FROM CRISIS TO INNOVATION: SEARCHING FOR THE ROOTS OF THE SUSTAINABLE DEVELOPMENT OF VIENNA

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Often mentioned as a best practice at the international level in terms of sustainability, the city of Vienna nowadays represents a rare case where the environmental protection, the public transport, the waste management together with the production and use of alternative energies are closely interrelated. The above mentioned policy fields, managed by the Municipality alongside with the welfare system and the housing policies, aim at a common objective: the improvement of the quality of life. It should therefore not surprise that Vienna is often classed first in many international reports, such as the Mercer Quality of Living Report, based on several criteria of liveability, or the Urban Audit Perception Survey, quoting instead the opinions of the EU citizens on their cities. The questionable topic is thus not if the city of Vienna is sustainable and good in terms of quality, but rather which the reasons for this success are: is it due to the obedience to the directives on sustainability and quality of life promoted in the last twenty years at the international level or are sustainability and quality of life the results of some choices made by the city according to an intrinsic logic?

Exploring some crucial moments of the history of Vienna when it has experienced deep crises in terms of housing shortage, isolation and lack of resources, peripheral role in the EU geography, this paper aims at revealing the capacity of the city to cope with changing problems and to steadily innovate its urban policies, thus creating a basis for sustainability and quality of life. The paper will particularly focus on two fields – the housing policies and the waste management – which are usually considered sectorial, but have become structural for Vienna and are still fields of experimentation on the topics of sustainability and quality of life.

Keywords: Vienna, Social Housing, environmental policy

Introduction. Vienna: a picture of the quality of life
Vienna nowadays stands out not only in Europe but also on the global level for its quality of life, as different researches and statistics show. In the last Mercer Quality of Living Report, published in 2010 by the British agency Mercer Consulting, the Austrian capital is ranked first of 215 international cities (Mercer Consulting, 2010). The report mainly analyses quantitative aspects of the city regarding political (stability of the government, respect of the laws), social (limitation of personal freedom, censorship), economic (bank services, competitiveness),
environmental and sanitary factors (climate, natural disasters, waste and water management, pollution) and further elements such as public transports and services, education and personal security.

The outstanding quality of life of Vienna is confirmed also by other statistics, such as the Urban Audit Perception Survey, proposed every year by the European Union in order to gather the opinion of the citizens on the situation of the cities they live in. The answers do not simply lead to a ranking of the European cities but show a more complex and subjective image that combines the satisfaction for different aspects of the city life. Vienna stands out of 31 considered cities in particular for the management of the public resources (1/31), for the perception of safety (2/31), for the public transport effectiveness (3/31), for the presence of affordable housing (4/31) and for the air quality (5/31). Alongside to the considered variables, the interviewed have also highlighted the outstanding cultural offer and the presence and accessibility of public and green spaces. 95% of the interviewed have given a positive answer to the overall satisfaction for the life in Vienna.

Vienna's ranking in the international statistics (sources: Mercer Quality of Living Report 2010; Urban Audit Perception Survey 2007)

Such statistics actually reflect not only a positive assessment (Mercer Quality of Living Report) and subjective satisfaction (Urban Audit Perception Survey) for the quality of life in Vienna, but also the effectiveness of the policies promoted by the Municipality of Vienna in the last decades and in particular in the Nineties: taking charge of services of general interest, from the urban planning to the waste management, from the education to the environmental protection, from the water management to the infrastructures, from the public transport to the
social and sanitary services, the Municipality has shown the existence of a substantial connection between the political organization, the sustainability and the quality of life of the city. Coping with different aspects of the urban life, in fact, the Municipality of Vienna has aimed at a common objective: a combination of effectiveness, good organization and comfort, what in German is expressed in a word, *Gemütlichkeit*, or in other words, the quality of living.

1. Goals and themes of the paper
This paper is the result of a joint work, inspired by a PhD thesis about Social Housing in Vienna and a Master thesis about Waste Management in Vienna. Both works have been published in different articles¹ and this is the first time they try to work together. The aim is to introduce and to discuss contemporary environmental policies in Vienna, showing how the topic of sustainability is not tackled in a sectoral way, but through broader logics, starting from the observation of the real phenomena and resources of the city and trying to give answers to several needs of the citizens.

Not by chance, the two analysed policy fields, Social Housing and Waste Management, seem distant and not very pertinent at a first glance, but share several common elements that this paper aims to show. The main common factor is the approach used by the Municipality of Vienna, able to work in research, experimentation and innovation. This will be the leitmotiv that accompanies the paper.

The paper consists of an introduction that explains the origins of an innovative and original approach concerning the sustainability theme. The introduction is focused on some salient events of the contemporary Viennese history, that have been an incentive to improve the environmental policies. The paper continues with the recent experimentation promoted in the fields of Social Housing and Waste Management, showing how the Municipality of Vienna has improved its policies through the innovation of tools, practices and actors.

A third part of the paper shows the close connection between the urban form and sustainability and how such relation is relevant for both the Social Housing policies and Waste Management. After a brief excursus on the planning tools, the paper focuses on a specific urban sector, Donaufeld, where several experimental projects have taken places. A significant project located in such area, Autofreie Mustersiedlung, is also analyzed.

In the final conclusions the paper combines again the two topics of the Social Housing and the Waste Management, promoting a general reflection on sustainability in Vienna and opening up new questions.

2. A brief introduction: the origins of an innovative approach
The history of Vienna differs from the one of many other European cities because of its continuous change of role in Europe, from central to peripheral city and vice-versa, due to the succession of several growth and decline cycles of the urban population and of the economy (Hatz G. 2008). While the big capitals nowadays are facing congestion, pollution and scarce cohesion problems, Vienna, as well as other cities that are not usually ranked among the main financial global markets, has intended sustainability as a necessary form of development in

¹ See references.
order to be competitive on the level of the quality of life.

After having been for long the capital of the Austro-Hungarian Empire, the city of Vienna has changed its character through time: after the First World War it has known a severe crisis, when it was nothing more than the capital of a small state of 6 million inhabitants that became a Federal State in 1921. The political and economic autonomy that the city gained as a consequence of the Secession, alongside with the strong presence of the social democratic party in the Twenties, has lead Vienna to become a model of “social city” known on the international level, the so called “Red Vienna” (Tafuri M., 1980). To the compact city of the end of the XIX century new social housing neighborhoods were added for a total of 60.000 housing units with internal hygienic services, external green surfaces and spaces for leisure. Such large scale intervention was made possible thanks to a radical shift towards a strongly redistributive policy (Scavuzzo L., 2009c).

The Second World War has represented the starting point of a difficult period for the city that saw the creation - at the end of the conflict – of the Iron Curtain in order to separate Western Europe from the states of the Communist Block. Vienna has therefore experienced both a peripheral position in Western Europe and the isolation from the Eastern European countries, which have always been its cultural, political and commercial partners. Given its difficulty to open towards the foreign markets, Vienna has decided on one hand to invest on its tradition, promoting its artistic heritage as a source of tourism, and on the other hand to continue the policies started in the Twenties aiming at guaranteeing the welfare to the citizens. The city has therefore taken charge of all the services of general interest (water, electricity, public transport, social and health services, water and waste management) and has taken care of their quality, widening its action from the social housing production to environmental issues thanks also to the importance gained by the Green Party in the Seventies and to the relevance of the topic of ecology in the society. The large investments in social, infrastructural and environmental policies started in the Sixties and Seventies were made possible thanks to the double role of Vienna as a Municipality and as a Federal State; the city, in fact, had and still has a jurisdictional power, an authority and an availability of resources that exceed by large those of the typical municipalities (Baldi B., 2007).

Since the second half of the Seventies the Municipality has invested in the strengthening of the infrastructural system and in the fast expansion of the public transport; moreover it has oriented its policies towards the reduction of the soil consumption and the protection of the environmental resources, proposing the idea of a dense city².

The fall of the Iron Curtain that took place at the end of the Eighties has represented the starting point of a new age for Vienna, since the city had the chance to cooperate again with its traditional Eastern European partners. After Austria entered the European Union in 1995,

² The new Urban Development Plan (STEP 05), published in 2005, shows the contemporary urban policies of the city, and highlights their continuity with the historical development and the morphological characters of the urban fabric of Vienna from the beginning of the XX century until now.
Vienna has started to be considered by the international companies and the EU governments as the “door to the East”. The city has therefore been chosen not only because of its geographical proximity to that rapidly growing area, but also because of its cultural affinity, the good connections, the high level of education of the population and the orientation towards the scientific research mainly on environmental issues. Nowadays not only the foreign investments in Vienna are growing (+7.3% in the years 2004/5), but also the investments of the Austrian companies abroad have increased with a rate of 12.3%.

Consistently with the opening towards the East new relations have been promoted among Vienna, Bratislava (Slovakia) and Brno (Czech Republic), thus giving birth to the CENTROPE region.

The network of cities that are bound not only by political and economic agreements, but also by physical connections (infrastructures and nature) aims therefore at competing on the international level with other regional networks, like for example the one Prague or Budapest belong to. While those compete on low prices, Vienna continues to promote the quality of the environment and of life that has become an element of distinction of the city.

As a consequence of various projects aiming at an improvement of the quality of the environment, in 1995 the Viennese Program for the Climate Protection (KLIP) was introduced with the goal to reduce the CO2 emissions by a rate of 25%. Such program has involved more than 300 people employed in the public sector and has anticipated the Kyoto Protocol (1997). KLIP has developed several measures, mainly regarding issues such as traffic planning, energy and waste management. Nowadays the greenhouse gas emissions have been reduced by a rate of 5.4 t/year.

The issue of ecology has penetrated in the last ten years several fields of action of the Public Administration, such as the social housing sector. After the fall of the iron curtain and the following immigration from the Eastern countries the city has been engaged every year in the construction of 5000-7000 public or subsidized housing units (80-90% of the new buildings) and has considered the quality of living as a fundamental feature of the new housing policies (Förster W., 2009). The energy saving and the use of sustainable resources have represented the common denominator among the different interventions and in some cases have been decisive for the project, as in the case of the Autofreie Mustersiedlung (experimental neighborhood without cars).

2.1 Innovative housing projects: theme and places

The Viennese case displays a considerable range of innovative projects which seem to allow an interesting understanding of the possible interplay between urban planning and housing solutions people can aspire to. The renown history of the housing policies in Vienna dates back to one century ago, when the conditions for a massive housing development plan were posed by the City. Since then the social-democratic government of the city has been enforcing public and social housing as a main drive for the enhancement of welfare policies. Along the time, pilot projects have been updating and innovating the solutions offered to housing problems.
The City of Vienna has renewed its housing policies starting from the already existing resources, transferring the tools acquired during the history of social housing to new housing policies, turning their rules of intervention from direct action to management of the processes and promotion of policies, shifting to the administration itself a role of coordination (Scavuzzo L., 2009). It was also proposed to tackle the problems of contemporary living through innovation in architectural projects, with the purpose of increasing the urban and social quality of housing (Bärnthaler C., Philipp E., 1999).

This experience was consolidated in the last fifteen years and new social housing projects were designed to improve the quality of housing, to minimize the cost of construction and to save energy. In order to guarantee the environmental performance the Municipality of Vienna has developed in the last fifteen years the developers' competitions system that will be explained afterwards.

**Different forms and ways of living with respect to sustainability**

In the last twenty years the Municipality has promoted experimentation in several directions: the first significant testing of the "theme projects" were introduced in the 90s when the municipality started a research aimed at answering specific housing and social questions. The themenstädte were programs in which the project was carefully focused on specific issues, investigating problematic areas in order to improve the quality of housing, use alternative energy sources, promote the socio-cultural integration and explore a wide range of planning resources. For an overview, some significant themenstädte were selected.

The Frauen-Werk-Stadt I (1993-1997) recalls the topic of the Everyday Living: Frauen-Werk-Stadt I, which literally means "the working women’s city", could also be translated as "the laboratory of women" just changing the letter "d" in Stadt with "t" of Werkstatt and it’s probably this second translation that expresses more closely the history and the nature of this experience. The result was a pilot project: the largest apartment complex of its kind in Europe, a model of success capable of applying theoretical knowledge to specific domestic space and to transfer the results achieved in the housing projects in general (Kail E., 1994).

The Interkulturelles Wohnen (1993-96), "Intercultural living" represents one of the most significant experiences in the field of the Living and cultural integration and is the first project of intercultural cohabitation in Vienna. Further projects have worked on the same topic afterwards, such as Integratives Wohnen (2002-2004).

Compact City (1993-2001) suggests a new way to inhabit peripheral areas favouring the character of urban settlements and promoting a shared space for Living and working. The complex proposes a mix of uses and functions: the housing were designed to become work spaces, the ground floor was built to be a supermarket, the first floor was designed as a huge square on which offices and laboratories overlooked.

Sargfabrik (1994-96) is one of the most radical social housing experiments regarding the topic of Community housing. Sargfabrik is the former factory (fabrik) of coffins (sarg) "Maschner & Söhne", built in the late nineteenth century and abandoned in the’70s. The space reuse project was developed in the mid-80s by a group of local residents: the Association for the Integration of lifestyles, was organized to find a way out of the housing market logic and that
could receive different lifestyles and cultures. All the selected projects, moreover, cope with sustainability issues through different forms of action: recompose the fragmented areas (*Frauen-Werk-Stadt, Interkulturelles Wohnen*), reduce the daily mobility (*Compact City*), reuse brown-field (*Sargfabrik*).

*The developers’ competitions as a tool to guarantee the environmental performance of the projects*

In 1995 a new tool for the promotion of state-funded housing was devised: the developers’ competition. The procedure of the competitions makes notice of the area to be purchased by manufacturers; it requires: the cooperation between developers and designers already under competitive bidding, the binding estimate and the cost of construction, a program for managing the social housing and an estimate of rental and sales for future tenants. The procedures differ depending on the type of competition and the projects are judged by a complex score system, related to architectural and urban quality, economic sustainability and environmental performance. In particular, the quality of architecture and urban planning is estimated according to: the design of open spaces, squares, streets, gardens, the architectural design of buildings that constitute the whole, the ability of projects to work on different scales, the use of innovative types of housing and the distribution systems capable of exploiting the paths between areas of different nature (such as housing and common areas, between the inside and the outside, between the green spaces and residence). The juries are made up of architects, representatives of the construction market and of ecological, economic and legal specialists. The final aim of the competitions is to reduce construction costs by promoting competition for investors and at the same time to improve the quality of architectural and urban design, the environmental impact and the technical characteristics of buildings.

Finally, the elements which contribute to define the environmental performance of residential interventions include: the energy consumption of buildings and use of renewable sources; the nature of the materials of construction and life cycle of building components; the environmental quality both of the housing and the whole settlement.

<table>
<thead>
<tr>
<th>PLANNING (Quality of)</th>
<th>COSTS</th>
<th>ECOLOGY</th>
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<tbody>
<tr>
<td>staircases, corridors, etc.</td>
<td>construction (incl. land costs and planning)</td>
<td>technical equipment, energy consumption</td>
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<tr>
<td>ground plan of flat</td>
<td>costs for user (rent, down payment)</td>
<td>ecological construction and materials</td>
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<tr>
<td>estate, green areas, etc.</td>
<td>running costs, maintenance</td>
<td>environmental qualities of flats</td>
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<td>architecture, urban planning</td>
<td>contract conditions</td>
<td>environmental qualities of estate</td>
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<td>total scores for quality criteria</td>
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Developers’ competitions: criteria for evaluating projects

This last point, environmental performance, plays a major role in the process of
experimentation with themes of environmental sustainability. It was approached over time in different ways and forms, through standards for climate protection, quality of building and testing of renewable energy sources. For over 15 years the residential construction has entered the environmental policy agendas and the Municipality has developed a system of public subsidies directed to the new developments and the existing ones. In this direction was designed the program Thewosan, which subsidizes intervention (even private) to reduce energy consumption through the thermal insulation in existing buildings due to action on façades, windows and roofs. As regards new buildings, however, they may benefit from public subsidies if they satisfy the standards Low Energy Building3: (1.) they must observe specific parameters of thermal insulation; (2.) they are required to avoid materials containing halogenated hydrocarbons which contribute to global warming; (3.) they must offer alternative heating systems; (4.) they must be equipped with gray water disposal systems. In addition, the City aims to reduce the use of conventional heating by promoting passive houses, because energy demand is reduced by up to 80% compared with traditional systems4. Currently in Vienna about 250,000 flats in passive houses have been built. These include the Molkereistraße Dormitory (designed by Baumschlager e Eberle), Kammelweg building (designed by S & S e Kaufmann) and Dreher Road building (designed by Lautner). One of the most significant interventions is the district Eurogate-2009 (masterplan by Albert Wimmer), the largest project to passive energy in Europe, comprising about 900 apartments for subsidized rent (Förster W., 2009).

2.2 Innovation in waste management
As for the housing policies, also Waste Management represents a sector that is strongly coordinated by the public administration since the last fifty years. Going back to history, in the Fifties, while large parts of the cities of Western Europe were experiencing a considerable growth and sustainability was still an unknown concept, the city of Vienna, which on the contrary was undergoing a severe crisis, due to the isolation from its traditional partners (Eastern Europe) decided to exploit the waste as a source of energy (Hatz G. 2008). From the first incineration plant built in 1959 to the present (now Vienna has the widest district heating network in Europe) a lot has changed, but not the commitment of the Public Administration to invest in this sector and the strong intention to shift from the “waste removal” (Abfallbeseitigung) to the “waste economy” (Abfallwirtschaft), a word that has a different meaning from the common term of “waste management”.

One event as the engine of the innovation process
Among the main changes that have taken place in the recent history of waste management in Vienna we can list the attention towards ecology and the integration between waste management – traditionally considered as a sectoral policy - and other urban policies. The main engine of this strong change of perspective has been an event: the accident occurred at the beginning of the Eighties in the incineration plant of Spittelau, famous for its central

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3 Urban Development Plan (STEP 05), 2005
4 A room in a passive building can be heated with the energy that is usually needed for two light bulbs.
location that is unusual in many other European cities. The inhabitants of the neighbourhood rioted for the immediate closure of the plant of Spittelau and the eventual creation of a new plant outside the city, while the sector of the municipality of Vienna in charge of the Waste Management (MA 48) confirmed the necessity of maintaining the plant in the same position because of economic and technical reasons. The two different positions led to a conflict during which the MA 48 tried to assume the role of director of the on-going process, sure of its political power: as a compensation of the public decision that could not be changed (to maintain the position of the plant) it proposed to renew the building, entrusting the famous Viennese architect F. Hundertwasser of the renovation of the façade. The decision taken by the MA 48 not only did not satisfy the inhabitants, but provoked the violent reaction of many other citizens and especially of the environmentalists: if Hundertwasser, member of the Green Party, had accepted to conduct this work, he would have betrayed the green principles (Hundertwasser F., 1988). To renew the façade, in fact, would have not solved the problem that in the perception of the environmentalists was the shift to a zero waste society where the only possible way of waste management was recycling. Unexpectedly after some months of reflection, the architect decided to accept the work commissioned by the municipality and to use his fame to act as a mediator between the environmentalists, who were supporting the local inhabitants, and the decision maker (the MA 48). As a result the MA 48 proposed not only to renew the architecture of the building but to take into account the demand for a more sustainable society, for a reduction of the threats to the environment and the human health and therefore invested a consistent amount of resources in the scientific research, in order to find new solutions in the mid and in the long term (Pessina G., 2010).

The research, promoted and supported by the Municipality of Vienna, mainly focused on new technologies for the incineration and district heating (reduction of emissions, introduction of filters, safety of the plants) and on alternative forms of waste management to be adopted in the long run. Therefore the Institute for Water Quality, Resources and Waste Management of the Technical University of Vienna was strengthened and the method of the Material Flow Analysis was consolidated, while a new Institute for Composting and Use of Compost in Agriculture was created within the University of Natural Resources and Applied Life Sciences of Vienna (BOKU).

The waste management therefore started to be considered a fundamental public service in the agenda of the city, that should have contributed to the quality of life, defined both as quality of the environment (reduction of emissions etc.) and of quality of the public space (cleanliness, accessibility). A deep knowledge not only of the topic, but especially of the context (existing resources, main features of the territory, needs of the citizens etc.) developed in the Public Administration and led to a stronger collaboration between the MA 48, other sectors of the municipality (Environmental Protection, Water Management, Urban Agriculture, Urban Planning etc.) and experts; even the inhabitants of the neighbourhood, the citizens in general and the representatives of environmental associations changed their role from enemies of the MA 48 to allies. This collaboration was mainly aimed at evaluating the
current situation and to draw future strategies, to be translated afterwards into selective investments made by the Public Administration. The cooperation continues still today and is formalized with the tool of the Strategic Environmental Assessment (SUP) that involves all the above mentioned actors and is aimed at the production of a new waste management concept (Wiener Abfallwirtschaft Konzept) every two years.

The waste management system in practice
Looking at the material results of the process, on one hand the extension of the district heating network has been promoted to reach the present 1000km (21,9% heating demand of the city), while on the other hand the process of composting has been introduced. The total amount of recycled waste does not exceed by large the minimum imposed by the EU (30%) (City of Vienna/MA 48, 2007). This datum actually is not contradictory for a city that is considered sustainable, but shows the peculiarity of a choice taken some decades ago by the Viennese politicians and updated but basically confirmed nowadays. Sustainability therefore stems from the combination of different Waste Management methods. The improvement of the performances of the incineration plants and the consequent substitution of polluting resources with clean resources (heating obtained from the waste and not from oil; use of compost instead of chemical fertilisers) have contributed to a strong reduction of CO2 emissions and to the enhancement of the environment.

3. Urban Viennese shape and sustainability issues
The city of Vienna is dense of functions and spaces, where every single surface, even small, represents a public space resource equipped with sport facilities, as green areas or simply as a place for leisure. Developed as a dense city the alternation between built areas and open spaces first has guaranteed quality and liveable places, secondly has allowed to use agricultural resources in the immediate surroundings of the city. In the past the city developed between the Danube’s west river and the hills to the west of the urban centre. After the Second World War, with the introduction of the public transportation (U-Bahn, S-Bahn and tram), the city has expanded towards the north-west, beyond the river, in rural areas. Nevertheless the urban development has preserved the wealth of open spaces and green areas.

In fact, since the late Seventies the Vienna’s urban policies guidelines have aimed at implementing a compact development in order to preserve the environment. These planning strategies were implemented through time and nowadays constitute a fundamental part of the Urban Plan 2005 (STEP 05), which incorporates the ideas contained in the AgSTEP (Plan for the Agricultural areas) on the protection of agricultural land inside the urban areas, the expansion of a production that is respectful of the environment and the enhancement of green spaces.

Even today, the Viennese urban policies aim at reducing land consumption. New expansions involve mainly brown-field sites or small areas of interstitial fabric. In addition in the consolidated context these put in place interventions of urban saturation and include high
density intervention, ensuring appropriate access, services and facilities. In this context, the new Social Housing projects play a pioneer role to experiment different kind of living spaces, technologies, environmental devices and so on. They are mainly located close to the public transportation, so that they do not foster the use of cars. Moreover they represent an opportunity to redevelop parts of the city, to deploy the facilities equipment, the public spaces and experiment new solutions for the housing project.

Also the choice for the district heating and for the composting shows a strong connection between waste management and urban planning. On one hand the creation of a capillary network of district heating has been possible and less expensive than everywhere else thanks to the compact shape of the city; on the other hand the idea of introducing the composting process has been suggested by the traditional presence in the city of the urban agriculture that has lately declined. Hence the production of natural manure became part of a more general revitalisation policy of the urban agricultural areas through the introduction of biological agriculture and the sale of the products in the city, which was made possible only after various campaigns of the Public Administration to make the citizens more aware of new forms of consumption.

The urban shape of Vienna (source: AgSTEP in STEP 05. Elaboration by the authors)
Social Housing projects implemented between 1993 and 2008 with relation to the urban shape of Vienna
(sources: STEP 05; Pandi C., 2005; Elaboration by the authors)

Social Housing projects implemented between 1993 and 2008 with relation to the public transport in Vienna
(sources: STEP 05; Pandi C., 2005; Elaboration by the authors)
Social Housing projects implemented between 1993 and 2008 with relation to the district heating network in Vienna
(sources: STEP 05; Pandi C., 2005; Elaboration by the authors)
4.1 The STEP 05: Target Neighbourhoods and sustainability strategies
The new Plan still proposes a compact development for the city, optimizing the public transport system, concentrating the development (residences, workspaces, leisure and commercial spaces) in some strategic areas with higher density. The Plan underlines also the importance of recovering and modernizing the existing building, bringing the idea, developed in the Urban Development Plan 1974 (STEP 1974), of a soft urban renewal as the heart of the urban policies. In fact already since the mid of the Seventies the Municipality has created an office for the renewal (Gebietsbetreuungen), managed by architects and private investors in the building industry and in 1984\(^5\) started one of the most important programs of housing rehabilitation, known as Sanfte Stadterneuerung (soft urban renewal), that still today represents an effective tool for the rehabilitation of the existing fabric. Today in the STEP05, the areas where investments will be concentrated are called Zielgebiete (target neighbourhoods).
In the historic city centre are provided measures for the conservation of the architectural heritage and the improvement of the public spaces, but in the other target neighbourhoods interventions are planned in continuity with the existing city and are strongly linked to the environmental issues.

The target neighborhoods addressed by the development strategy of the City of Vienna (source: STEP 05)

4.2 The Donaufeld area: a place where the experimentation can be observed
Among the target neighbourhoods, the area indicated as Donaufeld covers about 70 hectares. It is located between two major urban poles, Florisdorf e Kagran and about 6 Km from the

\(^5\) Through the Wohnhausanierungsgesetz (Housing Rehabilitation Act) the rehabilitation of 170.000 housing units has been completed.
centre of Vienna on the East Side of the Danube, a cluster of heterogeneous urban materials of various ages, densities and properties. This district in the past suffered from a negative stigma being placed “on the wrong side of the river”, in the area called Transdanubien, a context characterized by dismissed industrial areas and the presence of peri-urban agricultural residues.

Donaufeld (i.e. “field of the Danube”) represents the portion of the Florisdorf neighborhood where the original features of this territory can still be recognized: in the past such territory used to be one of the most important agricultural areas of Vienna, thanks to the favorable conditions of the soil; such conditions have also brought the settlement of several manufacturing industries that have progressively fragmented the area.

The traditional long and narrow allotments have been divided, often interrupted and progressively occupied through low density residential and industrial buildings. As a memory of the past several small portions of agricultural land have been occupied by farmers and are devoted to the production of vegetables, mainly for self-sustainment or for a small trade.

Even though in the Seventies some professionals, politicians and academics promoted the idea to re-compose the agricultural fragments thus creating a green wedge able to connect the city centre to the larger agricultural area in the east, the investment of the resources in other sectors has not allowed to implement such project. Moreover, because of the worsening of the soil conditions and of the conflict with the industrial activities, several farmers have abandoned the fields. Nowadays, because of the reduction of the industrial activities and of the strong shift of the urban planning towards sustainability, the idea of the green wedge is again valid and has been presented in the AgSTEP 05 plan.

The large supply of land for building and the presence of public transport (underground line U6, U1, tram and railway) have favoured in the past two decades new urbanisation projects, including various Social Housing complexes that have not destroyed the agricultural character of the area, but on the contrary have redefined it. Some examples are represented by the new complex in Tokiostrasse, the Frauen-Werk-Stadt, the Compact City, the Autofreie, the Integrative Wohnen; all of them share some common features, such as the good connection to the transport network, the link to the district heating network, the effort to complete the fragmented urban fabric, the respect of the agricultural land and of the indications contained in the AgSTEP.

4.3 Autofreie Mustersiedlung: an example of sustainable neighborhood in the Donaufeld area

The history of the project Autofreie Mustersiedlung (car-free neighbourhood) began in 1992 when the Vienna City Council adopted the proposal of the Green Party to build a residential estate in which they could experiment new ways to inhabit the city in relation to the mobility issues (Scavuzzo L., 2009b). The idea, endorsed by the Council, was to achieve an urban area where the economic resources usually devoted to the construction of garages and parking places were transferred to alternative infrastructures (bicycle services etc.) and public areas
This project belongs to a development strategy that can be found also within the Transportation Plan that was approved by the Vienna City Council in Fall 2003; according to this document the chosen development for the transport in the city in the next 20 years foresees the reduction of the car circulation between 35% and 25% and at the same time the implementation of alternative and sustainable transportation modes. In accordance to this the Municipality has promoted several projects in order to empower the public transport connections, trying to make more convenient the use of the tram, the buses and the underground. One of the most relevant elements of the Transportation Plan is the project “1000+1 km of bicycle paths” that foresees the extension of the existing paths for the cyclists (1000 km) in order to guarantee further connections among different places in the city and to promote the intensive use of the bike as a daily means of transport.

Regarding the **Autofreie Mustersiedlung** the most important features are represented by: energy saving and high environmental standards; introduction of services to the residences and common areas for the community; substitution of parking lots with other forms of mobility and introduction of the car-sharing system; participation of the inhabitants in the project and in the management of the estate. On the scale of architecture some technical devices have been introduced in order to optimise the energy needs of the buildings, such as the use of renewable energy sources for the water heating and air conditioning, the use of geo-thermal and solar energy alongside to the energy produced from waste for the district heating, etc. Moreover the cycle of water is carefully managed through the recycling of the rainwater and the grey water, in order to reduce the water consumption within the buildings. Finally recycled materials are used for the open spaces (Seavuzzo L., 2010).

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6 The reduction of the car based transport includes also further experimentation, such as the freight transport through trams for the movements within the city that has been promoted by the society that managed the public transport, Wiener Linien (STEP 05).
Therefore the *Autofreie Mustersiedlung* is a project where the experimentation in the housing field is combined with the one in the building devices, in the green spaces, in the energy supply and at the same time represents a way to orient the daily life towards the respect of sustainability. Starting from this experience in Vienna, other projects, including the recent *Bike City* (2008), have further applied the idea of the car-free neighbourhood. The Administration has introduced an exception to the building regulations for all projects that demonstrates a high capacity to promote experimentation related to the mobility issues as an alternative to cars (Ottes L. et al., 1995).
5. Conclusions
As a result of such policies in the fields of planning, energy management, housing etc. Vienna nowadays plays a pioneer role in terms of environmental sustainability. The Municipality has invested large economic and knowledge resources already since the Seventies, through the promotion of projects aimed at the improvement of the urban quality and at the protection of the environmental resources, integrating the topic of sustainability in all its aspects.
In fact sustainability stems from a moment of crisis and necessity and is therefore the result of intrinsic logics of the city.

It is a city where the European directives on sustainability or experimentations have not been simply applied, but also interpreted and often even anticipated. In the case of the waste policies, in fact, the EU directives (EU, 2006b) have not always been considered useful to reach the final objectives of waste management, that is to say the protection of the health of the humans and of the environment, the conservation of resources (materials, energy, space) and the treatment of the waste before their disposal in order to avoid the creation of economic and environmental problems for the future generations (Brunner P.H. et al., 2004). Therefore district heating, recycling, composting and waste disposal are intended as different means to be combined in order to achieve those final objectives. In fact, while the reduction of the volume of produced waste through recycling has been intended as a long term action, the main concern in the short and medium term is represented by the elimination of hazardous elements contained in the waste through the treatment; also the choice for composting aims at reducing the use of chemical fertilizers that endanger the soil and also the human health. Vienna therefore cannot be considered an avant-garde city in the field of the waste management just because of the presence of high tech plants, but rather for the existing synergy among the different methods that are used and are all aiming at the highest collective benefit. Such capacity to introduce innovation and anticipate the European experimentations in the field of sustainability is even more evident in the case of the housing policies: the Autofreie Mustersiedlung is in fact the first project in Europe of a car-free neighborhood that has been considered as a model for further experimentations across the continent. Such neighborhood has not been only considered as a model from the technological perspective, but also because it embraces social and behavioral aspects of the domestic space as well. Alongside with aspects such as the performance of the involucre of the building (reduction of the heating dispersion etc.), the use of the energy (use of renewable resources, reduction of energy consumption etc.), the Autofreie Mustersiedlung, promote and ease those daily behaviors (use of bicycles instead of cars etc.) that contribute to create a sustainable way of living, in accordance to the housing policies in Vienna.

Since the shift towards sustainability has represented a necessary response to the crisis for Vienna, it is also evident its strong relation to the research activity that is not only theoretical but rather made practical through experiments, trials and errors. In the field of waste management the crisis and the environmental conflicts that took place at the end of the Eighties have pushed the Public Administration towards the widening of the already existing
Institute for Water Quality and Waste Management (IWA) at the Technical University of Vienna and the creation of a new research institute specialized in Composting and Use of Compost in Agriculture within the University of Natural Resources and Applied Life Sciences of Vienna (BOKU). Such research institutes have been responsible for the experimentation and the improvement both of the district heating system and the composting system in collaboration with some sectors of the Municipality. In the field of housing, the Municipality has promoted several researches mainly focused on the changing housing demands, populations and sustainability: such researches, on one hand, have been collected and have given birth to the “Vienna Housing Research”7 in 2004 and on the other hand have been tested and used for the definition of the experimental thematic housing projects (sustainability, women, immigrants, ...) that have been promoted in the last fifteen years.

As a result of such continuous applied research activity, Vienna has gained a renowned role as a sustainable city across Europe that can be taken as a model or even called as a problem solver in case of crisis. In the case of housing, in fact, neighborhoods such as the Autofreie Mustersiedlung or the Bike City are listed as best practices in several European publications8 and exhibitions regarding sustainability such as the recent “Green life” (Triennale di Milano, Milan - Italy, 5 February - 28 March 2010)9. Moreover, the Viennese experience has allowed the creation of a specific exhibition, “Housing in Vienna. Innovative, social and ecological”, that has been promoted by the Architektur Zentrum Wien and has been presented since 2008 until today in several European cities such as Vienna, Venice, Milan, Ankara, Munich and Berlin. Even in the field of waste management Vienna has gained a leading and model role not only in Europe: in 2001, in fact, the City of Osaka created a partnership with the City of Vienna in order to transfer the experience of the Spittelau plant to the Maishima Osaka Plant (MOP). After the Municipality of Osaka asked arch. Hundertwasser to beautify the façade of the plant (2000), the cooperation among the two cities has started on waste management policies, technologies, communication with the citizens and conflict management. The fame of Vienna and of its researchers in the field of waste management have also pushed cities that were experiencing a “waste emergency” such as Naples in 2008 to ask the IW A-TU Wien for technical consultancy in order to analyze the situation and give technical advice to overcome the crisis.

Finally, if sustainability has a primary function in the urban transformation processes, the Public Administration of Vienna shows how to play the main role in their coordination. The city, in fact, continuously renews itself and the public action is at the centre of such renewal. From both the experiences of the housing policies and the waste management it is possible to learn the capacity of an administration to redefine its institutional role and at the same time to invest in the environmental quality in order to give valid and effective answers to the needs of

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7 Since 2004 the City of Vienna (MA 50, Housing Department) is regularly presenting results of funded research projects in the fields of housing and urban renewal in order to provide facts, data and arguments for the housing policies of the City of Vienna. http://www.wohnbauforschung.at/en/wohnbauforschung.htm


9 www.mostragreenlife.org/EN/home
the citizens. Both the housing and the waste management, in fact, are considered in the local agenda fundamental public services to be equally guaranteed in the city in order to substantially contribute to the quality of life. Moreover the public coordination and implementation of such policies, usually considered as sectoral and not integrated as in the case of Vienna, have allowed to mobilize, articulate and create resources: on one hand the innovation of the public policies has started a learning process within the institutions themselves; on the other hand the high quality of the public interventions has pushed private actors to emulate them. In the field of the housing projects the innovation promoted by the public sector has led many private investors to promote significant experimentation in the free market; with respect to waste management the effective Viennese system has represented a model for private companies working outside Vienna and unable to compete with the public sector in the city.

In conclusion the analysis of the policies promoted by Vienna to improve sustainability and the quality of life leads also to reflect on the trend towards the liberalization of the public services that has started in the last two decades in Europe and is considered unavoidable in several European countries and cities (Pessina G., 2010). The case of Vienna, on the contrary, shows a different way, where the public management of the services does not represent a burden for the Municipality, but becomes even a field of investment and a source of income.

References