

How do European cities ensure sustainable development in their area?



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Executive Summary

The paper is centered on the issue of sustainable development and how cities approach in their urban planning the need to diminish the environmental impact of their economic activities and at the same time create quality of life for their citizens. The focus is specifically on linking economic growth with sustainable patterns in urban areas by proving that economy and sustainability are notions which manage to exist simultaneously at urban level. The work is structured in three main chapters aiming to present a comprehensive picture by first defining existing problems, then cities' strategies and finally giving additional evidence with concrete examples from case studies in the field.

Chapter one is an introduction to the issue of sustainable development, its definition and different elements. The need for analysing sustainability at a city scale is explained with support from academic sources for the impact of urban areas on environment. Thirdly, the two contradictory notions of economic development and sustainability in the paper are presented to the reader with their definitions and the angles from which this work will look at them: 'green economy' and eco-innovation.

Chapter two is based entirely on results of the survey 'Cities investing in sustainable strategies' conducted by the author among the members of the Economic Development Forum of the urban European network EUROCITIES. The chapter is further divided into two sections, the first acquainting the reader with the results, the second one presenting their analysis. The aim is to distinguish the milestones of cities' strategies and approach concerning sustainable development.

Chapter three is a collection of examples from three major European cities (Bergen, Vienna and Malaga) of concrete projects they conduct in relation to 'greening' the local economy and eco-innovation. The projects stress on cities' involvement in the sustainable future of the European continent and their ability to create innovative solutions to environmental challenges.

The paper ends with the most important findings from the issues presented. For instance, the fact that there are no 'one-size-fits-all' solutions for cities aiming at combining economic growth and sustainability- strategies need to be tailored to the local and national context. The conclusion includes also thoughts and evaluation from the author on the significance of the continuation of sustainable development in European urban areas and the involvement of citizens as a crucial factor.

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1. INTRODUCTION

“Policies are a bit like leaves...they grow and they fall downwards. And it's only when they reach the ground that we have to deal with them practically. This is where you come in.”

Janez Potocnik -EU Commissioner for Environment

These are the words of the European Commissioner for Environment when addressing cities at a seminar on sustainable urban development in Brussels (*Janez Potocnik, 2010*).The quote from Mr Potocnik is a challenging introduction to this final paper, which is both an overview on how European cities are dealing with environmental challenges, but also an evaluation of how we, as human beings, regard the topic and show our commitment. The natural resources with which we are surrounded sooner or later will be on extinction and the Earth will face irreversible changes. It is the responsibility of all to protect it for future generations, as well as preserve it for the sake of a better quality of life here and now. There are too many concerns people tend to ignore in their everyday life, but which the policy makers at local, national and supranational level should not leave aside. Concepts such as sustainable development, climate change, greenhouse gas emissions and ozone depletion have long been subject of debates and inspirations for developing strategies. The problem, however, is of the ability of governments, both local and national, to take action, to escape from the abstract and think in terms of concrete feasible measures applicable at the lowest possible level- starting from the local one.

This paper will examine the possibility of implementing sustainable strategies which bring at the same time economic benefits, and further explain the relationship between the degradation of the environment and its effects on the economy in European cities. It is an evaluation of the manners in which cities approach the problem of sustainable planning through analysis of a survey conducted among major European urban areas. The paper will explain why cities concentrate on some particular fields (transport, energy efficiency and waste management) and not on others and what is their added value for the economy in the area. The challenges which cities face are explored in order to determine which obstacles they need to combat for integrating a sustainable approach. Investigating financial means is an essential part of the last point, as the availability of capital defines the success of the strategies. Naturally, every European city has its own approach; however, certain patterns can be distinguished across Europe. These common characteristics can serve as basis for better integrated environmental sustainable management at the various governance layers. Finally, projects of eco-innovation together with greening the economy will be presented to support the statement that European cities are one of the leaders of urban environmental management. Moreover, they are also

determined to remain in the lead in the field by proving that sustainability is not simply used as ‘green rhetoric for continuing economic growth as usual’ (*O’Neill, Holland & Light, 2008, p. 184*).

1.1 Sustainable development

In order to prove that sustainable development is an important element in current politics and governance, it is first essential to clarify the term. The most common definition of sustainable development can be found in the Brundtland report: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (*United Nations General Assembly, 1987, p.24*). Sustainable development incorporates in itself issues connected not only with environmental degradation, but which also engage economic and social aspects. Nevertheless, a crucial element of the existence of the term is the preservation of the surrounding environment. The definition gives a broad way of interpretation, however, it outlines one important characteristic- it stresses the necessity of harmonizing every sphere of human progress with the need to protect the available resources. It includes the opportunity for governments at all levels to choose their own way to implement it, measure it in their own context of living so that better results can be achieved.

Going back to the Brundtland report, it can be pointed out that it supports a very crucial idea. Though written as early as 1987 when the issue of sustainability was making its way in the policy area, it argues that local authorities are extremely important in engaging people in strategies for sustainable development. It is, after all, the local level that is mostly reachable to citizens, where they meet the majority of their everyday problems and where they can be easily involved in initiatives: “People’s main environmental concerns are related to their local day-to-day living conditions, such as state of their water, air pollution and the perceived threats from chemicals” (*European Environmental Agency [EEA] , 2005, p. 30*). If authorities manage to ensure sustainable development at the local level, it will certainly lead to change of the state of environment in the country. The options for taking such initiatives are numerous, as well as the human abilities to realise them. From being a purely theoretical term, sustainable development has grown into something bigger, leaving governments, organisations, companies to create their own strategies in the area. Most importantly, these initiatives guide the way for inventing original solutions which keep up the level of protection of the environment high and which show that being involved in sustainable development is one of the greatest signs of human progress.

1.2. European cities- why should analysis be held at local level?

“As recently as 1975, just over one third of the world’s people lived in urban areas. By 2025, the proportion will have risen to almost two-thirds” (*The World Resource Institute, 1996, p.1*)

As stated also by *Eurostat (2008)*, “in the EU-27, 74 per cent of the total population lives in cities and towns” (*p.1*), making it absolutely compulsory to take into account the urban environment, as well as the phenomena that will shape the life of the future generations in cities. The centre of each country’s power lies in the urban dimension and the quality of life it offers to its citizens. If cities as major pollutants do not consider seriously the danger they represent to the environment, the global strategy of fighting climate change and restricting greenhouse emissions is not viable. Then, if cities in most countries try to accomplish certain standards, the outcomes would be much more visible from a global perspective. Therefore, it is extremely important to start at the local level, where citizens can also be directly involved and where, more than anywhere else clear results can be achieved.

Another reason to look at cities as the basic unit in which sustainable development should be realised is because cities are the drivers of economic growth in the world. They are the “centers of population and human activities” and “they provide, on average, greater social and economic benefits than do rural areas” (*World Resources, 1996, p.10*). However, cities are also the main polluters in countries, generating enormous amounts of waste and harmful emissions. There is no doubt, for example, that London produces more greenhouse emissions than rural England. Moreover, “as income increases, urban households and cities as a whole consume far more resources, such as energy, water, and building materials- and generate far more of certain types of wastes”(World Resources, 1996, p.18.). Studies show that European cities and regions have significantly high GDP numbers. According to a research, conducted by Eurostat (2009) on regional GDP in Europe “the regions with the highest per inhabitant GDP are in southern Germany, the south of the UK, northern Italy and Belgium, Luxembourg, the Netherlands, Austria, Ireland and Scandinavia. The capital regions of Madrid, Paris and Praha also fall into this category” (*p.50*). These regions represent a big percentage of the European Union and key urban areas are situated in them. The wealthy European cities produce waste that has to be managed, air pollution that has to be reduced and greenhouse emissions that endanger the life of the citizens living in them. As it was mentioned earlier in the paper, sustainable development is related to other aspects, that is why the solutions to these problems have to be linked with economic or social factors. If environmental protection is not connected with economic progress, for example, unemployment and crisis will entail serious consequences in themselves leading to appearance of violence and crimes.

Investigating the need for sustainable solutions at urban level, it becomes clear that even bigger concerns rise with the fact that cities expand in the course of time to greater metropolitan areas which have further detrimental effects on the environment. The physical expansion of the urban areas is often referred to as ‘urban sprawl’ (*European Environmental Agency [EEA], 2006, p.6*). Population growth leads to an increased need for housing and the most logical consequence is to spread to the outskirts of the city. More compact cities produce less waste and greenhouse emissions than expanded urban areas. Urban sprawl, most importantly, is of major concern to local government officials who have to develop strategies to ‘redefine’ the boundaries of the city and manage with the increase in pollution and invest in sustainable solutions. Better transport linkages will be needed, and moreover, they have to be environmentally friendly and produce high return on investment economically. Assuming that all major cities in Europe expand with time into bigger metropolitan areas, the map of the continent will be significantly reshaped. A question rises if urban sprawl is a phenomenon that appears but to which local governments cannot provide remedy and which can not be stopped unless more serious measures are undertaken. This paper will investigate possible answers to the issue raised by analysing some of the actions initiated by cities.

In relation to the growing danger of urban sprawl, urban areas are significant natural resource ‘spenders’. An environmental term exists that describes how much nature people exploit: ‘ecological footprint’. According to *World Wildlife Fund UK (2002)*, “the footprint expresses the land area that is required to feed, provide resources, produce energy, assimilate waste, and to re-absorb its CO₂ output from fossil fuels through photosynthesis” (p.7). Imagine cities as living organisms or rather ‘ecosystems’ that produce and consume, and as such utilise natural resources. Then the ecological footprint is the evaluation of their spending and a distressing figure for the pace with which cities waste natural treasures. For example, London’s ecological footprint is measured to be ‘120 times the area of the city itself’ (*Urban Ecological Footprints, para 1*). Keeping in mind that the infrastructure in cities is built for the long-term and influences the allocation of resources, it becomes clear how important their stance in recognizing opportunities to both reduce ecological footprint and urban sprawl is (*Footprint for cities, para 5*).

1.3. Important notions

The central problem of this research is how cities ensure progress and development and still sustain all available resources and manage to preserve nature. Some people consider economic development and sustainability two contradictory notions, as the economy would always be more interested in the market value and optimising profits, rather than in increasing environmental 'friendliness'. These specialists can be referred to as 'deep ecology' writers. On the other extreme are those who believe in the 'abundance' of nature and the ability of mankind to find innovative solutions to the appearing environmental problems. (*Marina van Ceenhuizen & Peter Nijkamp, 1995*). The two views are quite opposite in their beliefs, however, one fact is known with certainty- people cannot afford to ignore the dangerous consequences of human progress on the environment. The need for the combination of the two models- the economic and sustainable one, rises as a must. As Jacobs (1991) argues "because current patterns of economic growth are environmentally damaging, it does not follow that the solution to environmental problems is no growth" (p.42). The author suggests that rather than not existing at all, current economic growth should change its 'content'. It should incorporate in itself models that are not only harmless environmentally, but which are innovative and strive towards technological and social change.

As another famous report argues, "The relationship between economic growth and development and CO2 emissions growth is not immutable. There are examples where changes in energy technologies, the structure of economies and the patterns of demand have reduced the responsiveness of emissions to income growth" (*Stern, 2005, p.169*). This statement proves that certain changes in the economic approach can lead to increased sustainability. European cities have the resources and the power to encourage different economic and sustainable patterns in citizens, as well as the professional expertise to develop innovative approaches. Combining economic growth with sustainability is an area, which urban areas are still exploring. However, uniting the two notions is of great importance to the quality of life, as well as its preservation for future generations.

For the purpose of this report two notions need to be clarified as the research tries to find out their implementation in cities and to what extent they are present in the agenda of European local governments: 'green economy' and 'eco-innovation'. For the first notion, green economy, the definition from the United Nations Environmental Programme will be used: "greening the economy refers to the process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using less natural resources, creating less waste and reducing social disparities" (*About*

Green Economy Initiative, para 2). From this explanation, it becomes clear that the green economy represents economic growth with a sustainable pattern. In the context of the European urban environment, it concerns the preservation of the competitive position of the city, centering its economy on industry and service and making its citizens feel that they live in a safe, clean and environmentally friendly surrounding.

The second notion is eco-innovation. Economic progress is often related to technological development. Technology not only creates ways to improve existing models and lifestyles, but is also a driver towards new approaches and changing current attitudes. James (1997) explains eco-innovation as “new products and services which provide customer and business value but significantly decrease environmental impacts”. Others consider that it is not necessary for a technology to be brand new in order to be used in an efficient and ‘greener’ way. Therefore, eco-innovation is also using existing structures in an innovative way. As long as an invention changes usual patterns and strives towards better quality of life and environmental protection, it can be regarded as eco-innovation. For the purpose of this report, the two views will be used when describing the approach of cities.

Nowadays, it is not enough for a city to call itself sustainable and green, rather, it has to prove its advantages and compete with others in the field. The beginning of campaigns such as the *European Green Capital Award* is an evidence of the growing interest of placing sustainability as a special feature of a city. The importance of going deeper into the aspects of green economy and eco-innovation is obvious- they include in themselves the primary idea of sustainability as outlined in the Brundtland report and are a hallmark for the advance of the city and its engagement in issues concerning general human value. In this paper, the processes that determine the current state of the urban environment will be seen in their complexity. It is easy to claim that cities, as major pollutants and resource spenders, have the responsibility of harming the environment. However, cities as centres of human activities serve primarily the interests of citizens, therefore unhelpful ‘dualisms’ should be avoided (*Marcotullio & McGranahan, 2007, p. 276*). What is meant is that cities should not be at the same time blamed for the worsened state of the surrounding nature and regarded as unable to change their patterns of growth. Especially as urban areas have the possibilities and economic resources of making ideas come true, of developing and implementing effective sustainable measures so that the culturally rich and geographically various inheritances from the European continent can be preserved in time.

2. CITIES' SUSTAINABLE STRATEGIES

2.1 Introduction

This chapter includes presentation of the results and analysis of the survey 'Cities investing in sustainable strategies', which was conducted among the members of the Economic Development Forum of EUROCITIES in March and April 2010. As mentioned in the introduction to this paper, the aim was to identify main areas of concentration of efforts on sustainable development, as well as obstacles cities encounter along the way. It analyses financial aspects of investing in green economy and eco-innovation, which are an important part in city planning and attitude. The survey supports with evidence some of the processes described in the introduction of the paper and its evaluation tries to find explanation for the common patterns occurring among major European cities. The survey targeted at signs for active or insufficient cities' involvement and managed to create a coherent picture with the information coming from different parts of the European continent. It should be noted that some cities which completed the survey are not from European member state countries and present another interesting angle of looking into the subject. Certain variations of attitudes were marked; as well as useful conclusions were drawn for the missing elements of current strategies. Cities also shared interesting suggestions for addressing those gaps. The hopes of cities for improvements were expressed with regards to finding possible opportunities to counter problems and challenges. The analysis shed some light on the processes presented in the answers of the survey based on support from other sources, namely, professional opinion, books and articles.

2. 2. Description of results

2.2.1 Methodology

The survey was conducted among European cities with more than 250,000 inhabitants. Twenty cities participated, giving valuable results and sharing their experience on the topic. Namely, the cities which took part were: Bratislava, Brno, Dortmund, Düsseldorf, Edinburgh, Gijon, Helsinki, Istanbul, Liverpool, Malmö, Netwerkstad Twente, Nottingham, Novi Sad, Oslo, Poznan, Prague, Preston, Rotterdam, The Hague and Vienna. They presented different perspectives as the answers originated from all parts of the European continent.

The survey was divided into four main sections. The first one included general information about the city participating in the investigation. The second part consisted of questions directed at understanding the general sustainable approach of cities, with some special attention to greening the economy and eco-innovation. The third section concerned the financial mechanisms cities use and in the last part cities were encouraged to share opinion of what they would change in their current sustainable strategy if they had the opportunity to do so.

Some of the questions permitted more than one response, which is reflected in the percentage representation. This is why, for a certain number of answers the total of all the percentages amounts to more than 100 %. In these cases, each percentage shows how many cities choose one particular answer. The survey (Appendix 1), as well as graphic charts with the answers (Appendix 2), can be found after the references of this paper.

2.2.2 Sustainable approach

The majority of the cities (55 %), which participated in the survey, have population between 250,000 and 500,000, which can define them as being medium-sized. Thirty per cent have population between 500,000 and 750,000 and the rest (15%) have more than one million inhabitants. The level of urban sprawl, which is of particular interest for environmental issues, can be stated to be between 5-10 % for most of the 20 European cities (47.1 %), confirming its recognition by the European Environmental Agency as ‘the ignored challenge’ (EEA, 2006).

The areas on which the cities, participating in the survey concentrate most of their efforts on sustainable issues were determined as: public transport (75 %), energy efficiency (60 %) and waste management (50 %). Water management, green infrastructure and air quality have approximately the same level of percentage (*see the relevant chart in appendix 2*) , ranking them on equal terms in the hierarchy of importance for environmental management. Other areas of particular interest were pointed out as noise reduction, prevention of urban sprawl and climate change.

When asked why they concentrate exactly on these particular areas of environmental management the cities stressed on the following issues. Improving public transport system leads to less traffic, therefore, less greenhouse emissions, air pollution, traffic accidents and noise. It is the main way in which urban sprawl can be reduced, as good transport linkages ensure more compact city structure. Public transport also provides more employment opportunities and attracts visitors to the city. Energy efficiency coming from fossil fuels in modern cities can be replaced with biogas, which is connected mostly with utilising efficiently waste management mechanisms. With introducing energy efficiency measures, the cities generate less demand for energy and this in turn produces less greenhouse gas

emissions. Green infrastructure was pointed out as the basis for biodiversity and increasing the quality of life of the citizens. Cities often explore their geographical situation, when for example, making use of water management and creating alternative energy. Those situated near the sea or close to big rivers have the advantage to use the power of water. Some cities e.g. The Hague, Vienna, have signed charters and drawn detailed strategies for greenhouse reductions and CO₂ neutrality which serve as additional drivers for better sustainable management of resources and analysis of opportunities. The Hague has signed, for example, the EUROCITIES Green Digital charter and the Covenant of Mayors. The Green Digital Charter is developed by EUROCITIES as part of the Green Shift Europe Initiative. By signing the Green Digital Charter, mayors of European cities commit themselves to “reducing emissions through Information and Communication Technologies” (*EUROCITIES, 2009*). What is meant is that the cities which signed will identify opportunities to share expertise, create partnerships and develop new technologies to serve sustainability goals. The Covenant of Mayors, on the other side, is a European Commission’s lead initiative that aims at reduction of the CO₂ emissions by all the local authorities which signed with 20 % by 2020 (*Covenant of Mayors, 2009*). Vienna has developed the Vienna Climate Protection Programme that sets around 385 individual measures in this field of action together with reduction of emissions per capita to 21 % as compared with 1990 by the year 2020.

On the question of what ‘eco-innovation’ means for their city, the majority (47.4 %) pointed out that it concerns using known technology in innovative ways of city planning. Some cities also invest in creating new technological advances (26.3 %) and the rest are conducting research for sustainable solutions. The examples given for ‘eco-innovation’ projects were various. The city of Vienna presented the opening of Vienna Centre for Research and Development (R&D) for companies situated in the district as a step forward to connecting research firms and the city. Oslo, for example, provides eco-certification for all their municipal services. Gijon shared an interesting project for creating a ‘living lab’- electric cars will be used in real environment. It represents a public-private-partnership (PPP) among private companies, banks, R&D centres and the municipality of Gijon. Poznan recently purchased new city buses and trams with eco-engines that are based on hybrid system (using diesel-fueled engines with electric motors).

The majority of cities (63.2 %), when asked how they encourage small and medium enterprises (SMEs) to be ‘greener’, explained that they involve them in specific projects, as well as support green procurement (36.8 %). Cities also inform businesses on relevant ‘green’ EU legislation. However, as evident from the survey, quite high percentages of the cities surveyed do not have a specific strategy for SMEs (15.8 %).

Seventy-nine per cent of the questioned cities invest in green infrastructure in order to relate economic growth with sustainability. A high percentage (63 %) combines the two notions with the means of building efficiency. Identifying the economic risks and losses from environmental degradation is not highly used by cities. The least they invest in is construction of technological parks, for example for production of biogas.

After a first look at the answers to the questions of the survey, cities are optimistic about economic growth and sustainability as notions which can manage to live together in the urban environment. The issue will be analysed further in part 2.2 of this paper.

Concerning their sustainable strategy, cities pointed out that they involve mostly citizens (78.9%), big private companies (78.9 %) and SMEs (68.4 %) in its development. The national governments and research centers, such as universities, play also an important role. Local community voluntary organizations help out in some cases in the delivering of the plan that the city envisions. When asked how they involve their citizens, the majority of the urban areas shared that advertising is their main tool (52.6 %). By advertising should be understood communication through brochures, TV, radio, billboards and the Internet. Marked as 'other' answer were the mixture of all these tools and the raising awareness among citizens on project bases. They are followed by direct participation (15.8 %) and questionnaire conducting (10.5 %), which have approximately equal percentages.

One of the main challenges cities face, when designing and delivering their strategy is actually the fact that its results are not always visible in short-term perspective (38.9%). It is difficult in this way to convince citizens, for example, of its benefits or to encourage SMEs to invest more in 'greening'. The other major problem the urban environment has to deal with is insufficient financing. Almost thirty-nine per cent of the cities questioned share that they do not possess the financial means to realise their strategy. As other obstacles some cities consider that the local leadership does not support strongly enough the plans the city develops. The political will is a very important factor for the success of the measures adopted. There is also a controversy between the future urban planning of the city and the current business practices and citizen's lifestyle.

Looking into financial matters, an interesting result can be observed. The majority of cities (41.2 %) point out that sustainability is not very important for the planning of their budget. The economic crisis was partly blamed for the cutting off of the budget and some cities find it much more vital to invest in service delivery (to children and the elderly, for example). Thirty-five per cent shared that it is important and big percentage of their finances is allocated to it. Only four cities stated they dedicate huge amount of investment in their area for sustainable measures, integrating them in most of their

approaches (Helsinki, Gijon, , Novi Sad and Preston). Others do not have particular finances allocated for sustainability; it is rather part of the budget for the rest of the sectors, which at some point of the delivery considers sustainable development. These statements on the importance of sustainable development are supported by the percentage of the city financing dedicated to it. The majority (52.9 %) expressed that less than 15 per cent of their budget is dedicated to sustainable issues. Only one city spends more than 50 per cent of its budget on sustainable development: the city of Novi Sad. As regards to the nature of the funds used, 44.4 per cent of the questioned cities use local government financing, followed by national one (22. 2 %). Eleven per cent extensively uses EU funding programmes to ensure sustainable development. The EU financial mechanism predominantly utilised to finance sustainable projects is INTERREG, which falls under the Economic Regional Development Fund (ERDF). However, the majority of cities (72.2 %) share the view that they can provide funding for such projects without EU help.

The question on possible improvements in cities' current sustainable strategies encouraged more thorough evaluations. Although cities concentrate many of their efforts on improving the transport system, they still feel that it is not developed on the sustainable and infrastructure level they would like to have. They feel the need for modernisation and more advanced links with other cities in the area. An opinion was shared that sometimes the cities cannot manage alone with the challenges they face at urban level, but contact points and support should be made available at regional and national level. National governments could make, for example, in the tax system, the consumption of fossil fuels much more unfavourable. Initial capital is missing for creating closer partnerships with companies, universities and businesses for successful implementation of the vision of the city. Subsidies can be of use to persuade SMEs to invest more in environmentally 'friendly' solutions. Moreover, citizens are not always aware of the benefits of having a sustainable city. This is an issue which leads to their insufficient involvement and engagement in constructing the quality of life.

2.3 Analysis of the results

2.3.1 Overall strategy

Bigger cities have greater environmental problems and their management often must ensure good coordination of measures and comprehensive evaluation of all dangers. Most of the participating cities, being medium-sized have fairer advantages for the success of their strategies, however, from the results it can be concluded that they have problems of different nature. Though they are not as much spread into metropolitan areas as urban conglomerates with more than 1.000.000 inhabitants, the medium-sized cities have quite high levels of urban sprawl. This shows the irreversible changes, that take place on the continent and which make the notion of a 'city' comprising much more complicated structures than before. Medium-sized cities having alarmingly high level of urban sprawl is of major

concern for the future development of sustainable measures. This means that they will need to invest much more in improving transport connections, purchasing vehicles that do not produce high percentage of CO₂ and greenhouse emissions; which are comfortable and convenient for all citizens. It is also necessary to convince the population of the benefits of using this public transport system, as more car usage will be enormously damaging for the urban environment. Encouraging alternative ways of transportation is connected also with the overall leadership strategy of the city and investing in infrastructure, for example, in building bicycle lanes. In addition, areas such as waste management and energy efficiency change their significance with the expansion of the city and thus require more funding.

The three main fields of concentration of the efforts of cities, therefore, are predictable, keeping in mind the problems they have to face: transport, energy efficiency and waste management. First of all, the reason for developing better transport linkages is urban sprawl. As stated in the survey, good transportation improves the image of the city and increases the quality of life. Secondly, energy efficiency was pointed out as the next important field for concentration of efforts. An energy inefficient city produces bigger amounts of greenhouse emissions. Part of this pollution can be attributed to the usage of fossil, instead of alternative fuel, which moreover leads to scarcity of natural resources. Thirdly, if a European city manages to create efficiently working waste management, it can supply big percentage of the public energy needs (with production of biogas) and be much less dependent on external factors of supply. For example, the city of Madrid constructed the Valdemingomez Technological Park, which deals with separation and sorting of recyclable materials, biomethanisation, composting, energy recovery from process screenings and urban waste, energy recovery from biogas, etc. The benefits for Madrid are: “reduction of the consumption of raw materials by 190,000 tons a year, greenhouse gas emissions by 129,000t/year and energy savings in production processes that are equivalent to the annual electrical consumption of over 200,000 households” (*City Council of Madrid, 2010*). Due to the recovery of the recycle material the energy saving for the city was 1.000.000 MWh/year in 2007. In addition, the city uses biogas to supply the public transport system and its vehicles with environmentally friendlier fuel.

2.3.2 Towards a green economy

Relating economic growth with sustainability is not an easy task. When designing a strategy the city has to take into account a number of factors: its geographical situation, available natural resources, financial means, leadership position, orientation of the market- industry or service, etc. Identifying possibilities for action is crucial; for example, in a service based city it is easier to be ‘greener’ than in a city where industry plays an important role. Most of the cities questioned were positive about the correlation between the notions of economic prosperity and sustainability, as well as shared some

reflections in the survey about means to fruitfully promote these two terms' relation. The majority thinks that the possibilities of the city to invest in sustainable solutions define the scope of its actions. However, having enough financial resources does not always mean better sustainable management. To take an example, building technological parks brings benefits for the city in terms of connecting sustainability with economic growth as it can be seen from the case of Madrid. However, it is not a method used actively by cities so far as becoming evident from the results of the survey. The reason for this can be found in the big investments that such a project requires. The example that was presented is coming from the city of Madrid, which is a huge metropolitan area and has the necessary resources to support such installations. However, according to Mr Julio Cesar Ondategui, professional from the regional administration in Madrid, medium sized cities have better capabilities to introduce such innovations (*J. C. Ondategui, personal interview, 16 April 2010*). The perception that bigger cities having much more access to financing are able to perform better when it concerns technical innovation is wrong. Smaller cities can more efficiently allocate resources and plan better; as well as find easier solutions to problems. This point proves that having enough finances is not sufficient for making a sustainable strategy work; it is about defining appropriate objectives, planning and delivering in the context of the own urban environment.

In order to 'green' the economy of cities, enterprises and companies have to be involved actively in the promotion and implementation of measures. Some cities create eco-certification, which is a proof that the business is environmentally friendly and sustainable. For example, the city of Helsinki developed the EcoCompass project to assist in developing efficient sustainable management in companies. The business's impacts on the environment are assessed after which an action plan for 6 up to 12 months is drawn up for their restriction. An evaluation is held during the conduction of the action plan, which requires monitoring the key figures. The company has to provide annual reports to EcoCompass, which issues a certificate for the business according to its compliance with the rules. Through the project 'green' public procurement (employment engaged in sustainability) is also achieved. (*Paivi-Kippo Edlund, 2010*). The example shows how cooperation between public and private actors can prove to be successful for improving the environmental performance of SMEs. However, not a big percentage of the questioned cities use it as a method (9.5 %). This fact shows that the field of engaging more closely SMEs still needs to be explored. Even more alarming is the position of quite some few cities that they do not have a specific strategy for small and medium enterprises in terms of sustainability. Especially as SMEs "provide two out of three of the private sector jobs" and are "the backbone of European economy" (*Facts and figures about the EU small and medium enterprise, 2009, para 2*). Specific projects conducted together with SMEs are the main way of cities to involve them in their sustainable strategy. However, it has to be noted that projects are often concentrated on one particular area and have a defined period of time that is why the long-term perspective might be

missing from the cities' approach. Cities also provide advice on EU 'green' legislation and some encourage the creation of SMEs with environmentally friendly solutions. A successful way can again be determined to compose the combination of all mentioned methods, rather than concentrating on one particular medium.

When designing and implementing every sphere of action, city councils have to consider their major stakeholder- the citizens. Cities have difficulties convincing the population of the benefits of a sustainable strategy as stated in the survey that is why they should concentrate more efforts in the field. Citizens have to agree upon the objectives of the local government and be satisfied in their daily life with the results of the sustainable measures- quality of water, air, good transport linkages and possibilities for outdoors activities. Most of the cities are eager to acknowledge that they engage the inhabitants in their sustainability approach. However, only 19 % of them pointed direct participation as a tool. There exists a certain contradiction. In order to be effectively involved in sustaining the quality of life in cities, the ones living in them have to be able to contribute, express opinion and identify possible opportunities. Making informational campaigns about ongoing initiatives is necessary, but not the only way citizens can be brought closer to the local government's strategy. More efficient use of surveys among them should be explored to encourage citizens to share vision for green and sustainable urban area. The approval by people of the urban environment they are living in will surely raise the quality of life and the perception of it and also possibly attract investments in the area.

In addition, at the time of designing and delivering their sustainable strategy, cities noted in the survey that they do not only involve SMEs and citizens, but also other players, such as big private companies, green NGOs and most importantly, that they coordinate with national governments. Without any doubt, cooperation among different stakeholders is not only necessary, but also compulsory. Significant amount of EU legislation on sustainable measures is transposed by national governments. Cities, as vital centres of cultural and economic activities have to comply with these regulations. Their sustainable strategy is shaped as a response both to the needs for improving the urban environment and complying policies with EU environmental regulations. Finding the right balance in cooperation is a significant factor also. As Mr Ondategui shares, having strategies at European, national, regional and city level burdens the delivery and presents administrative trouble, for example, when applying for finances (*J.C. Ondategui, personal interview, 16 April 2010*).

Economic growth is impossible without investing in technology and innovation, therefore, its role in sustainable development also becomes a highly debated issue. The theme of eco-innovation is of particular interest, as it becomes clear that the definition is understood differently by European cities. For the urban environment, it means mainly using existing technology in a new way. The logic of this

statement is strong. Investing in innovation and technology requires an extra budget; for every city, which has to concentrate on many other issues of urgent matters, it is not a priority. Cities have to cope with unemployment, social problems, education, infrastructure and adding to the burden technological innovation does not seem the only possible path towards better quality of life. However, the ability to integrate existing structures in their own urban context can make a difference in the outputs of sustainable strategies. For example, most of the technology for efficient sustainable management already exists. What has to be explored by cities are the ways of its implementation and better use.

2.3.3 Financial matters

Significant percentage of the cities that participated in the survey pointed out insufficient financing as one of the main challenges they face when ensuring sustainable development. Driven by economics logic, sustainable development has to require certain capital investment in order to prove successful.

From what can be observed from the survey, almost equal percentages can be attributed to the answers that cities have more important issues to concentrate on than sustainability (41.2 %) and the answer that it is important in their city planning (35.3%). Trying to explain the differences in attitudes, analysis was held of the different situation of the cities that gave the two answers. The financial crisis was partly blamed for not enough attention on sustainability, as well as the perception that the budget for more traditional issues should not be less than the one for sustainable development. The city of Vienna stated that it does not have a specific budget for the area; however, sustainability is integrated in most of its planning. Some other cities consider the question extremely important, but still dedicate to it less than 15 % of their financial outline. What is the right budget percentage that has to be allocated to the issue? The most logical answer will be - it depends on the situation of the certain urban environment. A lot of financing can be spared for sustainable measures, but if there is no clear definition of objectives and concrete planning, not much can be achieved. Sometimes with less financial resources but better coordination and management clearer results are accomplished.

The EU also provides financial support to cities for projects of sustainable development. The most utilised mechanism was pointed out to be the Economic Regional Development Fund and especially the INTERREG initiative. The ERDF serves regions under Objective 1 (regions lagging behind) and Objective 2 (more developed regions) of European regional policy. Evaluation from the European Commission was published recently for the period 2000-2006 of the functioning of the fund. The financing allocated from it managed to help the recovery of European regions, creating around 13,000 jobs in research and development. The environment and transport areas were also of main focus for improvements under the initiative (*European Commission, 2010*). The main accomplishments in the field of environment and sustainable management in the period of 2000-2006 were increasing the

number of households connected to main drainage and wastewater treatment systems as well as to clean drinking water. “Local authorities were given the freedom to determine their own development strategies”, however ‘there was little attempt to relate the projects undertaken with other aspects of development policy’ (*European Commission, 2010*). The report stressed the necessity to integrate the sustainability with other development and economic strategies. Financial support for projects is vital part for realisation of local government plans; however it is not viable without defining clear overall objectives.

Interesting is the statement of cities that they can deal with sustainable projects without the mentioned EU funding. Moreover, as they stated that they do not possess the sufficient financial means to deliver at times the sustainable development measures. The most viable explanation can be attributed to the fact that cities still need to explore how to use EU funding mechanisms and for this reason they develop projects which are feasible with local governments’ funds. For the wealthier European cities this is not a problem, however, for cities without great financial means it can be of an issue. Using EU mechanisms ensures cooperation with other cities in the area, as well as national and supranational actors. This can affect the designing of an overall sustainable strategy, which can be more successful in co-ordination with other stakeholders. The EU could also ease the access to financing by simplifying of procedures when applying for project support in order to encourage local authorities. It can be stated also that it is more the mixture of local, national, EU funds that is actually of value. The EU support could also help cities in providing leadership when such is missing from the regional or national scene. As noted by the *European Voice (2010)* “In the complicated, overlapping world of local, regional, national and European law-making, the EU sometimes can be the ally of the city planners in their battles with a reluctant central government”. Furthermore, when cities are faced with challenges that they cannot manage at the local level, the supranational and national institutions can be a point of reference. The supervisory role of the European Union is also of importance, and the fact that it provides big amount of ‘green’ legislation to be integrated at all levels pushing for high quality standards.

The idea of having more national support when introducing stricter measures for ensuring sustainability also emerged as an issue for improvement in the answers of the survey. An example was given from the city of Malmö for tax legislation making the use of fossil fuels more expensive. Such an act will influence directly both the companies and citizens and possibly drive them towards more conscious behaviour. The phenomenon of pricing environmental resources as a ‘goods’ is called ‘market environmentalism’. It looks at the environment from a market perspective and according to it ‘green growth’ will alleviate poverty and unemployment and restore the ecosystems and climate through pricing greenhouse gas emissions (*Hulme, p. 256, 2009*). If such an approach is the right one

is debatable, however, its impact on the urban dimension would be very visible. The common wish of cities for better integrated urban transport underlines its importance for urban sustainable development. People tend to take for granted good transport linkages and quality vehicles where they exist, but many times it represents hard effort to co-ordinate and to ensure sustainability of the vehicles. For the cities with less financial resources is very difficult to accomplish both these goals.

2.4 Conclusions

The results show that European cities are committed to ensuring greater sustainability combined with economic growth in their area, as well as to combating the challenges that the urban environment is witnessing. Some cities are more involved than others, but this also depends on the economic situation of the area and the number of other urgent issues the city has to concentrate on. Part of this difference can be attributed to the fact that cities, after all are components of countries, which have diverging traditions in environmental management and resources allocated to it. For example, cities from Nordic countries have a bigger share of the government expenditure than in Eastern and Southern Europe; in the latter case urban areas receive 5 % of the government funds. (*European Voice*, 2010). Cities still have long way to go to accomplish effective communication and cooperation with the European Union. As stated in some parts of the chapter, there exist instruments, with which the European institutions can help cities develop a sustainable policy, especially when it concerns financial matters, but these are not always well targeted at cities' needs or cities do not know how to use them efficiently.

However, not only the financial angle is important, but also the co-ordinated cooperation among the various stakeholders is required for the success of linking economic and sustainable growth. For example, the insufficient participation in SMEs as pointed out in the survey in reducing environmental impact can influence seriously the urban environment. If cities show to businesses that they support their activities and at the same time encourage them to invest in sustainable development, companies will be more willing to participate actively. As noted earlier in the paper, projects are extremely important for SMEs, but for example, long-term cooperation in the area between the public and private sector will ensure feasible results and sustain them for future generations. Exchanging information with other cities can prove to be helpful in doing so. Finally, when speaking of closer cooperation, the most important stakeholder should not be forgotten- the citizens. Direct participation in projects is a point to be improved in the current strategies of cities in sustainable development. Although cities understand differently 'eco-innovation' and greening the economy, the great advantage of urban areas is that they can tailor such notions to their specific needs and circumstances. In doing so, they can be more successful than national or supranational governments whose strategies can be more distant from the real life situation on the field.

3. BEST PRACTICES EXAMPLES

The purpose of this chapter is to present concrete projects of cities for more sustainable urban life. The city cases come from different parts of Europe- North, Central and South- to emphasise the fact that excellent sustainable measures can take effect in all parts of the continent. The focus will be on initiatives that aim at greening the economy and eco-innovation, which in all three cases these components are mixed.

3.1 Bergen City Light Rail- Bybanen



3.1.1 General information

As stated previously in the paper, there are several particular areas on which cities concentrate when designing their sustainable strategies. The city case from Bergen, Norway, is an example of implementing a successful sustainable transport project, combined with expectations for economic benefits with the starting up of new companies and jobs along the rail line. It is innovative, because the light rail in Bergen is the first of its kind in Norway, and is planned to connect the city centre with the Haukeland hospital to Fyllingsdalen and on to Loddefjord; as well as Bergen with Flesland airport. (See maps in Appendix 3). The project was initiated on 7 January 2007 and its completion is due for 2012 (City of Bergen, 2008, p16). The first stage of the plan connects the Bergen city centre with Nestten and its opening date is scheduled for June 2010. Local authorities strive to obtain with the conducting of the project a better air quality due to reduced traffic in the city centre and changed habits of the citizens. The local government hopes that with the creation of the light rail network many will prefer using public transport as an alternative to their cars. The light railway is environmentally friendly, comfortable and a fairly fast mean of public transport.

3.1.2 Financing

Unlike cities part of the European Union, which could receive funding through Economic Regional Development Fund and European Social Fund, Bergen has to find other ways of obtaining enough finances for conducting the project. The project is mainly financed by the Bergen City Council, Hordaland Country Council, the state and the citizens through the so-called toll taxation. A motorway passes close to the city and the taxes from using it helps fund the project for the light railway. Overall

costs of the project are estimated to be around 225 million Euros. (*Bergen Light Rail System, Norway, para 1*).

3.1.3 Economic benefits

The current transportation system provides transport to 102,000 employees. Calculations by the municipality show that with the new rail network 50,000 new jobs can be established within a walking distance of a light rail stop (the stops will be situated every 800 metres) (*City of Bergen, 2008, p.17*). There are prospects of more people coming, as there will be direct connection with the airport are quite high. With this inflow, new businesses are also going to be established along the line, increasing job creation. Moreover, new positions will be also created for professionals to be involved in the railway activity. This is an example how a single transportation line which aims at better sustainable development can enhance greater economic benefits for the city.

3.1.4 Environmental benefits

“Despite the reduction in emissions from landfills and oil-firing, greenhouse gas emissions continue to grow every year. In the period 1991-2006 they rose by 14 per cent. Reducing these emissions poses a great challenge to Bergen, especially as 55 per cent of the emissions come from road traffic, which has grown by an average of 3-4 per cent annually in Bergen over the last few years” (*City of Bergen, 2008, p. 12*)

Therefore, it has been very important for the city council to develop a strategy that will both reduce emissions and improve the quality of life. The local government estimated that the building of the rail will decrease significantly greenhouse emissions from traffic, especially in the city centre. Furthermore, the construction of the light rail creates a highly dense urban structure that reduces the level of urban sprawl. It will make the city’s districts much more reachable by citizens. Decrease in the demand for land in the peripheral areas of the city will also result in lower energy requirements, as well as lower emissions of greenhouse gases.

3.1.5 Conclusion

As proof of the city’s involvement in continuing sustainable development, the local authorities launch other initiatives for optimising the transport system and encouraging citizens to consider alternatives to their cars. Besides the construction of the light rail network, the city council has adopted an integrated approach for land use and favouring more efficient transport arrangements within the city. For example, elimination of street parking and creation of more cycle parks are some of the planned

measures of this integrated approach. Projects need to be fostered at the same time within a certain area for a better efficiency of the sustainable development strategy. It is a long-term intended process which aims at integrating several strategies.

3.2 Vienna Eco-Business Plan



3.2.1 General information

The example of the city of Vienna concerns greening the local economy and shows how local governments can encourage businesses to take more sustainable actions and limit their environmental impact. The plan resembles Helsinki's EcoCompass, but it has been operating since 1998. The initiative already managed to prove its benefits to Viennese enterprises and is called Vienna Eco-Business Plan. It includes around 740 businesses in over 10,000 project frames (*Vienna City Administration, 2010, 'The Environmental Package Service of the city of Vienna' section, para 1*).

The City Administration of Vienna provides consultancy and advice to companies on how they can reduce their ecological footprint. The main objective can be summarized as encouraging the decrease of the environmental impact of the enterprises located in Vienna by applying integrated environmental approach. The solutions of how the ecological footprint can be reduced are tailored to the specific business activities. If the particular enterprise applies efficiently the sustainable advice of the city administration, it receives the Eco-Business label. The Eco-Business Plan consists of four main stages. During the first stage, specialists from the plan's network detect possible savings potential in the certain company and weak environmental links in its operation. Then, in the second stage, keeping in mind the results of the assessment, the businesses' management can decide whether it wants to continue with the programme . The next stage consists of developing environmental strategy together with the experts from Eco-Business Plan and implementing it within one year of the start of the participation of the enterprise in the initiative. An evaluation report is made during the last stage of the process. Depending on the progress the company achieves, decision is taken about awarding the enterprise with the EcoBusiness label, which stands for high quality service and environmental protection (*Vienna City Administration, 2010, 'Consultancy and Information' section, para 1*). All the 'best' practices are saved in the Vienna EcoBusiness database as good examples of sustainable management. The project enables Viennese companies to make better use of existing resources, utilising innovative opportunities and cost saving mechanisms, and thus managing medium term

employment. The Eco-Business Plan is the evidence for the successful cooperation between public and private actors towards sustainable economy and raising the quality of service through 'greener approach'.

3.2.2 Financing

The European Union supported the Vienna EcoBusiness plan with around EUR 674.000 through its Economic Regional Development Fund and mainly its INTERREG initiative within the framework of the project 'Wien-Gyor' (*Vienna City Administration, 2010, 'Philosophy and Objectives' section, para 10*). It can be stated that the European Union enabled the initiative; therefore, the important role of the European institutions can be recognised in developing sustainable patterns for management across Europe.

3.2.3 Economic benefits

The Eco-Business Plan managed to generate around EUR 55.7 million saving costs for companies participating in the programme (*Vienna City Administration, 2010, 'The Environmental Package Service of the city of Viena' section, para 1*). Businesses managed to sustain employment and growth with limited environmental impacts, which provides the symbioses between economic development and sustainability. The huge costs saving mechanisms serve as incentives for other companies which are not part of the plan to join. For the ones already part of it, it raises their competitive position and is a hallmark of the company's involvement in preserving good quality of life and offering top class service for Viennese citizens.

3.2.4 Environmental benefits

The figures are expressive enough. Vienna's solid waste was reduced with 118,452.5 tons (an amount that would fill Vienna's Ernst Happel football stadium); the saving of energy was estimated to be around 206.9 million kWh; 60,563 tons of carbon dioxide emissions was saved together with reduction of the drinking water consumption of 2,633,000 cubicmetres (850 fillings of an Olympic swimming pool) since the beginning of the project in 1998 (*Vienna City Administration, 2010, 'Benefits' section, para 2*).

3.2.5 Conclusion

The good example from the city of Vienna plans to be developed in other cities also. The main idea will be applied in the capital of Greece, Athens and India's fourth largest city, Chennai, to develop their own Eco-Business plan based on the experience of the local government of Vienna. It is precisely

its applicability in other contexts which makes it so valuable and underlines the need for sharing sustainable approaches, not only across European cities, but also in urban areas all over the world. Companies share similar environmental challenges and their management can benefit enormously from the support the local government offers.

3.3 Malaga's Green Apple Project



3.3.1 General information

The project case from the city of Malaga was chosen because of its innovative nature, which combines targeting key points on the sustainability agenda through a well-integrated and an innovative urban approach. The project the city is conducting is called Green Apple and is part of the CAT-MED programme initiated in 11 metropolitan cities around the Mediterranean Sea (Athens, Barcelona, Genoa, Communauté du Pays d'Aix, Málaga, Marseille, Rome, Seville, Thessalonica, Torino and Valencia), (*The CAT-MED project, para 1*). The CAT-MED programme will last for two years- from May 2009 to June 2011- and from February 2010 Malaga implements the sustainable concepts agreed in the urban planning documents. The 'green apple' will represent a neighbourhood that combines "residential, commercial, and tertiary activities, along with municipal facilities, social services and green areas" (*F. M. Contenti , personal interview, 25 March 2010*). The district will integrate technical and ICT based systems for energy efficiency, waste recycling and water management in the area. The project is an urban regeneration plan that aims at reviving the abandoned area of 'El Duende'. Currently, it is without efficient use, but it has good potential of becoming leader sustainable zone. One of the aims is to raise the quality of life of the residents allowing them to cover all their basic needs at a pedestrian distance and avoid private vehicles use thus reducing greenhouse emissions. Facilitating social interaction among citizens, giving them more time (avoiding traffic jams) and increasing the district's complexity and diversity are also major goals. Moreover, the investments in ICT based systems will significantly improve the living conditions and combine sustainable development with economic savings.

3.3.2 Financing

The Green Apple project is supported by the CAT-MED programme, which is financed through the ERDF under Priority 2, Goal 4 of the 2007-2011 Transnational Programme for European Territorial Cooperation. The Transnational Programme was agreed on 23 November 2007 by the ministers responsible for spatial planning and development from the member states on the five key principles of solidarity between regions and territories; multi-level governance; integration of policies; cooperation and subsidiarity (*First Action Programme for the implementation of the territorial agenda of the EU, 2007*) . The budget represents around EUR 250 million, which will be allocated accordingly among the different projects of the partner cities, including the Green Apple of Malaga. It should be noted that the INTERREG MED programme will finance only the first stage of the Green Apple. However, the second stage, namely the implementation of the actual regeneration will be carried mainly by a private and partially public municipal budget.

3.3.3 Economic benefits

The economic benefits for reviving the area are without doubt of significant nature. The most important one is addressing the construction companies (which have a vital role in the city in terms of sustainability) through obliging them to implement environmental criteria in the building process. The economic development and social cohesion are among the indicators the management of the project strives to optimize through basic service proximity, social housing rate and labour force participation. Businesses will be stimulated to develop and it can result in flow of people into the area, which ensures stable economic activity in the zone.

3.3.4 Environmental benefits

Eco-innovation, for example, generates an important part of the Green Apple experimentation. By investing in bioclimatic architecture, namely by the use of materials that incorporate energy efficiency and building settlement Malaga targets to introduce new technology at minor urban scale. The neighbourhood is planned to develop into multifunctional block that includes social and private housing, commercial and educational areas, entrepreneur centre and green open spaces. The indicators that the City Council of Malaga strives to optimise with the project are the following: territorial management and urban design; mobility and transport; natural resources management and ecological footprint and lastly, economic development and social cohesion. By the urban planning and mobility management the urban sprawl can be reduced, creating a much more compact zone. Bicycle lanes, bus and metro stops proximity, will ease the traffic, encouraging much more people to use public or alternative transport. The percentage of pedestrian streets will also be optimized, creating a

neighbourhood with a nicer outlook for citizens and thus reducing greenhouse emissions from private vehicles. Better water and energy consumption patterns will be integrated into the area, improving its ecological footprint.

3.3.5 Conclusion

By creating a metropolitan working group, Malaga will try to integrate the actions of all the relevant stakeholders. Malaga commits itself to continuously informing the citizens and encouraging their participation through the organization of public seminars on the topic. Updated information will be presented to them in the course of the project, so that they know about the latest developments on the topic. The case study of Malaga is a good practice example of public involvement, which as seen from the survey of can be improved in local authorities' management. If the project is successful in accomplishing most of the goals, the municipality will consider its general principles and try to replicate its performance in other urban planning and regeneration initiatives which will be developed within the city (*F.M. Contenti, personal interview, 25 March 2010*).

4. CONCLUSION

With the examples of the projects in the last chapter and the results from the survey in the previous one, it becomes clear that European cities consider attentively the problem of linking sustainable development with economic growth. The approaches that urban areas undertake are not perfect, nor developed in the best possible way, however, the subject of sustainable development is always present on the agenda. What is more important, cities believe in their capabilities of ensuring good quality of life but not at the expense of the environment. Being optimistic in one's chances to sustain the natural resources is a step forward to finding creative and innovative solutions in doing so.

As the city of Malmö has stated in the survey there are no 'perfect solutions' when sustainability is discussed. Every local government has to decide according to its specific surroundings, infrastructure and political leadership where it wants to stand concerning the issue. Cities as urban areas in which many people live cannot be flawless in developing and implementing sustainable strategies. There are too many environmental problems that occur at city level to state that the urban dimension has all the 'right solutions'. However, cities can at least strive to ensure the best protection of the surrounding environment and quality of life they can manage to obtain.

The future might bring new challenges for urban areas, more complex than the current ones. However, one can be certain of cities determination not to ignore the threats they represent to the environment. One must not forget also that the primary aim of urban areas is to serve the citizens. The responsibility of preserving the environment cannot be attributed only to the local policy makers, but also to the most important stakeholder in the face of the people living in the city. The state of the urban environment should be appreciated and kept sustainable with joint forces. One should look around when walking on the streets of his city and recognise that everything he does affects the nature around him. Or rephrased in another way- not using the car to go to work today ensures the clean air for children in the future. That is the least people can do to take their responsibility towards the environment that unconditionally offers its resources to provide human being with the most valuable treasure on Earth-life.

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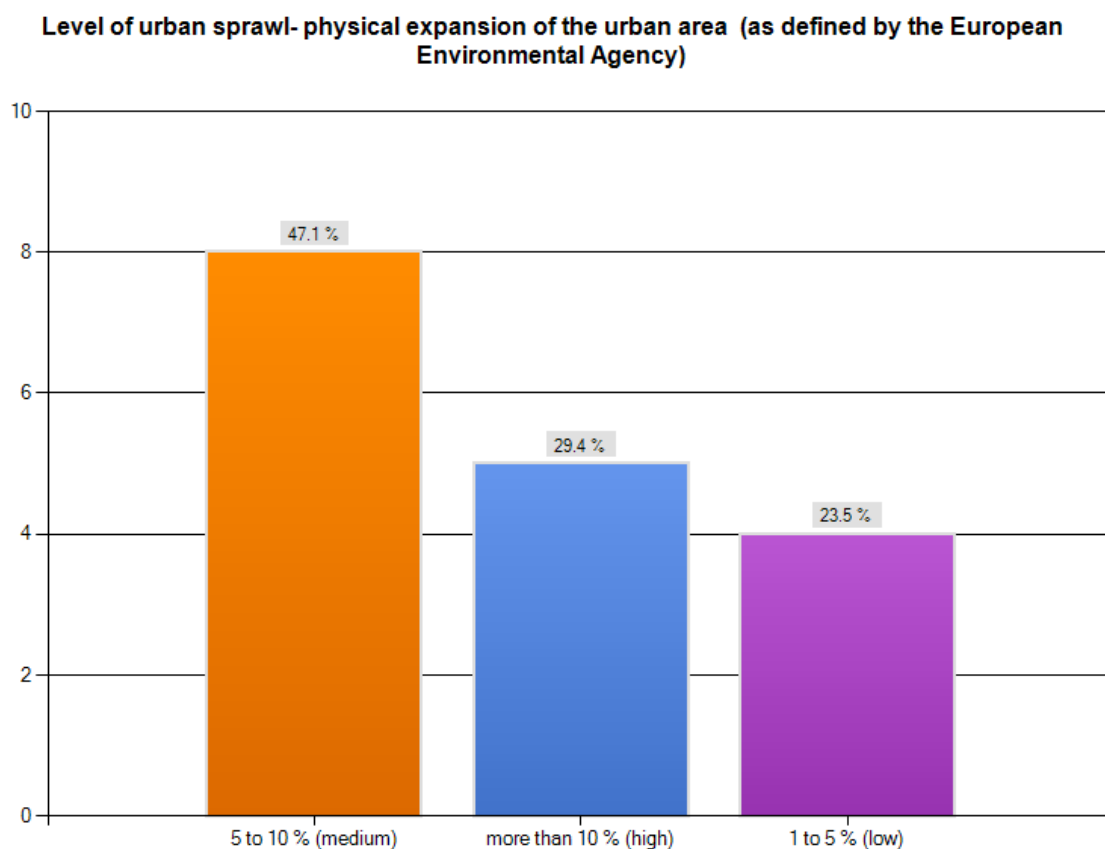
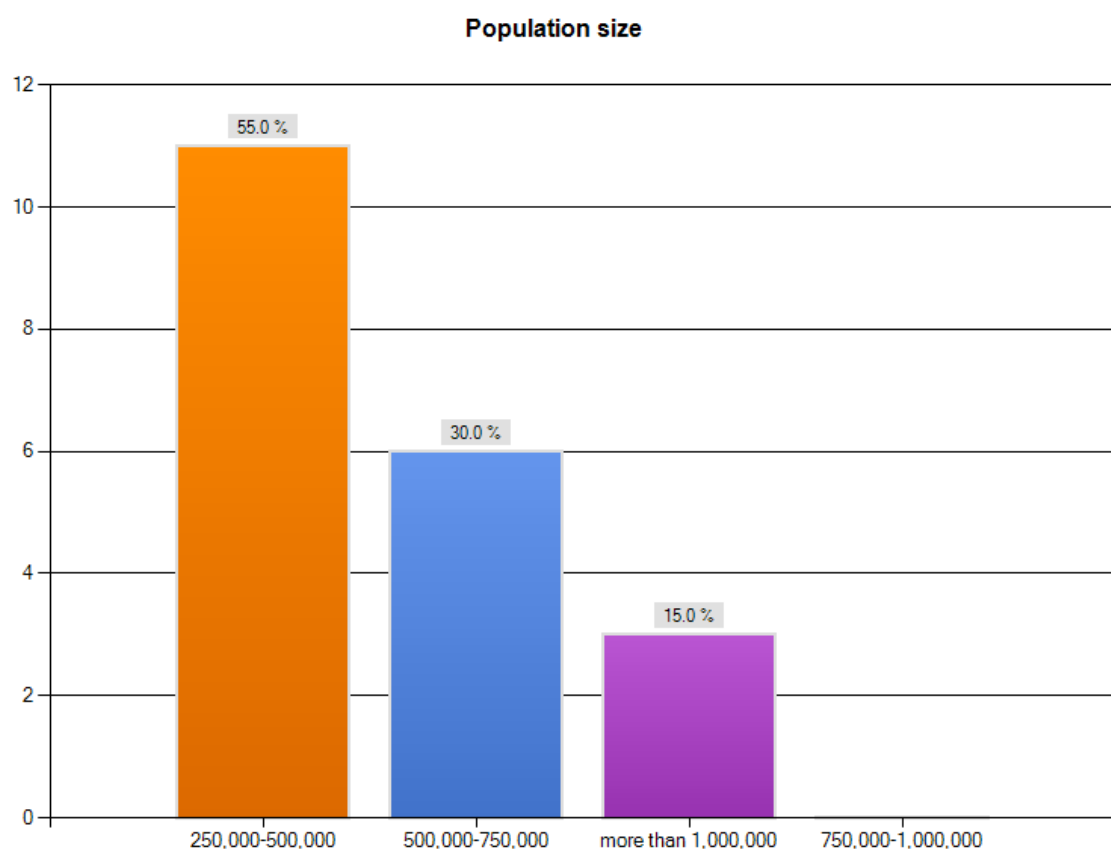
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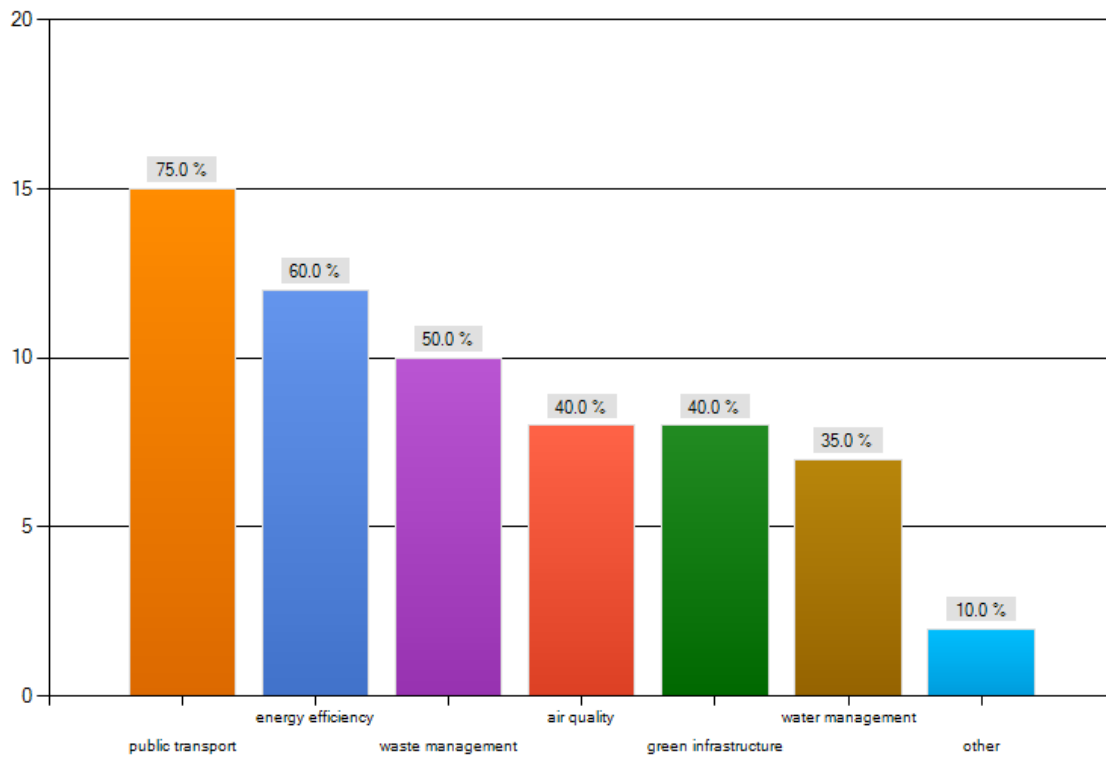
6 . A P P E N D I X E S

6.1 Appendix 1 – The survey

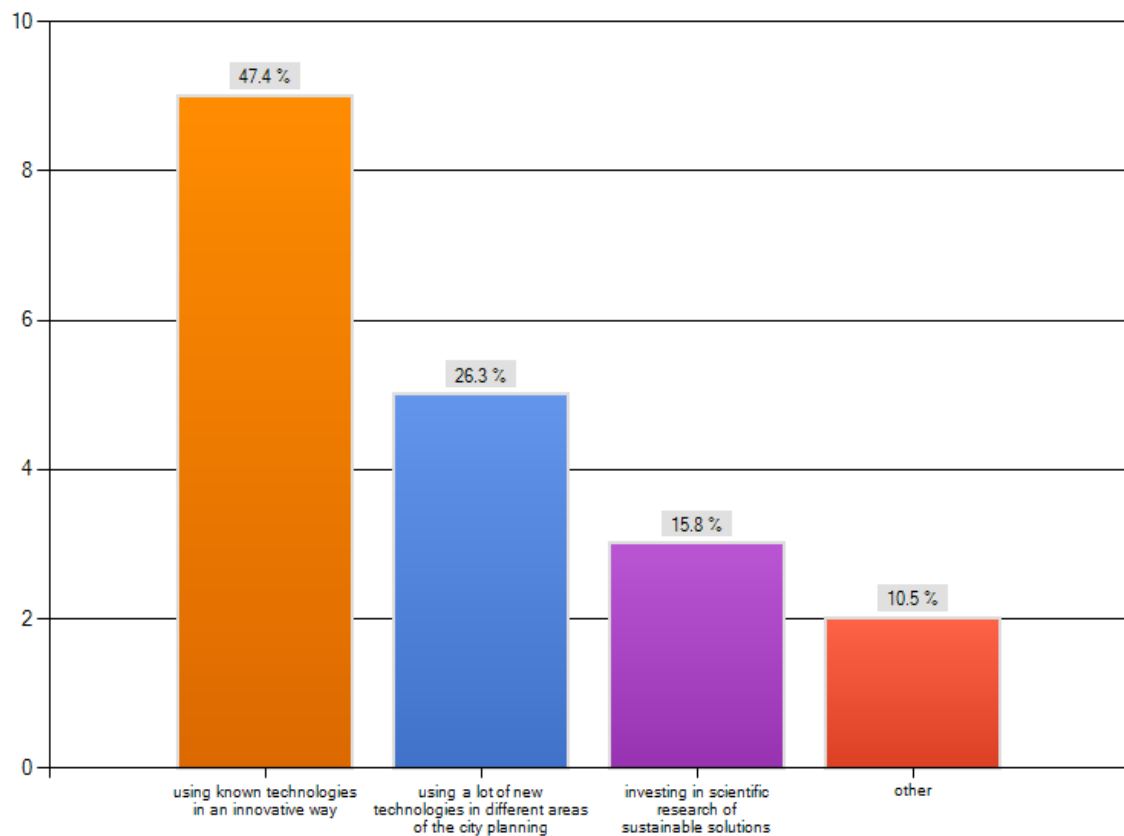
6.2 Appendix 2- Results charts

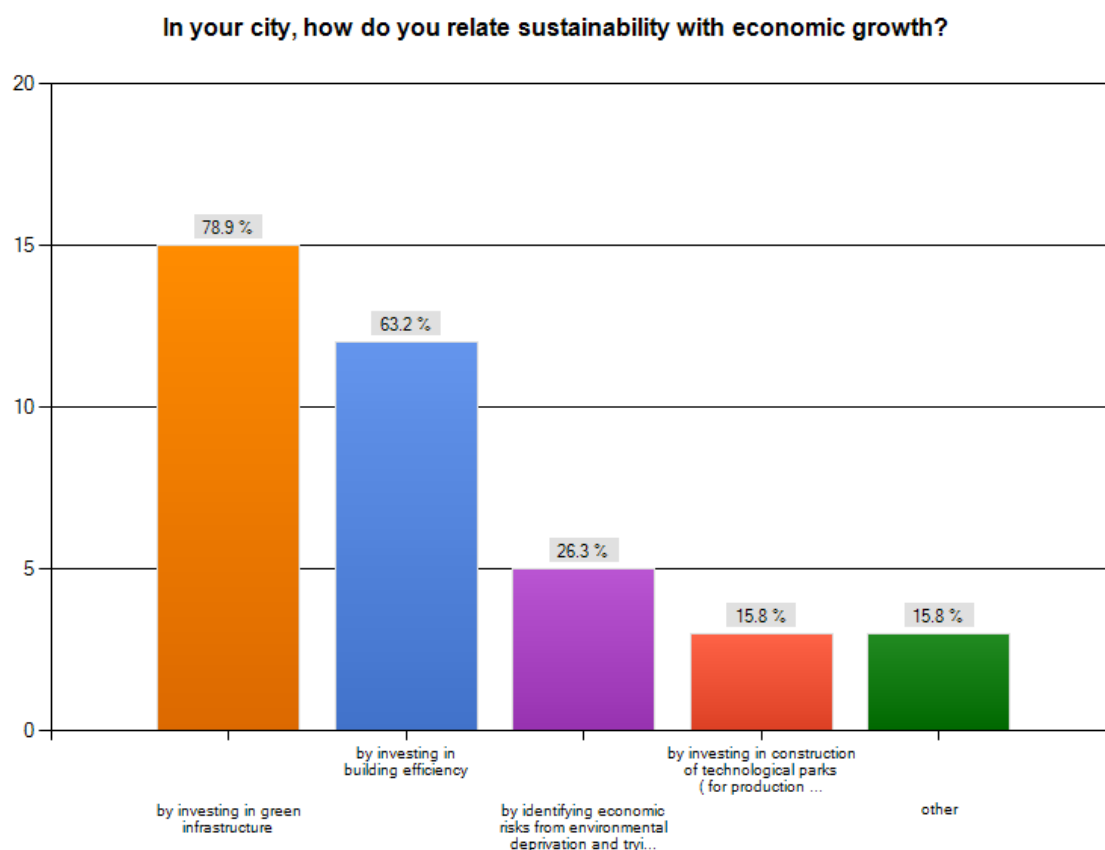
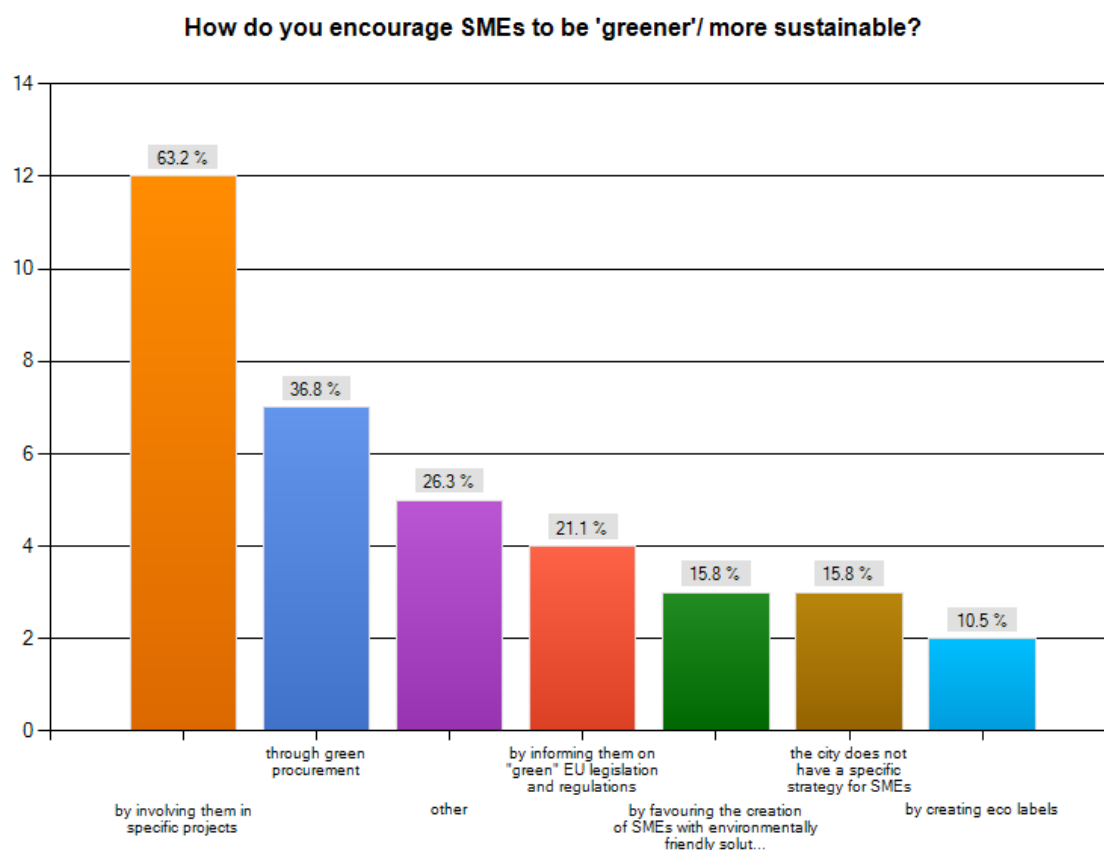


Which three of these issues are the main priority areas for your city in terms of sustainability?

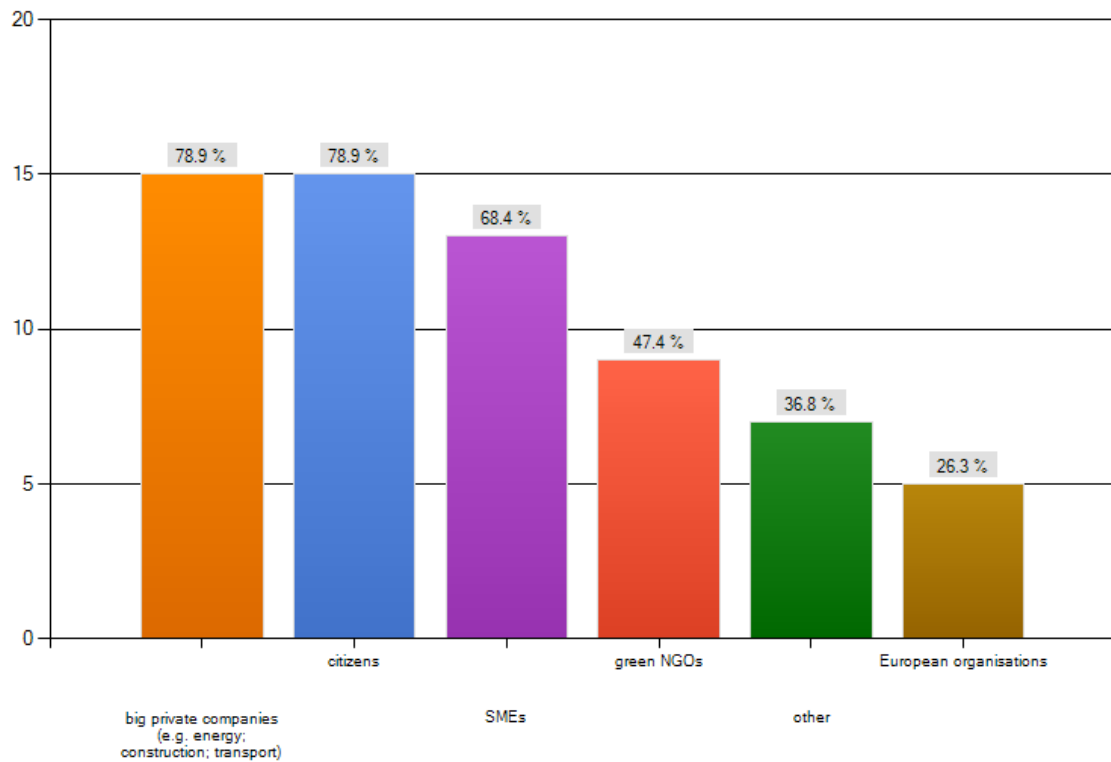


How best would you describe eco-innovation in your city?

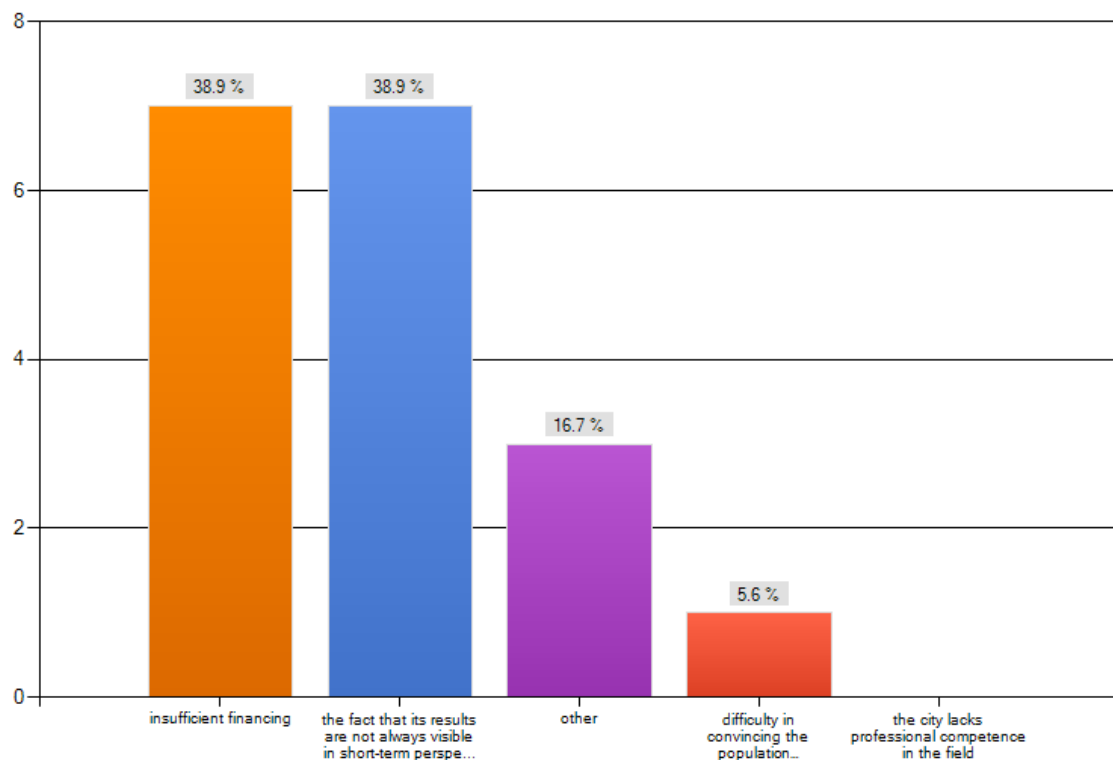




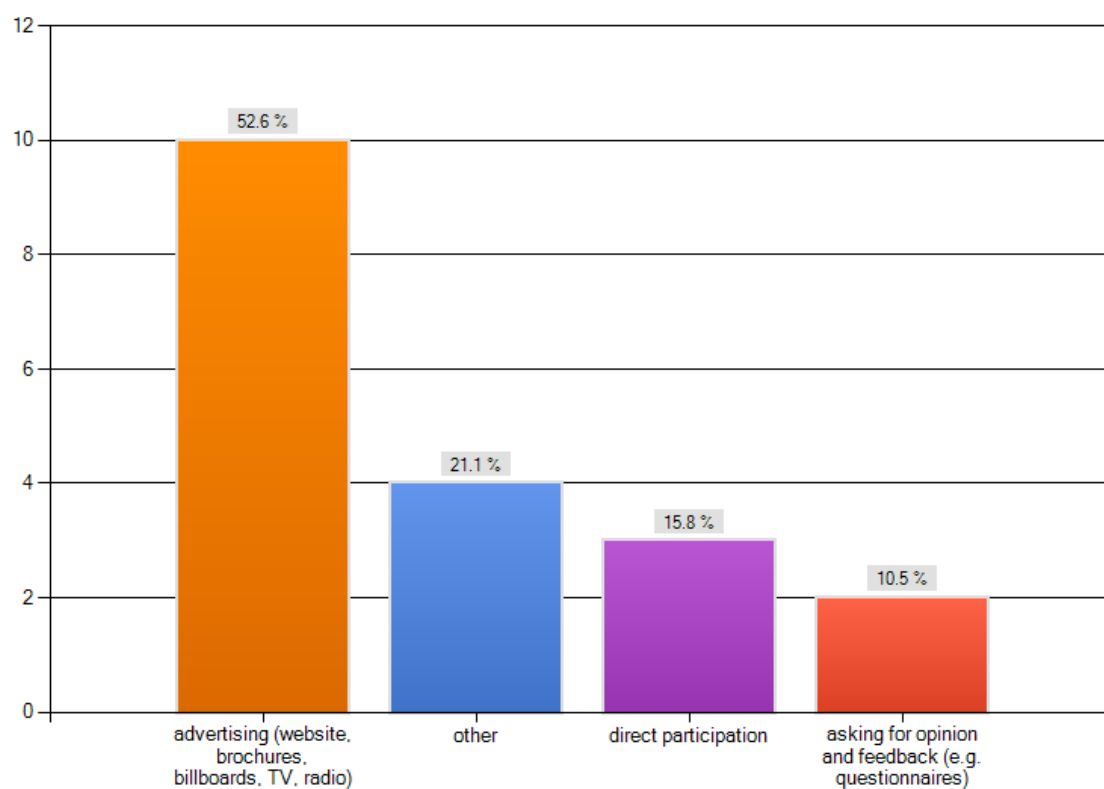
What kind of stakeholders do you involve when designing and delivering your sustainable strategy?



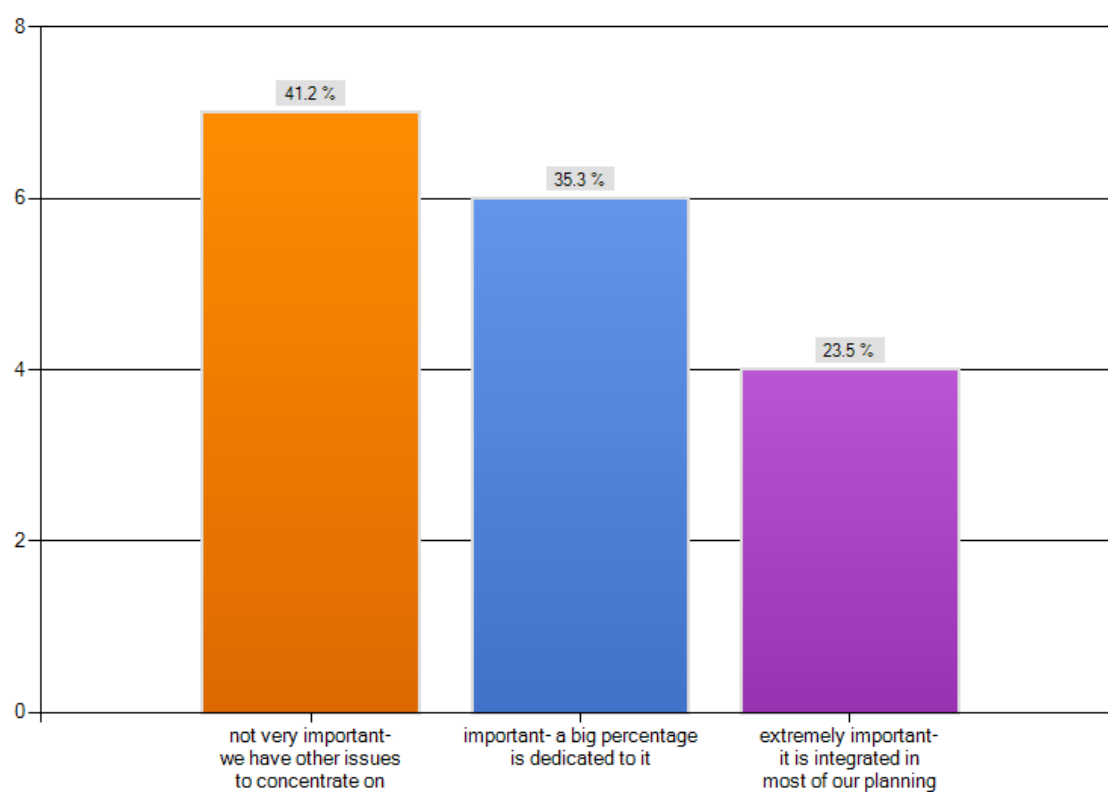
What are the main challenges you face when designing and delivering your sustainable strategy?



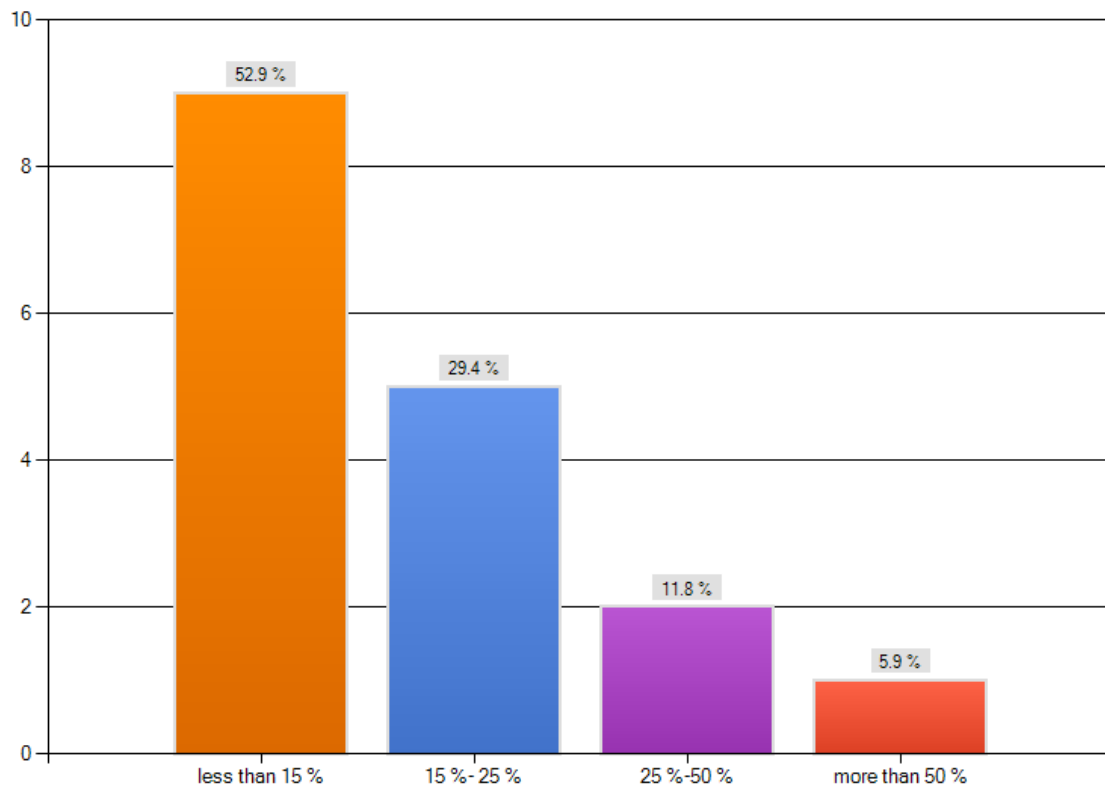
How do you involve your citizens in sustainable projects?



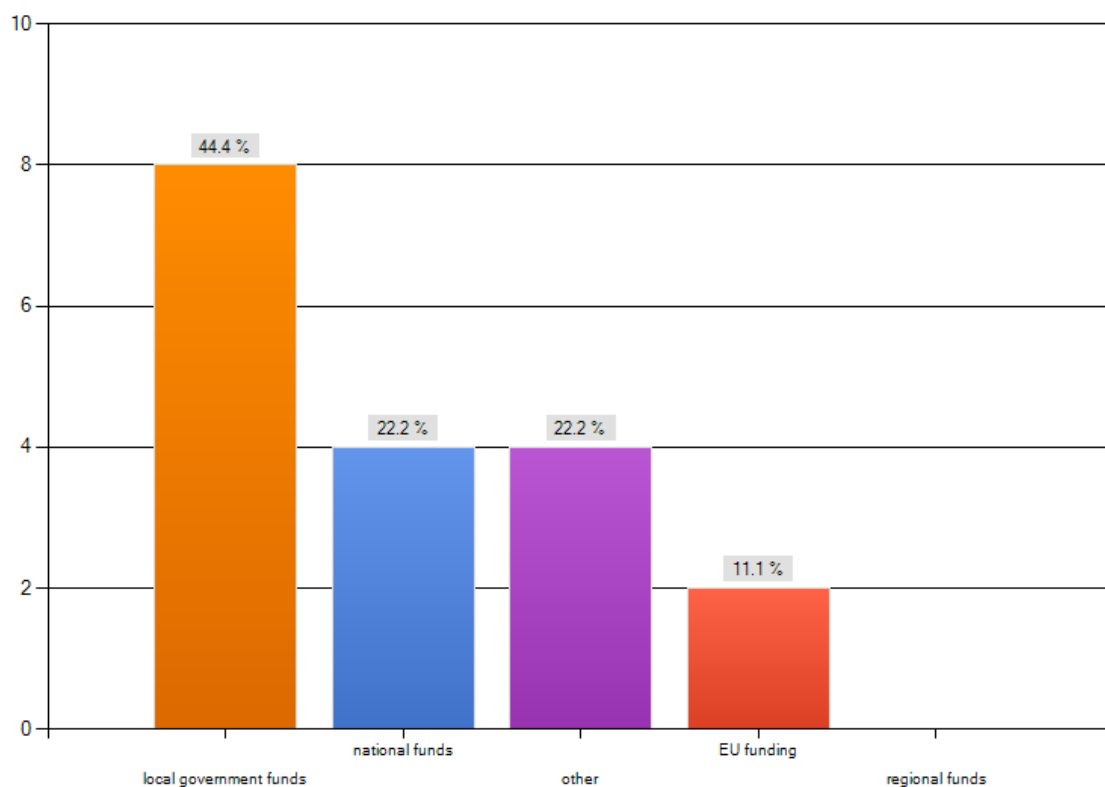
How important is the theme of sustainability in your budget outline?

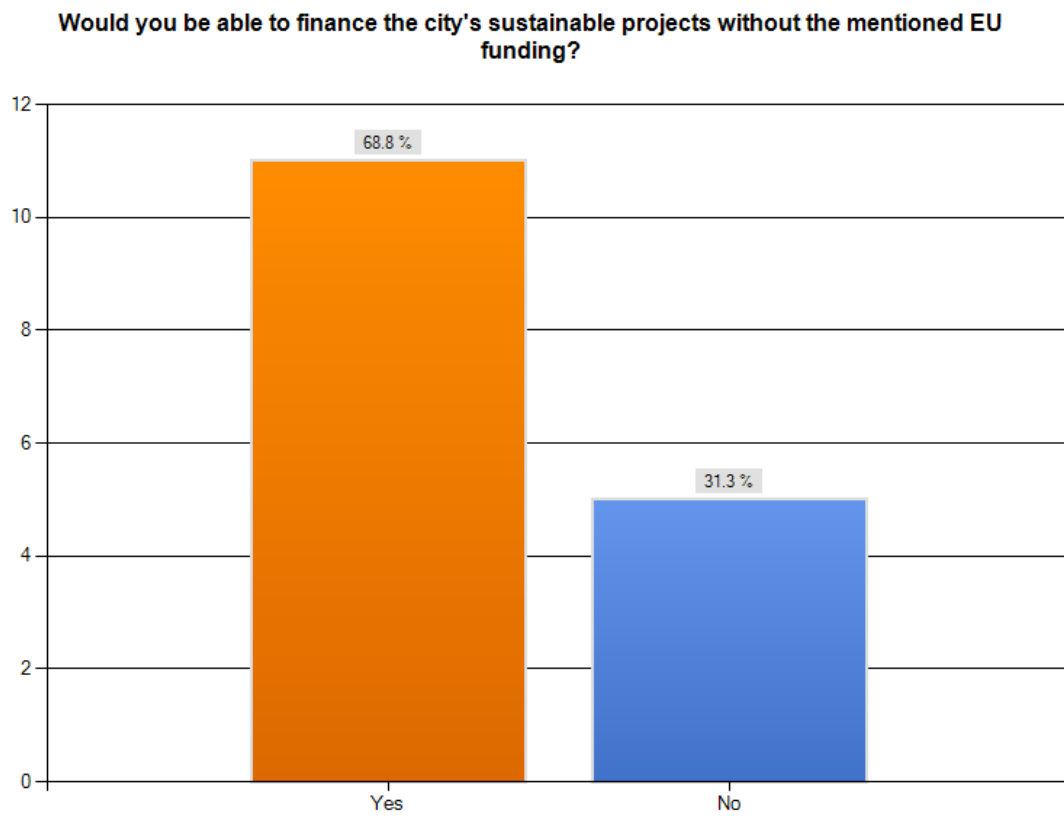


Please indicate roughly the percentage you dedicate to it in your city budget.



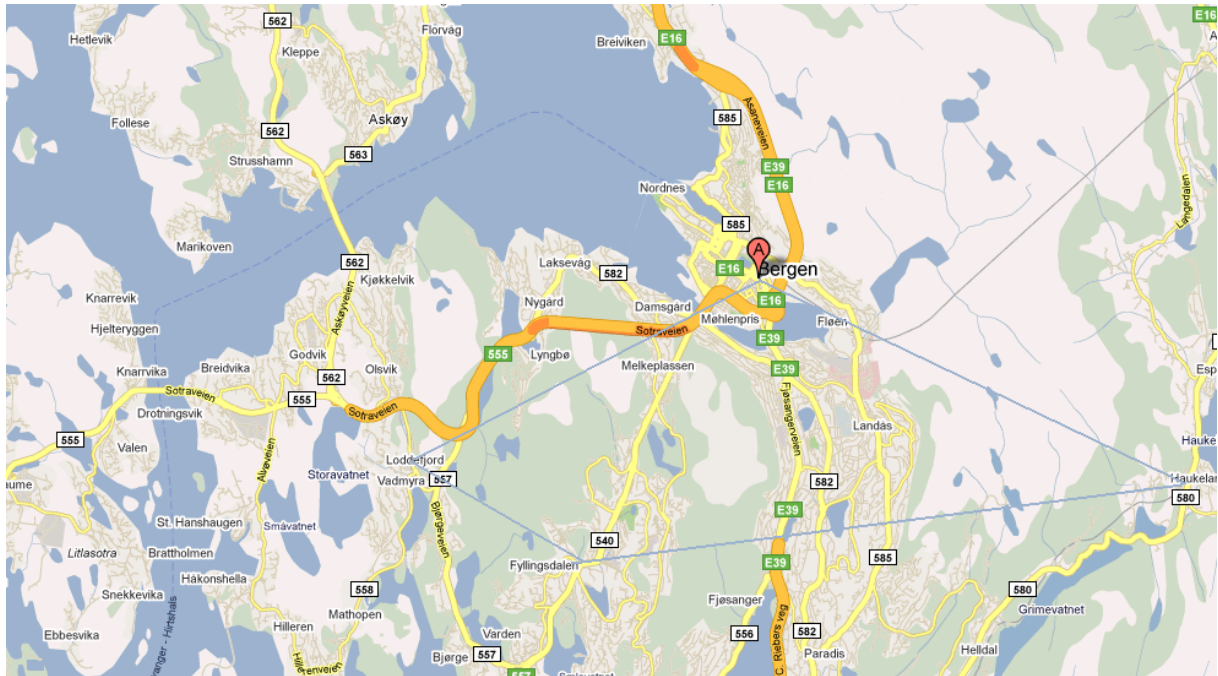
Your overall sustainable strategy is mainly financed through:



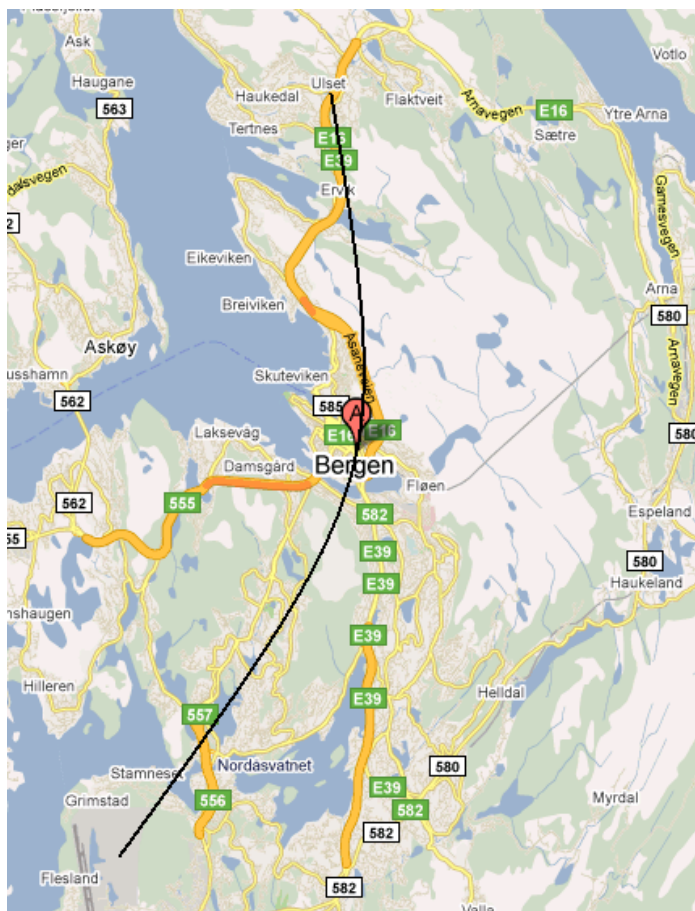


6.4 Appendix 3 – Maps of the light rail in Bergen

Track One- Bergen city centre with Haukeland hospital to Fyllingsdalen and on to Loddefjord



Track Two- Ulset through Bergen city centre to Flesland Airport



6.4. Appendix 4 - Personal Interviews

Filippo Maria Contenti, European Programmes Advisor, Malaga Green Apple (conducted via e-mail, 25 March 2010)

1. In which neighbourhood of the city of Malaga will the project Green Apple be conducted?
Which criteria did you use to determine its suitability?

In coherence with the Green Apple aim, an evaluation matrix has been elaborated to select the possible candidates settings of the new sustainable district, according to :

- environmental and climate change adaptation criteria
- urban planning criteria
- social and economic development criteria

According to these criteria, a group of experts of the Municipality finally decided to implement the Green apple in the “El Duende”, a dismissed area without any current use, but inserted within a consolidated and central part of the city, lacking of several basic and needing several regeneration actions. To select the area, it has been elaborated an evaluation matrix of the candidate areas for the green apple implementation, in order to analyse the potential possibilities of each zone, according to the following parameter groups:

Environmental parameters and climate change:

- Harmonious integration into the landscape
- Climate conditions
- Environmental quality
- Energy self-sufficiency
- Energy demand reduction – Eco-efficiency
- Water management
- Urban solid waste management
- Materials, systems and building technologies
- Mobility
- Natural risks

Urban parameters:

Scale and complexity of the action

Land management

Land consumption

Urban integration and accessibility

Mixed use, infrastructure and equipment combination

Social and economic development parameters:

Proximity management

Social and cultural sector

Rehabilitation-Reuse

Maintenance and creation of economic activities

2. What is your general vision for a Green Apple neighbourhood (e.g. car-free area; area with lots of parks and greenery; a cleaner area, example for the rest of the neighbourhoods, etc)?

The “Green Apple” will combine residential, commercial, and tertiary activities, along with municipal facilities, social services and green areas within the same district. Besides that, the Green Apple will also integrate technical and ICT based systems for energy efficiency, the control of the use of water, waste recycling, etc. It will represent the reference to regenerate the existing buildings and create new urban areas according to global sustainability criteria.

This will allow people inside the district to:

- 1) have all their basic needs covered at a pedestrian distance (shops and services, commercial, leisure and green areas, enterprises incubators, etc.)
- 2) avoid the use of private vehicles for these needs, contributing to reduce the greenhouse emissions in the city
- 3) facilitate the social interaction among citizens by giving them more time for their own (avoiding traffic jams, etc.) and increasing the district complexity and diversity (different activities within the same space and social diversity, mixing social and free market housing).
- 4) Consistently increment the buildings’ energy efficiency and recycling capacity, together with the inhabitants’ quality of life.

3. When is the approximate start and end date of the project?

The “Green Apple” is the main component part of the CATMED project, that lasts 2 years, from May 2009 to June 2011. For the “Green Apple” criteria definition and study phase, the start date for the transnational working group definition is February 2010, although several preliminary works, like the candidate areas selection and evaluation parameters definition, have been done since the beginning of the project.

From February 2010 on, the works on the Green Apple will consist in the integration of the sustainable concepts agreed in the urban planning documents, currently under revision, the development of a specific rehabilitation diagnosis and strategy and obviously, the composition of the transnational methodological guide that will combine the experiences and results achieved by all the city partners.

4. What are the indicators you strive to optimise?

The “Green Apple” will try to improve the district inhabitants’ quality of life through optimising indicators of 4 different thematic areas:

a) Territorial Management and Urban design

Population density

Urban compacity

Urban complexity

Green zones and recreation areas

Green zones and recreation areas proximity

b) Mobility and transport

Traffic modal split

Bus and tube stops proximity

Bicycle lanes and paths proximity

Pedestrian streets and walkways percentage

CO2 emissions

c) Natural Resources Management and Ecological Footprint

Energy consumption

Water consumption

Waste management and removal

Air quality

Silence quality

d) Economic development and social cohesion

Basic services proximity

Social housing rate

Labor force participation and unemployment rate

Evolution of the tourist frequency

Environmental activities in primary school

Each indicator will be calculated and analyzed for the whole city by each partner. Based on the results obtained, the project partners will discuss and establish the optimal range values and the specific objectives for each city. The works on the Green Apple will be analyzed and followed with the intention of reaching as much as possible these optimal values and objectives. This general overview will be also extended with the inclusion of additional sub-indicators to also give coverage to some more specific issues in relation with the parameters for the “Green Apple” area selection.

5. With what kind of methods do you plan to achieve these goals?

To achieve these goals it will be necessary to build up an interdisciplinary working group integrating all the different players in charge of the implementation and success of the project, which will be involved since the very first moment of the project start.

In order to achieve successfully the goals of the “Green Apple”, the CATMED project considers since the very beginning actions and objectives at three different levels:

- 1) Political commitment, that will support all the actions and the methodological guide creation.
- 2) Technical involvement, in the composition of the interdisciplinary “Green Apple” working group.
- 3) Citizen participation, through the execution of a transnational communication plan.

6. What part of the project is dedicated to eco-innovation? Could you give examples?

The part of the project which is directly related to eco-innovation is the Green Apple. This phase develops strategies orientated to introduce in the project innovative products, services and technologies that contribute to sustainable development and to reduce environmental impact.

The ecological criteria will be present by the inclusion of bioclimatic architecture, i.e. the use of techniques and materials that incorporate low energy, buildings settlement, energy efficiency, etc. This new ecological neighbourhood tends to reproduce a compact and complex urban model at a minor

scale. It is planned to develop a multifunctional block including social and private housing, commercial and educational areas, an entrepreneur centre and green open spaces.

7. Which local stakeholders are you planning to involve (or which are already your partners)?

To involve the local stakeholders it will be created a Metropolitan working group, consisting of local key actors representing the municipal public entities, such as the urban planning department and the municipal housing institute.

This initial composition of the Metropolitan working group will be extended with the inclusion of representatives of mobility and transport city services, energy and water supplier's entities, external experts and representatives from the civil society, neighbourhood associations, etc...

8. Malaga City Council has experience in delivering projects supported by European funds. How is the management of this project different from the rest? What are the main challenges?

The difference comparing with other projects is that, due to its nature, for its implementation both the city of Málaga and the other project partners have to involve a wide range of professionals from their municipal government areas - as for example it happens in projects such as the ERDF "Urban Initiative" – and for this reason the project becomes more complex to manage.

It is important to underline that just the preliminary study phase of the Green apple will be financed through the "Interreg" fund, whereas its concrete implementation will be financed with municipal budget (each city will establish how and when to implement it).

9. How is Malaga City Council informing its citizens about the Green Apple project? Is there a space for citizens' participation and feedback?

The City is informing and will continue to inform the citizenship about the project implementation through the organization of public seminars, both in the city of Málaga and in the other partner cities, which represent part of the CAT MED project. CAT MED website will also provide continuously updated information about the project implementation.

10. If the project turns out to be successful would you expand it to other neighbourhoods of the city?

The "Green Apple" objective is not just to create a sustainable neighbourhood. It aims to represent a sort of "visible and material" vademecum for sustainable urban planning, a way to reduce the

greenhouse emissions and to improve the city's environmental performance and social integration, and a possible example for both the regeneration of the already existing urban areas, and the creation of new ones.

Based on this main idea, if the project will be successful, the Municipality will consider its general principles and try to replicate its performance in other urban planning and regeneration initiatives to be developed within the city.

Julio Cesar Ondategui, official at the Regional Administration of the city of Madrid (conducted via e-mail, 16 April 2010)

1. Could you present yourself and your work with few words?

I am a lecturer and an official at the Regional Administration in the city of Madrid. My main task is to provide new ideas for the design the Regional Plan for S & T, and management of infrastructures programmes.

2. From your experience in the Dirección General de Universidades e Investigación, what do you think are the main advantages of building technological parks in cities when it concerns sustainable development (sostenibilidad medioambiental)?

Environmental sustainability is not covered in the construction of industrial spaces. These parks are mainly floor and ceiling, and therefore are closer to business parks and industrial estates in the seventies with new organizational structures that help the economic restructuring. In contribution to your question companies that are installed in these parks are of new economic sectors such as environment, energy, biology, etc.

3. What would you advise smaller cities, which don't have the financial resources to invest in technological innovation for sustainability?

The scale of medium-sized cities is very appropriate to introduce innovations. You probably think that the big cities and their metropolitan areas may introduce more technology innovations because they have access to funding. However, they are usually less efficient and much more of resource spenders. A small average city can plan better, improve allocation of resources and be more

efficient from the point of view of sustainability; energy consumption, transport and mobility, time-use-types in transport, transportation, types of activities and tasks are different, and so on. The recommendation is to plan its uses, time, spaces and activities. For sure they will be innovative and sustainable. Education is the key.

4. Is it really a matter of having good financial support to be able to better manage the sustainable development of the city? Could known technology be used in new ways and still be innovative and drive towards change (what I mean by that is, is it necessary to invest a lot of money in developing new technology or can you use the existing one, but in a more efficient way)?

I think the question is answered in the previous item. In general, the current EU governments do not know how the money is spent on. In order to be sustainable, what you have to do, is not spend that much, and do not require much technology or more new technology, which, moreover, all of it comes from other countries. Governments have plans and programs that claim to be strategies, but all the administrative levels (in Spain there are five: EU, State, regional, provincial, and local) have the same strategy. This is very inefficient and unconstructive economically for citizens. You do not need more technology; it requires proper training and use of existing resources. Another example is involving parks and infrastructure for innovation and technology. These parks are like ‘containers in a house’ which nobody really understands how to use. If these infrastructures are not open to society and stakeholders, if they are not designed in inclusive economies and industrial change, their results are not visible and known.

5. In your opinion, what is the most remarkable invention of technological parks when it concerns sustainable development of cities?

It seems that more technological parks and infrastructures provide more employment, the more the economy is stable, less financial problems for SMEs and households (the parks have always been a real estate business in Spain, the United States in the United Kingdom, etc). So where is the invention? Maybe, in the idea and belief that some day the university and industry will begin to work together and provide new sustainable technology. I hope.

6. What are the economic benefits of the city of Madrid for using technological infrastructure? And what are the costs?

Madrid has a plan to renovate infrastructure facilities that were built in the last century. In one such scheme, now the costs are high (for design, construction, operation and maintenance). The benefits for enterprises are becoming much clearer. The results for the system and to society are long-term, and here is risk and uncertainty. We believe that benefits will run as the plan is different from traditional

and classical universities approach before: the new centres are referred to as 'firms and companies', and the legal form chosen is consortium and foundation.

7. Did you use EU funding to support your research and innovation? If yes, namely which financial mechanisms?

The 7 Framework Programme, the ERDF, the ESF, ERA-Nets, Interrge III-IV, and others such as the EIB.

8. Could you describe with few words the main technological sustainable projects the city of Madrid is working on?

Introduce public buses with hydrogen, to replace old heating systems with renewable energy, install solar panels on the buildings, meet a new Technical Building Code, installing incubators and business centers sustained from universities in fields of energy and environment. These are the main and most urgent current plans, which as always require investment in training and education.