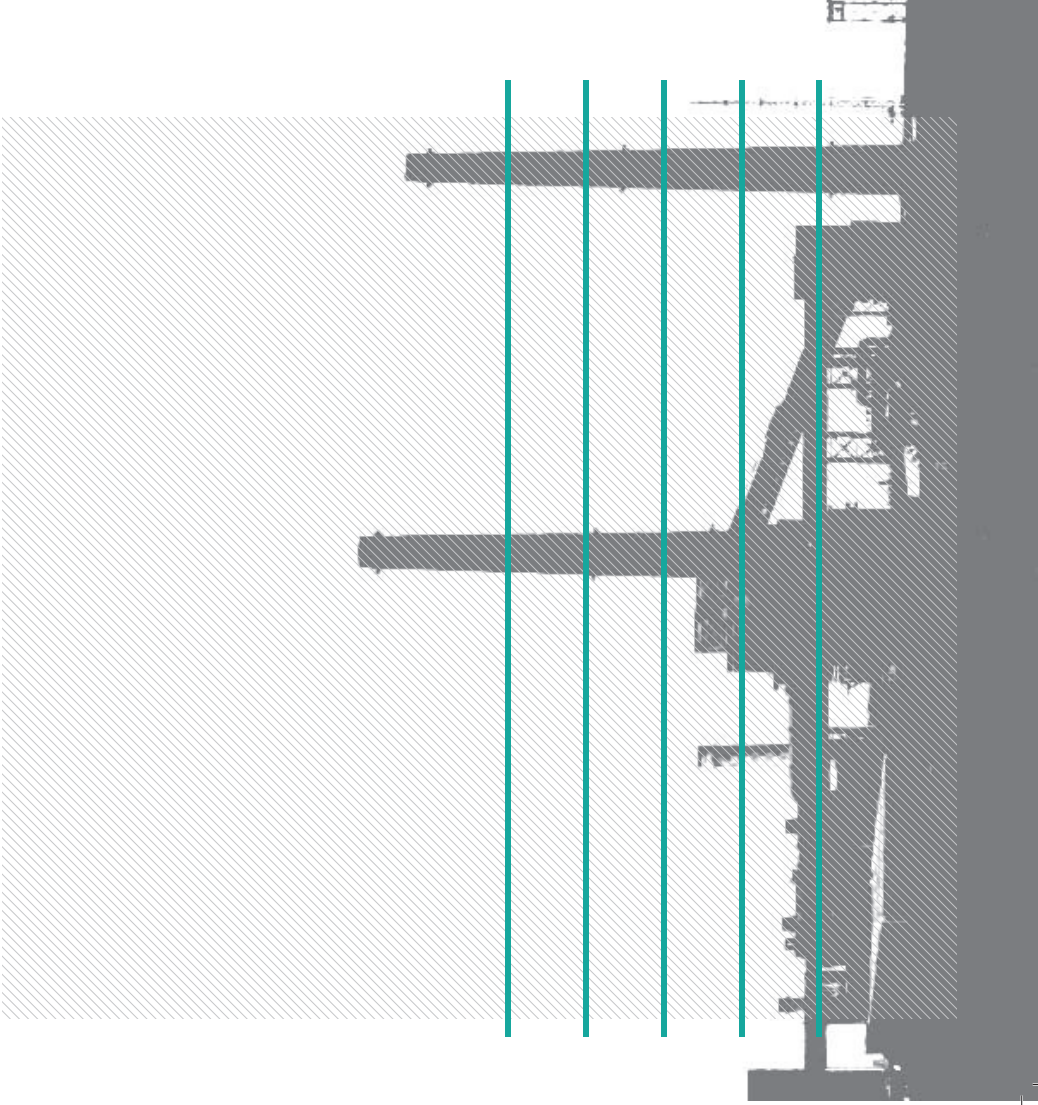


<h1>KREMIKOVITZI THE RED MONSTER AND ITS FUTURE</h1>	<p>DIPLOM WORK</p> <p>A diplom work in architecture for acquiring an academic degree of Diplomed Engineer.</p>	<p>Delyan Ivov Pantaleev Graz University of Technology</p> <p>Professor: Dipl. Ing. Dr. techn. Grigor Doytchinov Urban Planning Institute</p> <p>April 2013</p>
--	---	--



Statutory Declaration

I declare that I have authored this thesis independently, that I have not used other than the declared sources/resources, and that I have explicitly marked all material, which has been quoted either literally or by content from the used sources.

Graz am _____

Unterschrift _____

Eidesstattliche Erklärung

Ich erkläre an Eides statt, dass ich die vorliegende Arbeit selbständig verfasst, andere als die angegebenen Quellen/Hilfsmittel nicht benutzt, und die den benutzten Quellen wörtlich und inhaltlich entnommen Stellen als kenntlich gemacht habe.

Date _____

Signature _____

SPECIAL ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to:

Peter Dikov, City Architect of Sofia;
Prof. Dr. Arch. Vesselina Troeva, Director of the National Centre for Territorial Development;
Arch. Ivan Parvanov, urban planner;
Arch. Georgetta Rafailova, urban planner of SofProject Ltd.
Eng. Zlatan Zlatanov, CEO of GeoCAD Ltd and
Kremikovtzi Co., owner of Kremikovtzi

for providing me with incites and valuable information for the creation of this project.

Graz, April 2013

TABLE OF CONTENTS

<p>08 INTRODUCTION</p> <p>10 Main Goal and Objectives</p> <p>12 Methodology</p> <p>14 The Red Dust & The Red Monster</p> <p>18 The Vision for European Cities</p>	<p>22 CHAPTER 1 SOFIA AND KREMIKOVITZI URBAN ANALYSIS</p> <p>24 Sofia a Historical Background</p> <p>29 The Chain of Monasteries a Cultural Path</p> <p>34 Population Growth</p> <p>36 Urban Growth</p> <p>40 Subway Connection and Development</p> <p>41 Green Areas and Parks</p> <p>42 History Timeline of Kremikovtzi</p> <p>45 The Red Dust and The Red Monster</p> <p>51 Kremikovtzi 2006 Until now</p> <p>52 General Masterplan of Sofia</p> <p>56 Urban Analysis of Sofia and Kremikovtzi - Conclusions</p> <p>58 SWOT Analysis</p> <p>60 Boundary</p> <p>62 Territory</p> <p>63 Structure</p> <p>64 Railroad</p> <p>64 Engineering infrastructure</p> <p>66 Existing Major Engineering Structures</p> <p>70 Mega Buildings</p> <p>72 Landscape</p> <p>74 Pollution</p> <p>76 Kremikovtzi around the Site</p>	<p>84 CHAPTER 2 URBAN SCENARIOS FOR THE REGENERATION OF KREMIKOVITZI</p> <p>86 Scenario 1 Industrial Park</p> <p>90 Scenario 2 Logistics and Warehouse</p> <p>94 Scenario 3 Residential Development</p> <p>98 Scenario 4 Trade Fair</p> <p>102 Scenario 5 Green & Sports Park</p> <p>110 Urban Regeneration Scenarios Clean Up</p> <p>112 Comparison, Superposition and Juxtaposition of Regeneration Scenarios</p> <p>116 A Satellite City</p>	<p>123 CHAPTER 3 - AN URBAN DESIGN CONCEPT - A MASTERPLAN OF KREMIKOVITZI</p> <p>124 Masterplan</p> <p>126 Landuse</p> <p>128 Perspective View of the Masterplan</p> <p>130 Urban Values</p> <p>132 Size and Dimensions</p> <p>133 Existing</p> <p>134 Main Roads and Rail Roads</p> <p>135 Industry Areas</p> <p>136 Residential Areas</p> <p>137 Business Areas</p> <p>138 Mobility and Accessibility</p> <p>139 Public Spaces</p> <p>140 Green Areas</p> <p>141 Logistics</p> <p>142 Sports</p> <p>143 Trade Fair</p> <p>144 CONCLUSION</p>
--	--	--	--

INTRO- DUCTION

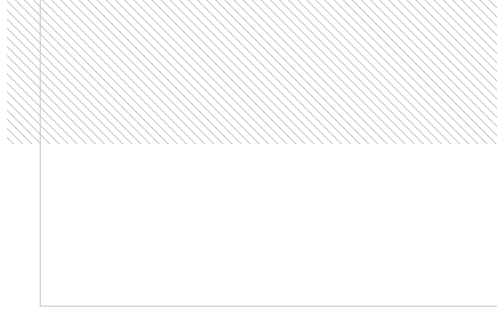
104 Site Repair

“Buildings must always be built on those parts of the land which are in the worst condition, not the best

Therefore: On no account place buildings in the places which are most beautiful. In fact, do the opposite. Consider the site and its buildings as a single living eco-system. Leave those areas that are the most precious, beautiful and comfortable, and healthy as they are, and build the structures in those parts which are least pleasant now”

A Pattern Language
Christopher Alexander

8



Referring to the quotation by Christopher Alexander, there is no doubt that the least pleasant area today in the Sofia Field, “the site for repair”, is the site of the industrial giant of Kremikovtzi, a former steel mills presenting one of the „difficult“ legacies from the Bulgarian communist past. Sadly, one of the most attractive parts of the vast valley the Sofia Valley, had been continuously deteriorating for 50 years until the enterprise shutdown in 2009. Despite the huge damages of the site and of its immediate vicinity, Kremikovtzi certainly possesses enormous value and even bigger potentiality. Therefore, it poses one of the major urban problems for both the City of Sofia, and the whole region. Even if the urban problem of Kremikovtzi is a typical brownfield regeneration problem, its magnitude implies a highly specific approach.

* Photo taken from: <https://www.flickr.com/photos/abolobolnikskovtzi/7646265064/>



9

THE MAIN GOAL & OBJECTIVES

The main goal of this diploma work is to explore the physical and space planning aspects of the site and outline alternative perspectives for its development.

The following objectives are derived from the main goal:

To provide a multi-level and multi-aspect urban analysis of Kremikovtzi and its vicinity

To explore possible regeneration urban planning alternative scenarios for the site

To test and compare the proposed scenarios

To examine the synergy potentiality resulting from possible interactions between alternatives and synthesize possible combined scenarios

To develop illustrations of a master plan concept based on a preferred scenario

Photo taken from <http://miriadna.com/preview/old-tree>

METHODO- LOGY

The methodology in the developing of the diploma work includes:

Meetings with urban planners and with city officials

Visits to the site and its vicinity

Meeting with the new owner - Eltrade Ltd.

Survey of available documents and plans in archives

Literature and Internet surveys

Analysis of the New Master Plan of Sofia

Data collection and historical survey

Case studies and survey of urban typologies

SWOT analysis

Comparative analysis of urban scenarios

Development of a Masterplan concept



Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

THE RED DUST & THE RED MONSTER

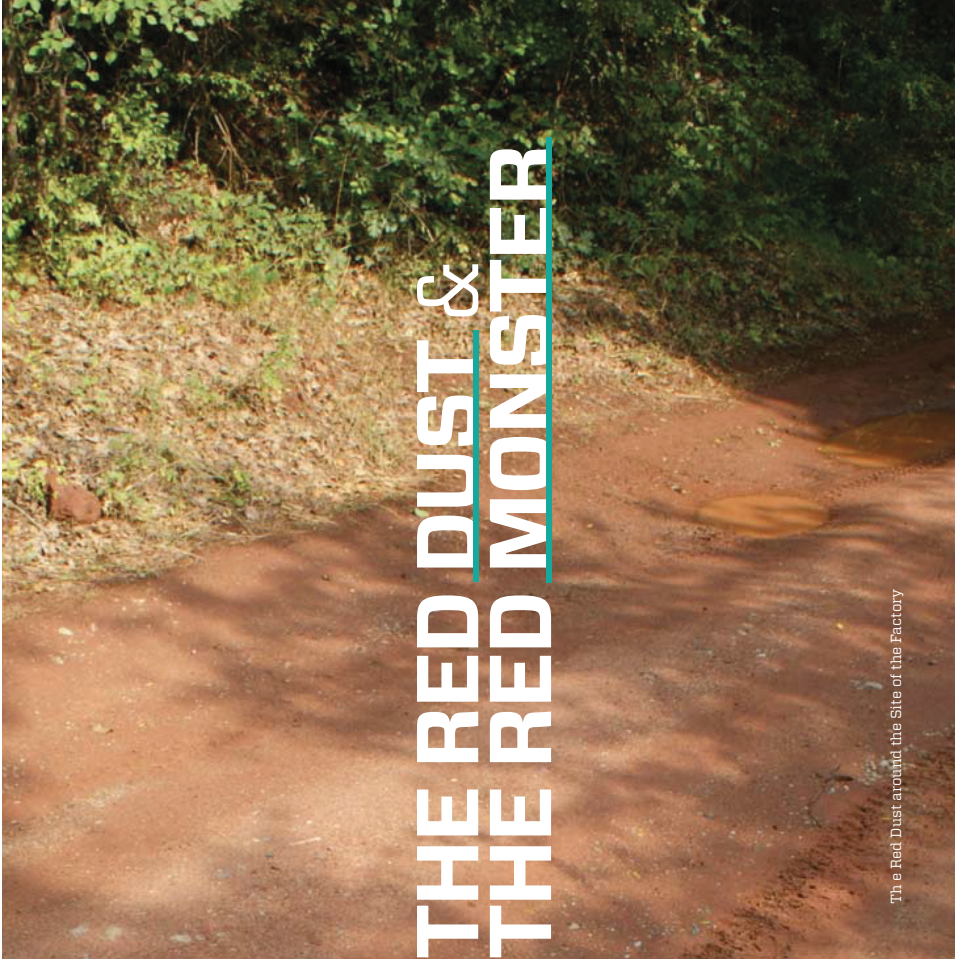
A natural phenomenon, the red soils that suggest the presence of iron compounds, accompanied by the pseudo-scientific discovery of "unlimited deposits" of very rich iron ore, is exaggerated by the highly centralized model of decision making to lead to what we believe the biggest mistake in the modern urban development of Sofia. Such is the planning and construction of the Kremikovtzi Steel-production Plant.



Typical View
of the Working Factory

* Photo taken from: https://de.pinterest.com/home/wirtschaft/realwirtschaft/3557753/Bulgarien_L_unklarer_Lager-im-Ringen-um-Kremikovtzi

Dejan Iovv Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz



THE RED DUST & THE RED MONSTER

The Red Dust around the Site of the Factory

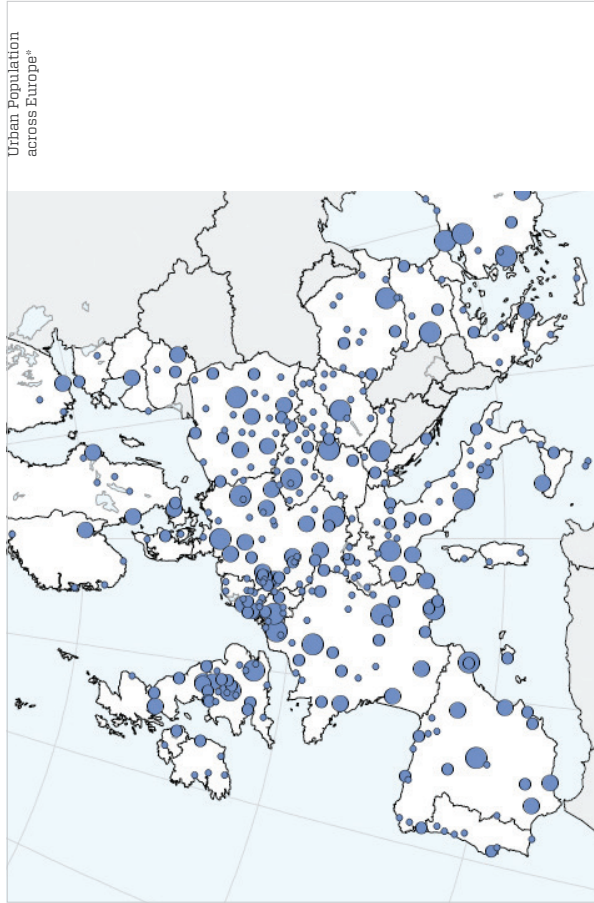
The massive steel-production plant of Kremikovtzi starts work in 1963 and reaches its production summit in the 70s. Thesis of this diploma work is that Kremikovtzi has become the main obstacle both physically and culturally (e.g. influencing thinking) to the urban growth of Sofia in northern and north-east directions. Even having in mind that at the time there is vague perception of ecology issues ("May chimneys start smoking" is a metaphor with a really positive meaning in communist poetry), Kremikovtzi becomes the obvious, and then the only polluter for Sofia. The red smoke produced by the plant has been spreading over the valley and the city for decades. The metaphor "The Red Dust created the Red Monster" illustrates exactly that determining factor in people's minds.

Dejvan Iovov Patrlevay, Kremikovtzi in Quest of a New Urban Vision, Diploma Work, Technical University of Graz

THE VISION FOR EUROPEAN CITIES

Urban planning and development in Bulgaria, as the newest EU member, has become an inherent part of the European urban context. Therefore, any research should take into account the major urban planning framework in the EC today, comprising of 4 documents: Europe Strategy 2020, the Leipzig Charter, the Toledo Declaration and The Green Paper on Territorial Cohesion.

Dejvan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz



POPULATION CLASS	Number of Cities	Population
Rural Population		154 125 040
Towns and Subburbs		156 398 720
50 000 - 100 000	387	26 690 068
100 000 - 250 000	224	27 690 068
250 000 - 500 000	62	28 690 068
500 000 - 1 000 000	36	29 690 068
> 1 000 000	23	30 690 068
TOTAL	732	480 470 140

*http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/European_cities_-_demographic_challenges

LEIPZIG CHARTER ON SUSTAINABLE EUROPEAN CITIES

The following is a quote from a concise resume of the key issues of the Leipzig Charter, adopted by the informal meeting of the Council of Ministers in Leipzig in May 2007:

"... the most important policy messages of the Leipzig Charter are:

Integrated urban development should be applied throughout Europe and, in order to be able to do so, the appropriate framework for this should be established at national and European level.

Deprived urban neighbourhoods must increasingly receive political attention within the scope of an integrated urban development policy. Europe must reach all of its citizens.

By adopting the document, the EU recognizes the important social, cultural and economic role that cities play. At a national level, the departments involved must work together better and financing sources for urban developments can best be combined. European cities (and metropolitan regions) must draw up integral development plans. It is up to the local governments to co-ordinate the implementation of these plans. National, local and regional governments must be involved in drawing up the plans, as well as interested individual citizens and private organizations. The Leipzig Charter mentions areas on which urban policy should now focus in any event:

- dealing with deprived neighbourhoods;
- improving the public spaces;
- modernising infrastructure with a focus on saving energy;
- better education for young children and refresher training for workers;
- better and more efficient public transport in and between cities." ²⁰

²⁰ http://www.euon.org/E_library/Urbun_Policy/Leipzig_Charter_en_Sustainable_European_Cities



LEIPZIG CHARTER on Sustainable European Cities

PREAMBLE
The LEIPZIG CHARTER on Sustainable European Cities is a document of the Member States which have signed the European Charter of Local Authorities in 1984. It is based on the knowledge of the challenges and opportunities as well as the different situations in the field of urban development in the Member States. The Ministers commit themselves to principles and strategies for urban development policy. The Ministers commit themselves to:

- to initiate a political debate in their states on how to integrate the principles and strategies for urban development into national, regional and local development policies;
- to use the tool of integrated urban development and the related governance for its implementation and, to this end, establish any necessary framework at national level and to
- to promote the establishment of balanced territorial organisation based on a

The Ministers thank the German Presidency for having prepared the report "Integrated urban development as a prerequisite for successful urban sustainability" and the studies "Strategies for upgrading the physical environment in deprived urban areas", "Strengthening education and training policies on children and young people in deprived urban areas" and "Sustainable urban transport and deprived urban areas" with their examples of good practice and their recommendations. The Ministers endorse the Leipzig Charter on Sustainable European Cities principles and strategies set out in the Leipzig Charter on Sustainable European Cities.

The Ministers declare:

We, the ministers responsible for urban development in the Member States of the European Union, consider European cities of all sizes which have evolved in the course of the last century as a key element of the European continent. We are aware that, with the objective of increasing the economic and social vitality of our cities, we strongly support the EU Sustainable Development Strategy, building on the Ljubljana Programme, the Rotterdam Urban Agenda and the Bristol Accord. In doing so, all Member States will be contributing to the achievement of the objectives of the Sustainable Development Strategy with the same weight. These include economic prosperity, social balance and a healthy environment. At the same time attention should be paid to cultural and health aspects. In

Our cities possess unique cultural and architectural qualities, strong forces of social inclusion and exceptional possibilities for economic development. They are centres of knowledge and sources of growth and innovation. At the same time, however, they suffer from a lack of affordable and suitable housing and environmental problems. In the long run, cities cannot fulfil their function as engines of social progress and economic growth as described in the Lisbon Strategy, unless we succeed in maintaining the social balance

THE TOLEDO DECLARATION – URBAN INTEGRATION REGENERATION

The following is a concise resume of an article analyzing the key issues of the Toledo Declaration:

"At the end of June, 2010, in Toledo, the urban development ministers, considering the future challenges of European cities, outline the need to promote sustainable development, based on social cohesion. The Toledo Declaration sets out the intelligent and sustainable development of urban areas, more precisely urban integration regeneration.

Outlined is the fact that an integrated approach of urban policies represents one of the key instruments that would facilitate the implementation of the 2020 European Strategy. The declaration states that "an integrated urban policy approach is a critical factor behind short and medium-term economic competitiveness of a sustainable economy. The goal of European cities should be to come out of the crisis better positioned to face challenges, and also to be more livable sustainable, integrating and eco-efficient. Set out is "the European Union's political commitment to defining and applying integrated urban regeneration as one of the key tools of the 2020 Strategy"

In order to create the model of an intelligent, sustainable and social city, outlined is the importance of implementing a development strategy that provides a global vision and the need to improve economic performance, eco-efficiency and social cohesion."²¹



TOLEDO INFORMAL MINISTERIAL MEETING ON URBAN DEVELOPMENT DECLARATION

TOLEDO, 22 June 2010

PREAMBLE

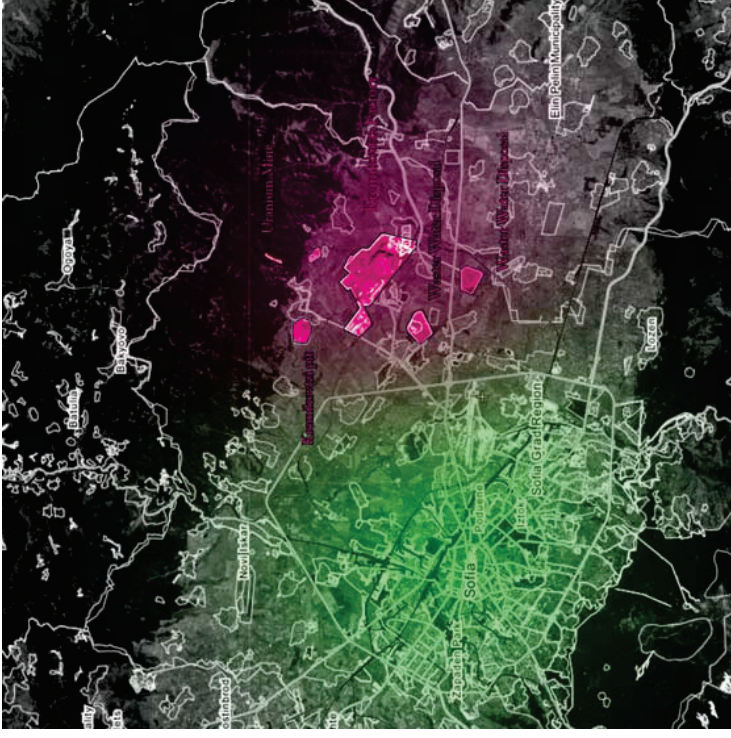
On 22 June 2010, in Toledo (Spain), in response to the invitation made by the Spanish Presidency of the Council of the European Union (EU), and within the framework of the Informal Ministerial Meeting on Urban Development, the Ministers responsible for Urban Development of the Member States of the European Union met in Toledo, Spain, to discuss the future of urban development. The meeting was also attended by the European Commissioner for Regional Policy and representatives from the European Parliament (EP), Commission of the Regions (CoR), European Economic and Social Committee (EESC), and the European Council. The Ministers also discussed the work of the three candidate countries for EU membership, plus Norway and Switzerland, and several observers and relevant stakeholder organisations related to urban development.

This meeting was held in a context of a global financial, economic and social crisis, which is having a strong impact on Europe's economy and also on its citizens' quality of life. In the short and medium term, the crisis has led to a sharp decline in public spending and a consequent increase in unemployment, with the risk of rising above 10% in some Member States. The crisis has also led to a loss of confidence in public institutions, a decline in public services, and a loss of trust in the political class. The crisis has also led to a loss of confidence in public institutions, a decline in public services, and a loss of trust in the political class. The crisis has also led to a loss of confidence in public institutions, a decline in public services, and a loss of trust in the political class. The crisis has also led to a loss of confidence in public institutions, a decline in public services, and a loss of trust in the political class.

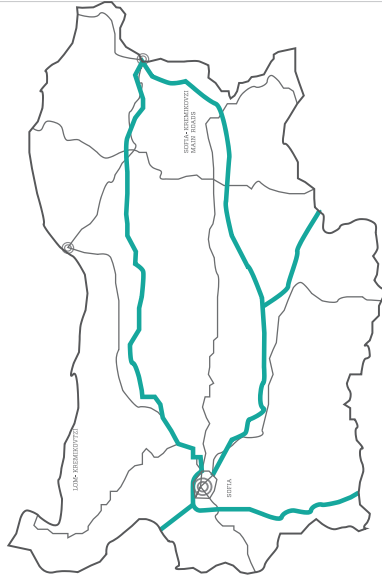


²¹ <http://www.allwaypro.com/wp/?p=2481>

CHAPTER I - SOFIA AND KREMIKOVITZI - URBAN ANALYSIS



SOFIA - A HISTORICAL BACKGROUND



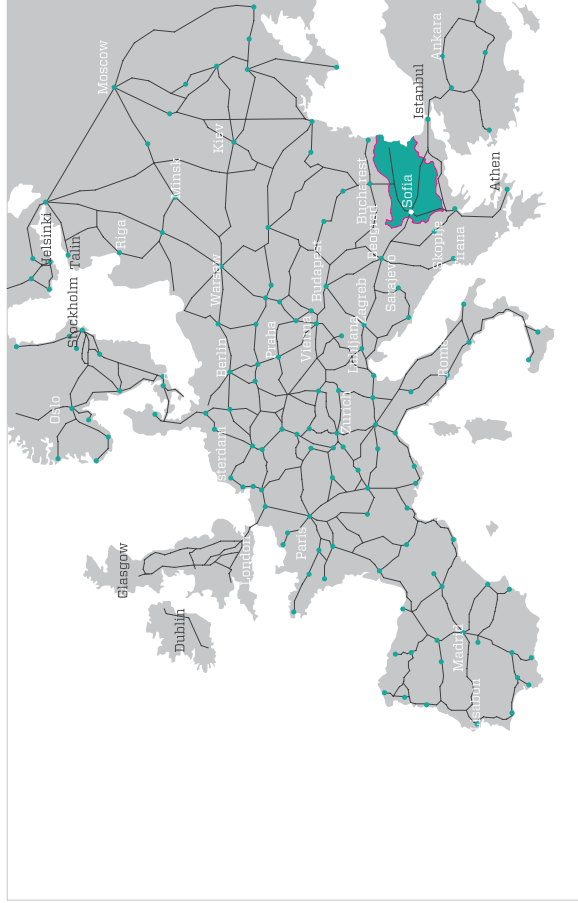
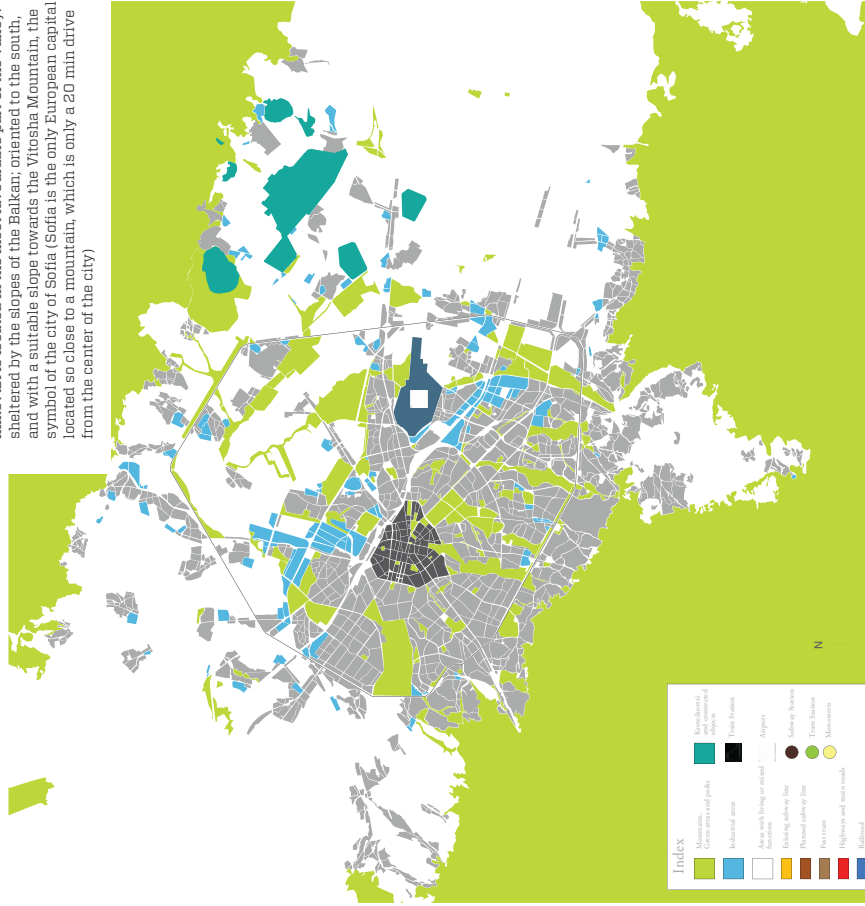
Sofia becomes the 27th capital city in the European Union after the inclusion of Bulgaria as a member in 2007. Sofia is a young city with ancient history. Its motto is "Grows Bigger but does not Get Older". It is located in the Sofia Valley which possesses unique natural, terrain and climate conditions, located on an average altitude of 500 m above sea level.



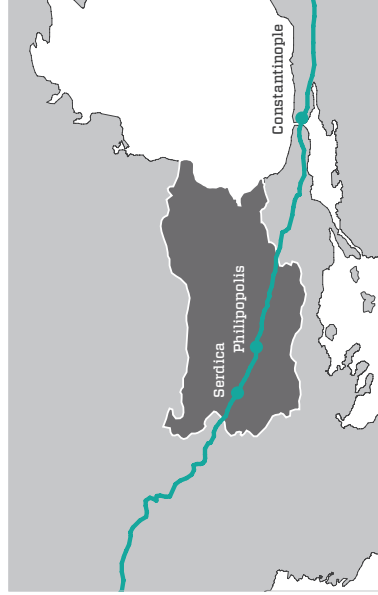
Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

KREMIKOVITZI

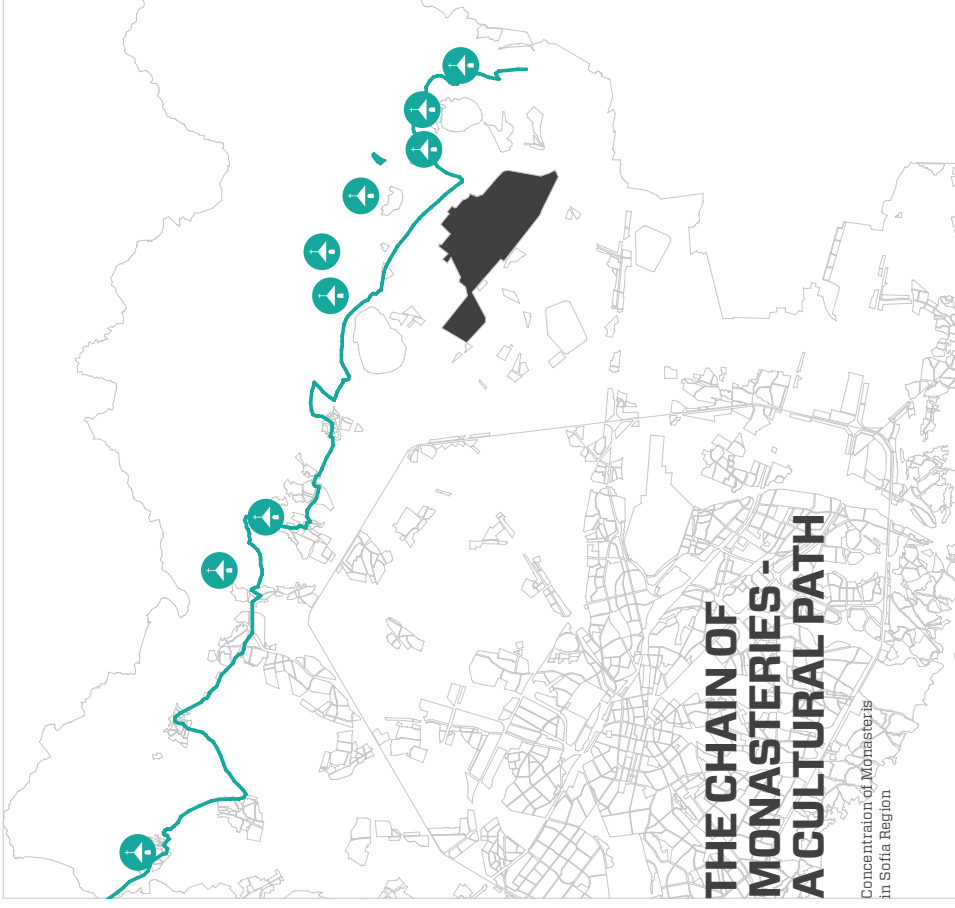
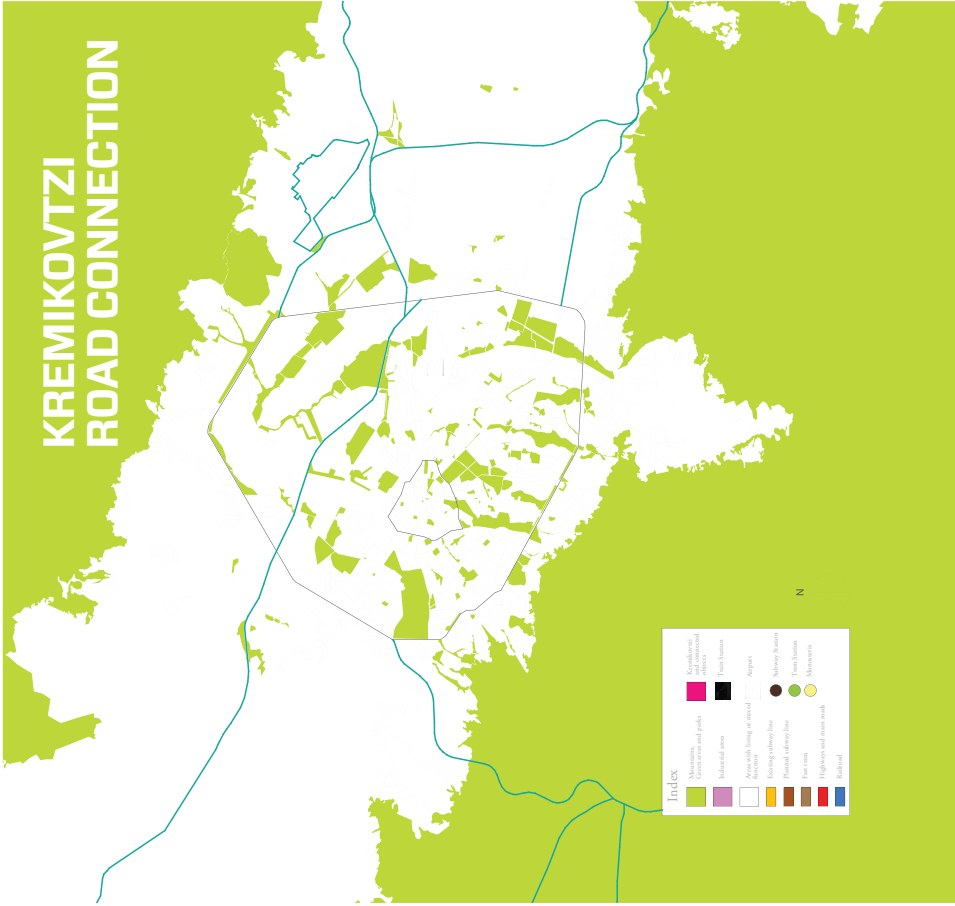
Sofia was created deep in antiquity. The oldest settlements date back to more than 5000 years ago. A thesis of this diploma work is that findings of earliest life traces in the Sofia Valley in the Kremikovtzi area are not a coincidence. Kremikovtzi is located in the most favourable part of the valley; sheltered by the slopes of the Balkan, oriented to the south, and with a suitable slope towards the Vitosha Mountain, the symbol of the city of Sofia (Sofia is the only European capital located so close to a mountain, which is only a 20 min drive from the center of the city)



The earliest planning of Sofia, then known as Serdika, was done by the Romans around 2000 years ago. In addition to the mineral springs, the Romans were attracted by the location. Serdika was positioned on the important road Via Diagonalis, which connects the central parts of the empire with Constantinople and Asia. Serdika's geographical location, being a settlement on a crossroad, is one of the major determining factors for the formation of the city and is still a main potentiality for its development. Sofia is the only European capital located on the crossroad of 4 pan-European transport corridors. A thesis of this diploma work is that namely the communication accessibility has enabled the very existence of the steel-processing plant of Kremikovtzi.



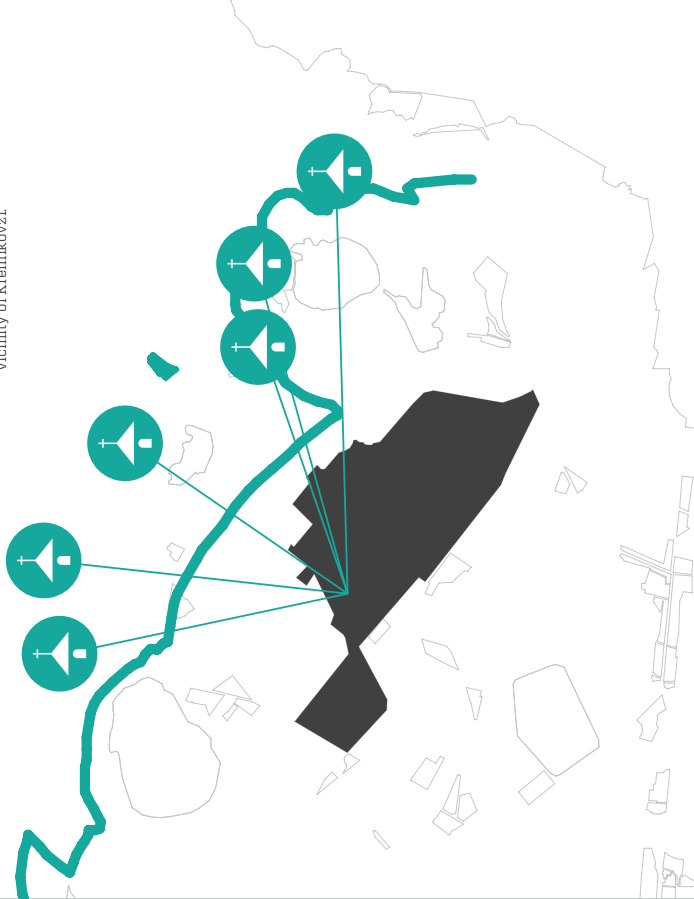
Dejan Tsvetkov, Kremikovtzi in Quest of a New Urban Vision, Diploma Work, Technical University of Graz



Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

THE CHAIN OF MONASTERIES - A CULTURAL PATH

During the late Middle Ages 14 monasteries were built on the outskirts of the valley, mainly on the slopes of the surrounding mountains. They are known today as the Holy Mountain (a name derived from the Holy Mountain Athos - the sacred territory with orthodox monasteries in Greece). Several of the monasteries are in the immediate vicinity of Kremikovtzi.



Beautiful icons of the Soslavtzi Monastery.



The Kremikovtzi Monastery



The monument of Dimitar Stefanov Kazaka above the Kremikovtzi Monastery



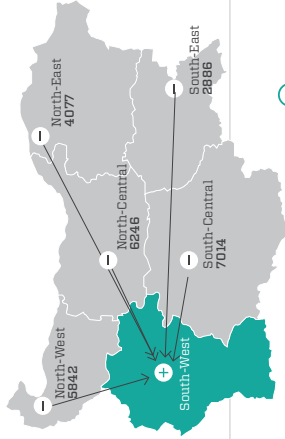
Seslavtzi Monastery "Saint Nikoley" dating from the XVIIth century

Deljan Iyov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

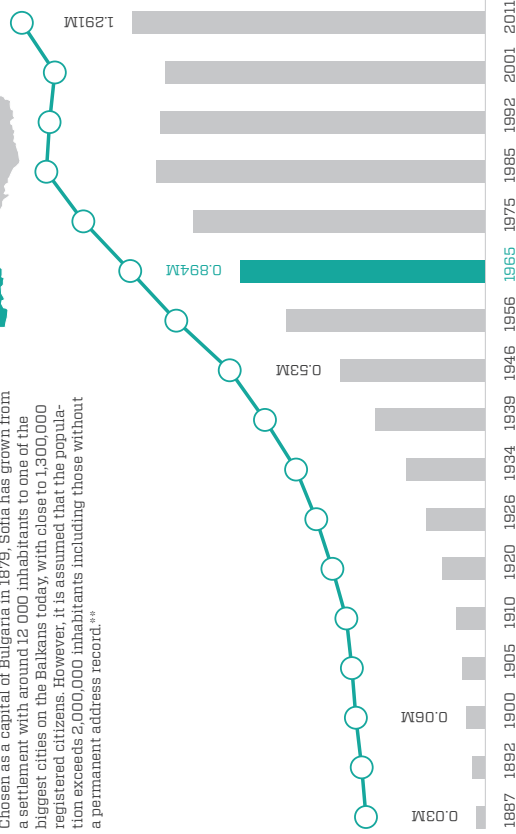
POPULATION GROWTH

Sofia Population through time

Bulgaria Population Migration per year*



Chosen as a capital of Bulgaria in 1879, Sofia has grown from a settlement with around 12 000 inhabitants to one of the biggest cities on the Balkans today, with close to 1,300,000 registered citizens. However, it is assumed that the population exceeds 2,000,000 inhabitants including those without a permanent address record.**



** http://www.nacled.government.bg/national%20strategy_final.htm
 * <http://en.wikipedia.org/wiki/Sofia>

Population Distribution in Bulgaria*

18.49% of the Bulgarian Population in Sofia



The forecasts show that the population of Sofia will continue to increase, according to the so-called Athens syndrome (approximately 40% of the people in Greece live in the capital). The continuing migration to Sofia can be explained with simple facts. Today 50% of the production and services in Bulgaria are concentrated in Sofia at only 18.5% of the country population. The state administration, finance, education and culture institutions are also concentrated in the capital. Bulgaria is often described as divided into "Sofia, and the rest of the country".

* http://www.nacled.government.bg/national%20strategy_final.htm

Dejan Tsvetkov, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

URBAN GROWTH

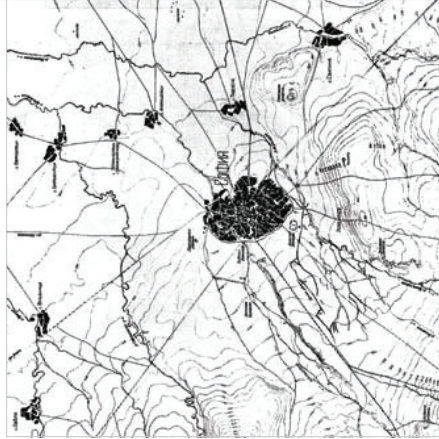
A chronological review of key periods, linked to the growth and urban transformations of Sofia, follows on the next pages:

1878 - 1879 - Liberation and proclamation of Sofia for a capital. Russian and European engineers prepare new regulation plans to straighten the crooked streets and squares into a network of European like urban structure. The construction of the first major capital projects begins: the Parliament, the Duke's (Knyaz) Palace, The Military Club

Until the 20s of the XXth century the structure of the city is steadily transformed into a European capital city with modern infrastructure and buildings similar to the good European examples. Public transportation, including tram lines, is developed.

The 30s of the XXth century are characterized by a fast economic development, entrepreneurship boom and quick growth of the city. For a short period, Bulgaria becomes the 6th economy in Europe and also the most developed country on the Balkans. Modern urban planning is established with the 1936 Witsman Plan which determines the contemporary urban structure of Sofia*.

Map of Sofia as declared Capital



* Photo taken from: <http://stara-sofia.com>

Dejan Iovov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

Map of Sofia in 1937



* Photo taken from: <http://stara-sofia.com>

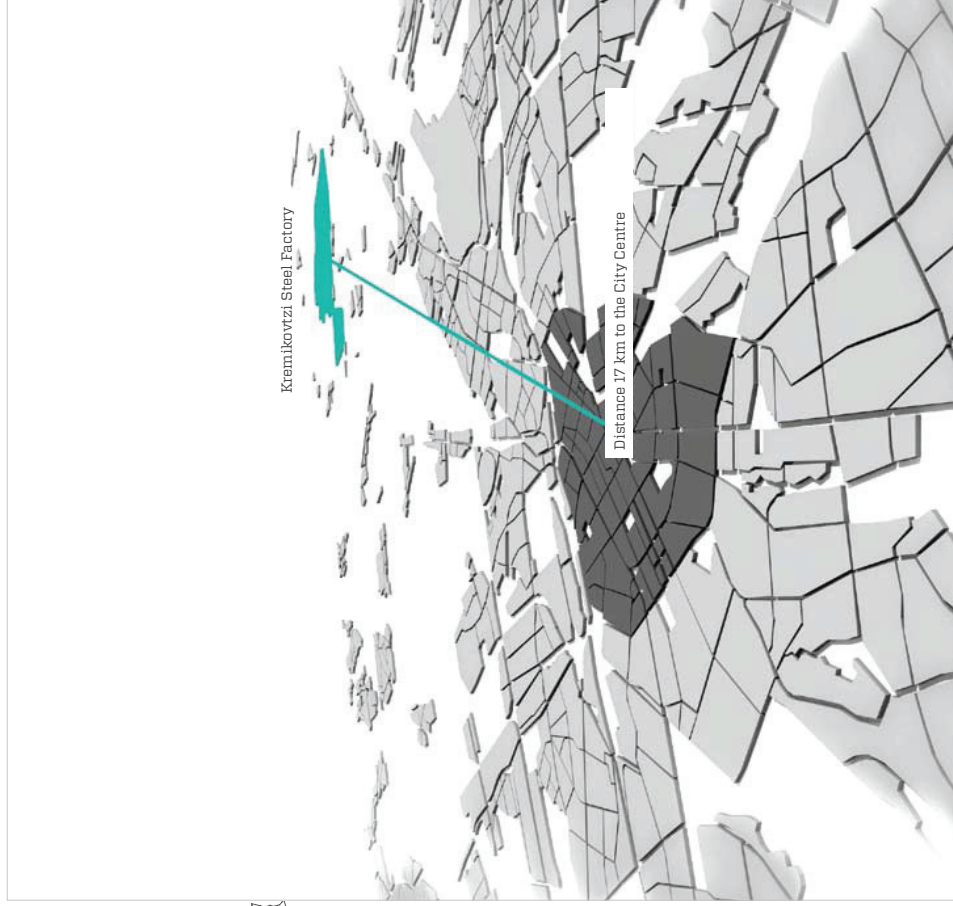
Old Sofia Top View



* Photo taken from: <http://stara-sofia.com>

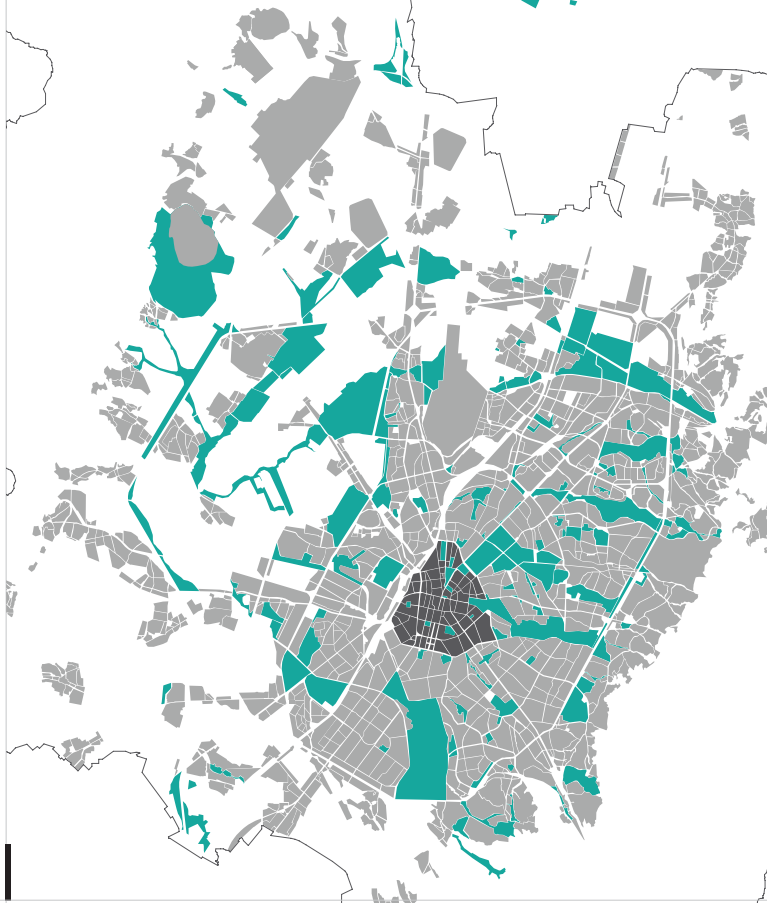
1945 - 1960 - the establishment of a communist regime in Bulgaria, called socialism, focusing among other things on industrialization. The Soviet influence and Soviet model are imposed - the Soviet Union is the "Big brother" with direct influence on decision-making. Industrialization has finished already in the USSR and its accomplishments are limited in Bulgaria. The ideological belief in the greatness of the working class is expressed through the will to transform both society and nature. The urban paradigm is radically changed. The centre of Sofia is re-planned in the 50s following the Stalinist architectural order. The idea of Kremikovtzi was conceived during this time - a steel processing plant done to the Soviet model, and to a Soviet grand scale, a sign for "standing even with the Big brother". In order to illustrate the widely spread voluntaristic megalomania of the time, another example comes forth - the Sofia Channel. Its construction starts along with Kremikovtzi with the idea to create a harbour of Sofia that is linked to the Black Sea. This mega-urban planning venture is abandoned as its construction starts to deviate substantial resources needed to build Kremikovtzi.

The diagramme presents the situation of Kremikovtzi

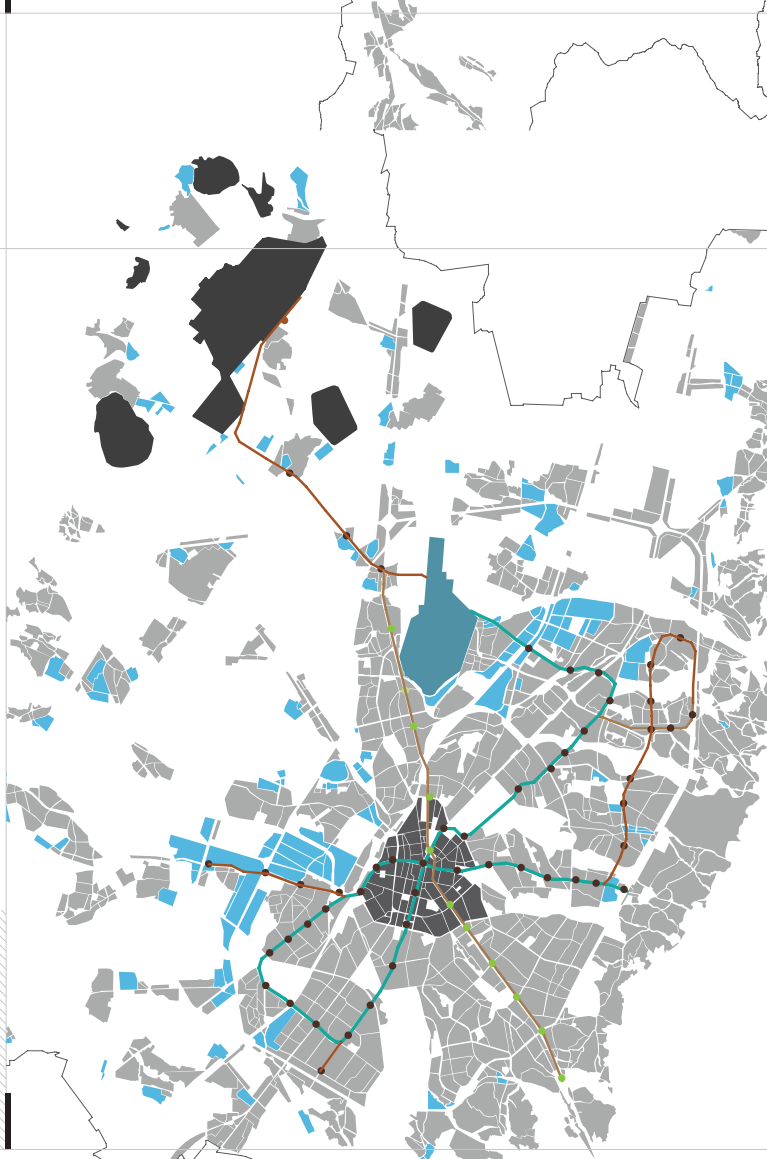


Dejan Iovov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Gra

**GREEN AREAS
AND PARKS**



**SUBWAY CONNECTION
AND DEVELOPMENT**



HISTORY TIMELINE OF KREMIKOVITZI

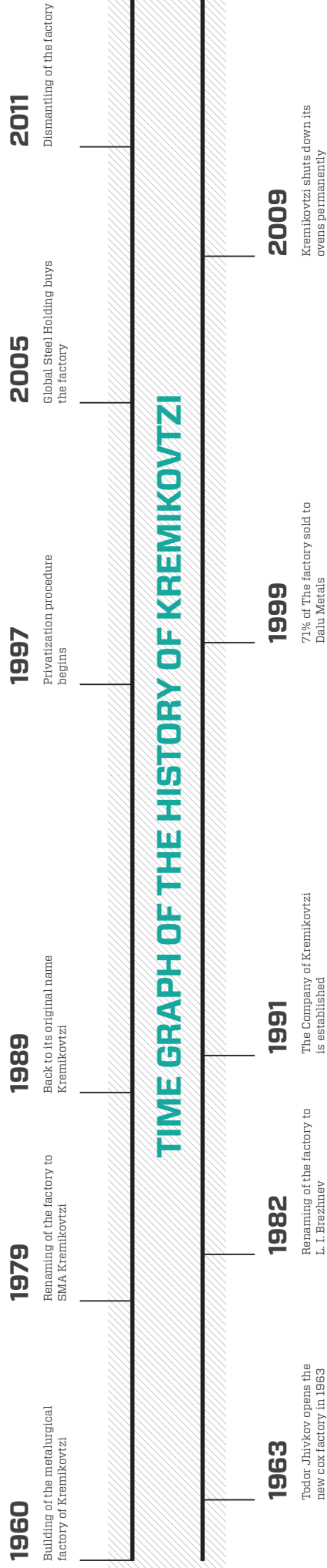




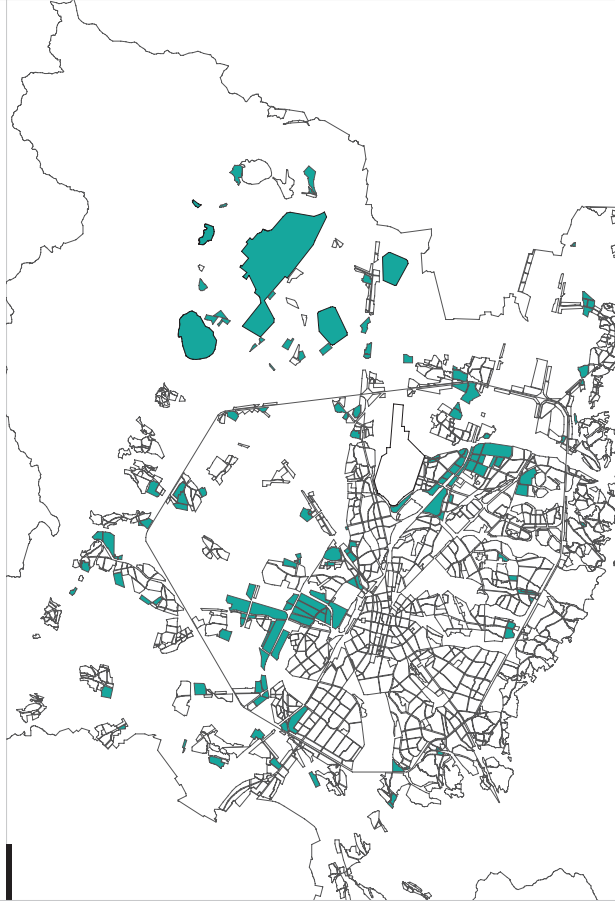
Photo taken from the near forest around the factory

THE RED DUST & THE RED MONSTER

Quite soon after Kremikovtzi starts production it is realized that neither is the ore in the vicinity so rich in iron nor is it in unlimited deposits. The only solution left is the raw material to be imported from abroad.

1960 - 1989 - is a period of the city growth under the so-called Developed Socialist Society. Sofia spreads in eastern and western directions with the construction of modern prefabricated residential districts which provide housing today for 20% of the city's population. During this period Sofia does not grow southwards because of two major reasons:

- A physical one** - the city is naturally limited by the Vitosha Mountain and
- A political one** - since the former villages in the southern territories are gradually converted in exurbs preferred by the communist oligarchy. Formal and informal residences for the communist rulers are built in the foot of the Vitosha Mountain. To the north, industrial zones are further developed to become later an obstacle for the city growth in this direction



Left page - the industrial areas in Sofia
 Right page - the residential areas in Sofia

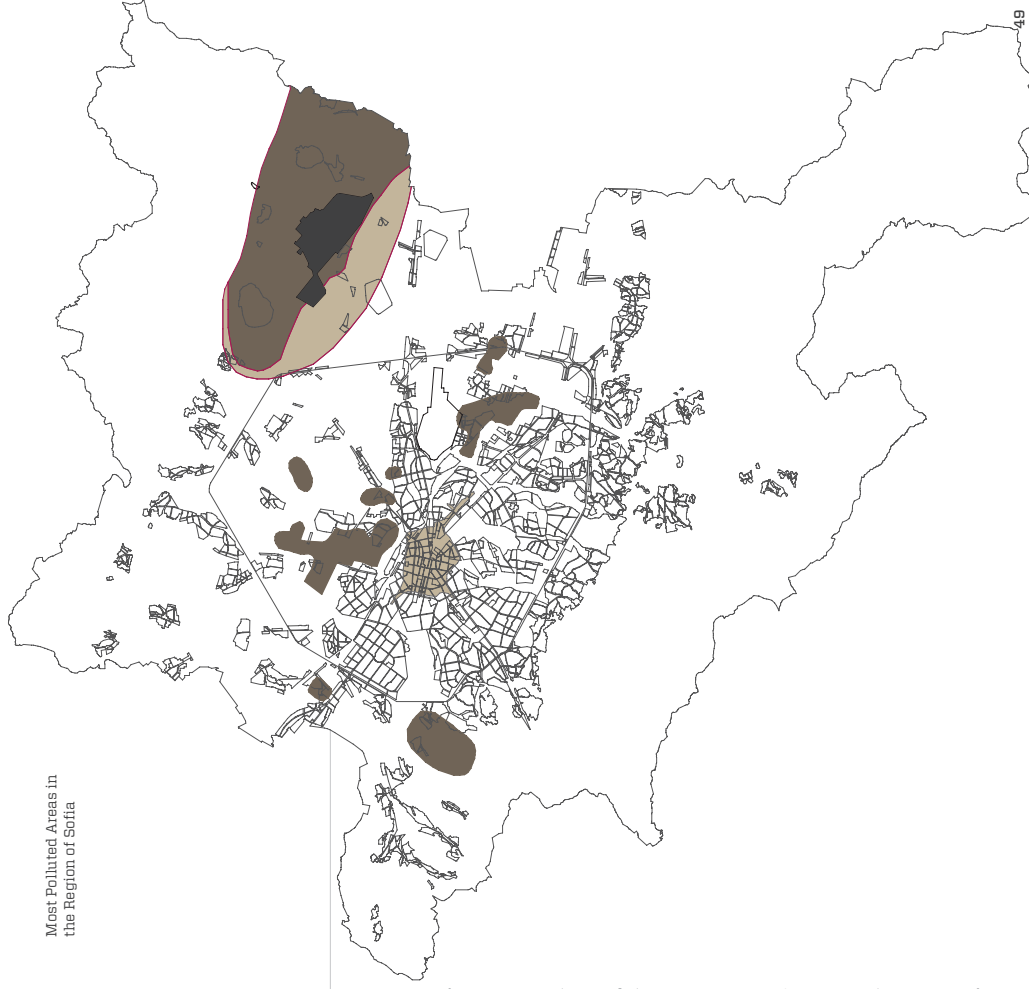


Iron ore from the former Soviet Union is transported along the Danube to the port of Lom. It is where the river port of Kremikovtzi is erected. The ore needs to be forwarded to Kremikovtzi via a 200 km railroad. Raw material starts to be later imported from Australia to the Black Sea port of Bourgas and then via railroad to Sofia. The cost of transportation contributes further to the inefficiency of the production. It is rumored that the Kremikovtzi steel is used by advanced economies such as Japan and Sweden as a raw material itself for the further production of high-profile steels. On the other side, the tremendous loads transported to and out of Kremikovtzi contribute to the development of a really dense railroad network. Therefore, it is today one of the main assets and potentialities of Kremikovtzi.

1989 - 2006 is a period of post-communist transformation of the city. The paradigm is changed radically again. The period is characterized by the collapse of the old centrally planned economy and by a fast process of economy transformation to create a free market in the conditions of a liberal social environment. Dramatic changes in both governing and ownership take place. Sofia continues to grow rapidly in terms of population and becomes an attractive centre for both the new entrepreneurs and the impoverished people from the country. Most of the latter have lost their jobs with the shut-down of the old mega-plants. The 90s and the first years of the new millennium are characterized by the fast and uncontrolled expansion of Sofia mainly in the southern direction along the so-called Vitosha Collar - a chain of interconnected villages in the foot of the Vitosha Mountain.

As a result of the lack of working urban planning instruments, combined with the lack of political will for planning, the southern areas are quickly overdeveloped. Dwelling in the south expresses a status of prestige and prosperity such as it used to be in former communist times. The capacity of the southern areas is virtually exhausted during the middle of the first decade in the XXIst century.

Most Polluted Areas in the Region of Sofia



Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

KREMIKOV TZI

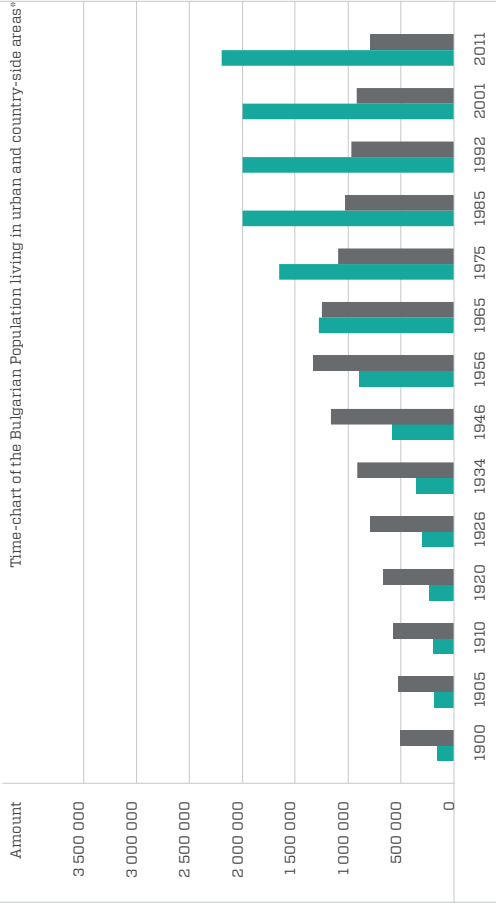
During this period, like most of the gigantic plants born by the communist industrial policy, Kremikovtzi is in a permanent state of crisis and becomes the subject of speculative economic interests. Ownership and management are changed a few times. Kremikovtzi has an ambiguous image to society: it is one of the two biggest polluters (surpassed only by traffic pollution as registered vehicles reach around 1,000,000) and in the same time as a major employer which continues to provide occupation for 7 000 workers and their families. The state as an owner and later co-owner has to constantly subsidize the ineffective work of the plant!

Kremikovtzi has turned into one of the major urban problems of Sofia, even if such a qualification is not publicly recognized by experts, politicians and media!

Kremikovtzi has turned into one of the major urban problems of Sofia, even if such a qualification is not publicly recognized by experts, politicians and media!

KREMIKOV TZI 2006 UNTIL NOW

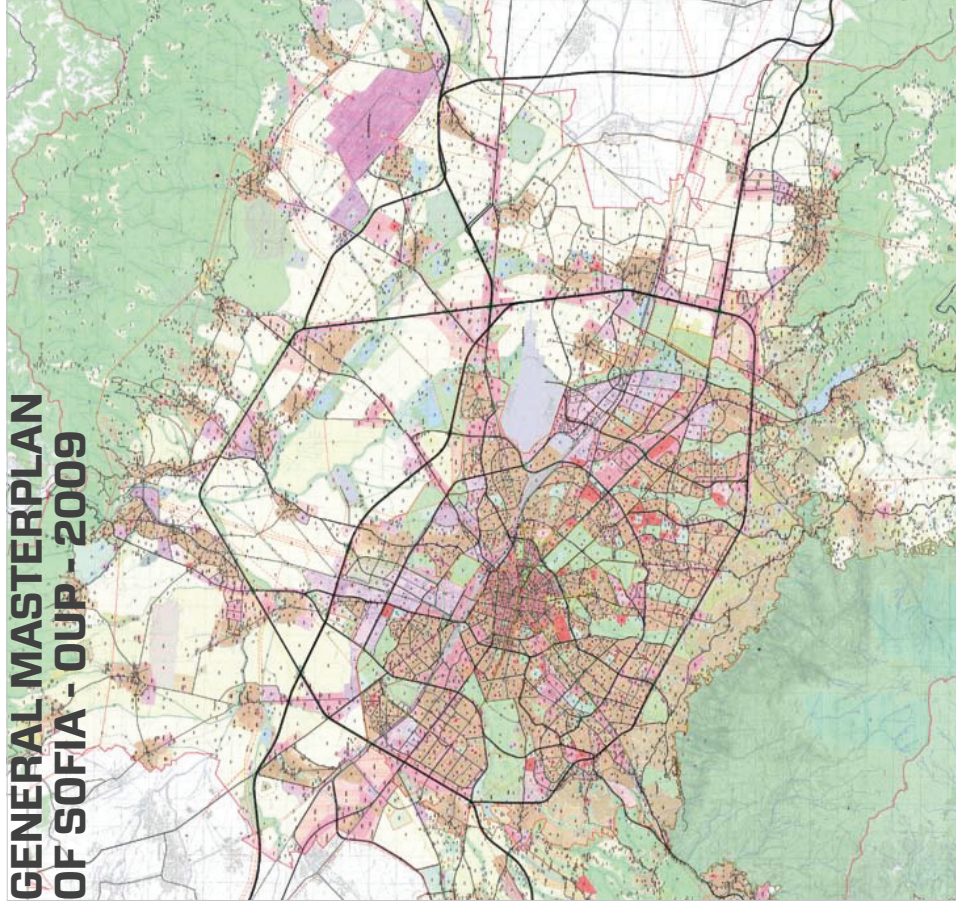
2006 - until today. The development of Sofia during the period since 2006 is characterized by the deliberate policy for regulation of the new city government and its specialized administration. Gradually and surely, they establish control over the spontaneous and piecemeal development that has led to the fragmentation of the city's fabric. In 2009 the new General Masterplan Plan (GMP) of Sofia was legally enforced. This is an unprecedented fact for the last 30 years. For a short period, between 2006 and 2008, development and construction boom in the private sector. The value of land in Sofia surpasses the value of land in Vienna. Following the short period of affluence is the healing global and local crisis in the economy, in finances and most of all in human thinking.



*http://www.nacel.government.bg/national%20strategy_final.htm

Belvan Tzov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

GENERAL MASTERPLAN OF SOFIA - OUP - 2009



Possibilities for territorial expansion of Sofia have been practically exhausted in all directions except to the north. The complex analysis of Sofia and its surroundings lead unexpectedly but naturally to the hypothesis that the single long term possibility for growth is to the north-east. The cycle is to close. To the north-east is exactly the territory of Kremikovtzi, where more than 5 000 years ago the first settlements in the area were established. In the period between 2008 and 2010 many ideas about the use of the territory come up to reach their climax in 2010 close after the shut down of Kremikovtzi. Announced is the vision to redevelop the site into a new secondary administrative business centre. The desire is to initiate the process quickly with the attraction of foreign, mainly from The Middle East, capital.



A Top Perspective View for a New Urban Vision of the Factory, project by arch. Peter Dilkov

Dejan Iovov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz



While new ideas for the future of Kremikovtzi became the centre of the media, the plant is passing through its last stage of existence in both economic and production sense. The facilities are over-aged both physically and in terms of technology. The production is heavily polluting. The area around the plant has degraded thoroughly. The latter is implicitly used as a background for the resolution of another critical issue for Sofia - the city waste depositing, treatment and recycling. On and around the area of Kremikovtzi sites are equipped for the storing and treatment of nonharmful waste. Modern private recycling facilities are equipped and further developed. The world economic crisis and the impossibility for further state subsidies brings to the temporary shut down of the plant in 2008. The temporary soon turns into final. During 2011 as a result of a consequent auction the plant finally finds its new 100% private owner. Kremikovtzi is bought by EITrade Ltd, a company representing a group dealing with recycling and trade of metals.



Deljan Tsvetkov, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

URBAN ANALYSIS OF SOFIA AND KREMIKOVITZI - CONCLUSIONS

1. The most probable scenario for the development of Sofia in the next decades is based on the assumption of continuing population rise and territorial expansion
2. Within the limits of the city, defined by the ring road of Sofia, plots for new development have been exhausted.
3. Urban renewal will be one of the main focuses in the next decades. In 2013 the first integrated urban plan for urban renewal (IPGVR) will be completed - www.sofiaxxi.eu
4. Nevertheless, the urban renewal cannot substitute the lack of large-size development plots, as well as the lack of urban functions typical for any European capital, such as: a Trade Fair, an Amusement Park and a Sports Park of an international magnitude.
5. In the present limits of the city there are no sufficient sites able to satisfy the necessities for contemporary technological and logistic parks, relevant to the strategic location of Sofia, a crossroad and transit between the West and the East, between Europe and Asia.
6. The sudden shut down of Kremikovtzi is certainly influenced by the fast growing not only among experts, but within the society as a whole ecological conscience. A new culture based on sustainable knowledge for urban planning and architecture has quickly emerged to grow into a major influential factor on decision-making. The growing intolerance of local people against the red smoke and the red dust from the landfills has been encouraged by the media on a regular base.

7. The statements and perspectives defined by the new General Master Plan of Sofia plus the actual necessity for new development territories and large-sites lead to the realization of a well-forgotten truth: The Kremikovtzi plant had occupied practically the most attractive territory of the Sofia Valley bringing along to its eco-deterioration. In the short-term oriented thinking of the local decision-makers, prior to this realization, the territory of Kremikovtzi is unattractive and without future in terms of its capacity for urban development.

8. The shut down of Kremikovtzi by itself poses the question about the transformation not only of the plant site, but also of its surroundings. Their structure is illustrated in the attached chart and comes down to:
 - 800 ha in the plant's borders
 - 210 ha area of the ore deposits
 - 300 ha landfills
 - 125 ha settlements
 - 1435 ha adjacent territories

SWOT ANALYSIS

A classical SWOT analysis will define which are the Strengths, Weaknesses, Opportunities, Threats of and from the Kremikovtzi heritage.



- Compact territory with an extra-large size
- Unique geographical and topographic location: in the slopes of the Balkan Mountain, slightly sloping towards the south with a magnificent view towards the Sofia Valley
- Rich cultural heritage - monasteries and archeological sites
- Well - accessible, located close to major local, state and pan-European roads and railway and air infrastructure
- High density of infrastructure - roads, railways, electricity production and network, natural gas, sewer and water mains
- Concentration of new industrial production
- Availability of a dense settlement network with well-built interconnections
- Availability of large scale buildings, a product of political megalomania, unprecedented in size and comparable with the world's largest buildings.



- Highly degraded and polluted environment
- Physically and technologically outdated equipment, infrastructure and building stock
- Large scale of the site as a whole, requiring enormous resources for the regeneration
- Demographical problems - population decrease in nearby villages
- Ongoing concentration of waste-treatment facilities
- Availability of enormous landfills, slag depots and eroded terrains of the former iron mines. The slag deposit is one of the world biggest
- Availability of abandoned mines
- Lack of natural water resources

OPPORTUNITIES

The strengths of both Kremikovtzi and its adjacent areas, combined with the high land value, well-developed infrastructure and inherited largesize building define the opportunities for regeneration and transformation to allow the development of "mega" urban structures, such as:

- Modern high-tech production
- Solar mega-park
- Modern logistic parks
- Amusement Park and facilities
- Sports Park of an international level
- International Trade Fair or Expo Centre
- Regeneration of nature through the creation of green parks, connected with the possibility for cultural tourism
- Development of a satellite-city
- Complex regeneration of the most precious part of the Sofia Valley
- In the case of strategic and well implemented state policy, the potential of the urban situation in Kremikovtzi can attract international capital, probably from the Middle Asia and the Far East

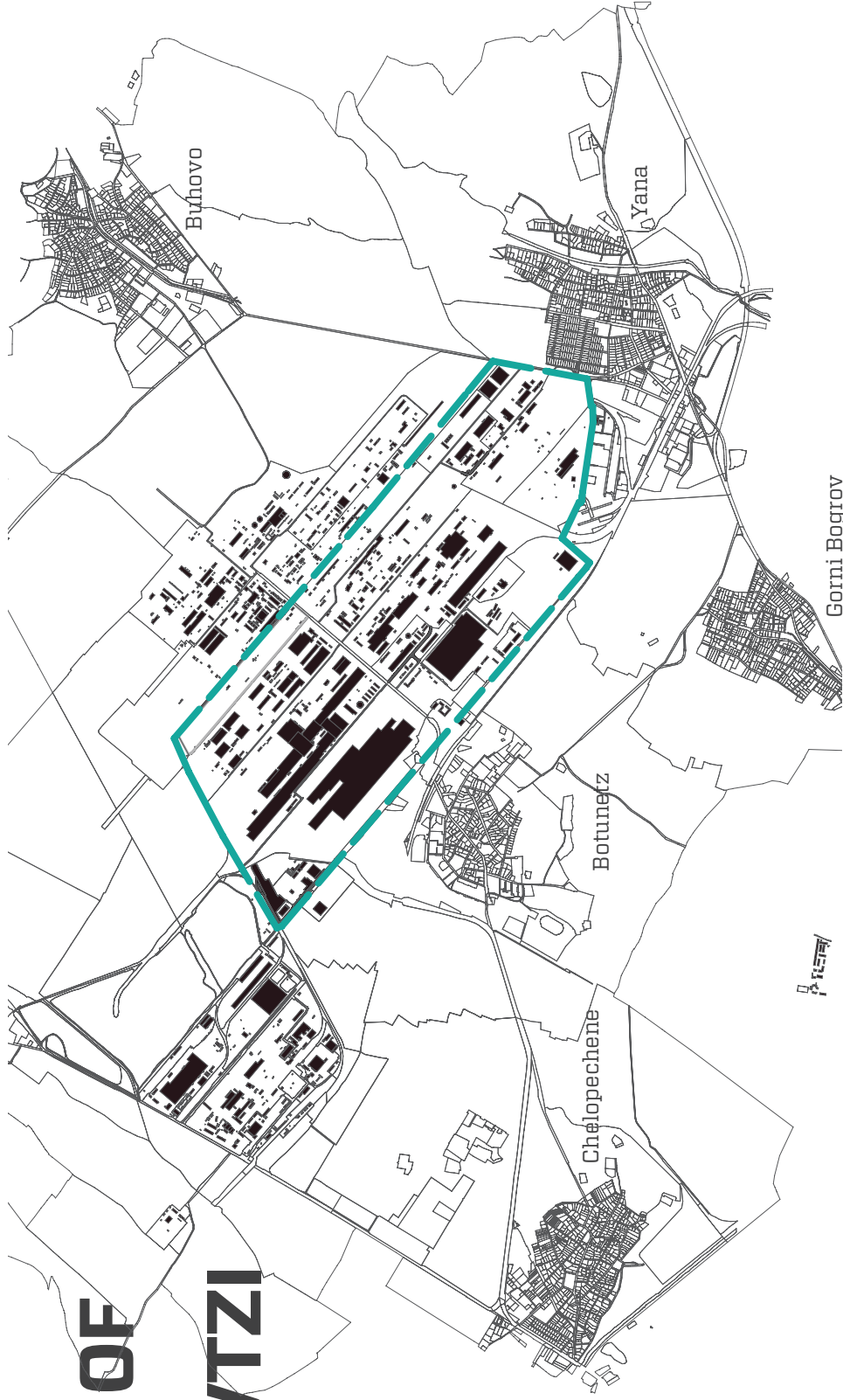
THREATS

Development strategies for the regeneration of Kremikovtzi area are based on the assumption of demographical growth. While possible this assumption is contradictory to the current progressive decrease of the population of Bulgaria. This tendency implies the risk of gambling with the ideas of development and growth, without the relevant consuming potentiality. Therefore, the following threats can be defined:

- Each urban operation will require huge financial and personnel resources that will burden not only the Metropolitan Municipality, but the whole state of Bulgaria.
- It is possible that the regeneration of Kremikovtzi will distract significant resources needed for the renewal of the city centre and for the rehabilitation of the prefabricated multi-family socialist housing. These tasks are highly important, enormous in scale, and without further capacity for delay.
- The lack of traditions and experience with the development of urban mega-structures, may supposedly lead to mega-errors with incorrigible consequences
- The regeneration of Kremikovtzi may also lead to overburdening of the resources for the whole valley, diminishing its natural potential.
- In philosophical terms it looks like that the realization of any large-scale operations is contradictory to the modern tendency of low-energy and low-emission development.
- With the current relatively low know-how level in Bulgaria (the statistics show the highest energy consumption per unit GDP among the EU countries) a large scale regeneration process of Kremikovtzi, regardless of the model, will lead to enormous carbon emissions and exhaustion of non-renewable energy sources.

Dejan Tsvetkov, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

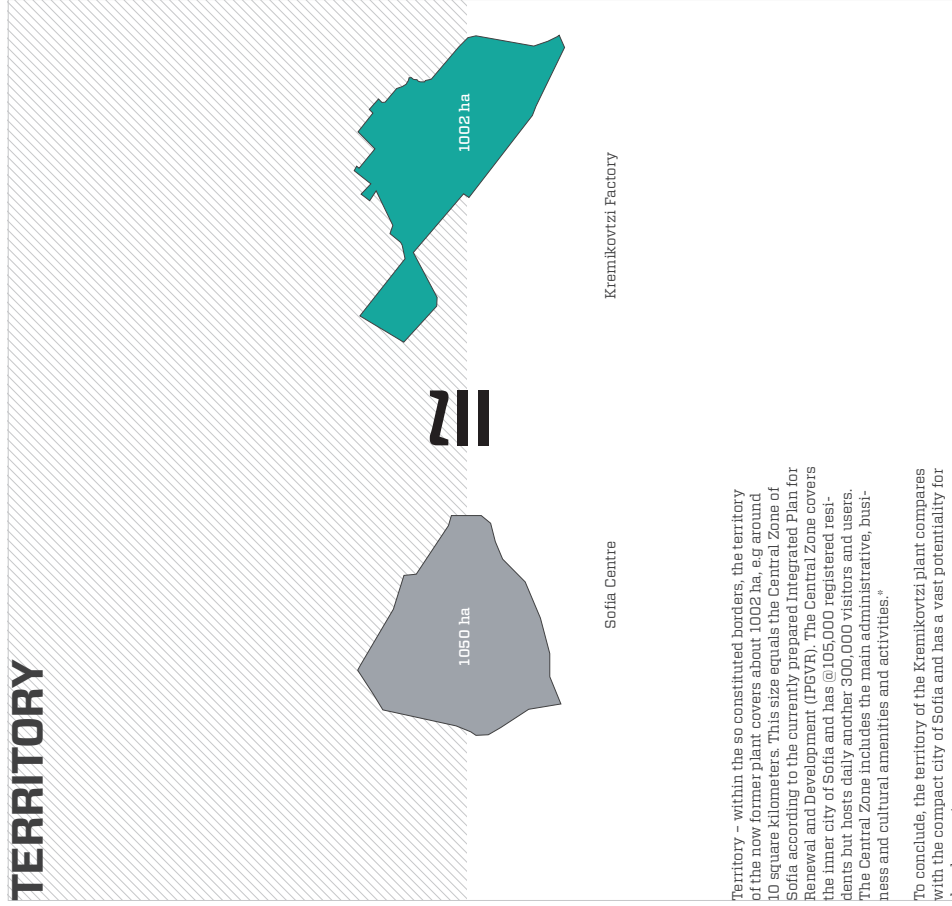
URBAN ANALYSIS OF SOFIA & KREMIKOVITZI



BOUNDARY

Having in mind the interconnection between the Kremikovtzi plant and its immediate vicinity, the definition of the scope and the limits of this research are relative. The selected territory is confined to the area naturally contoured by the railroad loop. Parallel to the railway line the plant is surrounded by an uninterrupted concrete fence and a ring road. The area overlaps with a major part of the recently purchased steel-processing plant.

TERRITORY



Territory - within the so constituted borders, the territory of the new former plant covers about 1002 ha, e.g around 10 square kilometers. This size equals the Central Zone of Sofia according to the currently prepared Integrated Plan for Renewal and Development (IPGVR). The Central Zone covers the inner city of Sofia and has @105,000 registered residents but hosts daily another 300,000 visitors and users. The Central Zone includes the main administrative, business and cultural amenities and activities.*

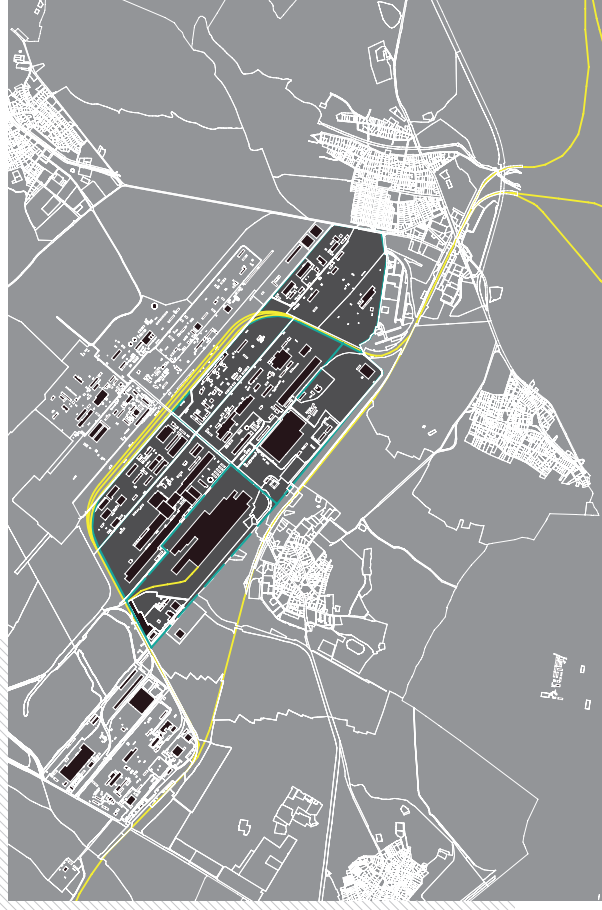
To conclude, the territory of the Kremikovtzi plant compares with the compact city of Sofia and has a vast potentiality for development.

* <http://www.sofiaxi.eu>

STRUCTURE

It is supposed that the urban structure of the plant has been determined by semi-professional masterplanning in the end of the 1950s. The plan spreads along its northwest-southeast axis. This orientation allows the development to take advantage of the natural slope towards the Sofia Valley. The site is structured in 7 mega quarters. These quarters are defined by the main street establishing the southwest - southeast axis and by perpendicular to it streets and railway lines. The main street divides the plan into two relatively equal parts - Kremikovtzi West and Kremikovtzi East. Railway tracks connect these two parts skillfully planned over the main street which runs on a lower level.

The chart illustrates the main structural elements of the site.

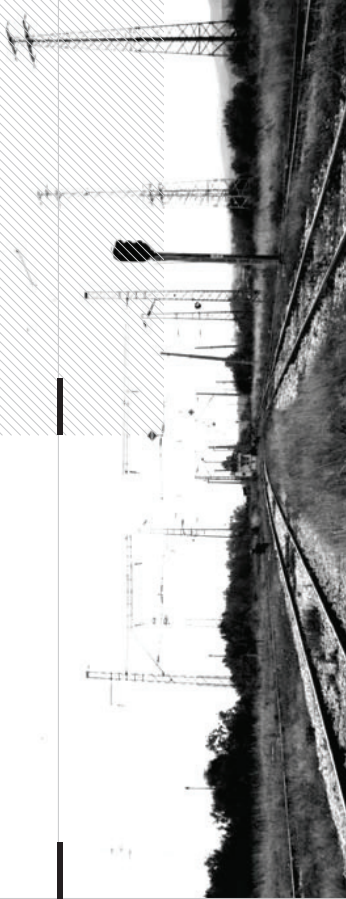


Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

RAILROAD

The infrastructure of the plant is superscaled and is determined by the great linear dimensions of the uninterrupted steel manufacturing and by the necessity of transporting enormous loads and volumes of ore, slag and inert materials, raw material and production waste, as well as large volumes of the ready production.

The railway infrastructure includes about 16.5 km of railroad tracks and 6 railway stations.



ENGINEERING INFRASTRUCTURE

The Engineering Infrastructure includes the water supply network and sewage. Determining is the above-ground high-voltage electric grid which is a powerful edge divider for the current and possibly for the future structure of the site. In addition to the engineering infrastructure are the two thermal power stations and the three electrical distribution sub-stations. Their future should be evaluated referred to the current electrical power overproduction and the steadily decreasing national, regional and local power consumption.

The graph shows the electrical plants, distribution stations and power network of Kremikovtzi

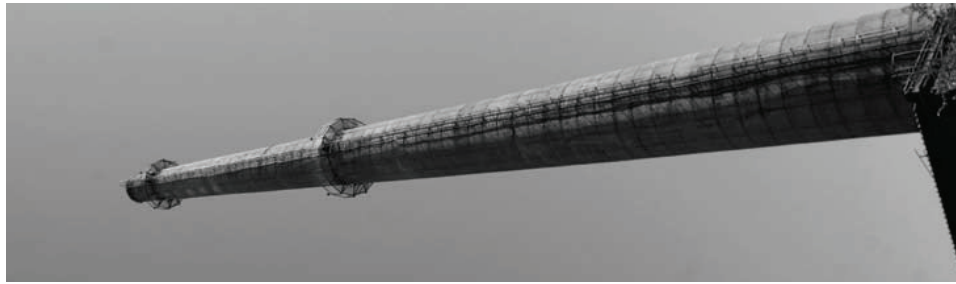


Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz

EXISTING MAJOR ENGINEERING STRUCTURES

Engineering Superstructures – the character of the steel production has determined the engineering horizontal and vertical structures: trestles, chimneys, cooling towers, masts, silos and furnaces.

They define the specific current silhouette of Kremikovtzi. A great part of the facilities is currently subject to dismantling and demolition, most of the trestles on the second and third urban levels are unusable after the production shut down.





MEGA BUILDINGS

In the course of two decades the plant has housed an unprecedented by scale amount of construction. Some of the buildings, referred to as MEGABUILDINGS, have linear and footprint size. In this sense the size becomes a quality feature. At least three of the buildings, even in bad physical condition today, have a vast investment and capital value. The comparison of these buildings within the ranking* of the largest buildings in the world shows that they can take a place at the very top. All three of them enable the housing of urban functions that are currently missing in Sofia: such as a trade fair, a theme/amusement park, an international size sports complex, up-to-date high-tech production facilities, and modern warehouses, distribution and logistics centres.

Positioning of the three major buildings: Building 1



Positioning of the three major buildings: Building 2



Positioning of the three major buildings: Building 3



70 * http://en.wikipedia.org/wiki/List_of_Largest_Buildings_in_the_world

Boeing Everett Factory with its 398,000 m² footprint



Building 1 229,000 m² footprint



Building 2 209,000 m² footprint

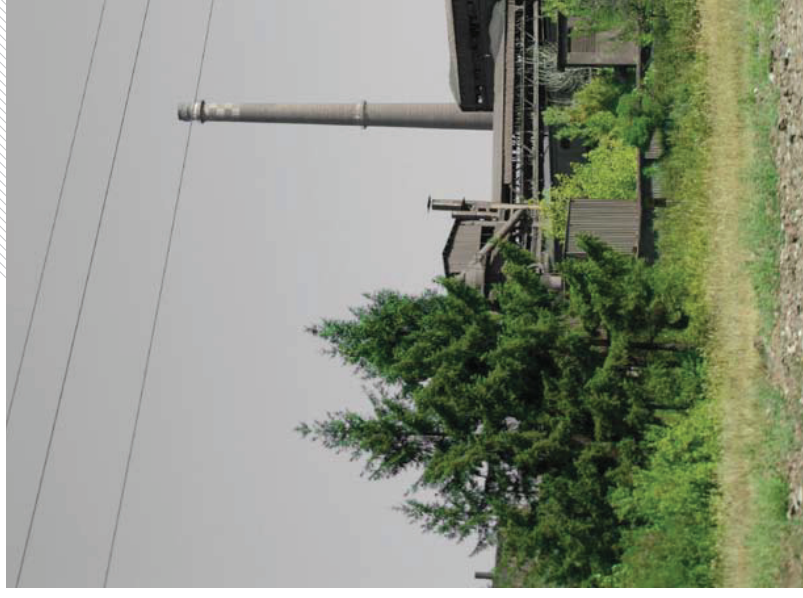


Building 3 107,000 m² footprint



LANDSCAPE

The erection of Kremikovtzi has brought to the direct and indirect urbanization of the natural environment in grand scales. About 1435 ha are used for the mine shafts, landfills, slag and inert material depots. Thus, the largest acquisition of natural environment in the Sofia Valley has been done, estimated to approximately 1500 ha of land. An interesting phenomenon is the growth of tall vegetation around and inside the plant site. This growth is the result not only from the planned protective for reforestation but also from decade's long spontaneous green growth. Paradoxically, the Red Monaster is perceived from a close distance as green environment. The really green site is a manifestation of the reaction of nature - a symbolic hint of what should be done against the ecological catastrophe that Kremikovtzi has caused.



POLLUTION

The pollution by and of Kremikovtzi has not been subject to published surveys. The red smoke has been floating around not only over the immediate vicinity but over Sofia and the Sofia Valley as a whole. In recent years before the plant shutdown, the media take up also the topic of the red dust from the landfills, which have not been drowned due to the lack of water. Vast polluters are also the construction and sanitary waste sites, a heritage from years of ignorant management. Regardless of what would the vision and strategy for the regeneration of Kremikovtzi be, any approach should necessarily include a timely first stage of survey of the pollution and its consequences, and also the definition of the measures and resource needed for the clean-up of the territory.







The photograph shows the colossal size and inner space of one of the megabuildings of Kremikovtzi. The space can be ideally used after the necessary transformations as a logistic park, combined with assembling industry

The remains of buildings and engineering structures still remind of the recent "glorious" past of the plant

The process of dismantling shall be completed approximately within the next 6 months





Photos taken from Botumetz reflect a ghost-like atmosphere. After being polluted regularly for almost 5 decades the neighbouring villages experience decline



Recent graffiti praising the might of the Communist Party

The conditions in Botumetz and Yana are atrocious. However, many people are still having their home there





A symbolic iron horse

Nature spreading over the factory



Ruins of engineering superstructures



The remaining building for ferroalloys



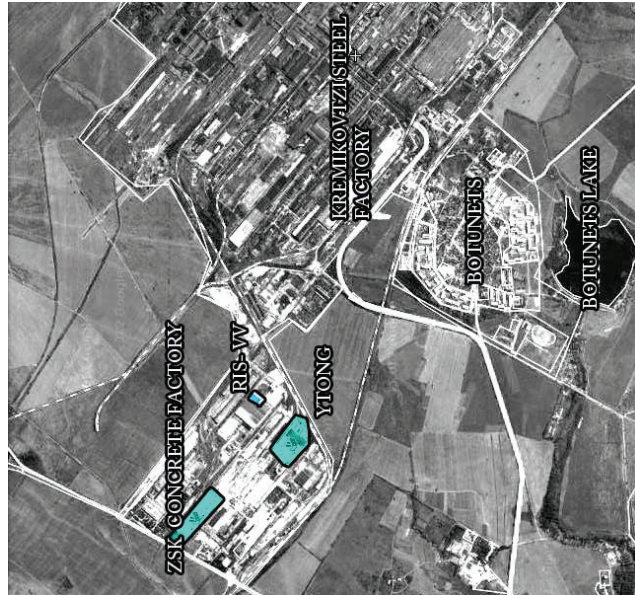
Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

CHAPTER II - URBAN SCENARIOS FOR THE REGENERATION OF KREMIKOVITZI

SIX POSSIBLE URBAN REGENERATION SCENARIOS

1. Industrial Park
2. Logistics Park
3. Expansion of Residential Areas
4. Trade Fair
5. Green Park
6. Satellite City

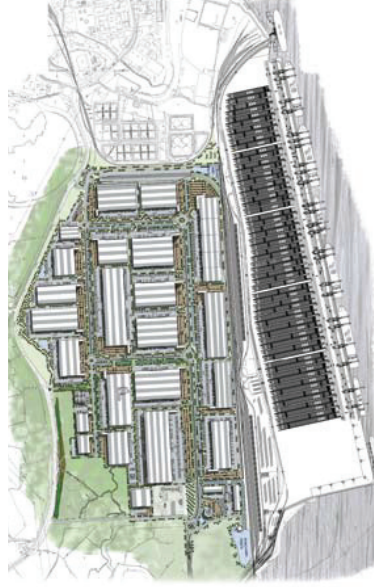
SCENARIO 1 INDUSTRIAL PARK



This first scenario is based on further development of new industries and upgrading of existing industries. Such scenario would be a natural continuation of the industrialization of the whole area. The vast technological infrastructure and low land prices due to both pollution and the worsened area image have been drawing new industries to the area after 1989. Currently, within the area neighbouring the plant to the south-west, there are working plants for the production of reinforced concrete prefabrication, for construction materials, as well as for waste treatment. The tendency for waste treatment concentration is strengthened by the modern recycling equipment of Ecometal Ltd. Construction of the Sofia plant for waste treatment has been finally started (opening date in 2016). Having in mind the great investments done in modern facilities in the recent past, as well as the prescribed in the Sofia General Master Plan (GUP) mostly industrial functions for the territory, it is hard to suppose a radical change in the tendency to industrialization, despite the fall-down of the steel-production giant. This scenario definitely contradicts with the idea for restoration of the original eco-system. However, it looks like that process of industrialization is already taking place, e.g. it is rather realistic.

SCENARIO 1 CASE STUDY - LONDON, MOSCOW

With a floor-plate of up to 1.29m sq ft (120k sq m), London Gateway can offer some of the largest logistics buildings in the UK. The Park is also providing 50 hectares of land specifically for rail-served buildings, and these are located to the south and east of the Park. In addition to the rail terminals in the Port, a common user rail terminal will be provided in the Park for use by those customers whose buildings are not directly served by rail. London Gateway will also offer a truck park with 24/7 facilities.**



A London Industrial park

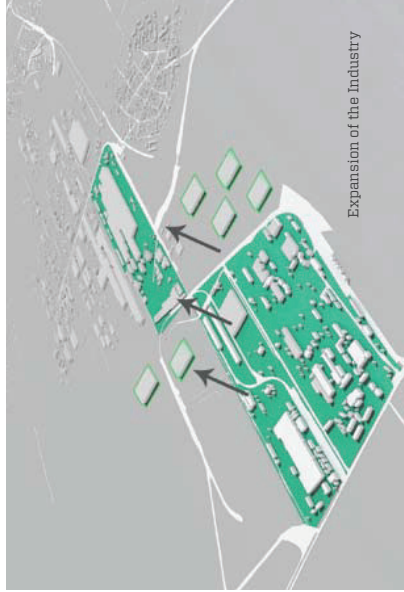


Industrial park around Moscow**

* <https://www.austrianlogisticspark.com/masterplan.html>
** <http://www.3dreal.com/content/78/view>

SCENARIO 1 INDUSTRIAL PARK

The urban typology is characterized by high construction density with large, mostly one or two story compact buildings. They are modulated, with adjacent large sites for loading and unloading, and flexible to use. Energy efficiency is a key factor. Highly developed infrastructure is important: this includes supporting business and service sector, and hospitality in some cases plus roads, railroad transportation, and sufficient engineering grids



Probable industry affecting the future development of the site

SCENARIO 1 PROS AND CONS

SCENARIO 1 CONCLUSIONS



The positive aspects of this scenario are:

- Continues naturally the current tendency
- Provides employment for the area and for Sofia
- Uses effectively the current infrastructure
- Requires lower investments for the site regeneration than other alternative options

The tendency for further industrialization can be regulated by legislative support and by incentives for clean productions. Restrictions can be also imposed to limit the territorial development only to the immediate vicinity of the currently operating plants. The regeneration strategy should be based on diversification, e.g. to combine different urban functions such as: clean-up, landscaping, logistics, dwelling and services. Given the excellent topography of the site, the possibilities for renewable energy production should be well explored even despite the currently over-supplied renewable energy market in Bulgaria.



A general negative aspect of this urban scenario is that it turns the industrialization process of the territory into a irreversible tendency which contradicts to the main natural and cultural potentiality of the territory

SCENARIO 2 LOGISTICS AND WAREHOUSE

SCENARIO 2 CASE STUDIES



New Project for a
Logistics Center in Romania*
ELP comprises 170,000 m² of
built form over a 32 Hectare
site.



Plan of a Logistics Center
in Varna, Bulgaria**

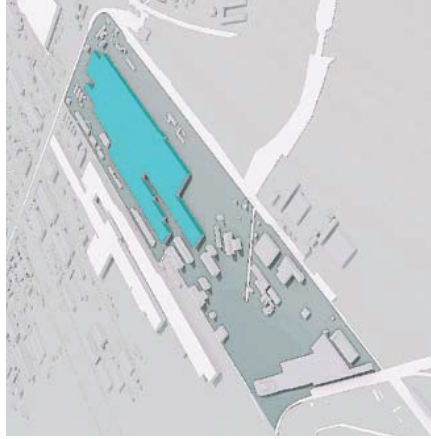
* <https://www.eurp.com/en/real-estate/park.com/masterplan.html>
** <http://pvc3ppic.com/>

Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

The Kremikovtzi area is highly accessible not only on a regional and on a national level but also within the context of the Balkan Peninsula and of Europe as a whole. Important is its location on the main road connecting Europe and Asia. The site is practically directly connected to the major national and European road and railway networks. The Sofia Airport is also very close. A highly developed freight forwarding infrastructure allowing the transportation of enormous loads and cargoes is currently available. The "Ecometal" Ltd. company is already constructing the first container terminal on the Yana railway station. The lack of sufficient warehouses sites locally and more generally in the region of Sofia, combined with the evident potential for logistics, provide the solid argumentation for such an urban scenario. What's more, it is compatible with the proposed first scenario, e.g. - the development of industrial production.

SCENARIO 2 TYPOLOGY

The typology of the logistic parks is similar to the typology of the industrial parks, since they are derivatives. However, in the logistic park scenario, the road and railway grids are of even greater importance. Flexible and separable large warehouse modules are the main feature. Also needed are spacious open-air storage sites.



Most probable area for Logistics in the Site of Kremikovtzi



SCENARIO 2 PROS AND CONS



The positive aspects of this scenario are:

Continues naturally the current tendency

Provides employment for the area and for Sofia

Uses effectively the current infrastructure

Requires lower investments for the site regeneration than other alternative options

The site of Kremikovtzi has a really high potential for logistics, including its most modern types - container terminals. According to the traffic (increasing with the aggressive rise of import from Asia to Europe) it is possible to convert taking the whole area of the plant into a mega-logistics park. The facility can be combined with a duty-free zone and plants for assembly and packaging of consumer goods.



A general negative aspect of this urban scenario is that it turns the industrialization process of the territory into a irreversible tendency which contradicts to the main natural and cultural potentiality of the territory

SCENARIO 3 RESIDENTIAL DEVELOPMENT

This is a possible but unlikely scenario. On a physical level the scenario finds its argumentation in the extraordinary location, landscape and topography of the site. To remind: remnants of the oldest settlements in the Sofia Valley are close to the site. Opposing to this scenario is the fact that massive speculative housing was constructed during the recent development boom of 2005 - 2008. An extensive part of the speculative housing is still underused. There is also a vast resource of dilapidated housing in the Sofia centre with good potential for rehabilitation. The delayed but also inevitable process of rehabilitation of the massive prefabricated socialist housing is also ready to start. Therefore, the scenario for housing expansion should be considered mainly as complementary to another urban scenario requiring habitation as one of its parts. The residential scenario could become a priority only in case of radical change in the current demographic tendencies (for instance, unexpected fast migration process towards Bulgaria).



Master Plan of Canal City in MENA Region by AE7 Associates with Estimated Construction Costs of about 20 billion dollar.*



3d Perspective of the Master Plan of Canal City in MENA Region by AE7 Associates with Estimated Construction Costs of about 20 billion dollar.*

* <http://www.ae7.com/>

SCENARIO 3 CASE STUDIES

SCENARIO 3 RESIDENTIAL DEVELOPMENT

Vast experience in residential masterplanning and development has been accumulated in international urban planning practice. Normally the actual forms of housing typologies correspond to the local context and traditions. However, some recent tendencies may seem to contradict to the classical typologies. It is possible to develop combinations of housing typologies: some as continuity to the present scale of housing in the nearby villages; others as high density and high-rise to match the grand scale of the site. High-rises may be also contextual, given the obvious concentration of verticals in the present silhouette of the enterprise. On a larger scale high-rises may symbolically define a relation to the distant city of Sofia.



SCENARIO 3 PROS AND CONS



Positive aspects of the residential scenario are its:

- Suitable location in the foot of the mountain
- Southern slope with perfect orientation
- Extraordinary view to the Valley of Sofia and to the city
- Being a part of the system of the nearby traditional villages
- Sustainability and eco-friendliness as a whole



The Negative aspects are also obvious:

- Highly polluted area, needing massive investment for the clean-up before development of any kind
- The availability of waste disposal sites in the vicinity
- The presence of a considerable dilapidated building stock in Sofia. Any new development will divert a significant part of the investment needed for renovation.
- Oversaturated housing market today

SCENARIO 3 CONCLUSIONS

As said, this is an unlikely scenario and should be considered as complementary to another urban scenario. In any case the new residential development should be combined with renewal of the satellite villages next to Kremikovtzi. Such a scenario may become a priority in case of a great migration wave to the Sofia valley bringing the need for new housing.

SCENARIO 4 TRADE FAIR

SCENARIO 4 CASE STUDIES



The Above Diagramme shows the Expo Center in Leipzig, Germany



Despite the fact that Sofia is a million plus population city, it does not have a real Trade Fair. Expo exhibits take place in the 12 year old Expo Center on Tzarigradsko Shosse Blvd. Some commercial exhibits also take place in NDK - the National Palace of Culture, some are hosted in sports halls. The Expo Centre is limited by its small plot and its inner city location. Therefore, it doesn't have the capacity for big international expos. The reason for the lack of such a trade fair in Sofia lies in the communist party policy favouring the traditional Plovdiv Fair, at only 150 km of a distance from Sofia. The communist centrally-planned economy does not assume competition between cities. Since the democratic changes in 1989, Sofia hasn't had its own potential and resources to develop such a complex facility, requiring a site of at least 100 and even more hectares, as shown by the study of the good European examples. Such examples, analyzing the typology of the trade fair, are from Germany, where the combination of working economy and competition amongst regions and towns has created trade fairs in each bigger city.

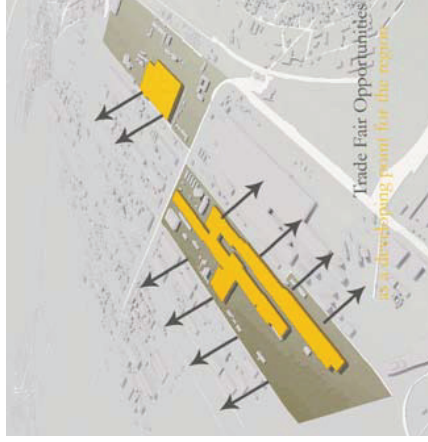


The Above Diagramme shows the Expo Center in Munich, Germany



SCENARIO 4 TYPOLOGY

The comparative case study of the trade fair examples provides the opportunity to summarize the following characteristics of the typology; trade fairs are located in the city's outskirts; often close to an airport; with convenient public transportation access (metro, railway, bus). The fairs have easy access from highways, enabling the entry of oversized trucks. Sufficient parking in the open air is provided with access usually from two opposite sides. The main facilities are the exhibit halls (from 10 to 20) that possess flexible spaces with integrated to the halls exterior spaces providing chance of open-air expositions. The fairs have entry halls comparable with those of airports and train stations. Sufficient hospitality commodities are available, such as: business and hotel centres with a large number of conference and meeting rooms, enabling the daily visits of tens of thousands guests. The areas of the surveyed fairs are between 100 and 200 hectares.



SCENARIO 4 PROS AND CONS



Positive aspects of the Trade Fair scenario are:

- Convenient access from Sofia
- Closeness to the airport and the Sofia ring road
- Availability of space – each quarter can house easily a trade fair
- Availability of buildings with size and spacial characteristics enabling their conversion into a trade fair (buildings 1 and 3)
- Availability of very developed inner road and railway infrastructure
- Availability of good engineering infrastructure and power stations



Negative aspects of the Trade Fair scenario:

- Need for a large scale clean-up
- The trade fair would cover no more than 1/6th of the Kremikovtzi area, which could gather even an international expo of the 2010 Shanghai
- Lack of functioning metro line
- Need for significant financial resource for the realization of the project

The Trade Fair scenario is not only possible but really an attractive one. Sofia and its outskirts provide just a few alternatives in terms of availability of land plots of the required size, access and infrastructure. Given the excess of land on the site of Kremikovtzi, the planning of a trade fair can be just a part of an urban scenario on a larger scale.

Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz



SCENARIO 5

GREEN & SPORTS PARK

This scenario should be considered more of an idealistic one. It is related to the idea of rebalancing the ecological system on the typical brownfield site of Kremikovtzi. Through regeneration brownfields can be rearranged "for parks, playgrounds, gardening, natural open-space areas, and walking. Converting brownfield properties into green spaces offers a potential solution" for „improving the natural environment by addressing contamination, as well as helping transform distressed neighborhoods into healthier human environments that provide more venues for walking, recreation, and other physical activities.”⁶⁶

102 * http://www.activativinaresearch.com/files/G_U_HIPPL_Weinmeister.pdf

SCENARIO 5 CASE STUDIES

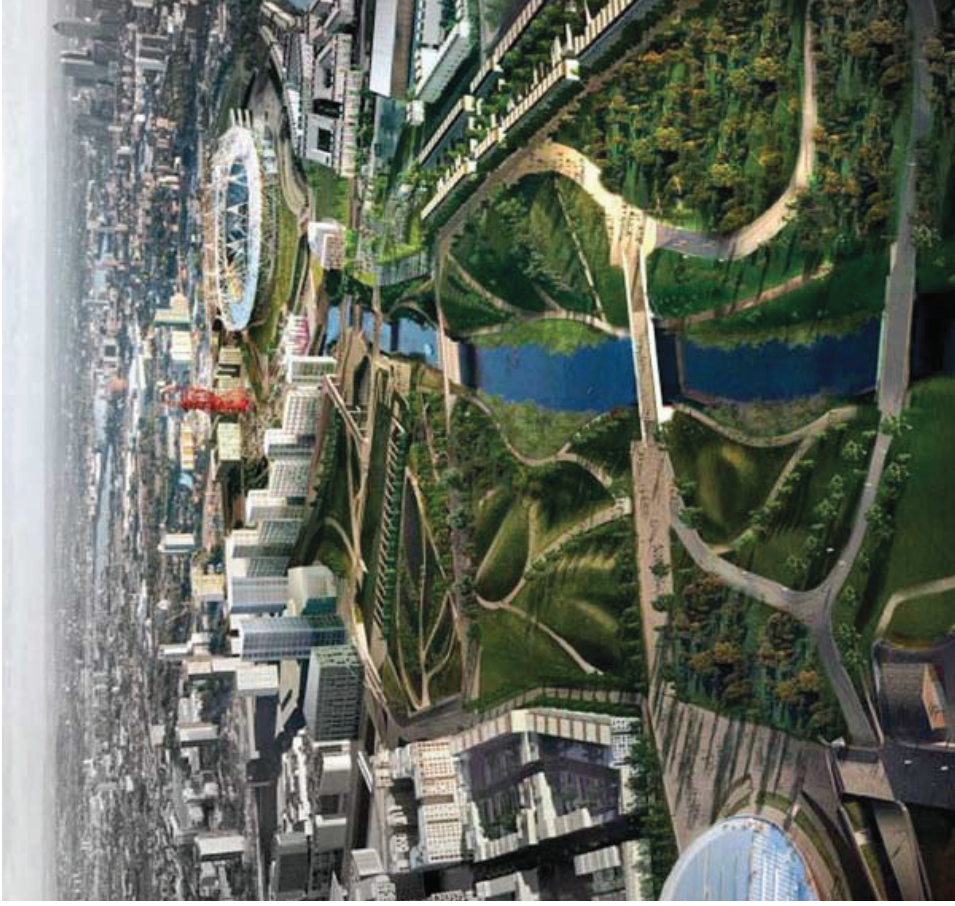


The centerpiece of the 2012 Games is the Olympic Stadium, designed by Populous. The 80,000-seat stadium will host athletic and paralympic athletic events, as well as serving as the backdrop for both the Opening and Closing Ceremonies. It is positioned on an island created by the convergence of several rivers; five footbridges lead spectators into the structure.⁶⁶

** http://buildipedia.com/aec-plus/featured-architecture/london-2012-architecture-and-masterplan-overview/print-1-1&tmpl=component&layout=London_2012



104 * <http://buildipedia.com/aec-pros/featured-architecture/london-2012-architecture-and-masterplan-overview?print=1&map=component&lon=51.507>



* <http://buildipedia.com/aec-pros/featured-architecture/london-2012-architecture-and-masterplan-overview?print=1&map=component&lon=51.507>

Dejan Ivoč Paršević, Kremikovci in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

SCENARIO 5 TYPOLOGY

This is a classic landscaping scenario. Possible options vary from **A** minimalist option for forestation of the territory after its re-cultivation to **An** urbanized green park



Landscape only



Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz



Landscaping + Sports park

SCENARIO 5 PROS AND CONS

SCENARIO 5 CONCLUSIONS



Positive aspects of the Green Park scenario are:

- Rebalancing the eco-system of the territory
- Permanent elimination of the most significant source for the erosion of the territory and its pollution
- Support the General Master Plan concept of the development of culture tourism, correlated to the notion of Sofia Holy Mountain
- Increasing of areas attractiveness as a whole for benefit of the nearby villages.



Negative aspects of the Green Park scenario:

- The investment in a green park does not give immediate return
- The scenario is even less likely, given the private property on the site
- The maintenance of a green park needs an adequate management structure and regular expenses.

Altogether, the Green Park scenario requires the least amount of investment. Investment can be reduced via citizen participation. This scenario can be viewed as a second stage after the inevitable first stage - the clean-up, preparing the territory for development according to future circumstances unforeseeable at the moment.



Deljan Iyov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

URBAN REGENERATION SCENARIOS CLEAN UP

The steel plant of Kremikovtzi has been the biggest polluter of Sofia and in Bulgaria. Measurements show contamination of the soil to 5 as compared to the allowable norms. The steel particles and parts, oil fuel, construction and machinery-rubble will remain in high amounts even after the dismantling process of the plant ends.

Therefore, a systematic and thorough clean-up is the necessary and inevitable first stage of the regeneration process.

Brownfield regeneration has created a whole new industry for the clean-up of derelict industrial sites. One of the leading companies in Austria and Europe in terms of cleaning up highly polluted industrial areas is Binder&Co. Binder&Co has proposed the method of screening as a possible solution for the cleaning of the Kremikovtzi site. According to this method, the polluted soil goes through a series of magnet filters, which take away and separate the steel particles. A special driving mechanism produces resonance and provides two vibratory movements in which flexible polyurethane panels are in turns expanded and compressed. Thus, the hard-to-screen product is separated at high acceleration. The dynamically excited screen panels remain clear and allow for further efficient screening.

Alongside cleaning the fine remnants of the steel industry, building-rubble recycling is also a question for the site of Kremikovtzi. Binder&Co provides also methods which allow the economical processing of building rubble, broken concrete and asphalt to produce unmixed secondary raw materials. Binder&Co has cleaned-up sites comparable and even bigger than the site of Kremikovtzi.



* Photo taken from <http://www.binder-co.com>



* Photo taken from <http://www.binder-co.com>

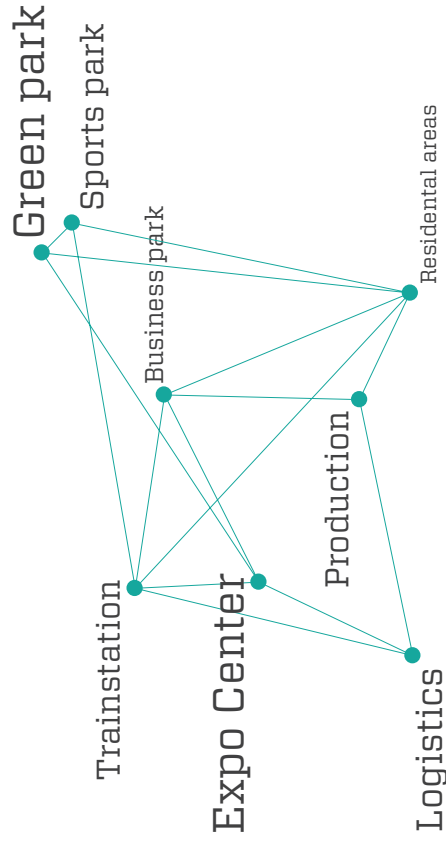
Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Diplom Work, Technical University of Graz

COMPARISON, SUPERPOSITION AND JUXTAPosition OF REGENERATION SCENARIOS

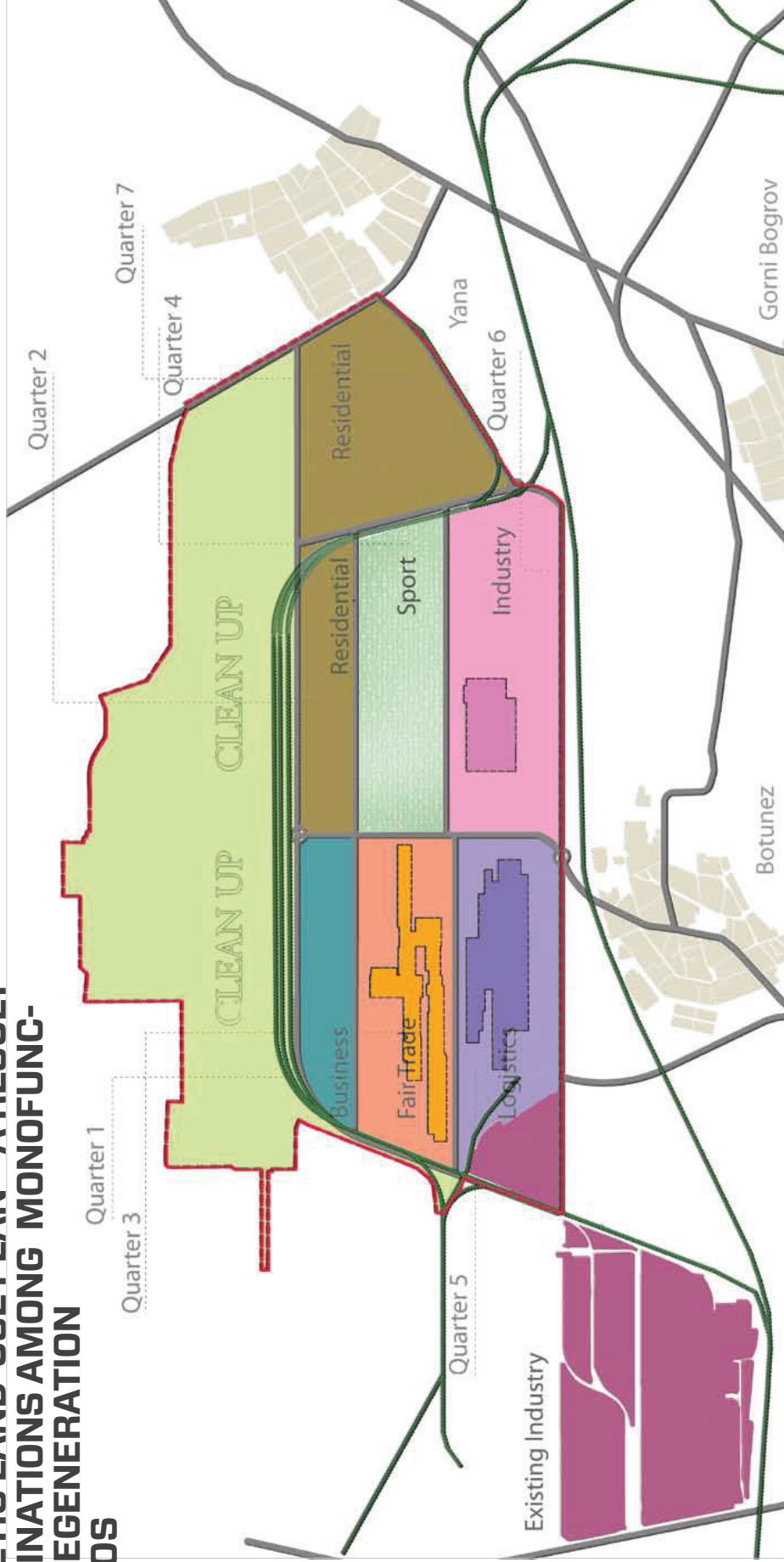
The six urban scenarios, defined previously, practically exhaust all monofunctional regeneration options for Kremikovičzi. The Pros & Cons analysis for each of the options, excluding the Green Park, show a certain balance between the positive and negative aspects. On the other side, none of the scenarios is exempt from high-risk given the negative demographic growth and the inevitable ups and downs cycles of a free market economy. It has also become clear that none of the monofunctional scenarios (excluding again the Green Park scenario) can envision the regeneration of Kremikovičzi on its entire area of 800 ha. This is why, in the current section of the diploma work the monofunctional options will be compared, super-positioned and even juxtapositioned to one another. The method aims to analyze not only the deficiencies and inner conflicts of the monofunctional scenarios, but also to explore the potential of combinations into a more complex multifunctional urban scenario.

Various combinations of this interplay are shown in the following chart.

Dejvan Ivov Panteljev, Kremikovičzi in Quest of a New Urban Vision, Technical University of Graz



A SYNTHETIC LAND-USE PLAN - A RESULT OF COMBINATIONS AMONG MONOFUNCTIONAL REGENERATION SCENARIOS



SCENARIO 6

A SATELLITE CITY

Kremikovtzi, a Satellite City of Sofia, is a topic that engages the media attention in 2010. The notion of transforming Kremikovtzi into a satellite city to serve as a secondary administrative and business city centre has been proposed by Peter Dikov, Chief Architect of Sofia. The idea reflects the conclusions of the recently enforced General Master Plan of Sofia according to which territories for new urban development are available only in northern direction. The idea is also based on the potential interest shown at the time by international investors from the Middle East. It is likely that the idea is sparked by the failure of the first large-scale international architectural competition for a secondary administrative and business centre of Sofia held in 2009. The visionary entry of Dominique Perreut, winning over Sir Norman Foster, impresses with the mastership of combining a long term planning strategy with a powerful urban design scheme. In 2010 Bulgaria has still not been hit considerably by the international financial crisis, and the high spirits raised by the construction boom of 2006 - 2008 still resonate. Preliminary estimates for the investment needed to transform Kremikovtzi into a satellite city total at around 12 bn. euro, 500 mln. of which are necessary for the clean-up only. The satellite city scenario is based on already discussed attractive features of Kremikovtzi such as: vast territory comparable with the size of the central part of Sofia; excellent location in close proximity to the city; highly developed infrastructure valued at close to 40% of the investment needed for a new urban development. The demographic tendency for a steady increase of the city population and the continuing concentration of economy in Sofia strongly support this scenario. Arguments are derived from the hypothesis that Bulgaria and Sofia may become the entry point of Asian capital and goods to the EU.

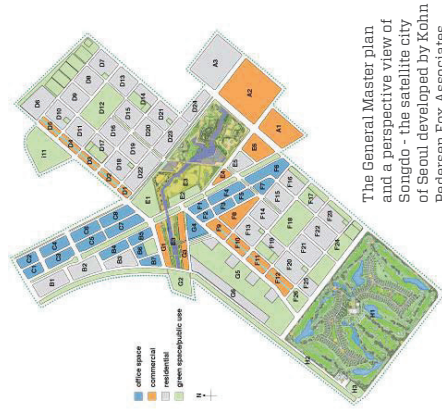


A perspective view of the conceptual urban design for Kremikovtzi City by arch. Peter Dikov

SCENARIO 6 CASE STUDIES



118 * Photos taken from <http://www.songdo.com>



The General Master plan and a perspective view of Songdo - the satellite city of Seoul developed by Kohn Pedersen Fox Associates



Business quarters and park areas in Songdo
<http://www.songdo.com/>
* Photos taken from <http://www.songdo.com>

DeJany Ivov Panteliev, Kremikozvtz In Quest of a New Urban Vision, Diplom Work, Technical University of Graz

SCENARIO 6 PROS AND CONS



Positive aspects of the Satellite city are:

The diverse potentialities of Kremikovtzi as a whole make it suitable for a satellite city

In the case of a complex development on the whole territory it will be easier to gather the needed vast resource for the realization of the project

A complex, multiuse development will permanently solve the issue of the urbanization of the Sofia Valley

The multifunctional scenario is more flexible, prospective and vital in the long-term future than the monofunctional zoning.

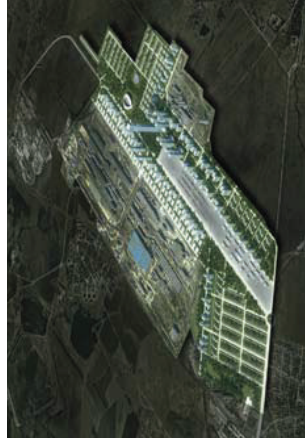


Negative aspects of the Satellite city scenario:

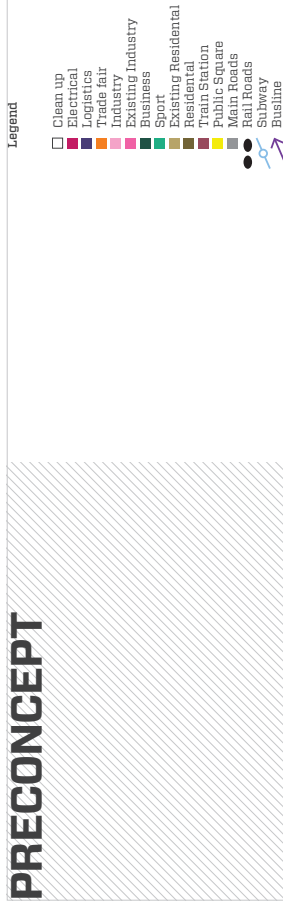
This scenario supposes the highest risk level

A newly built "city" goes with the risk of artificialness, proven by many of the new town cases built after the World War II.

The scenario for a satellite city needs careful analyzing of the needs for development on regional and even pan-European levels. Such a scenario is possible only with a coordinated policy governed by the state. A development agency should be established in order to provide the long term sustainable planning and realization of a project of such magnitude.



PRECONCEPT



The various combinations and juxtapositioning of monofunctional scenarios has led to the following preconcept land use plan for Kremikovtzi

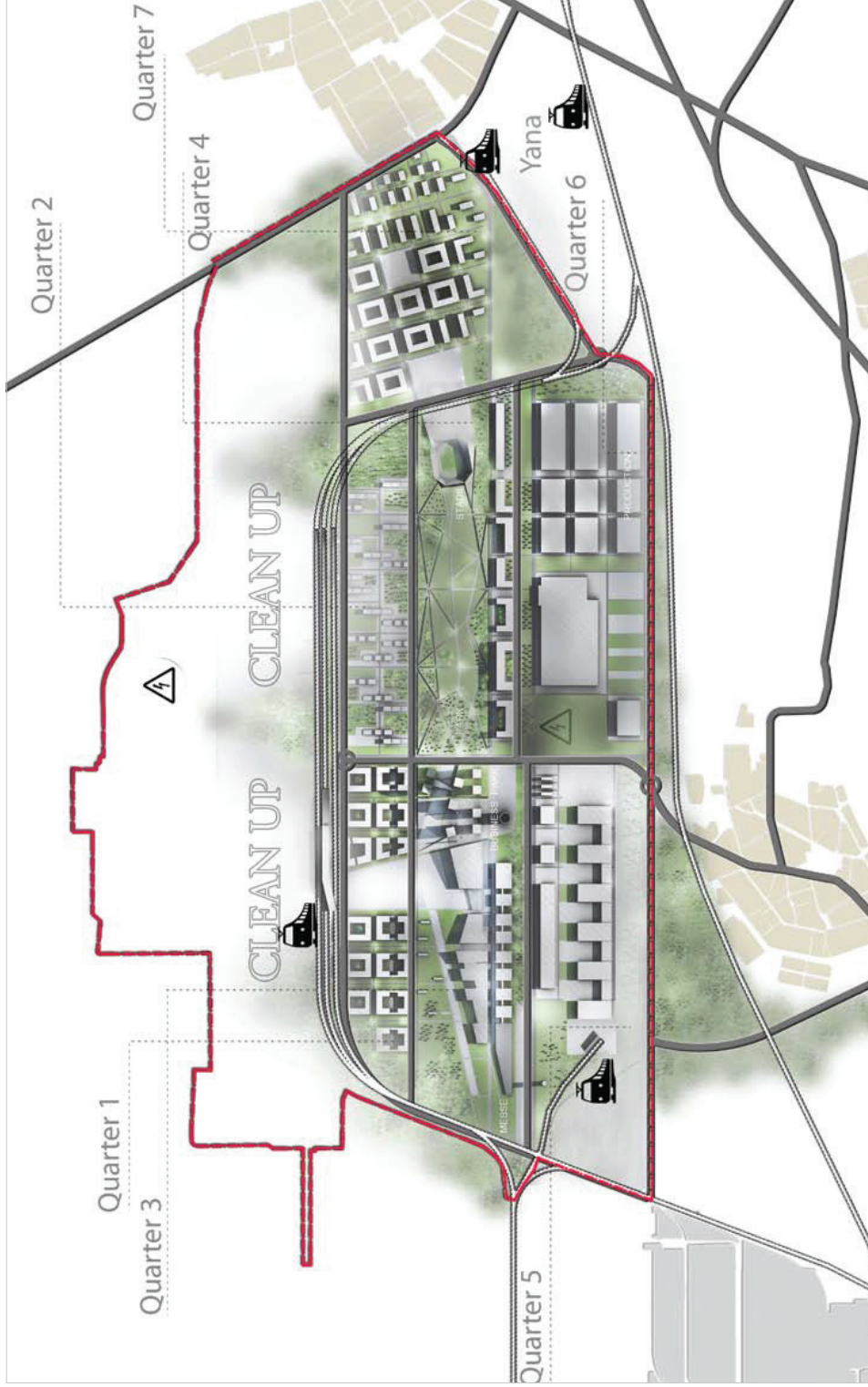


Dejan Ivov Panteliev, Kremikovtzi in Quest of a New Urban Vision, Technical University of Graz



expo
SOFIA

CHAPTER 3 - AN URBAN DESIGN CONCEPT - A MASTERPLAN OF KREMIKOVITZI



The masterplan concept illustrated in the third chapter is a natural continuation of the synthetic sixth scenario for a satellite city. This scenario is the symbiosis resulting from the interplay amongst the five monofunctional regeneration scenarios explored previously. The masterplan concept is based on the following 10 planning principles:

Radical clean-up and regeneration of the eco-balance of the site and its vicinity

Maximum preservation of the existing urban structure: railroads, roads, utilities and building stock

Contextualism - relation to the spatial and temporal context: villages, industries, cultural heritage, nature and history

Compactness and Openness

Diversity and Connectedness

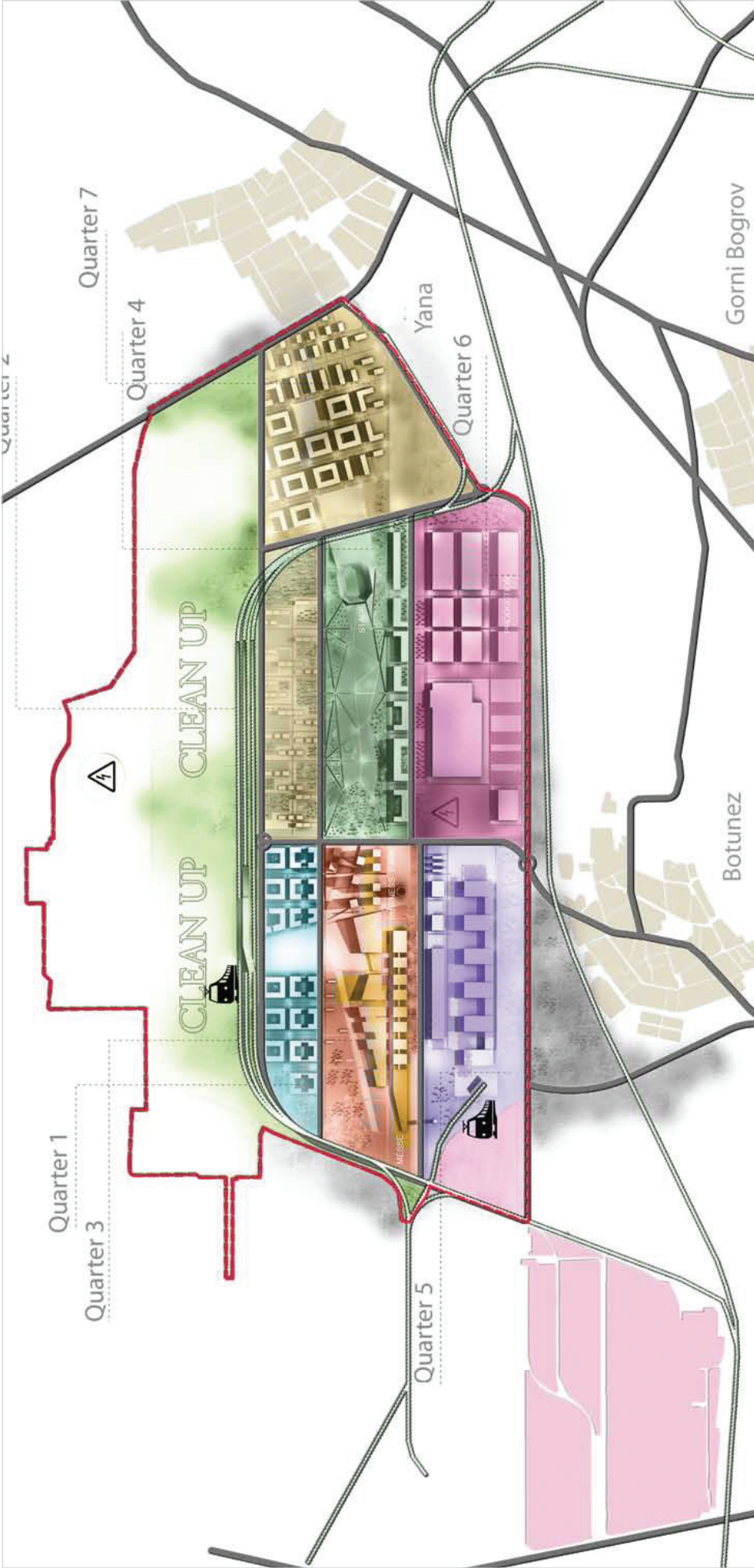
Mobility and Accessibility

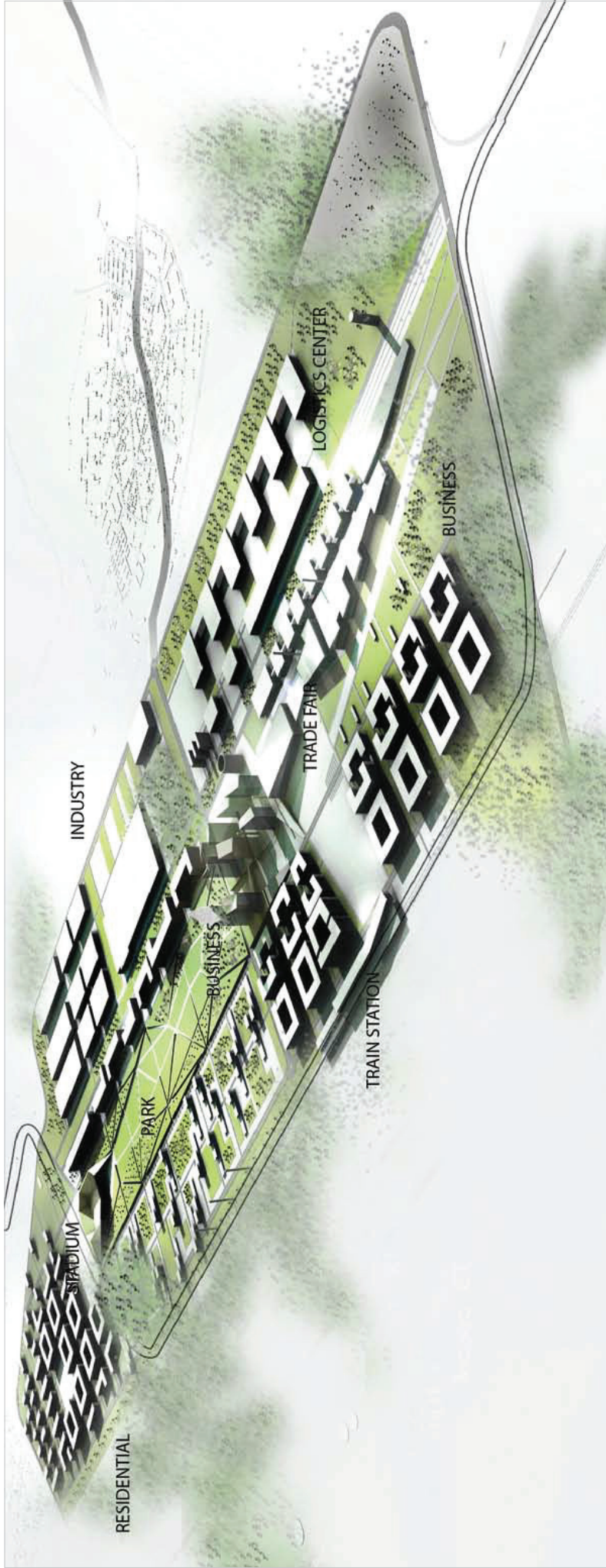
Attractive Public Spaces and Landscaping

Sustainable and Healthy City

Smart and Creative City

Enterpreneural and Dynamic City





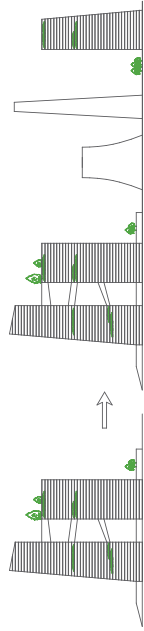
MASTERPLAN TYPOLOGIES

The table illustrates the major urban parameters of the masterplan, which provides the framework for a top spatial, social and technological environment for more than 150,000 inhabitants and users.

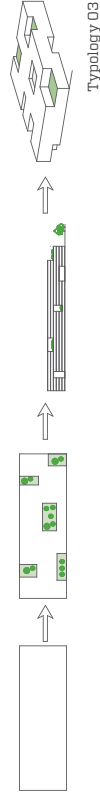
URBAN PARAMETER	AREA - sq.m	%	VALUE	UNIT COST euro/sq.m.	TOTAL COST in euro
SITE AREA LAND/ INFRASTRUCTURE	4940000			650	3211000000
HARDSCAPE AREA - ROADS, SIDEWALKS AND ALLEYS	580000	11.7		150	870000000
LANDSCAPE AREA/DENSITY	3380000	68.4		50	1690000000
BUILT AREA - FOOTPRINT/DENSITY	980000	19.9			
AVERAGE NUMBER OF FLOORS			3.5		
TFA - TOTAL FLOOR AREA ABOVE GROUND in sq.m.	3430000			2000	6860000000
TFA RATIO ABOVE GROUND			0.69		
TFA TOTAL FLOOR AREA BELOW GROUND	1500000			1000	1500000000
TFA RATIO BELOW GROUND			0.30		
GRAND TOTAL FLOOR AREA	4930000				
GRAND TFA RATIO			1.00		
CLEAN-UP	8000000				1000000000
GRAND INVESTMENT COST					12827000000
LIVING/WORKING AREA STANDARD - SQ.M. PER PERSON			20		
NUMBER OF INHABITANTS			150000		
POPULATION DENSITY - persons/ha			303		



Typology 01



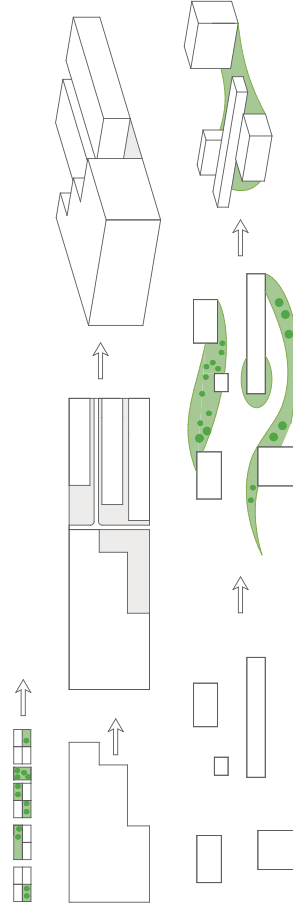
Typology 02

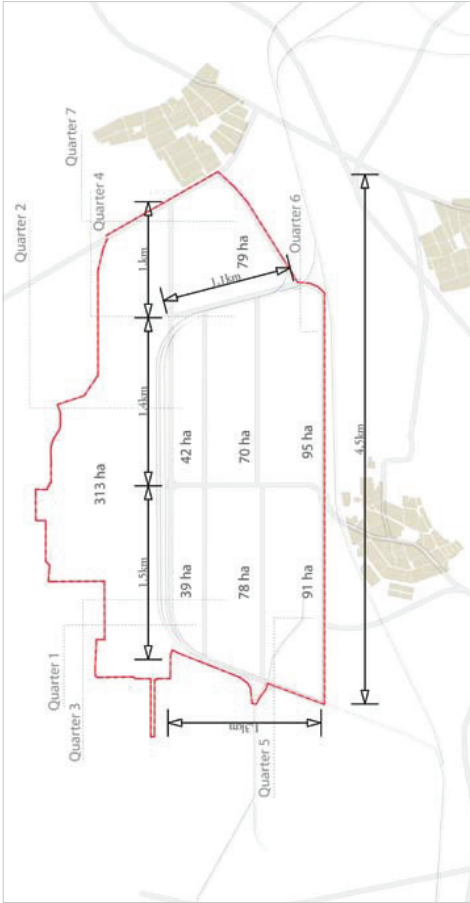


Typology 03



Typology 04





Size and Dimensions

Radical clean-up and regeneration of the eco-balance. The continuous pollution in the course of nearly 50 years implies the clean-up process to be systematically planned and performed on the entire site and its immediate vicinity. This process has already started with the dismantling of the majority of the rundown buildings and engineering structures. This process is going fast and major parts of the site have been released of construction. However, a radical cleanup suggests a thorough survey of contamination, recultivation and/or exportation of the necessary soil layers, preservation of greenery and conservation of valuable the construction stock - buildings and infrastructure.

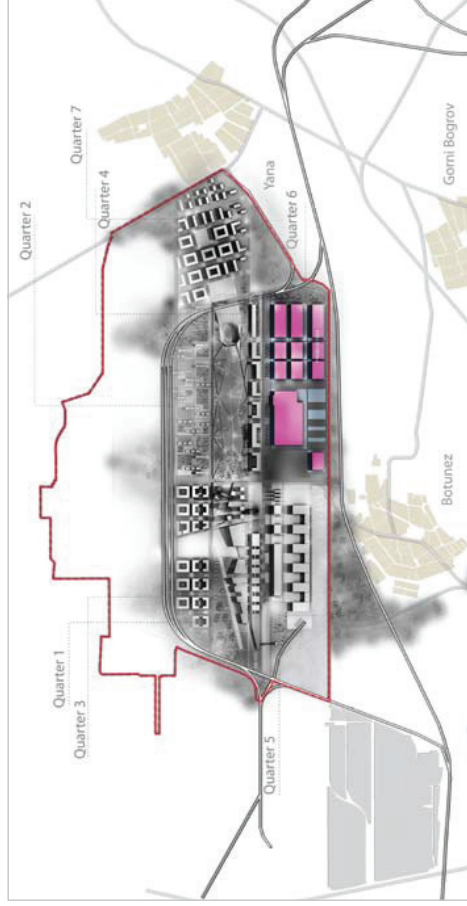
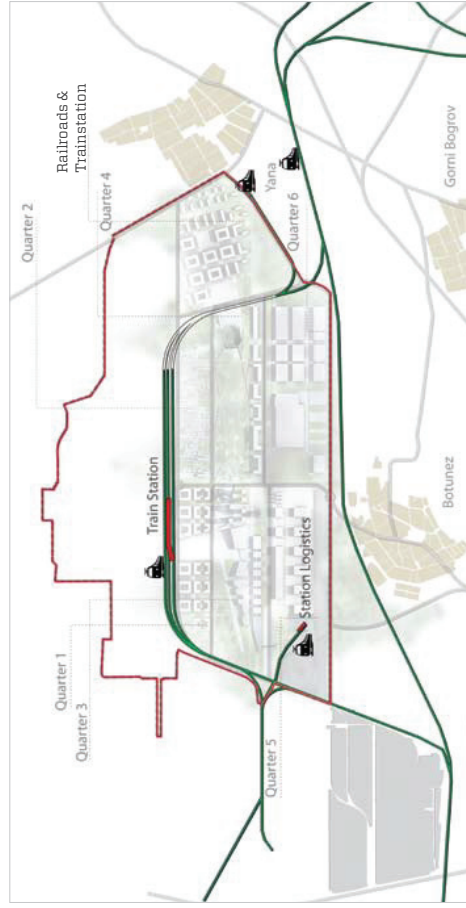


Existing Buildings & Infrastructure

Preserving the most of the existing values and assets is a main component of the sustainable approach. The proposed masterplan follows quite strictly the original urban structure, defined by the railroad loop, the main streets network and the seven urban quarters. The three mega-buildings are restructured into new facilities: a trade fair, a logistic park and an industrial park. Each function is specifically assigned to one of the buildings after careful analysis of multiple aspects: location and accessibility; potentiality for space reorganization; and the ability to comply with the typological characteristics of a trade fair, of logistic park, and of industrial park. The three megabuildings can be restructured so that to bring urban scale into their interiors and merge exterior with interior spaces.

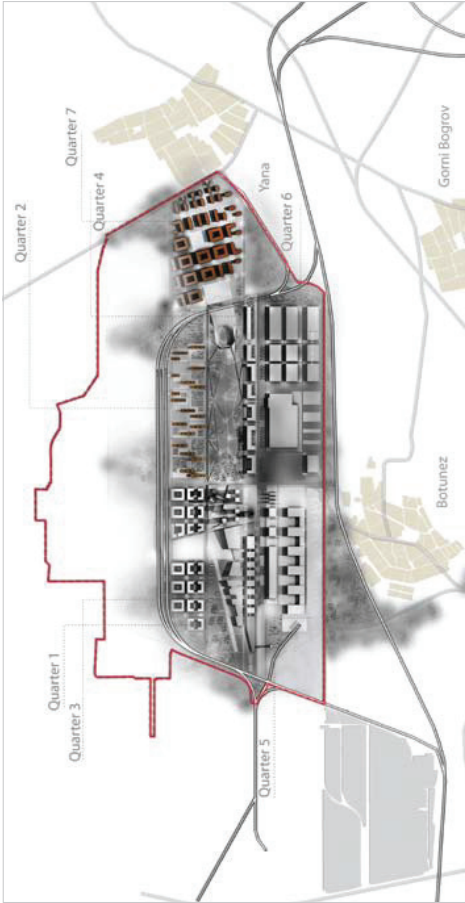
Legend

- Train Station
- Main Roads
- Rail Roads
- △ Electrical plant or Substation



New Industry Zone

Contextualism is achieved via the relation of the new development to the adjacent urban and natural elements: villages, industrial zone, natural environment and cultural heritage. The masterplan proposal respects and responds to the immediate surrounding. Thus, the logistic park and the industrial park occupy the southern quarters and are a natural extension of the well functioning industrial zone to the southwest. The residential function is assigned to quarter 7, which is naturally related to the village of Yana to the east. Contextual is also the superscale resounding the massiveness of the former steel plant. The high-rise towers echo the vertical elements of the steel plant and establish a new visual symbol for the Sofia Valley.



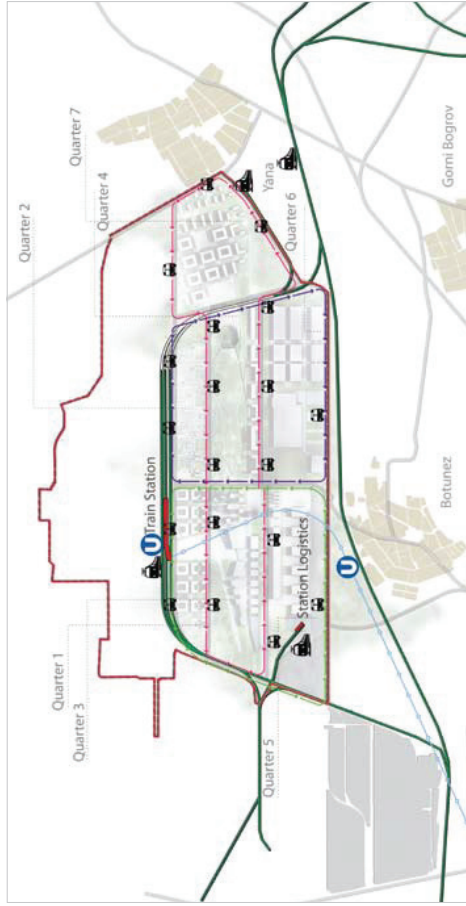
New Residential Zone

Compactness and Openness
 Compactness and density are also major elements of sustainable urban planning. The urban design scheme is based on high density concentrated in six out of the seven mega-quarters. Thus major functions are within walking distance from each other. While being compact, the masterplan does not express a closed structure but rather an open one. Spatial openness is secured by the massive green & sports park and the wide promenades of the main roads and public spaces. The green park is the Kremikovtzi Central Park; the main public square connecting the railway station with the Trade Fair interprets the Market Place. A secondary plaza related to the stadium provides a vast urban open space to serve also the residential quarters to the north and to the east.



New Business Zones

Diversity and Connectedness
 The masterplan offers a rich multi-functional environment with practically all the main urban functions: residential, occupation, commerce, recreation, culture and sports. A variety of industries will create economical viability on a local and regional level and may be a constant source for investment. Each urban quarter has a very specific use and its distinct character. Despite the radical differences, all quarters are integrated into a whole via the urban design composition: via the system of streets and pedestrian walkways, and the rich green and public spaces.



Public Transport

Mobility and Accessibility

Regardless of the walking distances among the different venues, a variety of public transportation secures the connection of the new Kremikovtzi with Sofia and provides an easy circulation within the satellite city. A new railway station is proposed to the north line of the loop. The position of the railway station allows easy access from Sofia to the main attraction - the Trade Fair. Yet, the position of the station allows for easy access to the mountain to the north and to the cultural path connecting the monasteries. The masterplan proposes an extension of the metro diameter with another section. A new end station will connect the metro line with the railway station under the main public square. Suggested are three bus lines: two external bus lines will connect Kremikovtzi with Sofia while an inner bus line will provide smooth internal circulation to access all main focal points and elements. A system of pedestrian and bicycle routes covers the whole territory of Kremikovtzi. The combination of eco-public transportation with pedestrian and bicycle mobility will reduce car traffic. Depending on the level of car usage in the future, sufficient parking will be provided in the underground levels of the new development.

Legend

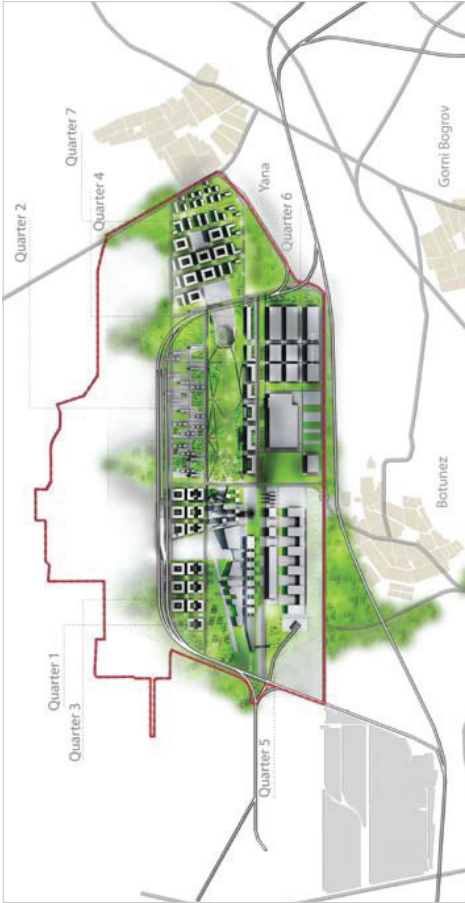
- Train Station
- Main Roads
- Rail Roads
- Subway
- Bus Line 1
- Bus Line 2
- Bus Line 3
- Subway Station
- Bus Station
- Train Station



Main Public Spaces

Attractive Public Spaces and Landscaping

The urban design concept is based on the modern interpretation of the classical urban morphology: city blocks, squares and streets, gardens and parks. However, new typologies will be experimented to respond to the innovative and progressive pursuits of the future generations. Rich landscaping will bring nature into the newly built high-density urban environment and will restore the eco-balance. Green belts will protect the City from winds and overheating and will restore the connection of the site with nature.



Landscaping

Extensive green spaces connect the existing landscape with the newly developed quarters. The graph expresses similarities to the Mussman plan of Sofia which established the concept of green edges connecting the city with the mountain



Logistics Park Zone

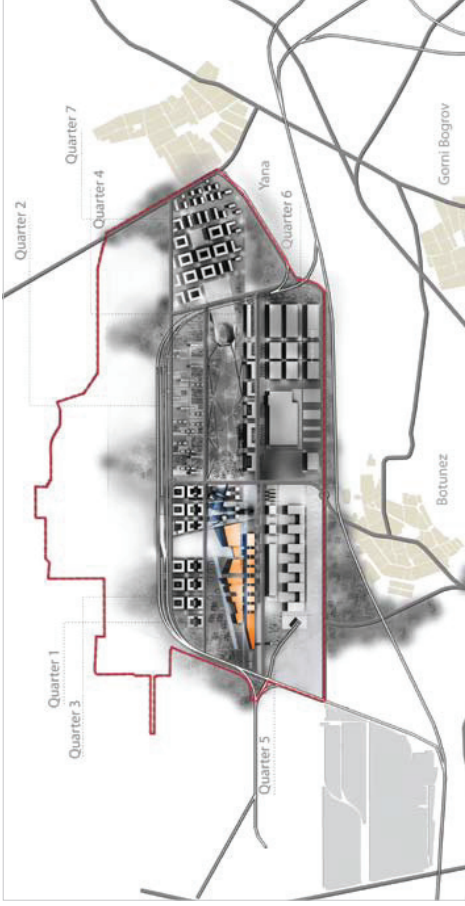
Smart and Creative City

The concept of the intelligent city is becoming more and more popular nowadays in Bulgaria. The new satellite city of Sofia will provide an opportunity to establish the achievements of modern technologies from the very conception. Central monitoring and management of all major urban processes will allow for efficient, risk-free and predictable environment able to be constantly upgraded with the changes of society and with the advance of knowledge. Promotion of creativity will be another main focus of the planning and development process. Innovation and looking into the future will be likely characteristics opposing conservatism typical for the traditional city.



Sports Park

Sustainable and Healthy City
 Given the advantages of new development, the satellite city of Kremikovtzi will necessarily use all knowledge on sustainability to provide an energy-efficient, resource-saving and healthy environment. As opposed to the energy-wasting and anti-ecological past of the site, the new city of Kremikovtzi will save and produce energy, will be eco-friendly, and providing a quality human habitat.



Trade Fair

Entrepreneurial and Dynamic City
 The concentration of a variety of industries within modular flexible building structures, together with the excellent infrastructure and crossroads location will be the determining factors for attracting capital and sustaining an economically sound environment for the new satellite city of Kremikovtzi. It may become a major generator of knowledge and inventions - a synergy of the traditional European values and the vanguard of the new world economies.

CONCLUSION

The regeneration of brownfields is a topical issue in modern urban planning. It is a natural phenomenon resulting from the inherent dynamics in market economies. Megaplants from the post-war period are forced to shut down and along with them whole inner and peripheral urban areas run into decay. Even countries with powerful economic and financial resources, such as the USA or the UK, do not have a ready-made and universally applicable risk-free solution for brownfield regeneration. An important aspect adding to the complexity of the issue is the private property on such large territories of abandoned industries. Each case requires a specific approach. A commonality amongst the diverse brownfield cases is the grand scale. It creates the necessity for mobilizing huge human and financial resources, accompanied by strong will and strategic vision in order to lead to a successful regeneration. A powerful vision and long-term policies on both macro and micro government and management levels are also required.

Kremikovtzi is not an exception. To some extent, the urban problem posed by Kremikovtzi will be even more difficult to resolve, as compared to a similar-size case within a more advanced economy.

It is namely the vast scales that lead to the conclusion that the regeneration and revitalization of the former steel producing Kremikovtzi plant is among several most important urban issues for the whole region of Sofia. The problem has been generated by decades of unreasonable policy targeted at a mega scale development with the accumulation of enormous state resources. Therefore, what seems to be a regional urban issue is practically of a state magnitude and cannot be solved without an active policy on a state level. A reason for this is the fact that the regeneration process should cover not only the 800 ha territory analyzed in this diploma work but also the whole north-east area of the Sofia Valley. The long-term strategy should be based on conservative assumptions about the likelihood to accumulate sufficient and sustainable financial resources. A matter of urgency is the analysis of the existing conditions, the actual pollution level and setting the methodology for the clean-up.

The preliminary estimate for the investment needed for the satellite city shows a range of 13 billion euro at current prices. (For comparison: the investment so far for Songdo City totals at 23 billion euro). Such investment cost is out of scale for Bulgaria. To compare: the current Bulgarian yearly GDP is around 60 billion euro and the yearly budget of Sofia does not exceed 600 million euro. Our understanding is that a number of alternative regeneration scenarios need to be developed and cover the complete range of investment needed: from a minimalist scenario to a full scale scenario with the possibility of transforming from one to another. A regeneration strategy should be based on conservative estimations for the financial accumulation.

Having in mind the current economy situation, as well as the conservative forecasts for the following planning period in the EC, attracting foreign capitals based on the strategic geographic position of Bulgaria connecting Asia and Europe, needs to be a first priority.

The complexity and vastness of the task and the inability to look into the future do not allow for a specific one-way solution. However, the following more general conclusions can be summarized:

The site of Kremikovtzi and its vicinity should be healed in order to provide valuable territory for the future growth and extension of Sofia. This process has already started.

The regeneration and development of Kremikovtzi can create new industries, thus strengthening both local and national economies.

First obligatory steps to be taken are the survey of contamination, the assessment of the current condition and the planning of the clean-up of the site and its vicinity.

Regeneration of the eco-balance should be the basis for any future development.

The problem needs an integrated multidisciplinary approach based on a strategic, long term vision on national, regional and local levels

Given the strategic location of Kremikovtzi within the European transportation network, the problem should be tackled necessarily on a pan-European level.

A task force should be set up in order to devise a program and the planning of the regeneration process. A public-private partnership should be targeted in all possible scenarios.

Decision-making should be inclusive and based on citizen-participation from both adjacent settlements and the city of Sofia.

The clean-up and landscaping process should be based on both local employment and voluntary involvement of citizens.

International investment should be attracted by sustainable marketing of the regeneration project and branding the name of Kremikovtzi on the international stage.

Preliminary surveys and preparation of a brief should be urgently assigned and prepared.

Urban planning and urban design are an investment into the future and should follow shortly.

Urban planning should be flexible and target multiple regeneration scenarios that will range between: the minimalist scenario, e.g. the re-cultivation + clean-up and forestation of the site and its vicinity and; the maximal scenario - an integrated multihuse development for a satellite city for Sofia.

We hope that this diploma work may draw the attention of decision-making and governing bodies, of experts and the public in both Bulgaria and Europe to recognize the significance of the issue and consolidate around a long term vision for the regeneration of Kremikovtzi.

BIBLIOGRAPHY

Articles and Books

Dikov Peter, „Memories about the Kremikovtzi Saga“, I have already said this“ IK KITO, 2011

Alexander Christopher, Ishikawa Sara, Silverstein Murrey, „A Pattern Language“, USA, Library of Congress, Copyrighted Material, 1977

Websites

<http://www.flickr.com/photos/slobodanmikovic/5513022342/>

<http://ianlunresearch.files.wordpress.com/2014/03/dunkeid-region-2013.jpg>

<http://miriadna.com/preview/old-tree>

http://transform-lab.blogspot.co.at/2012/09/blog-post_27.html
Masterplan of Kremikovtzi

<https://sites.google.com/a/chicagosouthlandcd.org/chicago-southland-economic-development-corporation/brownfield-sites>

<http://www.webpages.uidaho.edu/css385/Readings/brownfields.pdf>
Turning brownfields into green

http://www.activelivingresearch.com/files/8_JHPPL_Web-nstedt.pdf
Turning Brownfields into Greenspaces, Examining Incentives and Barriers to Revitalization
Juha Sikanmäki

http://www.activelivingresearch.com/files/8_JHPPL_Web-nstedt.pdf
Resources for the Future, Kris Wernstedt, Virginia Tech University

http://www.eukn.org/E_library/Urban_Policy/Leipzig_Charter_on_Sustainable_European_Cities
Resume of the Leipzig Charter

<http://www.railwaypro.com/wp/?p=2491>
The Toledo Declaration – 2010

<http://kremikovci.bg/>
Site with news on Kremikovtzi and links to topics related to Kremikovtzi

<http://paperstandartnews.com/bg/article.php?q=2009-05-16&article=279167>
The shut-down of Kremikovtzi

http://news.ibox.bg/news/id_110146686
The purchasing of Kremikovtzi

http://www.secorridors.eu/?w_p=23&w_c=3&w_l=1#
Via Diagonals

http://en.wikipedia.org/wiki/List_of_largest_buildings_in_the_world
World largest buildings ranking

