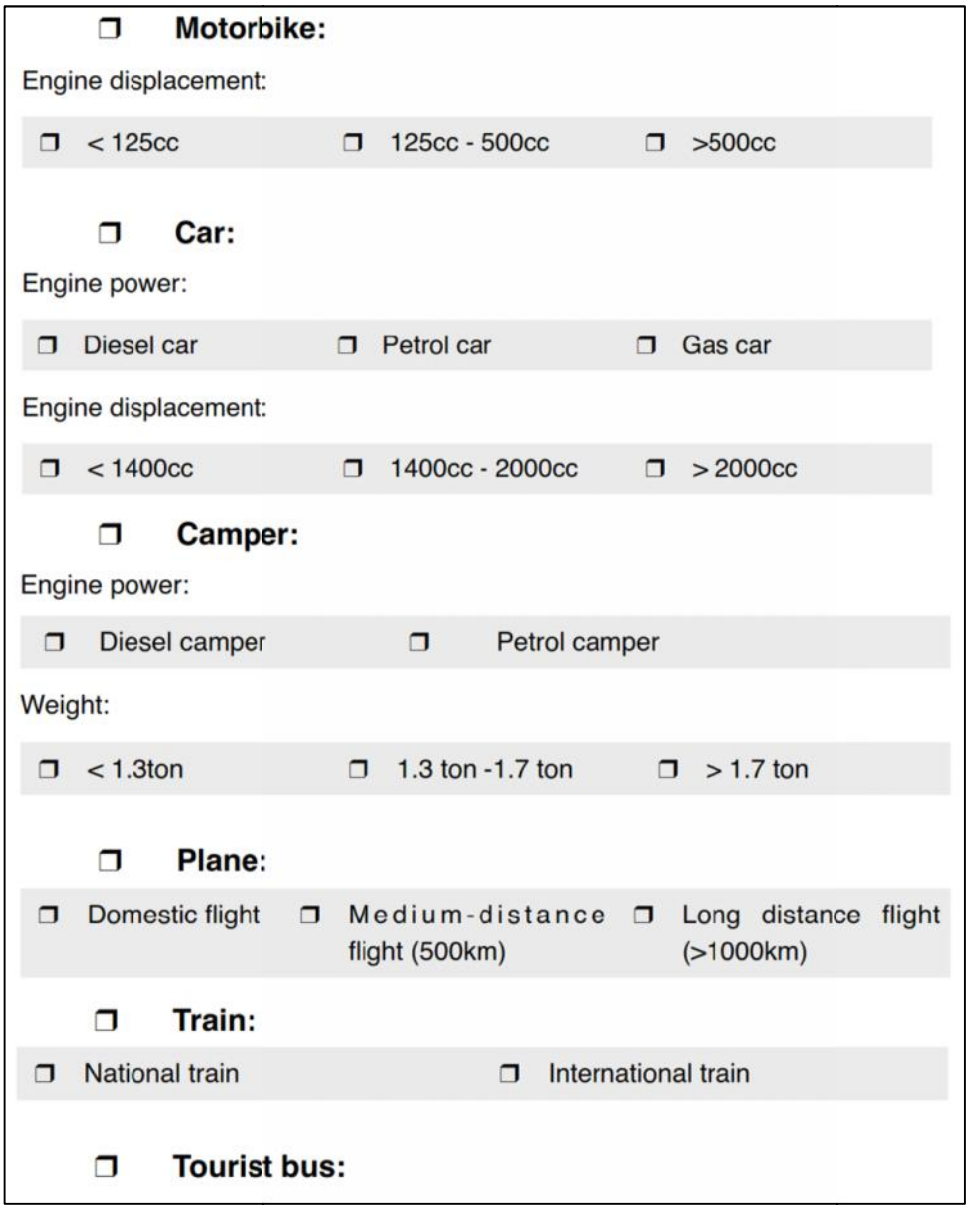
Age:	<25	❒
	25-35	❒
	35-65	❒
	>65	❒

Table 3.1 Part of the questionnaire related to the age

Qualification:	Elementari - primary	❒
	Medie - secondary	❒
	Superiori - highschool	❒
	Università - university	❒

Table 3.2 Part of the questionnaire related to the education

The second part is more specific with a question about transport method; we need to know it to calculate CO_2 emissions. The questionnaire considers several different method of transport, in order to give a wider range of possibilities to the tourist: motorbike, car, camper, plane, train, tourist bus.



❒ **Motorbike:**

Engine displacement:

❒ < 125cc ❒ 125cc - 500cc ❒ >500cc

❒ **Car:**

Engine power:

❒ Diesel car ❒ Petrol car ❒ Gas car

Engine displacement:

❒ < 1400cc ❒ 1400cc - 2000cc ❒ > 2000cc

❒ **Camper:**

Engine power:

❒ Diesel camper ❒ Petrol camper

Weight:

❒ < 1.3ton ❒ 1.3 ton -1.7 ton ❒ > 1.7 ton

❒ **Plane:**

❒ Domestic flight ❒ Medium-distance flight (500km) ❒ Long distance flight (>1000km)

❒ **Train:**

❒ National train ❒ International train

❒ **Tourist bus:**

Table 3.3 Part of the questionnaire related to the mean of transport

From Table 3.3 it is possible to understand how each transport method is specified considering engine displacement, petrol or diesel car, flight types for planes and lastly if the train adopted is national or not. All this variables affect the final computation of CO_2 emitted by the mean of transport.

The method adopted to compute emissions is based on a document produced yearly by the UK Department for Environment Food & Rural Affairs (DEFRA). The document that was used in our

analysis is about the year 2010 and it is "2010 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting: Methodology Paper for Emission Factors" (Department of Energy and Climate Change and the Department for Environment Food and Rural Affairs, 2010).

In the fourth part the travel distance, considering the round trip, is computed. There are three different methods (Table 3.4):

1. Travel distances expressed in km,
2. Tables with calculated distances for that tourists that do not know the exact distance of their trips. These tables are prepared for train and car, and they consider the distance between several Italian and foreign cities,
3. Computing of distances on line, this is used only for distances between airports (http://www.abspace.it/TripSpace/distanze.asp).

Anyway the first method was the most adopted, because the majority of the tourists known distances between their houses and Abano or Montegrotto.

❒ **Method 1** - distance in kilometers
the respondent has made a journey of _____ km (round trip)
❒ **Method 2** - distance in kilometers by country of origin
❒ **Method 3** - Calculating by computer-online (distance between airports only):
According to computer on-line distance between the airport of departure (_____) the airport of arrival (_____)is equal to _____ km (round trip)

Table 3.4 Part of the questionnaire that consider transport methods

The data obtained with these two last questions allow us to compute the CO_2 emissions and then we can estimate the price that the tourist should pay in order to offset his/her emissions.

Ton is the unit measure adopted to express CO_2 and the price attributed to each ton is 20€. We considered a price quite high because in 2010 in Less Developed Countries it was around 10€/ton; working in a developed country we assumed an higher price considering the local circumstances of the rich investigated area.

Point five introduce the second section of the questionnaire that concerns: availability to offset, types of compensation and willingness to pay (Table 3.5).

In this part it is important to ask if tourist travels alone or in group, because if he/she travels by bus, train or plane he/she has to decide if he/she wants to offset emissions only for himself/herself or for

the whole group. This specification is important because if the interviewee is travelling by car the amount of money that he/she will pay is independent from the number of people in the car. This is the only exception, because emissions of the vehicle are not so affected by the number of travelers.

Defining amount and type of compensation:
Amount of compensation:
Do you want offset just for yourself or for all components of the trip? (question only applies to bus - train - plane)
❒ Just for me
❒ For all the components components: ..... Total price = individual price • components = ...€

Table 3.5 Part of the questionnaire that deals with willingness to pay

The following question is on the willingness of the tourist about offsetting his/her emissions. If the answers is no, we ask him/her why, and which is his/her opinion about how much should be the amount that should be paid.

Point six defines the types of compensation. It considers four options: hedge, forest, wetland and no preferences (Table 3.6).

Type of compensation:
Define among the following types of compensation which is in your own opinion most suitable to offset the carbon dioxide in the local area (just one choice):
❒ Hedge
❒ Hood
❒ Wetland
❒ No preference

Table 3.6 Part of the questionnaire that represent type of compensation

The last point of the questionnaire is aimed at evaluating the willingness to pay and it asks the tourist to select three functions from a list and assign them a value. The value could be 1, 2, 3

considering which is the importance that the tourist gives to the function selected. Value 1 attributes the highest priority to the function and value 3 the lowest (Table 3.7).

Willingness to pay:

Define the three functions which must have priority action for compensation. Assign the number 1 to the most important value, the second most important value 2 and 3 to third most important value.

FUNCTIONS	CLASSIFICATIONS
Enhancement of the landscape	.....
Increasing of biodiversity	.....
Enhancement of water quality	.....
Protection to hydrogeological risk	.....
Increasing to available to woody biomass for energy purposes	.....
Limitation of noise of vehicles on roads	.....
Shading of cycle and pedestrian paths	.....
Recreational use	.....

Table 3.7 Part of the questionnaire in which tourist have to decide which are the main functions for the type of compensation selected

3.2 Interviews

The second main issue of the field work was to decide how and where to use the questionnaire. We considered different options. The first was to make an agreement with hotels and to stay inside the structures, making interviews at the end of the holiday periods. The idea was to provide the questionnaires at that time, because in this way tourists could get an idea of the surrounding environment and decide, with higher awareness, if they want to contribute to the offsetting project or not. The idea to work with hotels was, in the end, rejected, because we realized that it was quite unfeasible.

We considered also problems that the tourist should encounter to fill alone the questionnaire: understand the concept of CO_2 offset, willingness to pay and methods used to calculate travel distance, for example, are difficult to reach if you do not know the field.

The second option that we considered was to do interviews in the city center of Abano and Montegrotto. This was, from a statistical point of view, the best option because it provides the best representativeness of tourists without any bias in the selection process. After the first day of interviews we arrived to the conclusion that tourists feel safer in a known place, so we decided to transfer the work inside the touristic offices of Abano and Montegrotto. In addition the office provides a higher perception of professionalism and it highlights the work.

A negative aspect of this kind of location for the interviews is that the statistical reliability is, of course, a little bit compromised if compared to the street interviews because not all tourists visit the touristic offices.

Another method that we considered was to interview people during bike trips around Euganean Hills, organized by the touristic offices. We tried, but we saw that was not worth because the number of questionnaires obtained was very low compared with time spent to obtain them. In addition it is important to say that this kind of interviews is influenced by a sort of positive selection on tourists. People who, during holidays, are interested to go around by bike are more prone to be interested in these subjects.

4 RESULTS

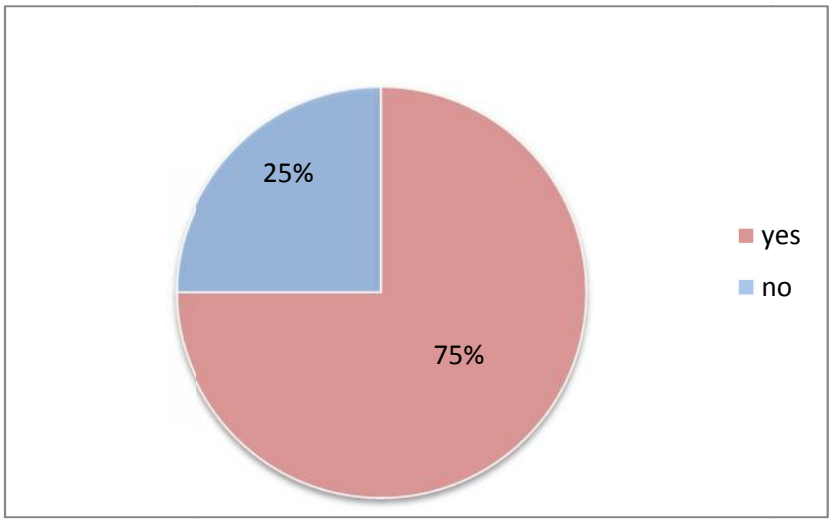
4.1 Respondents and their interest to offsetting

The interviews collected from Abano and Montegrotto tourist offices are 202 but, due to unreliability, two of them have been deleted. The interviews were carried out in two different periods, according with the highest fluxes of people; the first period was between September and December 2011, the second between March and April 2012.

From the first analysis come up that 150 interviewees compiled the questionnaire and 50 did not. This means that 75% of the people, who were asked to fill the questionnaire, responded positively.

	No.	**%**
yes	150	75,00
no	50	25,00
tot	**200**	**100**

Table 4.1 Tourists who want compile the questionnaire

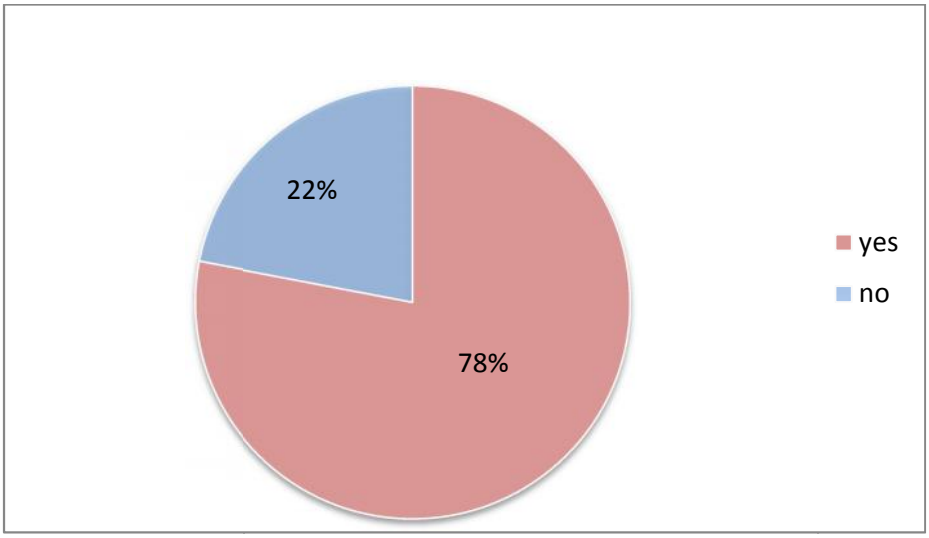


Graph 4.1 Percentage of tourists interested in filling the questionnaire

The next result is deduced from the 150 tourists which have positively answered to the offsetting question. From that number, 117 people want to offset their emissions in order to have less impact on the environment during their trip.

	No.	%
yes	117	78,00
no	33	22,00
tot	**150**	**100**

Table 4.2 Tourists interested in offsetting and not



Graph 4.2 Percentage of tourists interested in offsetting their emissions

4.2 Tourists profiles

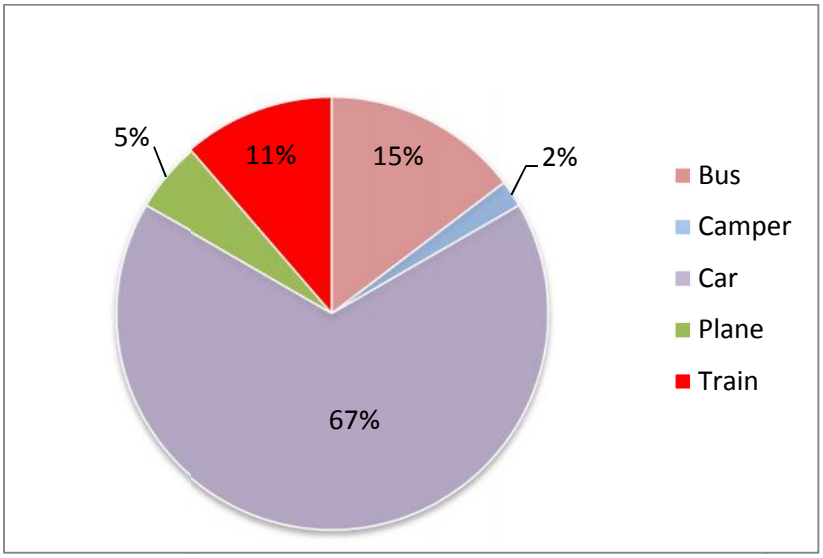
As saw above, tourists that decide to fill the questionnaire are not necessarily interested to offset their CO_2 emissions. Taking into consideration this aspect, I decided to split the elaboration and then to cross the results in the end. Origin country, age, education and mean of transport are the characteristics evaluated at point 4.2.1.

It is interesting to understand why some people accept to start the interview but at the moment of the compensation, even if they know that it is only a survey, they do not want to offset their emissions. I am going to describe traits of people that want and do not want to offset in order to describe the behavior reported in Graph 4.1 and Graph 4.2.

4.2.1 Tourists interested to fill the questionnaire

As already said, the tourists interested in filling the questionnaire are 150 and, from the elaboration of these data, one of the characteristic considered emerges: the method of transport. In 67% of the cases it is the car (Graph 4.3). This result is not a surprise, usually people still choose cars to move;

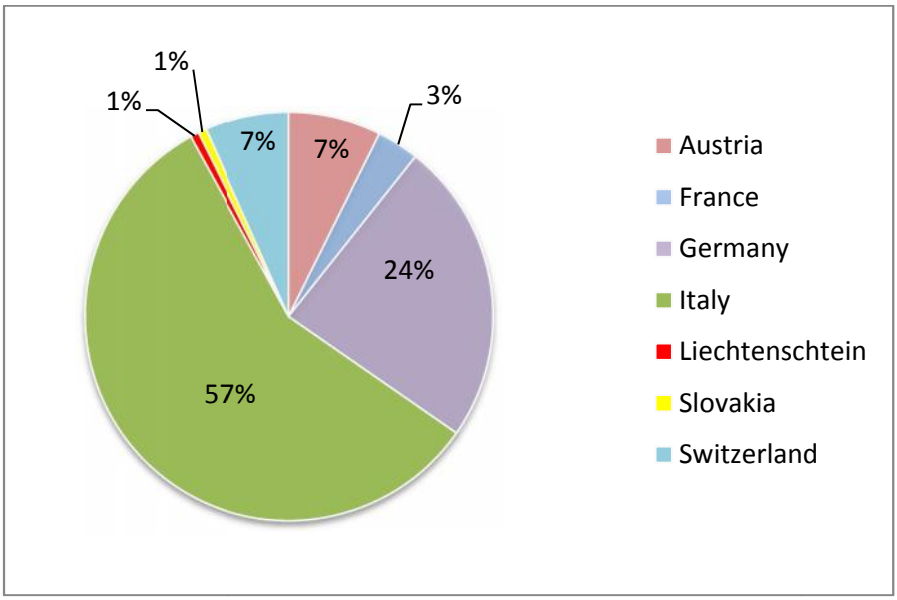
this statement is reinforced if we consider that most of interviewed comes from far places and almost half of them are foreign (43%) as Graph 4.4 shows.



Graph 4.3 Transport method adopted

First method of transport is the car, the second is the bus with 15% of the interviewed that use it. The method of transport that has the lowest emissions of CO_2 is in third place and it is the train; it has been used by 11% of tourists that were interviewed.

81% of the tourists interviewed come from two countries: Italy and Germany (respectively 57% and 24%). The other countries that complete the view are: Austria and France (both 7%), Switzerland with 3% and Lichtenstein and Slovakia that has 1% each one.



Graph 4.4 Country of origin of the tourists

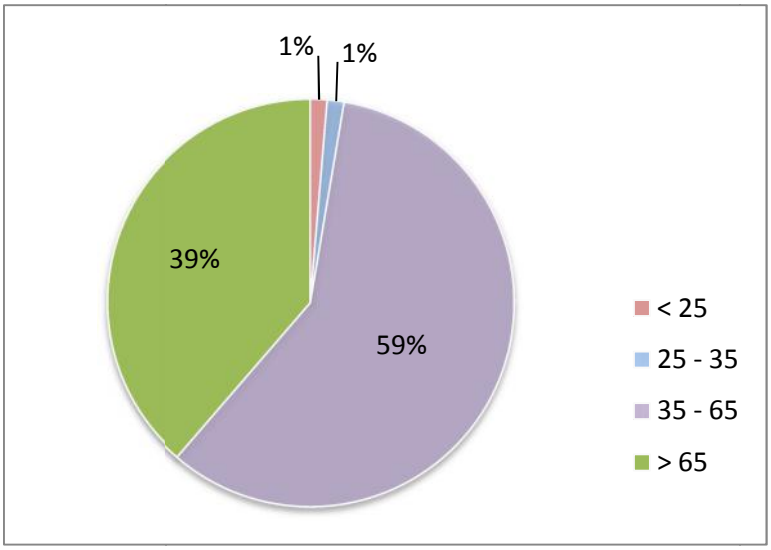
Mean of transport	No.	%
Bus	22	14,67
Camper	3	2,00
Car	100	66,67
Plane	8	5,33
Train	17	11,33
tot	**150**	**100**

Table 4.3 Transport method adopted by tourists

Country	No.	%
Austria	11	7,33
France	5	3,33
Germany	36	24,00
Italy	86	57,33
Liechtenstein	1	0,67
Slovakia	1	0,67
Switzerland	10	6,67
tot	**150**	**100**

Table 4.4 Country of origin of tourists

Another interesting characteristic is the age; according to different ranges of age, it is possible to identify how old are the tourists that spend their holidays in Abano and Montegrotto. In this way we can suppose different types of offsetting behaviors. From interviews emerges that 59% of tourists' age is between 35 - 65 and 39% are older than 65 years. This last result is very important because almost half of the tourists interviewed are aged and it is possible to assume that they maybe do not know very well this kind of environmental subjects and they might be not interested to offset. Combined with the willingness to pay, the age will produce a result that confirm or not the assumption above reported.



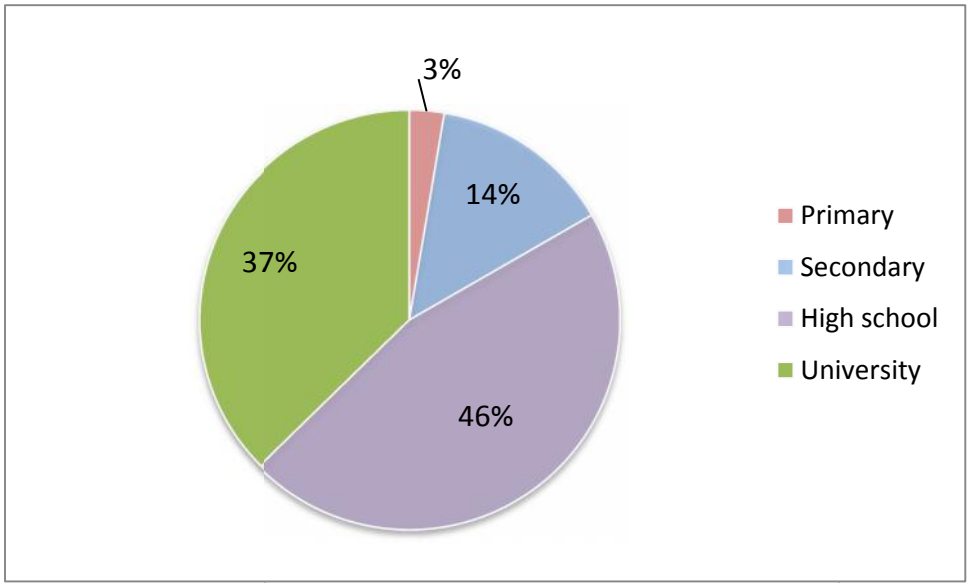
Graph 4.5 Age of tourists

Age	No.	%
< 25	2	1,33
25 - 35	2	1,33
35 - 65	88	58,67
> 65	58	38,67
tot	**150**	**100**

Table 4.5 Age of tourists

The education is the last characteristic examined. It will be combined, as for the age, with willingness to pay in order to understand if there is a connection between them, for example if a person with higher education is more sensible to these subjects.

46% of tourists are graduated and 37% have a master degree (Graph 4.6); then respectively 14% have a title from the secondary school and 3% from primary.



Graph 4.6 Education of tourists

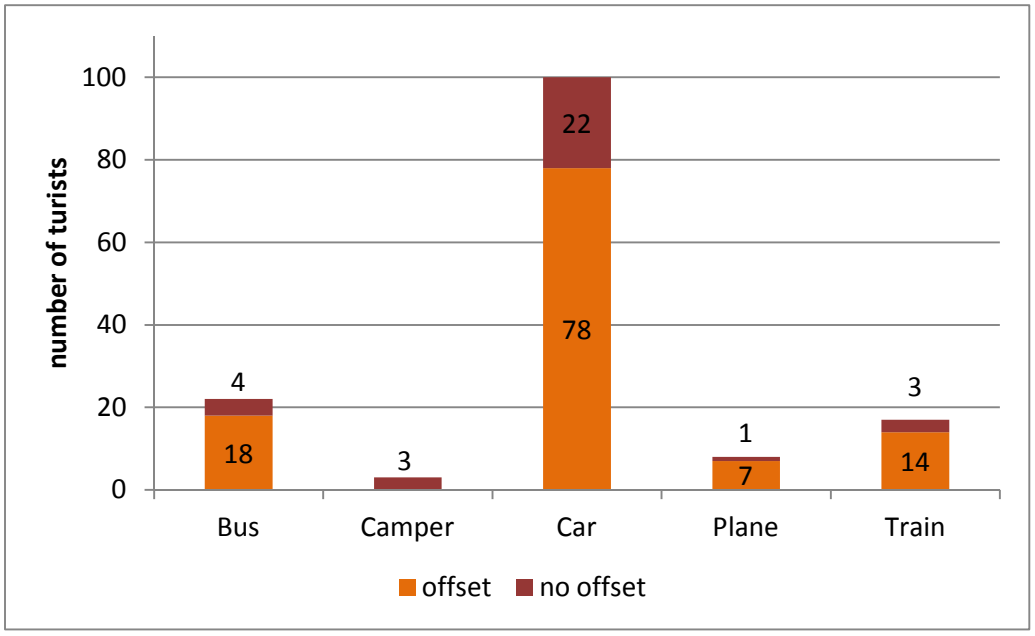
Education	No.	%
Primary	4	2,67
Secondary	21	14,00
High school	69	46,00
University	56	37,33
tot	**150**	**100**

Table 4.6 Education of tourists

4.2.2 Tourists interested to offset their emissions

In this section tourists interested to offset their emissions of CO_2 are analyzed. 150 people were interested in filling the questionnaire but only 117 want to offset. The characteristics considered are the same of the previous point 4.2.1.

In addition to the data obtained some statistics are done. The statistical function adopted is the Chi square that returns a value that determines if there is a significant connection between the characteristics considered and the willing to offset, that are the two variables. It will provide if there is dependence or independence between them. The threshold value is 0.1, that means that if the result obtained is lower than 0.1 there is a significant connection and the variables are dependent each other (for the complete data see Annex I).



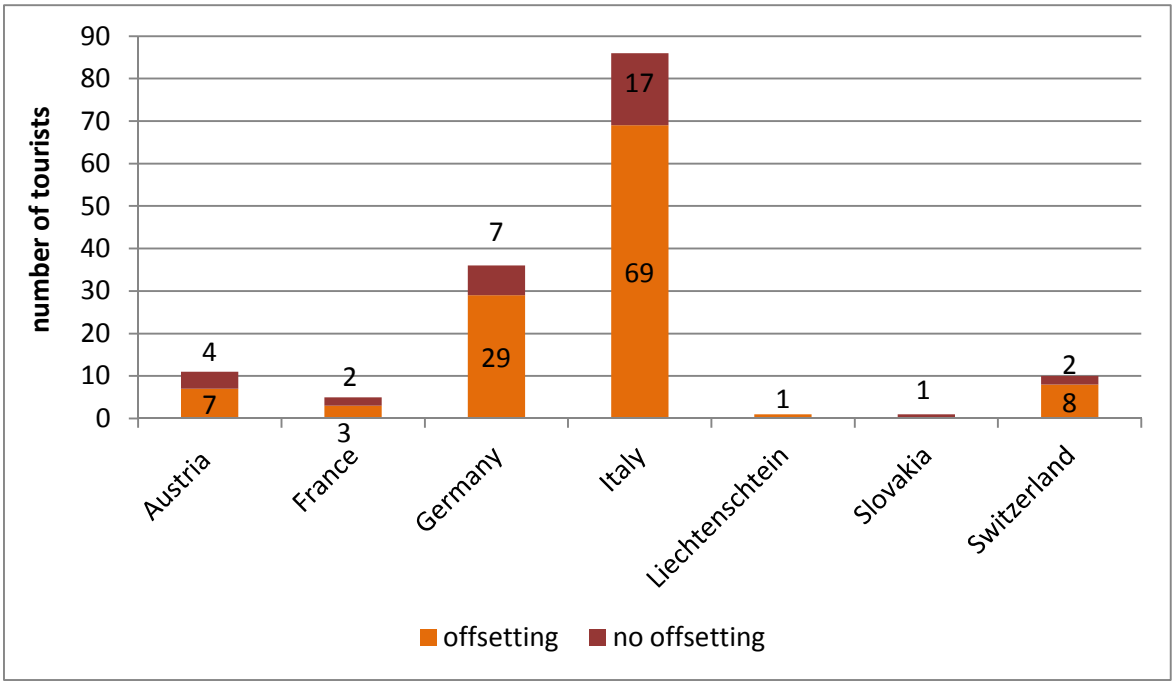
Graph 4.7 Amount of tourists willing to offset by mean of transport

Mean of transport	Offsetting	No offsetting	Filling	Offsetting %	No offsetting %
Bus	18	4	22	81,82	18,18
Camper	0	3	3	0,00	100,00
Car	78	22	100	78,00	22,00
Plane	7	1	8	87,50	12,50
Train	14	3	17	82,35	17,65
tot	**117**	**33**	**150**		

Table 4.7 Amount and percentage of tourists willing to offset by mean of transport

The method of transport covers an interesting role also in this section. From these data emerges that people that travels by plane and by train are the most willing to offset, respectively with 87.50% and 82.35%. The tourists that travel by car are 78, that means that 78% of them offset. This result seems very important, because car is the most adopted mean of transport, but come out that the drivers are the less interested in offset their CO_2 emissions if we consider all the 150 interviews.

The Chi square returns a value of 0.022 that is smaller than 0.1 and for this reason it is possible confirm that the mean of transport and the willing to offset are dependent. So it is correct affirm that tourists that come to the Euganean Basin by car are less willing to offset their CO_2 emissions.



Graph 4.8 Amount of tourists willing to offset by country

Country	Offsetting	No Offsetting	Filling	Offsetting %	No offsetting %
Austria	7	4	11	63,64	36,36
France	3	2	5	60,00	40,00
Germany	29	7	36	80,56	19,44
Italy	69	17	86	80,23	19,77
Liechtenstein	1	0	1	100,00	0,00
Slovakia	0	1	1	0,00	100,00
Switzerland	8	2	10	80,00	20,00
tot	**117**	**33**	**150**		

Table 4.8 Tourists willing to offset by country

Italy and Germany maintain their leadership also in this second section. Austria and France have the lowest offsetting percentage. Of course the number of people that want to offset is lower than the amount of people that have filled the questionnaire. The highest variation it is registered for the France that report a reduction of 40%, followed by Austria with 36.36%. Considering the number of tourists that do not want offset Italy register a reduction of 19.77% that is almost the same of the Germany.

From the statistic elaboration emerges that the country do not influence the willing to offset. The Chi square returns a value of complete independence between them, that is 0.369 (higher than 0.1).

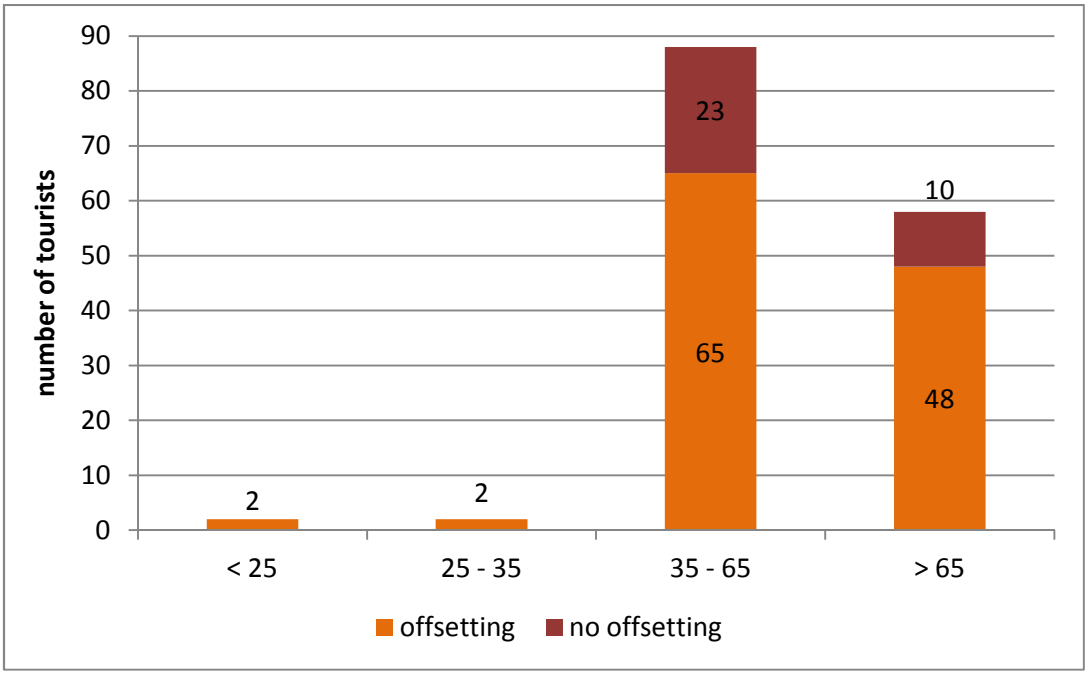
Graph 4.9 reports tourists that want to offset their CO_2 emissions considering the age, and some differences emerge from Graph 4.5 (relation age-compilation). In Table 4.9 the ages more influent are > 65 and 35-65 even if ages <25 and 25-35 offset 100%, but they are only two in each category. Comparing this result with the previously obtained comes out that people older than 65 years old are more willing to offset their emissions, their percentage being 82.76%.

In the range 35–65 years, tourists that offset are 73.86% and 26.14% don not offset. So, tourists which have an age higher than 65 years are, in proportion, more willing to offset their CO_2 emissions. This adjustment is important because in the previous paragraph it was assumed the opposite.

Even if in proportion tourists more willing to offset have an age higher than 65 years the Chi square returns a different value. The result of the statistic equation is 0.428 that express no significance between the two variables, so they are independent.

Age	Offsetting	No Offsetting	Filling	Offsetting %	No offsetting %
< 25	2	0	2	100,00	0,00
25 - 35	2	0	2	100,00	0,00
35 - 65	65	23	88	73,86	26,14
> 65	48	10	58	82,76	17,24
tot	**117**	**33**	**150**		

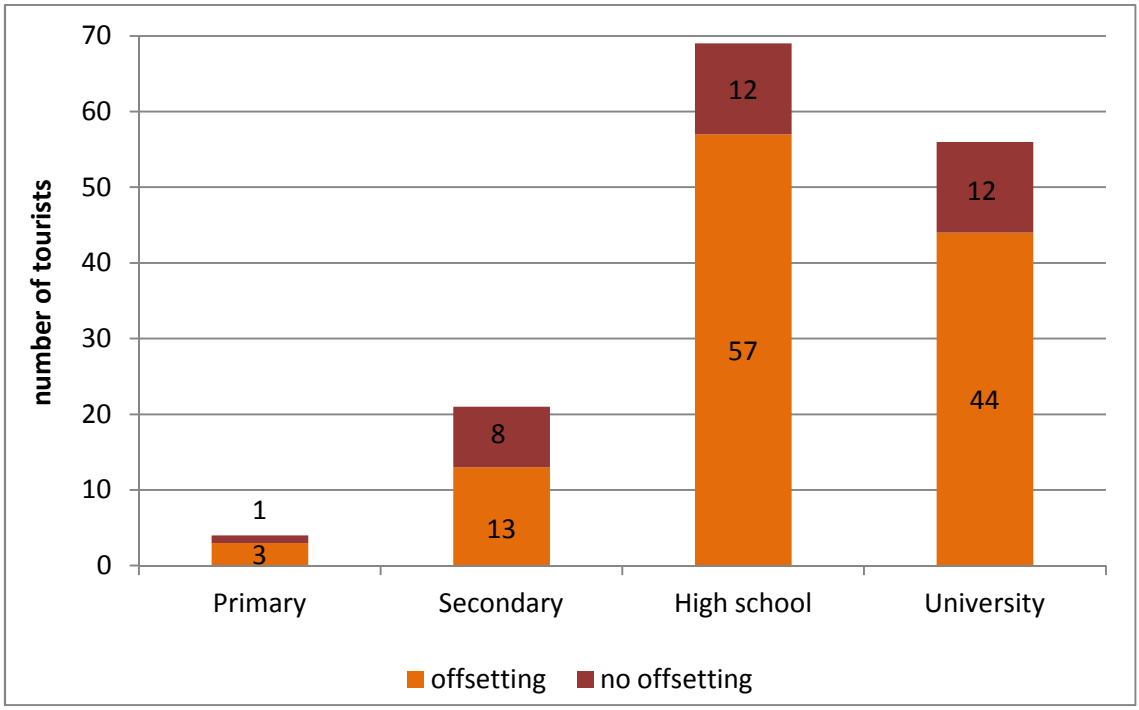
Table 4.9 Tourists willing to offset by age



Graph 4.9 Tourists willing to offset by age

Lastly, Graph below represents the results about which is the instruction level for tourists who want offset their emissions. Emerges that tourists with a high school degree are the most willing to offset their emissions (82.61%) and tourists with university degree are less willing (78.57%). Tourists with a secondary degree are the less willing to offset their emissions.

Also for this characteristic the Chi square returns a value that express completely independence between education and willingness to pay. There is no significance, the result of the equation is 0.255 that is higher than the threshold level (0.1).



Graph 4.10 Amount of tourists willing to offset and do not offset considering the age

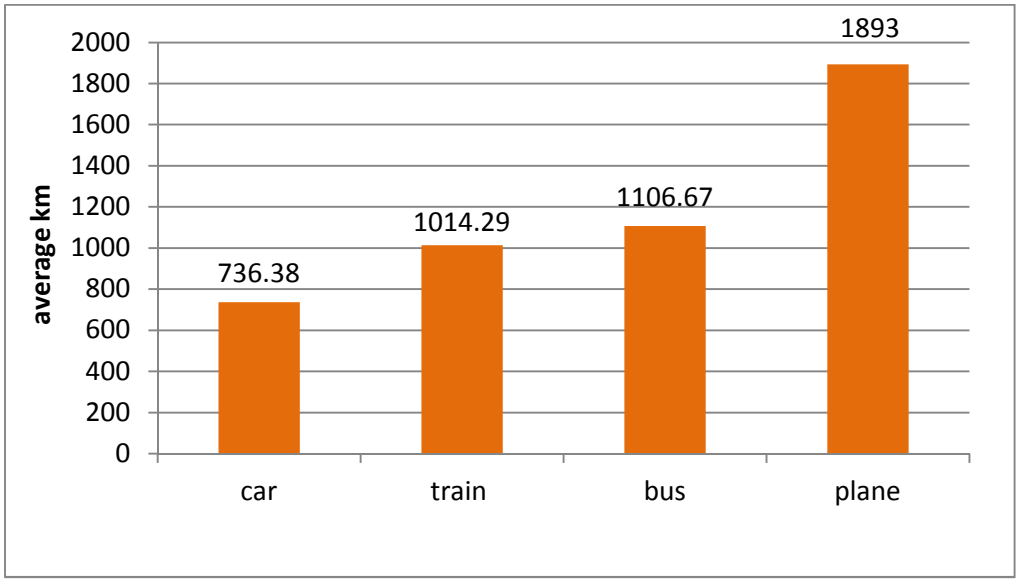
Education	Offsetting	No Offsetting	Filling	Offsetting %	No offsetting %
Primary	3	1	4	75,00	25,00
Secondary	13	8	21	61,90	38,10
High school	57	12	69	82,61	17,39
University	44	12	56	78,57	21,43
tot	**117**	**33**	**150**		

Table 4.10 Tourists willing to offset considering their age

4.2.2.1 Average distance, average emissions and average price for CO_2 offsetting

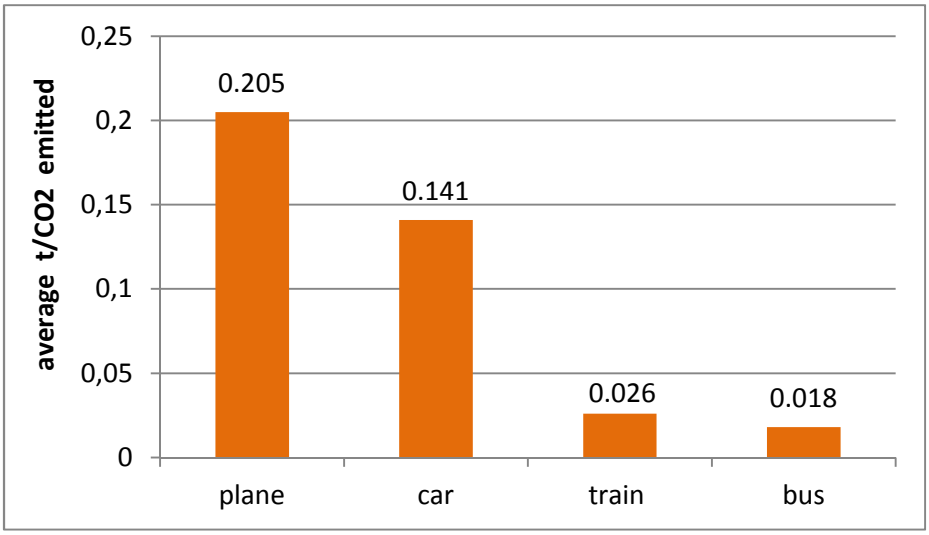
The main method adopted for the computation of CO_2 emissions is the first: information on travel distance expressed in Km provided by the tourist (107 tourists selected it out of 117). The average km computed by the tourists for the round trip from house to Abano or Montegrotto Terme is 895.78 Km. The average km computed are subdivided considering the single transport method (Graph 4.11).

We tried to connect also the willingness to offset with the distance to understand if there is a connection. In order to adopt the Chi square equation the Kilometers of the round trip was divided into ranges of 300 Km (see Annex I). The result of the equation is 0.821 that means that there is complete independence between the willing to offset and the distance.



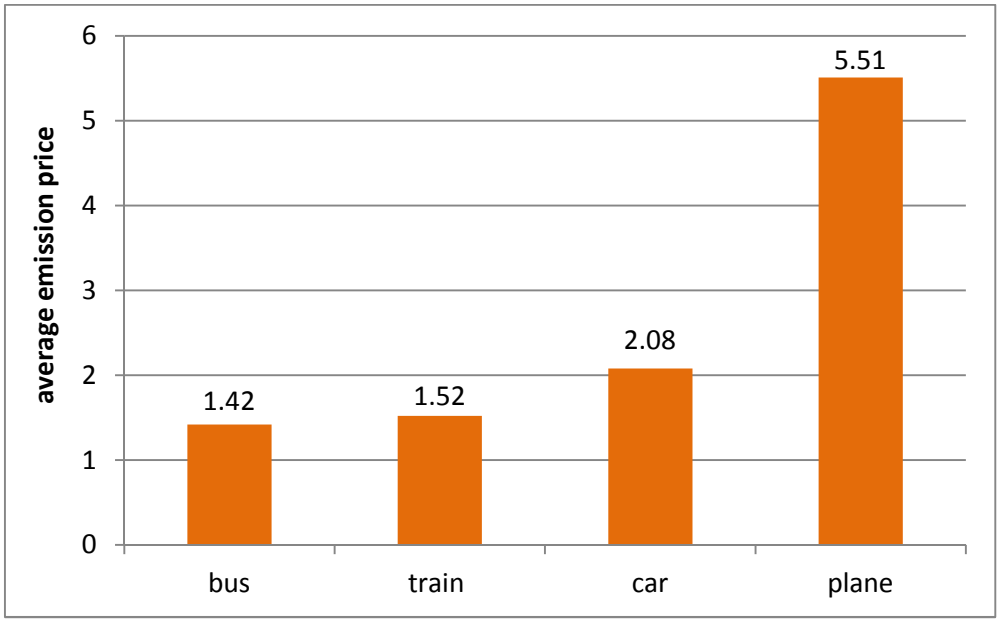
Graph 4.11 Average distance by method of transport

Then the CO_2 emissions are computed, the average value that emerges is 0.112 t/CO_2. This emission value consider all methods of transport adopted by the tourists. Individually the average emission values of CO_2 are reported in Graph 4.12.



Graph 4.12 CO2 emissions for each mean of transport

From the combination of CO_2 computed during the interviews and the price of one ton of carbon dioxide on the market the average offsetting price for one person emerges: it is 4.31€. It is particularly important, because CO_2 emissions are very different between each method of transport. Individual prices are reported in Graph 4.13.

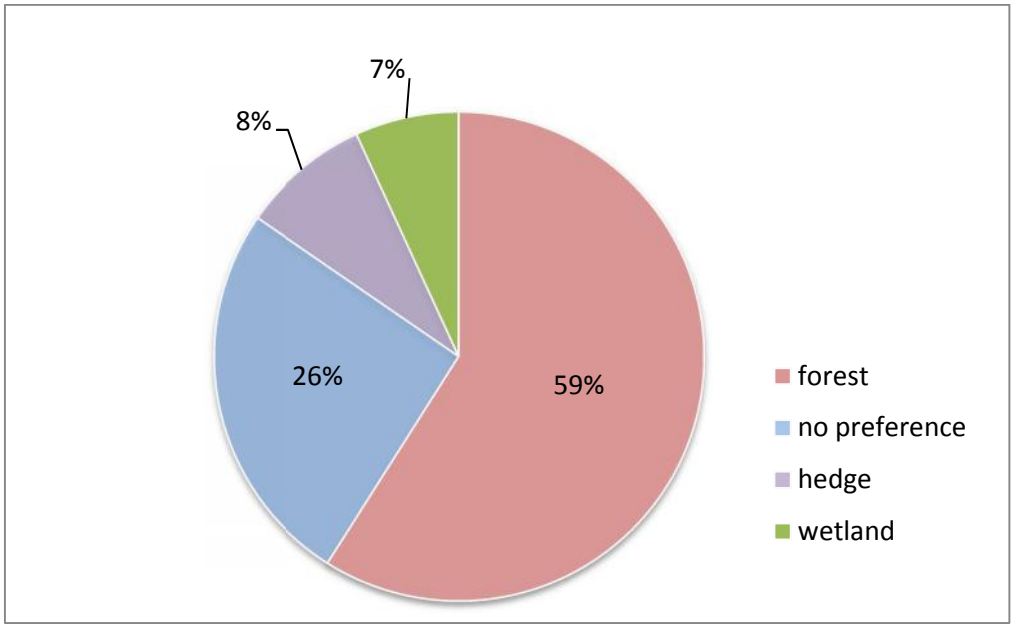


Graph 4.13 Average emission price for each mean of transport

4.2.2.2 Type of compensation and functions

Once the computation of the average emission price was done, the preference between different offsetting types was asked to the tourist. The answer had to be given selecting one out of four options: hedge, forest, wetland and no preference.

The forest was the most selected option, with 69 (forest 59%) choices, followed by no preferences, with 30 choices. Graph 4.14 presents all options.



Graph 4.14 Type of compensation selected by tourists

The last point of the questionnaire is to assign, the three functions considered the most important for the tourist (Table 3.7).

I have assigned to each value of the function different scores, in order to provide an understandable outcome and to highlight the differences between the function values. Value 1 has score 5; value 2 has score 3 and value 3 has score 1.

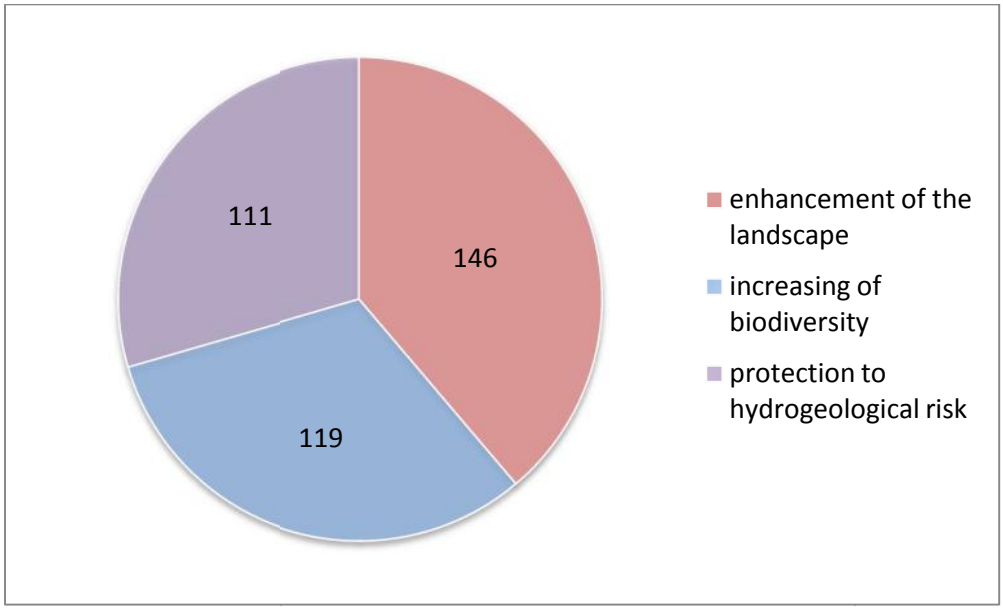
In absolute terms the enhancement of the landscape reaches the highest score (247 points), followed by the hydro-geological protection risk (213 points) and the last is the increase of biodiversity (186 points).

In the following Graphs and Tables I have reported only the two main offsetting types selected by the tourists, forest and no preferences. For the complete data see Annex II.

Forest is the offsetting type more selected and reaches also the highest score considering the three main functions associated to it. Enhancement of the landscape, increasing of biodiversity and the hydro-geological risk protection are the three main functions selected (Table **4.11**).

Offsetting type	Function	1	2	3	5	3	1	Sum
forest	enhancement of the landscape	18	16	8	90	48	8	**146**
	increasing of biodiversity	14	13	10	70	39	10	**119**
	protection to hydro-geological risk	15	10	6	75	30	6	**111**

Table 4.11 Functions associated to the forest offsetting type

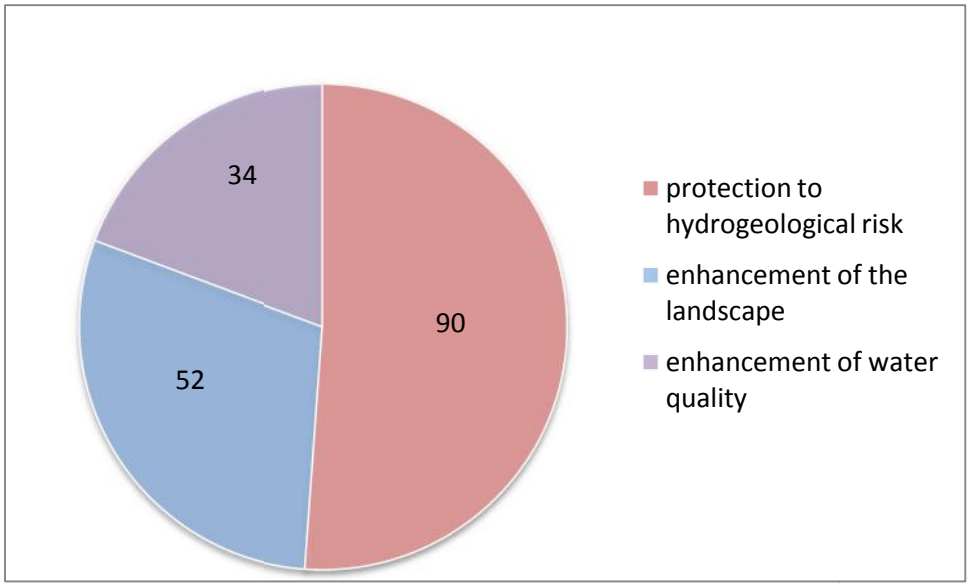


Graph 4.15 Main functions associated to the forest offsetting type

The second choice of the tourists ("no preferences") is un-expected. It seems that they do not have a defined idea of what they want to see in the Euganean Basin. Anyway the main function selected is the hydro-geological risk protection and the second is the enhancement of the landscape.

					Score			
Offsetting type	**Function**	**1**	**2**	**3**	**5**	**3**	**1**	**Sum**
No preferences	protection to hydro-geological risk	16	2	4	80	6	4	**90**
	enhancement of the landscape	6	6	4	30	18	4	**52**
	enhancement of water quality	2	6	6	10	18	6	**34**

Table 4.12 Functions associated to "no preferences" offsetting type



Graph 4.16 Here are reported the most functions selected with "no preferences" offsetting type

5 CONCLUSIONS

The aim of this thesis was to understand the possible willingness to pay of the Italian and foreign tourists that come to the Euganean Basin for their holidays. For this work the willingness to pay is referred to the offset of the CO_2 emissions produced during the round trip from the tourist's residence to Abano or Montegrotto. Money collected is thought to be transferred to a Green Fund.
From the interviews carried out emerges that 78% of the tourists that filled the questionnaire are very sensible to this environmental issues, and they have a certain willing to pay (wtp) to offset their emissions. We estimated an average emission quantity of 0.112 t/CO_2 and an average wtp of 4.31 €/person. If we infer these results to the total tourist arrivals in 2012 (615,829), the number of people who want to offset their emissions is 480,347., with a total wtp of 2,070,294 €. This is the potential amount that could be used to create a Green Fund to be used in offsetting projects.
Moreover, considering the type of projects that could be implemented, the forest is the most selected offsetting type (59% of the choices), followed by "no preferences" (26%). The tourists are the main GF sponsors and the offsetting projects should take care about their choices.
Finally, as far as the services that the compensation projects should provide, the most selected one is the enhancement of the landscape (247 points), followed by hydro-geological risk reduction (193 points) and by biodiversity protection (186 points). The main functions selected should also be taken into consideration.

About the data quality and the result reliability, the number of questionnaires obtained from the interviews and the statistics should be taken into consideration.
During the results it was assumed, and partly confirmed from the data analysis, that the age, the education, the country and the mean of transport affect the wtp. From the Chi square function a different answer emerged: three out of four characteristics considered in data analysis are not influencing the willingness to offset the emissions. Only the Chi square applied to the mean of transport has produced a significative result, that is 0.022 (threshold level of 0.1) confirming the dependence between the two variables.
The Chi square equation returns reliable values if the original data group numbers are higher than five; if they are lower it can provide not very correct estimations. So, in order to avoid any doubt about the reliability of the results in the statistical analysis and in the normal data analysis, higher amount of interviews should have been carried out. In addition it should be useful to collect data throughout the year; in this way changes in the flow of tourist related to their socio-demographic profiles could have been included in the analysis.

This thesis has anyway obtained interesting preliminary results that should be further verified and improved. Data show the level of awareness and the positive wtp that tourists have and the potential opportunities for compensation investments. It is also demonstrated that there is room for a win-win strategy based on the idea of greening the tourist offer and implementing C offsetting projects.

References

Azienda Turismo Padova Terme Euganee. (2012). *La Provincia - Arrivi - Presenze 2012* (pp. 1–25).

Bernstein, L., Bosch, P., Canziani, O., Zhenlin, C., Christ, R., Davidson, O., Hare, W., et al. (2007). *Climate Change 2007 : Synthesis report* (pp. 1–52).

Brotto, L., Cicarrese, L., Giulietti, V., Mori, P., Pettenella, D., Perugini, L., & Romano, R. (2010). *GLI ACCORDI VOLONTARI PER LA COMPENSAZIONE DELLA CO 2* (p. 238).

Cowell, R. (2000). Environmental Compensation and the Mediatin od Environmental Change: Making Capital out of Cardiff Bay. *Journal of Environmental Planning and Management*, 689–710. Retrieved from http://www.tandfonline.com/doi/citedby/10.1080/713676580#preview

Department of Energy and Climate Change and the Department for Environment Food and Rural Affairs. (2010). 2010 Guidelines to Defra / DECC ' s GHG Conversion Factors for Company Reporting : Methodology Paper for Emission Factors.

European Commission. (2000a). *MANAGING NATURA 2000 SITES the provisions of Article 6 of the "Habitats" Directive 92/43/EEC* (pp. 1–73). Retrieved from http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

European Commission. (2000b). *White paper on environmental liability* (pp. 1–30).

European Environmental Agency (EEA). (1996). Environmental taxes. Implementation and Environmental Effectiveness. *Environmental Issues Series*, *01*(1), 1–65.

European Union. (1985). COUNCIL DIRECTIVE of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment.

Masiero, M. (2010). *PROVINCIA DI PADOVA Dati Turistici dell ' Ambito Terme Colli Anno 2010* (pp. 1–94).

OECD. (1989). Recommendation of the Council concerning the Application of the Polluter-Pays Principle to Accidental Pollution. *Organization for Economic Co-operation and Development*. Retrieved from http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=38&InstrumentPID=305&Lang=en&Book=False

Peters-Stanley, M., Yin, D., Castillo, S., Gonzalez, G., & Goldstein, A. (2013). *Maneuvering the Mosaic, State of the Voluntary Carbon Markets 2013* (pp. 1–126).

Rajvanshi, A. (2005). 17 Mitigation and compensation in environmental assessment, (2000), 167–199. Retrieved from http://www.twoeam-eu.net/handbook/05.pdf

Regione Lombardia (struttura sistemi verdi integrati). (2012). Art. 43, comma 2 bis, l.r. 12/2005 e Fondo Aree Verdi. Retrieved from http://www.regione.lombardia.it/shared/ccurl/807/385/ART43_FAV_AGGIORNATOluglio_2012_per sito.pdf

Sinisi, L., Bartoccioni, A. C., Pranzo, S., Sini, V., Tuscano, J., Cammarata, V., Baccaro, G., et al. (2004). Le misure di mitigazione e di compensazione.

U.S. Environmental Protection Agency. (2002). Federal water pollution control act, 1–234.

UNFCCC. (1992). UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE UNITED NATIONS, 1–33.

UNFCCC. (1998). Kyoto Protocol to the United Nations Framework Convention on Climate Change.

Volpin, G. (2012). *La compensazione volontaria delle emissioni di CO 2 . Studio di fattbilità per la creazione di un Fondo Verde nel settore turistco termale di Padova*.

Webliography

http://ec.europa.eu/environment/nature/natura2000/

http://gcfund.net/home.html

http://it.wikipedia.org

http://unfccc.int/2860.php

http://water.epa.gov/type/wetlands/index.cfm

http://www.bafu.admin.ch/index.html?lang=it

http://www.cocit.org/cocit/mitigazioneambientale/mitigazioneambientale.htm

http://www.conad.it/conad/home/global/cooperative/nordiconad/impegno-sociale/Fondo-Verde.html

http://www.cooperazioneallosviluppo.esteri.it/pdgcs/italiano/speciali/Durban/Fondi.htm

http://www.corea.it/fondo_verde.htm

http://www.ecosystemmarketplace.com/

http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/index.html

http://www.european-charter.org/home/

http://www.ipcc.ch/

http://www.parcocollieuganei.com

http://www.parks.it

http://www.turismopadova.it

http://www.tuttitalia.it/veneto/56-abano-terme/statistiche/indici-demografici-struttura-popolazione/

http://www.zeroemission.eu/portal/news/topic/Clima/id/18589/Fondo-verde-per-il-clima-al-via-nominati-i-vertici

www.regione.veneto.it

http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/

Annexes

Annex I

- **Age-willing to offset**

	age	<25	25-35	35-65	>65	tot
offset	yes	2	2	65	48	117
	no	0	0	23	10	33
	tot	2	2	88	58	150

potential					
age	<25	25-35	35-65	>65	tot
yes	1,56	1,56	68,64	45,24	117
no	0,44	0,44	19,36	12,76	33
tot	2	2	88	58	**150**

Chi square: 0.428; no significance, variables are independent

- **Education-willing to offset**

	education	primary	secondary	high school	university	tot
offset	yes	3	13	57	44	117
	no	1	8	12	12	33
	tot	4	21	69	56	**150**

potential					
education	primary	secondary	high school	university	tot
yes	3,12	16,38	53,82	43,68	117
no	0,88	4,62	15,18	12,32	33
tot	4	21	69	56	**150**

Chi square: 0.255; no significance, variables are independent

- **Mean of transport-willing to offset**

	mean of transport	bus	camper	car	plane	train	tot
offset	yes	18	0	78	7	14	117
	no	4	3	22	1	3	33
	tot	22	3	100	8	17	**150**

potential						
mean of transport	bus	camper	car	plane	train	tot
yes	17,16	2,34	78	6,24	13,26	117
no	4,84	0,66	22	1,76	3,74	33
tot	22	3	100	8	17	**150**

Chi square: 0.022; significance, variables are dependent

- **Country-willing to offset**

	country	Austria	France	Germany	Italy	Lie	Slovakia	CH	tot
offset	yes	7	3	29	69	1	0	8	117
	no	4	2	7	17	0	1	2	33
	tot	11	5	36	86	1	1	10	**150**

potential								
country	Austria	France	Germany	Italy	Lie	Slovakia	CH	tot
yes	8,58	3,9	28,08	67,08	0,78	0,78	7,8	117
no	2,42	1,1	7,92	18,92	0,22	0,22	2,2	33
tot	11	5	36	86	1	1	10	**150**

Chi square: 0.369; no significance, variables are independent

- **distance-willing to offset**

	round trip	0-299	300-599	600-899	900-1199	1200-1499	1500-1799	1800-2099	2100-2499	>2500	tot
offset	yes	19	22	22	21	15	6	6	4	2	117
	no	5	7	5	5	5	1	3	0	2	33
	tot	24	29	27	26	20	7	9	4	4	150

potential										
round trip	0-299	300-599	600-899	900-1199	1200-1499	1500-1799	1800-2099	2100-2499	>2500	tot
yes	18,72	22,62	21,06	20,28	15,6	5,46	7,02	3,12	3,12	117
no	5,28	6,38	5,94	5,72	4,4	1,54	1,98	0,88	0,88	33
tot	24	29	27	26	20	7	9	4	4	150

Chi square: 0.821; no significance, variables are independent

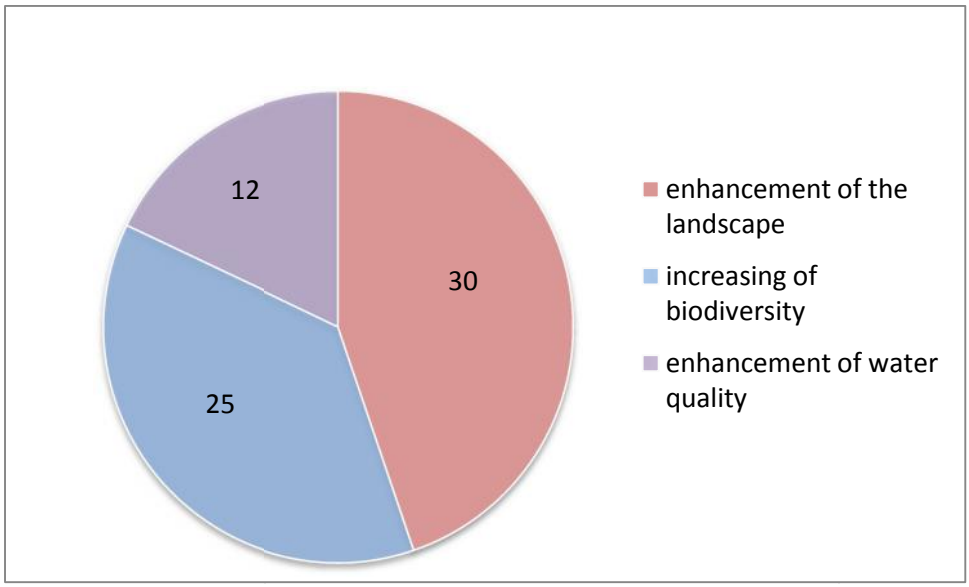
Annex II

offsetting type	function	1	2	3	5	3	1	Sum
forest	enhancement of the landscape	18	16	8	90	48	8	**146**
	increasing of biodiversity	14	13	10	70	39	10	**119**
	protection to hydro-geological risk	15	10	6	75	30	6	**111**
	enhancement of water quality	7	15	11	35	45	11	**91**
	limitation of noise of vehicles on roads	5	8	7	25	24	7	**56**
	increasing to available to foresty biomass for energy purposes	6	3	7	30	9	7	**46**
	shading of cycle and pedestrian paths	2	4	11	10	12	11	**33**
	recreational use	1	0	9	5	0	9	**14**

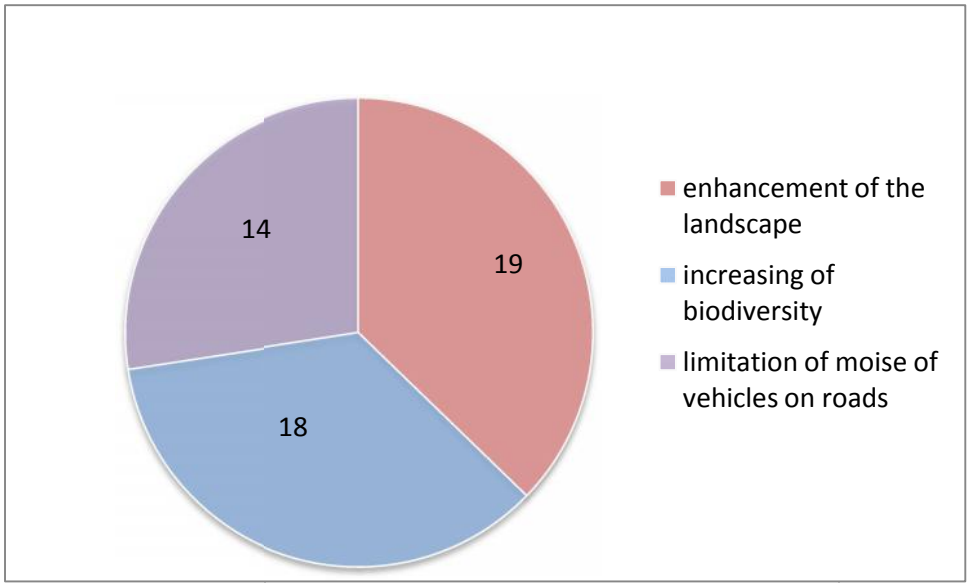
offsetting type	function	1	2	3	5	3	1	Sum
no preferences	enhancement of the landscape	6	6	4	30	18	4	**52**
	increasing of biodiversity	2	3	5	10	9	5	**24**
	enhancement of water quality	2	6	6	10	18	6	**34**
	protection to hydro-geological risk	16	2	4	80	6	4	**90**
	increasing to available to foresty biomass for energy purposes	0	7	1	0	21	1	**22**
	limitation of noise of vehicles on roads	2	4	3	10	12	3	**25**
	shading of cycle and pedestrian paths	1	2	4	5	6	4	**15**
	recreational use	1	0	2	5	0	2	**7**

offsetting type	function	1	2	3	5	3	1	Sum
hedge	enhancement of the landscape	4	3	1	20	9	1	**30**
	increasing of biodiversity	3	3	1	15	9	1	**25**
	enhancement of water quality	0	3	3	0	9	3	**12**
	protection to hydro-geological risk	1	1	0	5	3	0	**8**

increasing to available to foresty biomass for energy purposes	0	0	3	0	0	3	**3**
limitation of noise of vehicles on roads	1	0	0	5	0	0	**5**
shading of cycle and pedestrian paths	1	0	0	5	0	0	**5**
recreational use	0	0	2	0	0	2	**2**



offsetting type	**function**	**1**	**2**	**3**	**5**	**3**	**1**	**Sum**
wetland	enhancement of the landscape	3	1	1	15	3	1	**19**
	increasing of biodiversity	2	2	2	10	6	2	**18**
	enhancement of water quality	1	1	0	5	3	0	**8**
	protection to hydro-geological risk	0	1	1	0	3	1	**4**
	increasing to available to foresty biomass for energy purposes	0	0	0	0	0	0	**0**
	limitation of noise of vehicles on roads	2	1	1	10	3	1	**14**
	shading of cycle and pedestrian paths	0	2	0	0	6	0	**6**
	recreational use	0	0	1	0	0	1	**1**


14
19
18
enhancement of the landscape
increasing of biodiversity
limitation of moise of vehicles on roads

Annex III

Università degli studi di Padova
Facoltà di agraria
Dipartimento territorio e sistemi agroforestali
TESAF

Questionario numero .... Data: .....\.....\2011

Survey on the disponibility of tourists to offset the direct emission of carbon dioxide travel

Introduction:

Recently in environmental policy and in public opinion is increasing the feeling to reduce or offset emission of greenhouse gases, particularly carbon dioxide emission (CO2).

The increase of this gas in the atmosphere will increase the greenhouse effect, contributing to the rise of the medium planet temperature.

It is estimated that the atmospheric concentration of CO2 has increased by 35% since the industrial revolution and 20% by 1958. The main cause of CO2 increase can be put down to the use of fossil fuels, that contribute more than half of emission, while the second cause is deforestation.

Thanks to photosynthesis, trees have the ability to absorb and store CO2 into wood that is composed of 50% carbon. The main strategies for the control of CO2 emission, are not only based on reducing emissions, but also on its absorption, by reducing deforestation and by planting new forest.

During a trip, for example by car, we emit a certain amount of CO2 that pollutes our planet. To avoid this damage in recent years were born, in parallel to the regulated market of the Kyoto Protocol, voluntary initiatives for offsetting greenhouse gas emissions. We can for example estimate the emissions associated with the journey and give a certain amount of money to an entity, that after is invested in by funds in environmental projects with the main purpose to store the CO2.

In Veneto the public administration is engaged in projects to reduce and to offset emission and the private sector can contribute in the same way. We are collecting data to improve the environmental quality of Veneto.

Target:

The survey has the main purpose to know how (to find out) the interviewed would be ready to spend on a voluntary expense, and in which types of projects, to compensate the emission of CO2 emitted during the journey to the resort.

Are you interested in completing the questionnaire? (time required 5 minutes)

1

Yes	❒
No	❒

General interviewed's information:

Country of origin:	.....	
Gender:	Maschio	❒
	Femmina	❒
Age:	<25	❒
	25-35	❒
	35-65	❒
	>65	❒
Type of accommodation:	Hotel	❒
	Camping	❒
	Farm holiday	❒
Accommodation class:	★	❒
	★★	❒
	★★★	❒
	★★★★	❒
	★★★★★	❒
Qualification:	Elementari - primary	❒
	Medie - secondary	❒
	Superiori - highschool	❒
	Università - university	❒

Calculation of emissions:

Define your transport for this travel:

❒ **Motorbike:**

Engine displacement:

❒ < 125cc	❒ 125cc - 500cc	❒ >500cc

❒ **Car:**

Engine power:

❒ Diesel car	❒ Petrol car	❒ Gas car

Engine displacement:

❒ < 1400cc	❒ 1400cc - 2000cc	❒ > 2000cc

❒ **Camper:**

Engine power:

❒ Diesel camper	❒ Petrol camper

Weight:

❒ < 1.3ton	❒ 1.3 ton -1.7 ton	❒ > 1.7 ton

❒ **Plane:**

❒ Domestic flight	❒ Medium-distance flight (500km)	❒ Long distance flight (>1000km)

❒ **Train:**

❒ National train	❒ International train

❒ **Tourist bus:**

Calculation of travel distance:

Define the distance of travel (round trip) using one of the following methods proposed:

❒ **Method 1** - distance in kilometers

the respondent has made a journey of _____ km (round trip)

❒ **Method 2** - distance in kilometers by country of origin

Country	Situation	City	By train	By car
Italy	North	Milan	225 km	260 km
		Udine	155 km	180 km
		Trieste	220 km	205 km
		Tourin	370 km	390 km
	Middle	Rome	450 km	495 km
		Florence	210 km	225 km
		Bologna	120 km	108 km
	South	Naple	650 km	685 km
		Bari	750 km	770 km
		Catanzaro	1120 km	1070 km
		Palermo	1500 km	1390 km
Germany	North	Bremen	1220 km	1240 km
		Hannover	1100 km	1120 km
		Berlin	990 km	1110 km
	Middle	Frankfurt	900 km	910 km
	South	Munich	440 km	525 km
		Struttgart	760 km	685 km
France	North	Lille	1020 km	1250 km
		Paris	800 km	1090 km
		Rennes	1150 km	1395 km
	Middle	Bourges	640 km	932 km
	South	Marsiglia	700 km	755 km
		Toulose	900 km	1115 km
		Bordeaux	1100 km	1255 km
		Lyon	390 km	690 km
holland		Amsterdam	1230 km	1320 km
UK	North	Glasgow	1850 km	2185 km
	South	London	1270 km	1521 km

Country	Situation	City	By train	By car
Austria	Est	Innsbruck	370 km	370 km
	Middle	Villach	240 km	295 km
	West	Wien	550 km	660 km
Switzerland		Zurich	450 km	520 km
		Losanna	630 km	565 km
Belgium		Bruxelles	1030 km	1155 km

❒ **Method 3** - Calculating by computer-online (distance between airports only):

According to computer on-line distance between the airport of departure (_____) the airport of arrival (_____)is equal to _____ km (round trip)

Calculation of direct emission of CO2 during the trip

According to the calculator of CO2 emissions about the type of transportation (defined in Section 2.1) and according to the distance of travel (as defined in section 2.1) the total CO2 emission during the journey is equal to ____kg and the voluntary compensation amounting to € ___.

Defining amount and type of compensation:

Amount of compensation:

Do you want offset just for yourself or for all components of the trip? (question only applies to bus - train - plane)

❒	Just for me
❒	For all the components components: ..... Total price = individual price • components = ...€

Are you willing to pay …....€ to offset the emission of the trip?

Yes	❒
No	❒

If you answered "no" ,how much is willing to pay to offset the emission of the trip?

Type of compensation:

Define among the following types of compensation which is in your own opinion most suitable to offset the carbon dioxide in the local area (just one choice):

❒	Hedge
❒	Hood
❒	Wetland
❒	No preference

Willingness to pay:

Define the three functions which must have priority action for compensation. Assign the number 1 to the most important value, the second most important value 2 and 3 to third most important value.

FUNCTIONS	CLASSIFICATIONS
Enhancement of the landscape	.....
Increasing of biodiversity	.....
Enhancement of water quality	.....
Protection to hydrogeological risk	.....
Increasing to available to woody biomass for energy purposes	.....
Limitation of noise of vehicles on roads	.....
Shading of cycle and pedestrian paths	.....
Recreational use	.....

Thank you for your valuable contribution!

Ringraziamenti:

Un doveroso ringraziamento va alle dipendenti dell'Agenzia di Promozione Turistica di Abano e Montegrotto Terme per la loro assoluta disponibilità e competenza durante le ore di interviste passate negli uffici turistici,

Un grazie ai miei genitori per il supporto che non mi hanno mai fatto mancare da almeno vent'anni a questa parte. Un caloroso grazie anche a tutti i componenti della mia famiglia a Debora, nonni e zii

Ringrazio Gianluca Volpin per la sua indispensabile assistenza e la collaborazione tecnica necessaria per il design e la creazione dei questionari di questa tesi.

Grazie a Valentina per il suo incondizionato sostegno, che ogni singolo giorno, da due anni a questa parte mi da, in particolar modo in questi ultimi mesi di frenetico lavoro tra la conclusione degli esami e la stesura della tesi. Un sostegno che per me è stato essenziale e insostituibile.
Nella speranza che questo lavoro di tesi non sia stato solo la conclusione di un percorso di studi ma, l'inizio di qualcosa di più grande che parta perlomeno dal numero due.

E infine ringrazio tutte quelle persone che sono transitate nella mia vita in questi anni di università e che ora non ne fanno più parte, perché è anche grazie a loro e agli errori commessi che oggi sono riuscito a concludere questo percorso di studi.