



Eco-innovations in the urban regeneration projects



ECO-INNOVATIONS IN CITIES

Anna Szelałowska (ed.) Marek Bryx (ed.)



HUMAN CAPITAL
NATIONAL COHESION STRATEGY



SZKOŁA GŁÓWNA HANDLOWA
W WARSZAWIE
WARSAW SCHOOL OF ECONOMICS

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Introduction

As the originator of the ECO-INNOVATIONS IN CITIES project I would like to say a few words why I wanted to organize such a programme at Warsaw School of Economic and why I have still thought that it was a good idea.

First of all – a few trivial thoughts. The word is globalised. We even used to say – it is a global village. And it is the truth, however, only in a part. It is a village because each place is opened for business, for free flows of capital, perfectly connected by internet and telephones, surrounded by the natural environment, etc. On the other hand in this global village are places that, being under influence of globalisation, are independent (in specific sense) in their running and development. They are cities.

Cities are located where they are, and globalisation processes can connect them in better way, impact on them in the similar way, but cannot change this simple and obvious fact they are immobile. And the fact that they have their areas on the earth make them always different than companies that can be located everywhere due to the current needs.

Cities are very important units. More than a half human beings live in cities and the growth tendency will be continued. Cities were created by spatial planners and architects and built by constructors. Nobody will try to take these privilege back from the professionals, because of their knowledge and skills and experiences. On the other hand, contemporary cities have become an “urban jungle”. To understand it and to plan a development of existing cities is not enough to have knowledge on mechanisms of planning and be a good architect. To plan a sustainable city development requires interdisciplinary knowledge on socio-economic phenomena growing inside cities and changing their faces and structures. An implementation of complicated development plan requires also interdisciplinary knowledge, including project management and finance, public

finance, public governance, skills allowing interconnect people and charismatic leaders. Knowledge of a city has become as complex as never was and should be studied at different universities due to different curricula. This is my way of thinking on a topic and it explains why we decided to prepare and implement the project at Warsaw School of Economics.

Our university has been the best university in Poland since 1906 when started its activity. Our students specialize in different aspects of businesses, mainly in finance and management. As the graduates they will contribute in development of different companies and they will have an influence on the companies' strategies. We expect they will enhance the business social responsibility, build green companies and protect our common environment among their others activity of business.

All these expectations are strictly connected with cities and their growth. In my opinion, every graduate of our University should understand a city complexity and be prepared to cooperate with local authorities and residents. Only then, business and cities can cooperate not only for bigger profits but for higher quality of life inside cities. Therefore our graduates should understand cities and know how to cooperate with their authorities and inhabitants. I also dream that some of them will go directly to the cities' halls passing their knowledge there and implementing eco-innovations. And this has been a general goal of the project, which we – academic teachers involved in the project – would like to achieve: teach our students on civilization challenges and teach them to find solutions of problems facing cities.

Sometimes we cannot find a good solution for contemporary issues. The more, we cannot answer questions which are do not very obvious now, but the nearest future will ask them towards us and make them clear. We cannot teach our students answering not given questions. However, if we teach them a suitable approach of resolving the current problems, we give them a chance to troubleshoot the future.

The book you are now holding in your hands is the product of nearly three years of many people's work in the framework of the "Eco-innovations in Cities" project. The project has been launched by the Warsaw School of Economics in July 2013 and will have been completed by December 2015. It has been commissioned by the National Centre for Research and Development and carried out within the Priority IV "Tertiary Education and Science", Measure 4.3 "Strengthening the didactic potential of universities in the fields of key importance for the aims of Europe 2020 Strategy".

Our project has been implemented with the support of academics from Florida Atlantic University (USA), Idaho State University (USA), Northeastern

Illinois University (USA) and Fontys University (the Netherlands). The detailed information on the “Eco-innovations in Cities” project (including program syllabuses) can be found on the university website:

www.sgh.waw.pl/eco-innovations

The main aim of the project was to strengthen the educational potential of the university in the field of urban developing between 2013 and 2015 through creating an innovative educational product in compliance with the Europe 2010 Strategy (i.e. a new interdisciplinary program “Eco-innovations in the urban regeneration projects”).

The project objectives were as follows:

- to upgrade teaching, research and language competencies of 12 academic staff members (6 men and 6 women) and 2 foreign language teachers, and 6 junior academic staff members (PhD. students and junior academic staff);
- to educate 80 students attending an English speaking program in the application of eco-innovations in city regeneration processes by the fourth quarter of 2015;
- to increase the amount of practical training in the curriculum by conducting classes based on case studies, mandatory paid internships and the development of interpersonal skills such as team work skills.

A two-semester program “Eco-innovations in the urban regeneration projects” consists of six courses:

1. Eco-cities
2. Green urban regeneration projects
3. Green project funding
4. Planning and management in eco-cities
5. New models of urban entrepreneurship
6. Making the 21st century cities.

The program has raised the students’ level of knowledge and skills in the scope of operation, development and effective management of eco-cities and innovative solutions implemented in them for the sake of improving their inhabitants’ quality of life. Blended learning has helped students of the “Eco-innovations in the urban regeneration projects” program to learn about contemporary models and strategies of economic development, eco-business financial mechanisms in the global world, the function of eco-innovations in the development of urban area regeneration processes, etc. Graduates are able to:

- discuss innovative solutions improving the quality of life in urban and rural areas;
- create innovative and ecological solutions, the aim of which is to improve the quality of life in cities;
- compare and evaluate a green city strategy and innovative solutions implemented in green cities;
- recognize and react to social and economic challenges posed by urban areas in the contemporary world;
- develop city development strategies incorporating eco-innovations;
- make decisions in the city management processes;
- prepare professional applications for financing pro-ecological investment projects;
- evaluate the effectiveness of innovative instruments used for financing eco-innovative investment projects in cities;
- assess risks in municipal pro-ecological investment projects;
- assess the cost-effectiveness of regeneration projects in cities;
- develop professional city regeneration projects.

Six e-books which are included in the academic content taught to students of “Eco-innovations in the urban regeneration projects” program have already been published within the framework of the project and they are as follows:

- D.P. Brodowicz, P. Pospieszny, Z. Grzymała (2015), *Eco-cities. Challenges. Trends and Solutions*, E-book, CeDeWu, Warszawa.
- M. Bryx, J. Lipiec, I. Rudzka (2015), *Green Urban Regeneration Projects’* E-book, CeDeWu, Warszawa.
- H. Godlewska-Majkowska, K. Sobiech-Grabka, P. Nowakowski (2015), *Green Project Funding*, E-book, CeDeWu, Warszawa.
- S. Łobejko, A. Stankowska, M. Zabielski, *Planning and management in eco-Cities*, E-book, CeDeWu, Warszawa.
- M. Wojtysiak-Kotlarski, E. Szczech-Pietkiewicz, K. Negacz (2015), *New Models of Urban Entrepreneurship. Context for Development*, E-book, CeDeWu, Warszawa.
- K. Jarosiński (ed.) (2015), *Making the 21st century cities*, E-book, CeDeWu, Warszawa.

E-books can be downloaded free of charge from the website of their publisher: <http://cedewu.pl/Bezplatne-e-booki,c,73#t>.

This book is not exactly a synthesis of these six books mentioned above. It is a new monograph in which most of the project participants have included some

important thoughts or key messages contained in the six manuals had been prepared for students by them earlier.

The monograph does not want to solve every problem, but nevertheless, it contains some important thoughts that ordered, examples of activities and proposed solutions. In other words – I think it stimulates and provokes to think on eco-cities and discuss issues connected with the subject. With the enormity of knowledge concerning the cities we chose only those few aspects of cities and ordered them in this manner like it was done. It may therefore happen that the reader does not find an answer his/her questions, or find only a part of answer, or find answer in different place than she/he expected. I hope these situations will inspire a reader to provide her/his own answers and develop in the way of knowledge about cities and eco-innovations.

Authors will be glad for each suggestion or remark concerning the monograph.

*Professor Marek Bryx Ph.D.
Head of City Innovative Unit*

Preface

A city is not gauged by its length and width, but by the broadness of its vision and the height of its dreams.

(Herb Caen)

Today, we are living in extraordinarily dynamic times of permanent change, the “spinning” world, fast-paced globalisation and unprecedented pace in urbanisation. A train of the new paradigm shift moves with breathtaking speed past eco-city, blue city, white city, clean city, intelligent city, sustainable city, revitalised city, smart city and innovative city train stations. Along the other side of the rail showing us the direction of change, we pass somehow forgotten stations of smog-cities, congested cities, polluted cities, littered cities, abandoned cities, deprived cities, bankrupt cities, heavily indebted cities and ghost cities... It means that cities and contemporary urbanisation trends differ in particular parts of the world. But the fact remains that every city faces great challenges and such challenges may be formulated into problems which require answers to the following questions:

- How can we improve the quality of life and wellbeing of city inhabitants (young and old, single households and large families, healthy and sick, poor and rich), visitors and tourists?
- How can the status of an eco-city be achieved?
- How should we plan and manage a creative city?
- How can we discover the city’s potential?
- What can be done to efficiently regenerate deprived areas of any city?
- What can be done to enhance competitiveness of a city in the region?
- How can the best conditions for green businesses be secured in a city?

- In what ways should innovative solutions be implemented for the benefit of the present and future generations?
- What strategy for smart and sustainable development is to be selected?
- How should the above undertakings be financed with the limited resources of a city?

We will find answers to the above questions in this book. It consists of five parts written by senior and junior academic staff of the Warsaw School of Economics. The first part written by Dominika P. Brodowicz presents the classification of eco-cities and refers to the issue of a population shift and policies leading to eco-labelling of cities. She also focuses on emerging city-labels in the context of sustainable development of cities.

The second part of the book written by Stanisław Łobejko concentrates on the planning dimensions of eco-cities in the context of creativity. His research deals with the new role of creativity and creative cities. In particular, he draws our attention to the issue of planning for creative cities.

The third part written by Marek Bryx, Jacek Lipiec and Izabela Rudzka is devoted to the principles of green urban regeneration projects. The authors start with the issue of deprived areas listing causes and problems municipal authorities must face nowadays. They pay special attention to the uniqueness of cities and their own distinct character which often turns out to be the undiscovered potential of such cities that should be turned into performance by incorporating it into the strategy of a city and into its local development plan. Further, they concentrate on funding opportunities for eco-innovative solutions.

Following the issue of raising funds for eco-innovations, Katarzyna Sobiech-Grabka and Paweł Nowakowski analyse in Part 4 of the book green business models in highly innovative projects as tools to reinforce sustainable development. For that reason, their research focuses primarily on financial constraints as barriers to green investment projects and the main components of green business models. Next, they present the classification of business models used for implementing eco-innovations and examine any external factors impacting business models and effectiveness of green investment projects.

In the fifth part of the book, Marcin Wojtysiak-Kotlarski, Ewelina Szczech-Pietkiewicz and Katarzyna Negacz develop the ideas presented in the fourth part. They deal with some selected aspects regarding the development of urban entrepreneurship. In Part Five which is theoretical and empirical in nature, they direct our attention to entrepreneurship in urban areas (case of Taipei) and socially responsible investments in the urban context (case of Unrulybersity within tech City, part of a start-up scene in London).

The end of the book (Summary) which may be a contribution to further discussion on eco-innovations in the contemporary world is written by me.

This book is meant for anyone interested in environmental activism, and anyone looking for serious innovations in their cities. Eco-innovations in cities require the provision of new or modernised products or services which enhance their inhabitants' quality of life and improve their functioning, as well as the incorporation of new or modified processes which involve ecological aspects of the city functioning into their current development strategies.

The dissemination of knowledge about city eco-innovations appears to be the most effective where lasting interactions take place among:

- research entities (universities) providing educated specialists in eco-innovations in cities, e.g. the Warsaw School of Economics,
- businesses proposing eco-innovative solutions to cities and their inhabitants,
- municipal authorities that implement eco-innovations,
- and inhabitants themselves who use the implemented eco-solutions directly or indirectly.

This process should be interactive, diversified and consensual. The precise selection of the parties involved in the process of disseminating knowledge about eco-innovations and their implementation will depend on the environment (external and internal, micro, macro and meso). However, all partners' full commitment in the process of implementing and monitoring eco-innovative solutions and examining their impact on the quality of city life seems to play an important role. The city authorities should vertically prioritise complementarity regarding traditional and eco-innovative solutions offered by suppliers of products and services. They should also adapt them to their inhabitants' needs, legal regulations and their own financial resources. Hence, private partners are particularly important in the development of urban eco-innovations. Moving in the direction of smart and sustainable development constitutes a challenge both to towns, large cities and urban areas.

Prof. Anna Szelałowska Ph.D. – Project Methodological Coordinator

PART 1

Emerging City Labels – a Global Overview

Dominika P. Brodowicz

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1. Introduction

We need cities that are both prosperous and sustainable – bright and green – if we're going to tackle the planet's most pressing problems

Alex Steffen (2011)

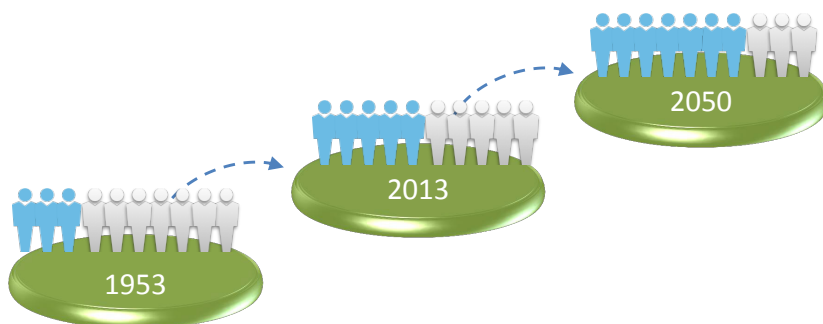
Contemporary cities are prone to fast and complex changes. They could be caused by numerous challenges including population growth, environmental deterioration and climate change, as well as energy safety and a growing demand for public transportation modes. Many of them are actually directly connected with ecology and greening of cities, or more broadly, with sustainable strategies. This chapter focuses only on selected examples of these strategies or rather on city labels understood as premature and still early policies towards converting cities into green and sustainable places.

2. Growth as a challenge for cities heading towards sustainability

'The world is facing an urban future' – this message has been expressed throughout recent decades by international forums including the United Nations (UN) and the European Union (EU), and more often among international corporations seeking for new products and services to offer to cities and city dwellers. This assumption is deeply rooted in demographic projections (see Figure 1.1). According to sources, including the UN, approximately 70 per cent of the world's population will be living in urban settings by 2050, as opposed to 30 per cent in the 1950s, and over 50 per cent currently¹.

¹ UN World Health Organization Global Health Observatory (UN WHOGHO) http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/ (accessed 15 Apr. 2015).

Figure 1.1. World urban population



Source: Own elaboration based on UN World Health Organization Global Health Observatory (UN WH-OGHO) http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/ (accessed 15 Apr. 2015).

Apart from demography, other salient issues affecting growing urban areas are environmental degradation, uncontrolled urban sprawl, poor public transportation and energy security². Paradoxically, growth perceived in the economic terms as positive, could be a negative phenomenon in the social and environmental context for cities already struggling with significant population growth, congestion and air pollution. In theory, the economy can grow without developing, and in fact, develop without growing. Yet human-made system of trade and production has boundaries and economic growth cannot be sustained without an end³. As Boulding famously noted “anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist”⁴. Similarly, cities should not only grow in physical or demographic terms without developing towards sustainability. From an ecological economist’s (or eco-economist’s) perspective, sustainable development is “development without growth – without growth in throughput beyond environmental regenerative and absorptive capacity”⁵.

Looking back at cities, shift towards environmental protection and social wellbeing while maintaining the economic stability is not a novelty or unique

² The world’s cities occupy just 2 per cent of the Earth’s land, but account for 60-80 per cent of energy consumption and 75 per cent of carbon dioxide emissions, <http://www.un.org/en/sustainablefuture/cities.shtml> (accessed 18 Apr. 2015).

³ Ratcliffe J., O’Brien G., Brodowicz D., *Built Environment Foresight 2030: Sustainable Development Imperative*, The Futures Academy, DIT, 2009, p. 37-40.

⁴ Boulding K.E., *The Organisational Revolution: A Study in the Ethics of Economic Organisation*, New York: Harper and Brothers, 1953, p. 253.

⁵ Daly H.E., *Beyond Growth: The Economics of Sustainable Development*, Boston: Beacon Press, 1996.

phenomenon of recent years. There are numerous examples of green initiatives and projects leading to improvement of infrastructure and the quality of life of its citizens. From King Minos from Crete, who decided to set running water for bathing and sewage disposal at Knossos place c.1700 B.C.E, the decision of English Parliament in 1388 to prohibit dumping wastes in the public waterway, to appointing Stockholm as the first European Green Capital by the European Commission in 2009⁶. Environmental issues were already widely discussed in the 1970s and the 1980s in Europe and the US, and elaborated further in the form of Agenda 21⁷, Kyoto Protocol⁸, Aalborg Charter and Aalborg+10 Commitments⁹. Urban areas, especially large cities, have always been hubs of business and social activities and, as a result, prone to faster change than rural areas.

Ultimately, a sustainable city represents the harmony between environmental protection, social wellbeing, safety of citizens, and economic growth (see Figure 1.2). Therefore, it is strongly connected with the concept of sustainable development, which since the publication of World Commission on Environment and Development (WCED) report entitled “Our Common Future”¹⁰, sustainability has been given numerous definitions, most of which indicate that “sustainability is about balancing what goes in with what comes out so that the entire process of development is regenerative in nature”¹¹. In practice, there is a large number of city projects labelled as sustainable, but varying significantly from each other in terms of size and solutions applied. This also concerns the concept of sustainable city and there is a general understanding in the international arena, especially in the organisations like the UN-Habitat, that cities are vital to achieve goals of sustainability¹². It will require an almost gargantuan effort regarding buildings, transportation, public and green space, and numerous other aspects connected with daily operations in the metropolises. Although the entirely

⁶ Beatley T. (ed.), *Green Cities of Europe: Global Lessons on Green Urbanism*, Island Press, Washington, 2012, p. xix-xxv.

⁷ United Nations Sustainable Development, United Nations Conference on Environment & Development Rio de Janeiro, Brazil, 1992, <http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf> (accessed 17 Apr. 2015).

⁸ http://unfccc.int/kyoto_protocol/background/items/2879.php (accessed 17 Apr. 2015).

⁹ European Conference on Sustainable Cities & Towns in Aalborg, Charter of European Cities & Towns Towards Sustainability, 1994, http://www.sustainablecities.eu/fileadmin/content/JOIN/Aalborg_Charter_english_1_.pdf, and <http://www.sustainablecities.eu/aalborg-process/commitments> (accessed 17 Apr. 2015).

¹⁰ Known widely as the Brundtland Report from the name of dr G.H.Brundtland, who was a head of WCED commission deliberating on sustainable development challenge.

¹¹ Ratcliffe J., O'Brien G., Brodowicz D., *Built Environment Foresight 2030: Sustainable Development Imperative*, The Futures Academy, DIT, 2009, p.28.

¹² <http://www.un.org/apps/news/story.asp?NewsID=47566#.U3K5MI6CZAI> (accessed 18 Apr. 2014).

sustainable city does not exist, there are examples of socially and environmentally responsible solutions applied in urban areas or, as discussed further in this chapter, green and smart projects. In Europe, these include Copenhagen, Gothenburg and Freiburg. Among cities in Asia and the Middle East, which are often rebuilt massively or built from scratch, Dongtan and Masdar are interesting examples. In North America metropolises like New York and Chicago are in the vanguard in applying sustainable transportation modes.

Figure 1.2. Selected elements of sustainable city



Source: Author's own elaboration.

3. Green and eco-cities

Currently visible 'green trends', including greening of buildings and public transportation vehicles or restoration of walkable paths in city centres, are just a new wave of change forced by environmental challenges, market competition and more often by stakeholders including local communities and environmental activists. Therefore, one can hear more often about what could be called a 'green city label' aiming to market city as liveable and environmentally friendly. Sometimes those are only marketing manipulations; in other cases they reflect the actual strategy of the city and changes taking place. As with any other emerging trend and terminology also green city has numerous explanations regarding what green city should and should not be. Referring to Cohen "cities that are green enable people who live and work in them to carry out their daily lives in an environmentally sound manner"¹³. They are also "resilient in the face

¹³ Cohen N. (ed.), *Green cities. An A-to-Z Guide*, Sage, 2011, p. x.

of large-scale risk”¹⁴. Another term used often as a synonym of green city in the literature and practice is an eco-city. Among numerous explanations of an eco-city Ecocity Builders define it as:

“a human settlement modelled on the self sustaining resilient structure and function of natural ecosystems. The ecocity provides healthy abundance to its inhabitants without consuming more (renewable) resources than it produces, without producing more waste than it can assimilate, and without being toxic to itself or neighbouring ecosystems. Its inhabitants’ ecological impact reflects planetary supportive lifestyles; its social order reflects fundamental principles of fairness, justice and reasonable equity”¹⁵.

Despite such a broad explanation even its authors admit that for each city being eco means different set of characteristics, priorities and actions. There is no one-size-fits-all model or one solution for all cities. In the path towards greening in the EU it is worth to mention the Europe 2020 strategy, the Covenant of Mayors, also the European Green Capital and the European Green Leaf. The first one, “Europe 2020 – a European strategy for smart, sustainable and inclusive growth” puts a strong emphasis on three priorities connected with growth¹⁶. First one is inclusivity possible to achieve through a high-employment economy leading to social and territorial cohesion. Second is a smart growth described as an economic development based on knowledge and innovation. Third priority is a sustainable growth achieved through promoting resource efficient and green development. Greening targets are based on the 20-20-20 rule, which aims to reduce the level of greenhouse gas emissions by at least 20% compared to 1990 levels, achieve a 20% increase in energy efficiency, and increase the share of renewable energy in final energy consumption to 20%¹⁷. Additionally, since the three priorities are more umbrella themes than exhaustive policies, the Commission is developing initiatives to support achieving the targets, including “Resource efficient Europe”¹⁸. It contains propositions to separate economic growth from extensive use of resources, enhance use of renewable energy sources and increase energy efficiency, and also to modernise

¹⁴ *Ibid.*

¹⁵ Working definition adopted by Ecocity Builders and the International Ecocity Standards advisory team, 2/20/10, Vancouver, Canada, <http://www.ecocitybuilders.org/why-ecocities/ecocity-definition/> (accessed 4 May 2015).

¹⁶ European Commission, *Europe 2020, A strategy for smart, sustainable and inclusive growth*, <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>, p. 3, (accessed 2 Mar. 2015).

¹⁷ *Ibid.*

¹⁸ <http://ec.europa.eu/resource-efficient-europe/> (accessed 2 Mar. 2015).

the transportation sector and continue shifting towards a low carbon economy. Execution of all initiatives is governed on two levels – EU (setting priorities, measuring targets, policy warnings) and Member States (setting strategies and achieving goals in practice, reporting to the EU)¹⁹.

Another important initiative closely linked with greening, specifically with decreasing energy consumption level in Europe, is the Covenant of Mayors. It is a voluntary, bottom-up movement of local and regional authorities committed to increased use of renewable sources of energy and energy efficiency in their territories, as well as reduction of CO₂ emissions, and through all of this to improve of quality of life and boost of local economies. It was initiated in 2008 and, so far, has over 6 250 signatory cities with combined population of almost 200 million inhabitants. In 2011, the Covenant was extended to Eastern non-EU countries like Belarus, Georgia, Kazakhstan, and Moldova²⁰.

Last, but not least is the European Green Capital (EGCA) initiative. It is directly linked with the 7th Environment Action Programme (7th EAP) entitled “Living well, within the limits of our planet”, which sets the basis for EU environmental policies towards 2020, including resilience and what is important in the context of this work also an objective to enhance the sustainability of EU cities²¹. It was started by 15 cities, including Warsaw, Prague and Helsinki, and is overseen by the European Commission. Its goal is to promote cities with ‘green vision’. It includes plans to cut on greenhouse emissions, develop more pedestrian friendly districts in city centres and improve the quality of living. The first city appointed as the Green Capital was Stockholm in 2010. Next, in the chronological order were Hamburg, Nantes, Copenhagen, Bristol and recently Ljubljana²². Referring to the criteria set by the award committee nominated cities have to “present consistent record in terms of achieving environmental standards and applying green practices, as well as pursuing long-term sustainability goals as well as a positive green image”²³.

Starting from 2015 smaller cities, with 50.000 to 100.000 inhabitants, can apply for the European Green Leaf (EGL) award. Similar to the European Green Capital award, this one aims to promote green efforts, but with a particular focus on initiatives generating green growth, new workplaces and perhaps the most valuable in social context, strategies to develop environmental awareness

¹⁹ *Ibid.*

²⁰ <http://www.energy-cities.eu/Covenant-of-Mayors-1424>, (accessed 2 Mar. 2015).

²¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013D1386>, (accessed on 20 Mar 2015).

²² <http://ec.europa.eu/environment/europeangreencapital/ljubljana-wins-european-green-capital-award-2016/>, (accessed on 15.05.2015).

²³ <http://ec.europa.eu/environment/europeangreencapital/about-the-award/index.html>, (accessed 15 Apr. 2015).

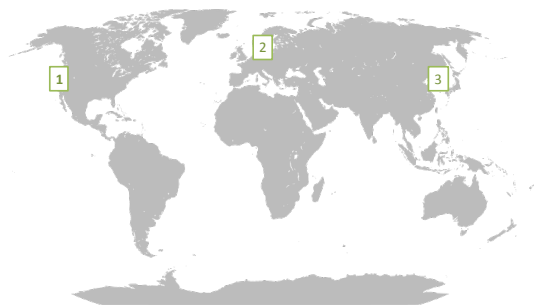
and active involvement in green initiatives among citizens. Cities participating in the EGL are seen as ‘green ambassadors’ in Europe.

Yet, still in many cases one cannot talk about eco-cities, because they simply do not exist yet. However, there are well-known initiatives in cities including specific neighbourhoods or districts in many part of the world. Broadly speaking, eco-initiatives in cities can concern new developments (built as new cities like in the Middle East); expansion of urban areas (common in the US and also with numerous examples from Europe); or retrofitting and more intensive regeneration (mostly Western and Central European initiatives)²⁴. The cities can be developed in a way limited only by local plans (zoning ordinances) and can use lessons learned from other cities. Existing cities need to adapt and mitigate already applied non-green solutions. Some of the well-known examples of cities following green strategies are San Francisco, Copenhagen and Seoul (see Figure 1.3).

²⁴ Based on Birch E.L., Wachter S.M., (ed.) *Growing Greener Cities. Urban sustainability in the Twenty-First Century*, Penn Press, 2008, pp. ix-27.

Figure 1.3. Examples of green/eco-cities

LEADING GREEN/ECO-CITIES



San Francisco

San Francisco is located in the greenest American state, California. It is known for strong cooperation between the public and private sectors in projects aiming to make it more eco and liveable, including subsidies for energy efficient solutions in buildings operations and encouraging use of mass transit instead of private cars for commuting to work. Its high position in numerous green indexes is a result of long-term sustainable policies forced by public authorities, public awareness and will to adopt environmentally friendly behaviours.

Examples of initiatives:

- Recycling programmes for citizens which are now common in the EU countries, but not yet in the US.
- San Francisco Green Business programme supporting companies adopting green strategies by providing technical assistance to them.
- Green infrastructure projects like Baker Beach Green Street, Sunset Boulevard Greenway, and Chinatown Green Alley.

Copenhagen

Copenhagen was chosen as the European Green Capital of 2014 and ranked as the greenest European city in the current Siemens Green City Index. Its success is not a result of new politics or projects. It is a city with long traditions of public-private partnerships and dedication to social wellbeing and support of eco-initiatives leading to green growth.

Examples of initiatives:

- North Harbour project with 'green laboratory' that will focus on eco-technologies.
- Encouraging cycling to work by developing road infrastructure and supporting companies adjust their workspaces to the needs of cyclists (sanitary facilities, bicycle parking).
- Goal to become a CO₂ neutral city by 2025.

Seoul

Seoul is one of the most technologically advanced cities in the world. With this comes the opportunity to relatively easily implement technology into daily living to support energy efficiency and green initiatives. Globally, it is known for dense metro, bus and tram systems allowing thousands of city dwellers to commute daily instead of using their private means of transportation. It has one of the lowest CO₂ emissions levels per capita and energy consumption per unit of GDP.

Examples of initiatives:

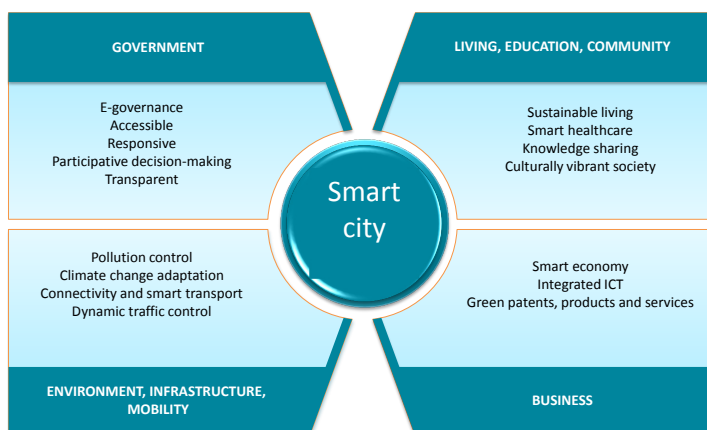
- Master plan to reduce greenhouse gas emissions by 25 per cent by 2020 and 40 per cent by 2030 from 1990 levels.
- From 2007 there are low-carbon, green-energy, building design guidelines.
- Massive urban renewal project of Cheonggyecheon Street.

Source: <http://www.sfgreenbusiness.org/who-we-are/>; <http://ec.europa.eu/environment/europeangreencapital/winning-cities/2014-copenhagen/>; <http://sfwater.org/index.aspx?page=614>; <http://www.siemens.com/entry/cc/en/greencityindex> (accessed 16 Apr. 2015).

4. Smart cities

Moving bit further with the emerging terminology closely linked with sustainability and greening, one has to notice a strong trend of smart cities. The term is used nowadays broadly to describe urban areas in which high-technologies play an equally important role as buildings to support social and environmental capital to achieve sustainable aims. In practice, smart cities are characterised by common use of energy efficient grids, affordable information technologies (IT) and green transportation to secure sustainable urban growth and citizens' wellbeing. The main emphasis is put not on IT but on human relations and social inclusion to enable low-income citizens access to modern urban technology²⁵ (see Figure 1.4).

Figure 1.4. Smart city features



Source: Author's own elaboration based on <http://smartdirections.info/cities/> and http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/ (accessed 4 May 2015).

According to Townsend “[S]mart cities can simply use technology to do more with less, and tame and green the chaos of booming cities”²⁶. This already happens in cities like Eindhoven, Vienna and New York, and with close cooperation of major technological corporations, including IBM, Cisco and Siemens. Taking closer look at New York, the shift towards using metrics and data to manage city resources at administrative level was introduced by former

²⁵ Pospieszny P., *Chapter 5 Green Urban Technologies*, in: Brodowicz D.P., Pospieszny P., Grzymała Z., *Eco-cities*, e-book, CeDeWu, 2015, pp. 61-62.

²⁶ Townsend A. is the author of bestselling *Smart cities: Big Data, Civic Hackers, and the Quest for a New Utopia*, W. W. Norton & Company, 2013, p. xiii.

mayor M. Bloomberg (nowadays he continues work in the smart cities field through Bloomberg Philanthropies²⁷). Private sector is also very active in introducing smart solutions in the form of public-private cooperation, which goes bit further than traditional public-private partnership (PPP) – concerning mostly financial matters. This new type of cooperation is based on knowledge and ideas sharing between companies, city authorities and their customers – citizens. One of the examples in City 24/7 platform created in collaboration between the City of New York and Cisco IBSG. It integrates open data about city life provided by the government, local business and citizens. The platform can be accessed on smartphones, tablets and other personal electronic devices, as well as on smart screen located around the city in places where pay phones were previously located²⁸. Among many issues regarding city living information provided through City 24/7 concerns security threats, biohazard and environmental conditions. Other example of linking smart solutions with urban environment is Hudson Yards project. An estimated \$20 billion project will be the largest commercial and residential area development in Manhattan since the Rockefeller centre²⁹. It will use smart solutions like digital tracking of environmental and lifestyle indicators like traffic flows, air quality, energy and water consumptions, waste management and with 14 acres of new open space and parks, as well as direct connection with the High Line (already iconic example of public park project created at the out-of-use railroad trestle)³⁰.

Looking at Polish cities, Katowice was noticed in IBM's "Smarter cities challenge"³¹. It is a city well known for decades for a significant level of air pollution with numerous environmental challenges. Although IBM focused mainly on economic aspect of this city, identified opportunities included also ideas connected with the environment and social wellbeing. For instance optimisation and effective use of public transportation services in the city and improvement of quality of life as a way of retaining young talent³². Other examples of so-called smart movement coming from the industry are smart water and electricity meters. To promote smart products companies offer municipalities in Poland free testing or lower unit prices, like for instance Orange applying smart water meters in Środa Wielkopolska³³ and Philips

²⁷ <http://www.bloomberg.org/about/> (accessed 12 May 2015).

²⁸ https://www.cisco.com/web/about/ac79/docs/ps/motm/City-24x7_PoV.pdf (accessed 12 May 2015).

²⁹ <http://www.forbes.com/sites/ptc/2014/08/15/5-u-s-cities-using-technology-to-become-smart-and-connected/> (accessed 12 May 2015).

³⁰ <http://www.thehighline.org/about> (accessed 4 May 2015).

³¹ http://smartercitieschallenge.org/city_katowice_poland.html (accessed 4 May 2015).

³² http://smartercitieschallenge.org/city_katowice_poland.html (accessed 4 May 2015).

³³ <http://www.ekonomia.rp.pl/artykul/1136356.html> (accessed 4 May 2015).

Lightning introducing energy efficient LED streetlights in Szczecin³⁴. As briefly presented in Figure 4 a smart city consists of interconnected areas including business, living, education, government and environment. Therefore, single efforts undertaken in some Polish cities regarding public transportation or smart meters do not constitute a smart city yet, but there are positive signals of preparation for EU Funding 2014-2020³⁵.

5. Conclusions

Like most terms describing new and emerging concepts, those discussed in the article could be perceived as fuzzy and in many aspects not consistent or unequivocal. Governments and city authorities often experience difficulties in setting coherent and realistic strategies towards green, smart and even sustainable cities that could be widely accepted by politicians and deemed as financially achievable. There are cities like Copenhagen and Amsterdam, which have a long tradition in developing and exercising environmentally and socially responsible policies. The other ones like Masdar and Abu Dhabi constructed from scratch are financially overinvested and loaded with the latest technological achievements, but significantly missing a human factor and have yet to prove their social viability. Many cities facing demographic growth, climate change consequences and other significant challenges are trying to develop new strategies labelled for example as smart, green and even slow, blue and ultimately sustainable. Sometimes even various terms are used simultaneously to describe the same city, yet different projects depending whether they are focused on environmental protection, IT or social wellbeing. This abundance of labels in case of specific cities does not have to mean 'green wash' or any type of misuse of the terminology. On the contrary, it can prove that cities are vibrant and proactive places when facing emerging trends and competition from other cities in today's complex world.

³⁴ <http://inhabitat.com/philips-to-install-led-streetlights-in-poland-for-a-70-percent-energy-savings/> (accessed 4 May 2015).

³⁵ <http://www.smartcities.at/europe/eu-initiatives/eu-structural-funds-2014-2020/> (accessed 4 May 2015).

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PART 2

Planning an Eco-city as a Creative City

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1. Introduction

We can find reviews in a large number of scientific studies claiming that the future of the world is closely related to the development and functioning of the cities in which the majority of the human population will live. The future of the city will become not only a place of living but also a place of work, education and leisure, and more importantly a place that will act as an accelerator of innovation creating well-being of its inhabitants. To achieve this goal, the future of the eco-city should be planned as the creative city, forming a favourable environment for creativity of its inhabitants. The planned and built in such a way eco-cities are becoming hubs of innovation and creative industries and will be able to win a competitive struggle with other cities and regions by attracting new residents. Nowadays more and more people are aware of the dangers posed by the development of modern civilization, and especially to the people living in cities. Worsening living conditions due to the environmental pollution (air pollution, problems with rubbish disposal, traffic congestion, etc.) will adversely affect the health and welfare of the city residents. Therefore, a lot of local communities are actively involved in the planning and developing eco-cities. It seems, however, that the ecological city planning cannot only ensure the proper conditions related to the environment and its residents quality of life. We must strive to ensure that the future city will be not only ecological but also creative. Creativity should be an integral part of the planning and management of the eco-city.

2. Modern role of creativity

The concept of creativity has been known for many years. It was used for the first time in 1875 and is particularly important in the modern economy. It is a broad concept which applies to every area of life ranging from the art by industrial activity to everyday life. Therefore, there are a lot of definitions of

creativity, for example Merriam-Webster Dictionary says that creativity is “the ability to make new things or think of new ideas”¹. According to the Dictionary.com creativity is “the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations, etc.; originality, progressiveness, or imagination”². Creativity is defined also as “the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others”³. Creativity as a social phenomenon has always been present in everyday life. It has gained special significance after the industrial revolution which also considerably contributed to it. Thanks to the creativity of the people of the industrial era, a large number of notable discoveries and inventions have appeared which have created the foundations of modern industrial economy and also enabled the rapid development of the cities. Electricity, the use of steam engines and gas enabled making production machines, equipment and building materials, which allow building multi-storey houses faster and faster. Thus, all the inventive ideas have determined the appearance and functionality of cities. The rapid development of rail, road and air transport has also had a huge, both positive and negative, impact on urban development. Private cars and public bus service allowed people to move over large distances that accompanied the spatial expansion of cities. The population growth of cities has made the city streets become increasingly crowded, which significantly hampered city driving, and contributed to the growth of air pollution by exhaust fumes. This situation has been improved to some extent by the construction of underground railway – the subway. As you can see urban development is strongly dependent on the creativity of the people who are discovering new resources, creating new materials, machinery and equipment influencing the socio-economic development of cities.

Industrial development of the world economy has led to the creation of new work and communication tools completely changing the face of the contemporary world. The industrial economy has evolved into a new economy also known as a knowledge-based economy or the creative economy. At the end of the last century new sectors of the economy called creative industries emerged.

Creativity is an important component of innovation, which according to J. Schumpeter, is the driving force of economic development⁴. Schumpeter

¹ <http://www.merriam-webster.com/dictionary/creativity>, (accessed 15 Feb. 2015).

² <http://dictionary.reference.com/browse/creativity>, (accessed 15 Feb. 2015).

³ R.E. Franken, *Human Motivation*, Brooks/Cole, 3rd ed., 1993, p. 396.

⁴ J.A. Schumpeter, *Business cycles: a theoretical, historical, and statistical analysis of the capitalist process*. Martino Pub, Mansfield Centre, Connecticut 1939.

emphasized for the first time the importance of creativity for technological progress, which is a key factor for economic development. Nowadays it is also stressed that creativity is closely related to innovation and long-term economic growth⁵. The expression “creative destruction” popularized by J. Schumpeter in his book *Capitalism, Socialism and Democracy*, first published in 1942, has now become particularly important⁶. We often hear that we are now living in a post-industrial information and communication or knowledge economy in which a creative class plays an essential role; to which belong workers in science and technology, arts, culture and entertainment, healthcare, law and management, whose occupations are based on mental or creative labour⁷. Creativity is one of the most important driving forces of the current rapid economic development based on technological progress. It is clear that not only workers in the creative sector but also workers in other sectors of the economy exerting a significant influence on the development of modern economy and standard of living possess the trait of being creative. As pointed out by R. Florida, the creative class could be created in cities and actively participate in their development if not only its expectations in terms of living conditions, work and doing business but also conducive atmosphere are fulfilled. “Florida turns the standard model of regional economic development on its head; in the new creativity-driven economy, people don’t follow the jobs so much as the jobs follow the creative people.”⁸ Therefore, this town must take care of creating conditions to attract creative people to settle in their area. Their presence will attract creative sectors and will have a positive influence on the development of the city in economic terms. Research on the relationship between creativity and the city has shown that cities are essential for innovation and long-term economic growth⁹. In creative economy not only the hardware and technology are important but also a vibrant people climate and creative space in the city¹⁰. To be successful in this field City government should plan urban development and have a long time strategy for managing urban space in the scope of tenants’ creativity and localization possibilities for firms and organization belonging to the creative sectors.

⁵ P. Hall, *Cities in civilization*, Pantheon, New York 1998.

⁶ J.A. Schumpeter, *Capitalism, Socialism and Democracy*, Routledge, London 1942.

⁷ R. Florida, *The Rise of the Creative Class*, New York 2002.

⁸ J. Zimmerman, *From brew town to cool town: Neoliberalism and the creative city development strategy in Milwaukee*, www.elsevier.com/locate/cities, (accessed 20 May 2015).

⁹ P. Hall, *Cities in Civilization: Culture, Technology, and Urban Order*. Weidenfeld & Nicolson London, Pantheon Books, New York, 1998.

¹⁰ P. Lehtovuori and K. Havik, *Alternative politics in urban innovation*, in: Kong, L. and O’Connor, J. (eds.) *Creative economies, creative cities: Asian-European perspectives*. Springer: Heidelberg, 2009, p. 213.

3. Creative city

Nineteenth century industrial cities grew around rail nodes, which facilitated the supply of coal and steel needed for their development. The cities of the second half of the twentieth century were developed on the idea of uniform functionalities zones. The cities of the 21st century will be developed based on the idea of creative activity on a small scale and will need to respond to the increasing diversity of personal needs. This should have a great impact on behaviour of the contemporary city, and the methods of planning cities as compact, ecological and sustainable eco-cities. The term *the creative city* was coined by Charles Landry in the late 1980s as a response to the dynamic changes occurring in the economy and in the cities. Landry came to the conclusion that in the rapidly changing circumstances the creativity can play an increasingly important role in urban development. He pointed out that it is necessary to change the approach to planning and urban management towards a specific culture of creativity that will allow people to think, plan and act with imagination in order to solve urban problems. One should strive to make the existing hierarchical city management structures more democratic, allowing for better use of the potential, the resources and assets of the city. By opposing creative city to the urban engineering approach Landry points to the need for greater emphasis on the human factor that is as important as urban infrastructure.

A creative city needs a highly developed hard and soft infrastructure. According to Charles Landry, “hard infrastructure” is defined as “the nexus of buildings and institutions such as research institutes, educational establishments, and cultural facilities and other meeting places as well as supportive services such as transport, health and amenities”¹¹. Such hard infrastructure is present in a lot of cities, however, is often dispersed, and not connected to each other as well as not forming conditions and climate for the active development of the creative class. In many cities there are abandoned buildings and even entire former industrial neighbourhoods, which thanks to a new approach to city planning can be revitalized and used for the creation of hard infrastructure for the creative industries or entire entertainment districts. Old streets can be rebuilt in grand boulevards which can boast the best fashion, food, leisure and culture, as was done in Shanghai¹². Soft infrastructure defined as “the system of associative structures and social networks, connections and human interactions that underpins and encourages the flow of ideas between individuals and

¹¹ C. Landry, *The creative city: a toolkit for urban innovators*, Earthscan, London 2000, p. 133.

¹² W. Wu, *Cultural strategies in Shanghai: regenerating cosmopolitanism in an era of globalization*, *Progress in Planning*, No. 61, 2004, pp. 159-180.

institutions”¹³ is crucial for the creative city. Therefore, investment in soft infrastructure including construction of new cultural facilities and infrastructure is also needed as well as taking action to attract and organize national, regional and international artistic events to increase global importance of the city.

Today, more and more cities in the world want to be in the group of those who identify themselves as creative cities. A great number of cities of Western Europe and North America aspire to become the creative ones. These include: Amsterdam, Berlin, Barcelona, Dublin, Gothenburg, Helsinki, Montreal and others. Charles Landry began the discussion on the concept of the creative city by publishing in 2000 the book entitled “The Creative City: A Toolkit for Urban Innovators”. While wondering why some cities are more successful in their development than others, Landry came to the conclusion that some cities are better than others in the scope of their potential because they have developed innovative plans for their development. Richard Florida publication under the title of *Cities and the Creative Class* which was released in 2005, launched a broad discussion about the impact of the creative class on creative urban development. At the core of his concept of creative cities is the assumption of the existence of a triad of factors: technology-talent-organization.

The simultaneous occurrence of these three factors in a particular place and time allows the formation of creative centres bringing together representatives of the creative class. Creative cities bring talented people together, the creators looking for a suitable atmosphere and favourable conditions for their development. Settling in the creative city firstly influences their further development and encourages others to come and settle there and secondly, confer an income and the reputation of the city. With this cooperation both sides, the city and its inhabitants, benefit. However, the process of formation of creative cities is not spontaneous and should be strongly supported by the local authorities. Their task is to implement the socio-economic policy in relation to the city, which will enable the combined occurrence of the three mentioned by Florida factors: technology-talent-organization. Creative people are looking for cities in which existing important factors facilitate the ecology, underlying ecological city and high-quality cultural services that contribute to improving quality of life and especially the immaterial part related to the spiritual life of a man. A high quality of life in the creative city means friendly environment for daily life, work, entertainment and relaxation. The majority of services in the creative city is at a high level, easily accessible to its residents.

All this can be achieved through the well-developed technological infrastructure including road infrastructure, computer networks, buildings,

¹³ C. Landry, *The creative...*, *op. cit.*, p. 133.

universities, schools, kindergartens, hospitals, parks and gardens and charming public places open to all and rich in attractions. By providing these favourable conditions a “creative class” can be created and “creative capital” developed which will enable future development of the city and increase its relevance and competitive position in the world. The creative class consists of scientists, engineers, professors of universities, poets and writers, entertainers, painters, sculptors, fashion designers, architects, media people and many other professions. In particular, the creative class are specialists in the field of new technologies, financial services, law and management. The developed creative class is a vital force for the creative city. Broad and attractive opportunities for doing business and the implementation of a variety of lifestyles and a high quality of life are achieved for the creative class through innovation in all spheres of social and economic life.

4. Planning creative city as eco-city

The possibility of transforming the traditional city into the creative one is an important issue. This requires an active approach of local authorities and local communities to regulations that may be introduced in the city to make it attractive and entice new creative inhabitants. The literature points to the need to make changes within four key areas: business and economy, technology, infrastructure and space as well as the environment. Each of these spheres are important but the sphere of space and the environment is particularly vital because it may shape the process of planning and managing the development of the city. Properly shaped and attractive space and environment creates favourable conditions not only for life but also for business, attracting investors, tourists and residents thanks to the development of creative industries and sectors. It is also essential that the development of a creative city is made based on innovations arising due to the commitment and high creativity of his inhabitants.

Past experience in the development of creative cities indicates that the creative class in the cities tends to create spatial concentration in relation to residential areas and workplaces. Such places of living and work concentration of the creative class in urban spaces are called creative districts. Therefore, the transformation of the city into the creative city is closely related to the planning of city development, which should take into account the needs and expectations of the creative class in relation to the conditions of residence and work. City economic growth is no longer driven by traditional industry, but rather by the

population of creative people. Cities being attractive to creative people prosper economically very well and will have sustainable competitive advantage for more new companies, jobs and innovation.

According to developed by D. Throsby concept and model of the so-called concentric circles, the impact of the creative sector on the economy through reciprocal linking with non-creative industries strongly influences the city's development and generate "spill-over" effects on creative economy and builds quality of the cultural identity of the place. That's why these sectors should therefore be always a reference point in the planning process of the city.

As Anna-Lisa Müller research has shown a planning approach based on the idea of the Triple Helix¹⁴ and the creation of science and technology parks in urban areas can play an important role in the development of creative cities. In her study the history of two cities development: Dublin and Gothenburg, which claim to be the creative cities, was analysed in detail. In Gothenburg revitalization of the former port land has helped to build the modern creative city whose central point is the science and technology park – LindHolmen Science Park. In Dublin, the focus was pointed on the development of selected areas of the city. A good example is The Digital Hub, a cluster for digital media enterprises. According to the author both the Digital Hub and Lindholmen Science Park are planned according to Triple Helix concept. Science and Technology Park may thus be an important element in the transformation of creative cities in the city.

Particularly interesting is the approach of authorities of the city Dublin to the creativity. After a series of dramatic changes which Dublin has experienced in recent years the authorities have taken decisive action to transform it into a creative city. Dublin City Council (DCC) stated that Dublin will rise as a creative city and become an important component of creative economy. DCC vision for Dublin has been concluded in 2011-2017 Dublin City Development Plan and is strongly influenced by the popular theories of Charles Landry's creative city and Richard Florida's creative class. This vision shows the following excerpt from the development plan of the city: *"Within the next 25 to 30 years, Dublin will have an established international reputation as one of the most sustainable, dynamic and resourceful city regions in Europe. Dublin, through the shared vision of its citizens and civic leaders, will be a beautiful, compact city, with a distinct character, a vibrant culture and a diverse, smart, green, innovation-based*

¹⁴ Triple helix concept was introduced initiated in the 1990s by Etzkowitz (1993) and Etzkowitz and Leydesdorff (1995). It assumes still growing triadic relationship between university-industry-government influencing the Knowledge Society. The main thesis is that universities will play more important role for innovation and economic development and all three institutional spheres of university, industry and government working together can reinforce peoples creativity. http://triplehelix.stanford.edu/3helix_concept (accessed 10 Sep. 2015).

economy. It will be a socially inclusive city of urban neighbourhoods, all connected by an exemplary public transport, cycling and walking system and interwoven with a quality bio-diverse green space network. In short, the vision is for a capital city where people will seek to live, work and experience as a matter of choice."¹⁵ As can be seen Dublin City Planners adopted after Landry that people are the most important factor for city creativity, which used effectively can contribute to the development of creative economy. How important are the favorable conditions for the development of city creativity emphasizes Landry emphasized that the cities should "pay attention to how people can meet, exchange ideas and network"¹⁶. The importance of people to the success of cities in the creative economy it was emphasized in Richard Florida works. According to Florida those talented people, working in the creative industries drive the creative economy.

Another example of the Creative Village is Orlando in Florida, which arises as a result of the transformation of the old Amway Arena in downtown Orlando in the quarter for the leading higher education institutions; high-tech companies, digital media and creative companies; and a diverse mix of students, employees and residents. It will be a friendly place for tenants in terms of living, learning and fun.

Berlin, the capital of Germany, the largest city in the country and also the centre of the creative industries also aspires to become the creative city. The city government has been developing strategies, master plans, and tailor-made support programs encouraging development of creative industries, understanding that they are vital for Berlin's economy. The creative industries are also one of the key target fields in Berlin's innovation strategy. Berlin is known as a cosmopolitan, tolerant, open-minded and exciting city and its special atmosphere makes the city very attractive for creative people from around the globe. All this makes Berlin the world's second most popular city for congresses and conventions. One of the largest science and technology parks in Berlin – Adlershof Science and Technology Park is also very significant for the functioning of the city.

New ideas of creative cities perfectly fit into the approach referred to as "creative placemaking" promoting multiple dispersed centres rather than one big centre of creativity. The realization of such ideas is possible thanks to the joint efforts of the public sector, the sphere of science and local communities. "In creative placemaking, partners from public, private, non-profit, and

¹⁵ DCC, *Dublin City Development Plan 2011-2017*, pp.10-11, <http://www.dublincity.ie/main-menu-services-planning/city-development-plan> (accessed 10 Sep. 2015).

¹⁶ Landry, *The Creative City – A Toolkit for Urban Innovators*, xxiii.

community sectors strategically shape the physical and social character of a neighbourhood, town, city, or region around arts and cultural activities. Creative placemaking animates public and private spaces, rejuvenates structures and streetscapes, improves local business viability and public safety, and brings diverse people together to celebrate, inspire, and be inspired.¹⁷ Research on a sample of American cities shows that “through creative placemaking, arts and culture make substantial contributions to local economic development, liveability, and cultural industry competitiveness.”¹⁸ To succeed in transforming cities in the creative ones they need a common platform for action and mutual understanding between different spheres of social policies and activities at regional and local levels. We have more and more examples when culture and art can serve as a catalyst for economic and social development and increase the efficiency of activities in transportation, housing, new workplaces, health care, education and others. Also, the creative industries are actively collaborating with the sectors such as the government, private business, business organizations and foundations that make up a chance for sustainable development of the city. Creative industries play an important social and economic role especially in the knowledge economy. The economy based on creative industries defined as the creative economy, which is made up of three groups of actors: creative workers, cultural industries and creative communities. The cultural industries working together with business and non-profit organizations bring to market cultural foods and services. According to the new possibility in the sphere of creating and using knowledge in a productive way – the democratisation of knowledge – creative workers bring innovation to market¹⁹. Creative communities play a supporting role in the creation of new marketable products and services to enhance the competitiveness of companies and contributing to improving the living conditions of local communities. Also it indicates that the current techno-economic paradigm is being replaced by a new techno-cultural paradigm. “It creates seeds of innovation which are an amalgam of technology and culture in the form of new social practices.”²⁰

Further development of creative cities based on techno-cultural paradigm is strongly dependent on the availability and the universality of ICT infrastructure conditioning the digital content creation and innovation in all sectors of the

¹⁷ A. Markusen, A. Gadwa, *Creative Placemaking*, White Paper, National Endowment for the Arts, p. 3, <http://arts.gov/pub/pubDesign.php>, (accessed 15 May 2015).

¹⁸ *Ibidem*, p. 6.

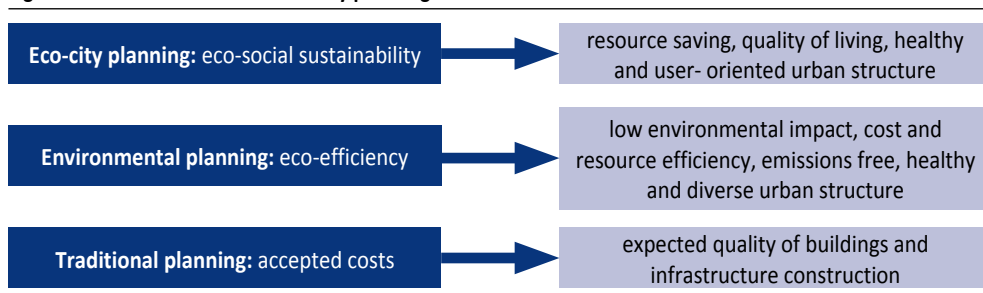
¹⁹ von Hippel, E., *Democratizing Innovation*, MIT Press, Cambridge MA 2005.

²⁰ Foth M. with Bilandzic M. and Hearn G., *Urban Informatics: Research and Insights for Libraries, Cultural Industries and Innovation Systems*, Australian Business Foundation Research Fellow on Innovation and Cultural Industries 2011 sponsored by the Aurora Foundation, March 2012, p. 9.

economy, referred to as urban informatics. The urban informatics paradigm is based on three pillars: people, place, and technology. Urban informatics is concerned with human-computer interaction. Traditional human fixed desktop computer relation is changed in new mobile, multipoint connections with more attention to communication and interaction, social networks, and human knowledge and creativity. Urban informatics using network technologies can “affect the overall configuration of the city (such as the control and monitoring of resources through sensor networks) to an individual’s day to day interactions with technologies (such as mobile social media and location-based services)”²¹.

The ecological and the cultural views on city creativity implies the need for transformation of a traditional city into the eco-city. Traditional city development is based on a production oriented approach starting from a master plan and going to a construction process. In such an approach time plays a crucial role for achieving expected quality with accepted costs, which means the domination of the economy of other aspects of life in the city. Environmental master planning presents a different approach. It is concentrated on efficient resource using and emissions free, healthy and diverse urban structure guaranteeing a high quality of life. And eco-city planning continues environmental planning with additional concentration on resource saving, healthy and user-oriented living environment and socio-cultural equality of life²².

Figure 2.1. From traditional to eco-city planning



Source: Adapted from: J. Nieminen, P. Lahti, A. Nikkanen, U-M. Mroueh, T. Tukiainen, J. Shemeikka, P. Huovila, S. Pulakka, C. Guangyu, *Miaofeng Mountain Town EcoCity*, Julkaisija-Utgivare 2010.

The creative class in the cities consists of the educated people with a broad world view, open and sensitive to their environment as well as caring for its harmonious development. They present a pro-environmental attitudes and

²¹ *Ibidem*, p. 13.

²² J. Nieminen, P. Lahti, A. Nikkanen, U-M. Mroueh, T. Tukiainen, J. Shemeikka, P. Huovila, S. Pulakka, C. Guangyu, *Miaofeng Mountain Town EcoCity*, Julkaisija-Utgivare 2010, p. 111.

beliefs related to caring for the environment, striving to reduce pollution and living in accordance with nature. They are in favour of a balanced, harmonious development on a city, region and global scale. Therefore, the idea of the eco-city is an important element in the city's development strategy focused on its transformation into the creative one. The city government have to understand that there is no chance to be the "creative city" without being the "eco-city". Ecology is fundamental for the creative people, and should be fundamental for planning the creative city.

The cities of the second half of the twentieth century were developed on the idea of uniform functionalities zones as well as on the idea of creative activity on a small scale and will need to respond to the increasing diversity of personal needs. This should have a great impact on behaviour of the contemporary city, and the methods of planning cities as compact, sustainable eco-cities. As J. Zimmerman concludes "if you want to succeed in the new economy, shift your agenda towards improving not only the local business climate, but also the local "people climate". In addition, ensure that the creative class feels both welcomed and satisfied if you want your city to succeed."²³ The cities authorities that want to be creative must change their approach to urban development planning from the traditional approach based on the relationship of inputs to the effects (*effectiveness*) to the modern approach based on the relationship of the means taking into account the economic effects of ecology, environmental protection and specific of the creative city.

5. Conclusion

The modern world is the world of dynamic economic and social changes caused by the development and dissemination of new technologies. The modern technology and machines are reducing demand for labour in agriculture which has the effect in intensified migration of the people living in the countryside to the cities. Already, more than a half of the world's population lives in cities and the growth dynamics of urban population is very high. This rapid increase in the size of cities causes that cities become increasingly crowded and living conditions in many urban agglomerations are steadily worsening. As it is not possible to stop the mass migration of people from rural to urban areas, it means that a lot of cities will have to meet the new challenges. These challenges are numerous but as the most important ones we can show the need to provide

²³ J. Zimmerman, *From brew town to cool town: Neoliberalism and the creative city development strategy in Milwaukee*, www.elsevier.com/locate/cities, (accessed 20 May 2015).

dwelling and to solve the problems of transportation and environmental protection. In meeting these new challenges, the use of knowledge and experience in planning and urban management can be helpful, which allows the transformation of the existing cities into the modern ones by using modern technological solutions in terms of construction and infrastructure. Modern technologies allow for the construction of the cities known as the Eco-cities, where residents live in harmony with nature and care about environmental protection. Undoubtedly, the modern city of the future is a city planned according to the idea of the eco-city. However, if we take into account the fact that the current increase of human well-being depends on people innovativeness and creativity, we should strive to ensure the future of the city by checking if they were planned so as to foster the creativity of its inhabitants. Already, we observe the transition from a local competition to the level of regional and global competition. In the future, the competitive battle will be won by the cities and regions with higher creativity. For this to happen the traditional urban planning must pass long way from the environmental planning until the stage of planning eco-city as a creative city.

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PART 3

Principles of Green Urban Regeneration Projects

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1. Introduction

The main goal of this part of the book titled “Eco-innovation in Cities” is to explain the main issues of green regeneration projects of cities: a need, reasons of the problem, the main aspects of the regeneration procedure, a significance of public spaces (including greenery), costs and method of financing these projects in the context of “green” and show an example of practical application of theoretical solutions. Without solving problems of deprived areas in cities, it exactly means to regenerate them technically, economically, socially and usually spatially as well, any city can become a green city. Thus methods of regenerations are important for a whole city and its sustainable (green) development. Moreover, lessons from the implementation of these projects are useful for city managers in developing other parts of the city as well.

First of all, the reasons for which deprived areas have appeared in Poland and in other socialist and non-socialist countries should be presented. Then, a need of public authority intervention should be also substantiated. When it is known that the intervention in a chosen area is required, it is obligatory to learn how to do it.

Therefore, at first our goals have to be specified. Seemingly it looks obvious, but it is not. The structure of goals and tasks depends on a lot of influences, interests and usually is subordinated perfectly to political and financial circumstances as well. At first glance it looks like a jungle but it is not so complicated. Going step by step it is possible to understand interrelations between these phenomena, economic needs, risks and financial determinants.

To accept goals of regeneration projects and actions to implement these projects, it is necessary to understand what a “green urban” or “green city” means. Why should urban regeneration projects be “green” and why should our city be “green”? Is this the same as a “sustainable city” or eco city? These definition dilemmas are presented in the first chapter. Preparing a good regeneration project, an action plan, which should change a deprived area, requires good analyses of the different aspects of the situation in the area and

a few perfect ideas for its development and sources of financing the planned projects. Usually it is a development strategy of the area which is pretended to be renovated.

There are many differences in an initial situation between different areas even in the same city. There are also differences in a way of regeneration projects management realised at deprived city areas or at post-industrial territories. Inhabited city areas and empty post-industrial areas are two different spaces, although their procedure of regeneration is very similar; the same documents are required, the activities of citizens and investors are different but required, and relations between these groups of interested people and the city authorities, are also clearly different.

We generally distinguish two kinds of spaces that must be regenerated: homogenous – like post-industrial, post-railway or post-army territory and a city area which is a mixture of functions and stakeholders having different interests to the area. Despite these big differences, through implementation of regeneration projects we want to breathe new life into both of them. We try to return both these spaces to former and future citizens, however, in cases of these post-industrial areas it is necessary to invent and implement a totally new method of using them. It does not concern city areas, although it may be changed partly as well. Thus, to make all these deprived areas attractive to citizens it is essential to plan, in our action plan, new or renew attractive spaces and answer to all or most of civilization challenges facing citizens every day. It means that it is vital to regenerate them as “green”.

To achieve a positive result we ought to use procedures prepared by central, regional or local authority and presented in the existing law. As in every complicated procedure a final success depends on a lot of factors, but as usually a few of them are crucial. Thus, the three main factors are as follows:

- People – leaders, local society and authorities and their engagement in the projects and city development;
- Ideas – the better ideas the deeper people are involved in actions;
- Money – usually difficult to obtain, but there is a clear rule: the more people will be engaged, the better ideas are proposed (to be implemented) and therefore the easier way of possessing sources.

It means that creative people with irresistible ideas usually gain enough money to realise their project(s). And it does not depend on sources of funds – special public funds or private sources can be used to finance the ideas. In both situations attractiveness and accuracy of the action plan is the best circumstance to possess money to realize the plan.

One last note about general character. This chapter is based mainly on the Polish regeneration and planning experience and Polish examples of using the applied solutions are presented here. However, it contains references to the experiences of other countries as well. Poland has its own, extreme experiences, but similar to the experience of the entire group of the post-socialist countries. Within several months, the country that had not remembered what it meant unemployment experienced this on an unprecedented scale. The release of market mechanisms caused – on the one hand – growth of business and entrepreneurship but on the other hand – a massive scale of unemployment, which was the primary cause of deprived areas. Authentic solving these problems began after accession to the EU, when regeneration projects could be financed from European funds.

It does not mean that the authors do not appreciate the experience of other countries, e.g. UK. However, the British methods of renovating degraded areas are quite different than in post-socialist countries and Germany. Mainly, because they base on public-private partnership that can and should be disseminated (by maintaining adequate sharing of risks and rewards), but it must take into account the specific existing law in this area, the other in Poland than in the UK. Another difference is that British regenerated areas were mainly homogenous, without unemployed people living there.

In the end of introduction it is worth to add that a lot of solutions used in regeneration processes in Poland are very similar to German solutions and all of them are exactly according to European Union legislation. Different aspects of these procedures and cases of public intervention into deprived areas are also presented in the chapters of this part of the book.

2. Green urban, green cities, green regeneration projects

The authors of the book, published 10 years ago, said “Sustainability is the word of the moment. It is everywhere – in the press, in government reports, on business websites, all over the internet.”¹ They asked if it is just another fashion of intelligentsia or merely a useful cover story for business as usual. They also gave an answer that sustainability does mean something important and new².

After that moment when their book was published, a new word “green” started to be useful in describing goals of cities’ development. It is not easy to

¹ Low N., Gleeson B., Green R., Radovic D., *The Green City*, A UNSW PRESS BOOK, 2005, p. 13.

² *Ibidem*.

explain a difference between a “green” and ‘sustainable’ city. In my opinion, for a long period “sustainable” has been rather connected with the word “development”. Sustainable development suggests rather a process in which different aspects of growth are balanced. They are balanced from different points of view but generally speaking the nature of the city would not suffer from or deteriorate as a result of the implementation of this development plan. Thus, this sustainable development leads us to a “green city” as a perfectly balanced urban unit. Consequently, it should mean that a green city is the main goal of sustainable development. In other words: going to (creating) a green city people must develop it in a suitable way. An aspiration to be a green city means to fulfil all important conditions and work according to the rules of sustainability.

According to T. Beatley, Europe has been a pioneer in the area of green cities. Europeans have found many similar ways to inspire, encourage and provide positive support for cities pursuing sustainability. Cities can now compete for the designation of the Green Capital City. This programme was created by the European Commission to recognise cities that have a consistent record of achieving high environmental standards and are committed to ongoing and ambitious goals for further environmental improvement and sustainable development”³.

These documents of the European Commission referred by Beatley in his book and his own deliberation rather confirm the idea of a green city and confirmed “green” is rather a goal of sustainable development. On the other hand, a sustainable city is also a goal of the actions. Therefore, I believe that these two names could be used interchangeably, however, for me, “green” will always be more related to the purpose (what the city wants to be), and “sustainable” is strongly connected with the process for achieving this objective. But I admit that these names can be used interchangeably as very similar and general names.

This distinction is not merely semantic. It allows us to understand that urban green is a new and the most important goal of urbanization. The city has not only cater to the opportunity to live, but to do it in a balanced manner, so that the objective, named a green city, can be achieved. It is probably easier in a city built just from the beginning as Dongtan in China or Masdar in Abu Dhabi. But generally in the world it is necessary to change existing cities into sustainable or green cities which is a long and hard process. On the other hand, European cities, or rather their local authorities, show that they are creative in this field of blending the old with the new. They always try to reconcile their historical

³ Beatley T., *Green Cities of Europe*, Island Press 2012, p. 3.

achievements, including buildings, places and traditional behaviours, with a long-term sustainability allowing them to build their cities as green.

This is a result of deep understanding and engagement in the subject of a green city by local politicians but especially by local societies which are strongly interested in higher level of their lives. European cities that are at the forefront of these changes have reached their position between green cities because of a joint effort of their society and authorities.

There are a lot of definitions of “Eco-cities”, thus there is no sense in trying defining it again. It is more suitable to understand the idea and remember the most important features of a green-city as such.

First of all – a green city is a human settlement which, as a multi structure, aspires to be close to the natural ecosystem. “Aspire” means to take a different action to revive, rebuild, protect or implement ecosystems inside a city (water, air, greenery, spoil). When we think about areas that can be regenerated it means that at least one of these ecosystems must be included in the implementation of green regeneration projects. Making cities green also means that citizens go to a final result when all these systems provide a healthy abundance for inhabitants and visitors (see Photo 3.1).

Photo 3.1. The High-Line Project, New York



Source: <http://prolandscapermagazine.com/wp-content/uploads/2012/09/High-Line-4.jpg>, (accessed 04 Aug. 2015).

But it is not enough to treat a city as a green one. We also ought to remember the second feature of green human settlements, which is:

- To produce not more (better – less) waste than a city can assimilate,
- To consume not more (better – less) renewable resources than a city produces.

The third feature, also required, means that not only a city government but especially inhabitants have to make a positive impact on the city environment by their lifestyle.

And the fourth important issue – the inhabitants of a green city must confess to the fundamental principles of fairness and justice.

The last sentence places stress on the human aspects of eco-cities or green-cities. It reminds us of the principal rules of green cities that are not built for an idea but for the local society, for human beings to create for them the best kind of life and solutions for development. It also means that it should be created together by governments (local, regional, central) and by people. It explains why an eco-city must be against social and other exclusions but it is for the integrated, friendly and cooperative society.

And, what is also important, a green city as a part of green economy is connected with green jobs⁴. According to the U.S. Department of Labour's draft definition that cites "green jobs are jobs involved in economic activities that help protect and restore the environment and conserve natural resources," such as renewable energy, energy efficiency, or greenhouse gas reduction, among other fields. It can even be said, as George Sarrinikolaou, a senior programmes officer at ISC, remarked: "usually when we talk about climate change, we talk about cutting back, consuming less, using less, spending less, but with green job creation, we get to create wealth and prosperity and at the same time we reduce our greenhouse gas emissions"⁵. This opinion is somewhat exaggerated, however, at least can be realized partly or totally, and thus it is true.

Therefore there is a question what the relation between a green city and a green regeneration project is? Another question would be if a city can regenerate deprived areas by a non-green project?

The answers to these questions are based on a deeply established conviction that it is impossible to build a green city if a part of it is neglected or deprived. All parts of a city should be green or going to be green in a sustainable way.

⁴ [http://www.iscvt.org/... \(how_weve_helped/green_jobs_cla](http://www.iscvt.org/... (how_weve_helped/green_jobs_cla), accessed 28 Feb. 2014).

⁵ *Ibid.*

It is rather hard to imagine that a city is partly green if green is closely connected with high quality of life. So, if a city pretends to be green and have a deprived area in its limits, it must change the area by regeneration process and its main goal is to reorganize and rebuild the area into a new part of the city, which has to fulfil all expectations of citizens living at the deprived area and outside the area limits according to their imaginations of their city.

If the society understands, accepts and supports the idea of a green city nobody agrees to rebuild a deprived area and spend money on a project whose results would have not been completed. That is why we connect city regeneration with the global problem of sustainable development and climate changes. Therefore acting reasonably neither local community nor local authority should accept partial revitalization plans that do not guarantee achieving full success meant to rebuild degraded area to “green”. Through the creation of new functions in a deprived area these projects can help to build a new environment, but this means – new behaviours, customs and opportunities for all people living in such an area.

If something must be done, reorganised, rebuilt and people in the crisis area wait and require these changes, it is easier to realise such an eco/green project; start to build a green city and introduce new solutions exactly there. And when the project is realised, its effects can be shown to all citizens and positive changes can be demonstrated and disseminated not only in this specific city but all over the region, country and even globally.

Finally, we can say that there are three main goals of the regeneration projects in deprived areas inside cities:

1. The reduction of the unemployment and exclusions by educating people, creating new jobs and prospects for those who live in these deprived areas.
2. Improve and refine buildings and infrastructure.
3. Introduce and develop different aspects of the green economy.

And all these goals are closely interrelated and the realization of one of them should support the implementation of the other two.

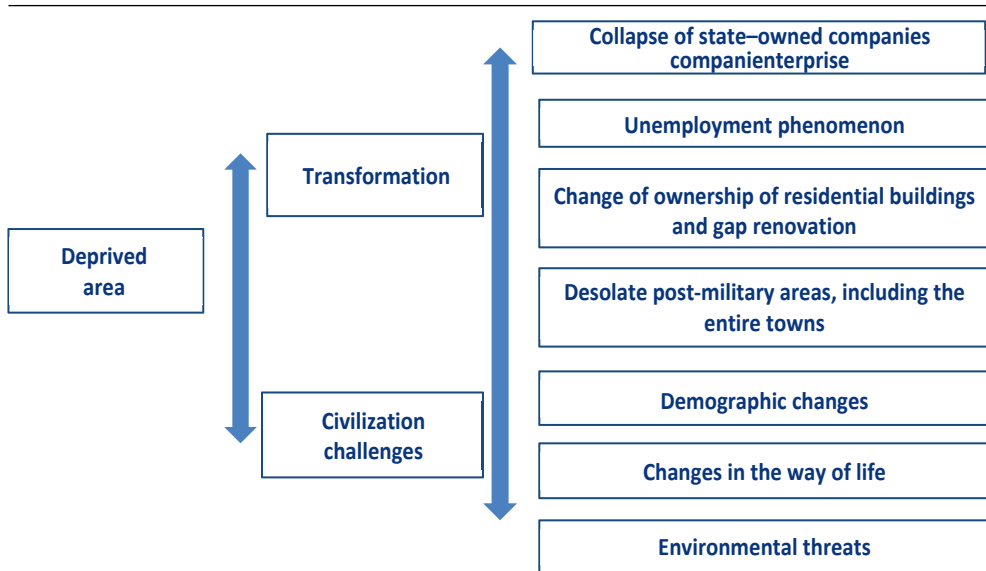
3. Deprived areas – reasons and problems to solve

Walking or driving we can observe that some areas in a city are neglected or shabby. It is visible and, very often, at first glance it cries for renovation. Those are not only facades of buildings, but also technical infrastructures of the area which wait for renovation and we can also see people there living in squalid

conditions. But technical neglect does not mean that the area needs full regeneration, because regeneration means much more than renovation. Despite technical neglect, the degraded area is characterized by increased levels of unemployment, poverty and, consequently, social pathologies. If these few reasons appear together, then we can say that the area is deprived.

Trying to answer why these deprived areas have appeared in Poland, we must remember about two groups of reasons, as it is shown in Figure 3.1.

Figure 3.1. The causes of deprived areas



Source: Bryx M., Lipiec J., Rudzka I., *Green Urban Regeneration Projects*. E-book, CeDeWu, Warsaw, 2015, p. 10.

Defining objectives of urban regeneration requires first a discovery of why the city falls, and consequently must undergo revitalization. For hundreds of years in the world history cities went into decline, and even fell completely or they were also deliberately destroyed by enemies. This phenomenon does not explain the situation that took place in the recent past years and the consequences of which we must fight and eliminate today. At the end of the second half of the twentieth century, we had to deal with changes in the functional structure of cities on an unprecedented scale. While bankruptcy of a company may be based on errors in management, non-competitiveness of the industrial plant or similar, the collapse of entire industries is a result of the rapid opening of the economy of a country for the global competition. It radically changed conditions of

running of state enterprises and living conditions of thousands of people for the worse. This situation appeared in many European countries when they had opened their territory for a global competition. Whole industries in some countries proved their lack of competitiveness in the global economy. It resulted in the collapse of entire sectors of industry (e.g. shipbuilding), state agriculture industry, coal mine companies and others. It also explains why the old EU member states support the new EU countries, by the various funds, assisting them in making the necessary structural changes. That is why we try to exploit the positive experience of the country which went the same way earlier.

Poland was in transition from central planned (socialism) to market-oriented economy, since the first days of 1990. We can assume that the transformation process was finished when, on 1st May 2004, Poland joined the European Union. In the meantime all the economy was changed and a new market-oriented economy resulted in a lot of new positive, but also negative consequences.

The main negative consequence of bankruptcy of many industries was a huge unemployment not remembered by people in Poland who had lived in the central-planned economy system which had been ineffective because made a lot to provide a job to every adult. To understand why unemployment was a big shock for Polish society, we must remember that full employment was guaranteed by the Polish Constitution and realized by every socialist government for more than 40 years. Of course, one of the results of it was that all economic relations were unmarketable because the idea of full employment was realized in the conditions of the artificial rates of exchange, understate salaries, wages and prices which were not reflected in production costs.

Unemployment raises a number of different pathologies. First of all: social exclusion and crime. A continuation of the situation preserves bad relationships and creates barriers for the normally raised and developed young people. They are not correctly educated and prepared for their normal lives. They are in a trap⁶. They are not educated well and therefore they cannot get jobs. Without salaries they cannot live normally and educate themselves and their children. These are typical problems of countries whose economy has been radically changed.

Thus the biggest problem at deprived areas is always a social situation of people living there which usually is not visible at first glance. Mainly, there is no fault of these people that they have no jobs and their future looks dark and

⁶ For example the at-risk-of-poverty rate after social transfer was 17.7% in all Polish population in 2011 but in a group between 0 to 17 years old it was 22.0%; The average for the EU27 is 16.9%; http://www.stat.gov.pl/cps/rde/xbcr/gus/wz_dochody_warunki_zycia_raport_2011.pdf, Warsaw 2012, p. 144.

insecure. We must help them by creating new jobs, by educating and re-educating them to allow them to fight for their future and future of their children.

We can say, as in democratic countries that we deeply believe that all people are equal and our countries must create the same chances for a decent life for them. It is a response suggesting a reason and a main goal of city revitalization projects.

Sometimes it is suggested that one of important reason of a necessity of regeneration projects is a gap in houses renovation. It is true that it existed in socialism era but it was deepened during transformation period. The tenants at the deprived areas have no jobs thus have no money to pay their rents, the owners have no revenues so everybody waits for a miracle. It is a classic situation. From local authority and the owners of houses point of view the deprived area is a stock of flats which usually has an investment potential that is why it should be renovated. But if in the area the only houses will be renovated without any changes in social life of their tenants and house-owners then the area goes to the former shabby state very quickly. The people living there must have incomes and care for their flats which means – their living conditions have to be changed.

What is specific in Poland and other post-socialist countries? This is a size and form of houses. There are multifamily houses in specific areas called blocks of flats (more elegantly called the residential areas). The socialist economy did not have the sufficient financial resources to solve or moderate the growing renovation needs of the urban area. Although blocks of flats were built mainly from prefabricated concrete in the 1970s and 1980s are still possible to live in, however they need to be upgraded. There are also houses from the interwar period, and even before the First World War. They are still used, but majority of them have not been renovated. It was due to the policy of low rents, which did not allow to collect necessary sources for repairs by the private owners and housing cooperatives⁷. As a result, the majority of houses in every Polish city were neglected and in varying degrees fell into deterioration. The renovation gap in the transition time deepened and is estimated at 1.6 million flats – 12% of the existing stocks.

The passage of time, the phenomenon of mass unemployment and reduced residents' income caused the demand for raising the standard of these apartments. Many of them belonged to local authorities and were sold to their tenants usually for 10 percent of their value, but the new owners do not have

⁷ In socialist times private owners of houses owned their property but had no influence on anything concerning their houses. Above all, they did not decide who would live in their houses, usually containing several apartments, or how much would be paid for it.

any funds for essential repairs. If the unemployment, exclusions and renovation needs meet together in one place, frustration and aggression of people are strengthened.

Special places of revitalization activities are post-military areas. There are many of them and some of them were used in socialist times by the Polish and the Soviet armies. The Soviet army stayed in Poland as a result of the Second World War using polygons which had been created before World War II within the German territories. At its peak, there were about 400,000 soldiers of the Soviet army in Poland. They occupied at least 70 known garrisons. The command headquarters were located in Legnica, where the Soviet army occupied about one third of the city. The Soviet army finally left Poland in 1996⁸. And when it happened there were large areas and even cities that should have been renovated⁹. The majority of them have still been deserted areas requiring restructuring and renewal for the purpose of reuse.

The traditional European glance at the role of the governments is that the governments, on each level, should help citizens to realize their goals, especially if their living conditions are extremely worse than average. And it concerns people living at deprived areas.

In other countries, as for example in the U.S., this would be viewed as socialism rather. In countries with free-economy market it is expected that the private market plays the main role in creating different business opportunities or job training. But the situation shows that it is not enough. According to the public opinion and tradition the authorities should create a development opportunity for these areas and for people living inside to help them return to their normal lives, with jobs, with a living salary and with the possibility of education for young people (but also for adults) to help them to be reskilled. It is important for the authorities from the political point of view, but for those people living there too because it gives them a chance for a normal life. Many countries, including Poland, encourage the private sector to participate in these activities through subsidies and other incentives prepared and implemented by the government.

After entering the European Union, Poland, as well as other states joining the EU, received financial assistance for the regeneration projects including

⁸ The number of Soviet troops in Poland, in February 1991, was approximately 53,000; plus 7,000 civilian employees, and about 40,000 of their families. In its armament were 20 launchers operational-tactical missiles, 598 tanks, 23 bridges accompanying 952 armoured vehicles and 390 guns and mortars, 202 aircraft including 81 carriers of nuclear weapons and 85 helicopters.

⁹ Very interesting example of solving the problem of brownfields in USA are presented in the EPA Brownfields Program Benefits <http://www.epa.gov/brownfields/index.html>, (11.03.2015).

different aspects of regeneration needs. There were 16 regional assistance programmes for housing, including the so-called “Concrete Blocks of Flats Programmes”¹⁰. In Poland there is no one common national programme for all the regions. Regeneration projects are implemented at the level of subsequent communities, often with financing programmes from the European Union. The same regulation applies to every state being a member of the European Union¹¹.

The effect of the immense needs of revitalization which is mainly a result of the economic system transformation are many brownfield sites, which include first of all areas of collapsed state-owned companies of different branches of industry (chemical, agricultural, foodstuffs, steel, mining, etc.). In Poland these areas are approximately 8000 square kilometres, what is more than 2.5% of the country’s area¹².

As it was said earlier there is the second group of reasons for the renewal of the deprived parts of cities. It concerns not only the deprived area but cities as a whole, regions and states, although many times it begins to be solved in these crisis areas. This is a sustainable development issue.

Simultaneously with the development of civilization and from the beginning of creating settlements, cities were a cradle of cultures, science, wealth and growth. However, the biggest changes of civilization in the cities can be observed during the past 200 years. Now, more than a half of global population lives in cities, but a half means much more than a hundred years ago. It creates new consequences for cities and their citizens. It also means that we have to look for new ways of city development and redevelopment, and to regenerate our city we must make them more modern by meeting these civilisation challenges.

The whole world is in crisis and in deep discussion because of limited non-renewable resources, climate change and its consequences for many areas in the world. Many governments signed the Kyoto protocol in which they obliged to reduce greenhouse gas emission which is treated as the most important reason for climate change but not all of states accepted it.

¹⁰ 3 National Strategic Reference Framework 2007 – 2013, Guidelines of the Minister of Regional Development in the programming activities on housing, http://www.mir.gov.pl/fundusze/wytyczne_mrrr/obowiazujace/horizontalne/documents/wytyczne%20-%20mieszkalnictwo%20-%20aktualizacja.pdf, Warsaw, (accessed 13 Aug. 2008, 26 Feb. 2014).

¹¹ Regulation (EU) No. 1300/2013 of the European Parliament and of the council of 17 December 2013, Regulation (EU) No. 1304/2013 of the European Parliament and of the council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006, Regulation (EU) No. 1301/2013 of the European Parliament and of the council of December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No. 1080/2006.

¹² http://www.senat.gov.pl/gfx/senat/userfiles/_public/k8/komisje/2012/kgn/prezentacje071112/tadeuszadamski.pdf, (accessed 26 Dec. 2014).

There are a lot of different methods of lower energy consumption which, on one hand, protects resources, and on the other hand – decreases the emissions of greenhouse gases. This may be new kinds of engines (hybrid or gas), zero energy buildings and others. When we discuss or consider green urban regeneration projects, it is rather obvious that we think of a way in which deprived areas can be reused and how we can breathe new life into these spaces. It means that each eco-regeneration project makes its way towards a green city.

4. Definition of regeneration processes

According to the big changes implemented during transformation process of economic system a lot of companies collapsed and a new phenomenon occurred in cities – left and neglected areas without a view for better future. Every city aspired to be green must to solve problems of these deprived or crisis areas at first. There are a lot of different definitions of deprived or crisis areas. One of the most precise and comprehensive is a definition prepared and accepted by the Scientific Committee of the research project ordered by the Polish Ministry of Science entitled “The Regeneration of Polish Cities as a Way of Protection of Tangible and Intangible Heritage and a Factor of Sustainable Development”¹³. It stresses five important aspects of regeneration processes in cities:

1. A regeneration process has to counteract the degradation of urban space and other phenomena of crisis. This means a fight against social pathologies, such as exclusion, and economic decline. It is important to remember that both of them are only two sides of the same coin. The growing range of exclusion leads to economic crises, and an economic crisis enhances social exclusion.
2. A regeneration process is an important component of the development policy. Every restoration of a deprived area and the allocation of new services create new workplaces. It is a key element of a local policy in the area of development. However, a development policy should always mean a social development as well.
3. A regeneration process should carry not only economic growth, but should also activate local society and improve the quality of life in the deprived area and its neighbourhood directly and indirectly. For this reason each local society from a revitalised area and its neighbourhood

¹³ It is included in every book published as a series of books of the project under common title “Rewitalizacja miast polskich” (Regeneration of Polish cities) published in Poland by Instytut Rozwoju Miast (Institute of Urban Development) between 2009 and 2012.

must be included in the decision-making procedure of developing a regeneration process, especially because they will be the main beneficiaries of the regeneration process. Without local society activity and development we cannot speak about regeneration projects or processes but only about the improvement of infrastructure or buildings renovation.

4. A regeneration process should be provided as a common action made by local authorities, local society and other stakeholders. This especially concerns city centres or other deprived urban areas, where local authorities are explicitly responsible for the results of the project and thus they are ready to be the coordinators of these processes. In the cases of brownfields, regeneration processes require the consultation of local societies but the procedures of rebuilding or renovating such areas are simpler than in a city centre or at a residential area. And of course these latter processes are usually enacted by developers/investors and not by the local authorities. Therefore, the role of private capital and private participants, ready to start with new economic activity in the regenerated area, grows.
5. A regeneration process is complicated and must have a strong leadership. If it is an area of a city with different users and citizens, the local authority grips this position. It can be organized in different ways but the local authority must be a leader (and the leader should be personalized) and takes responsibility for the political, economic and social results of the project. If it is a post-industrial or post-army area or another brown field a new investor, a developer or an owner must be a leader.

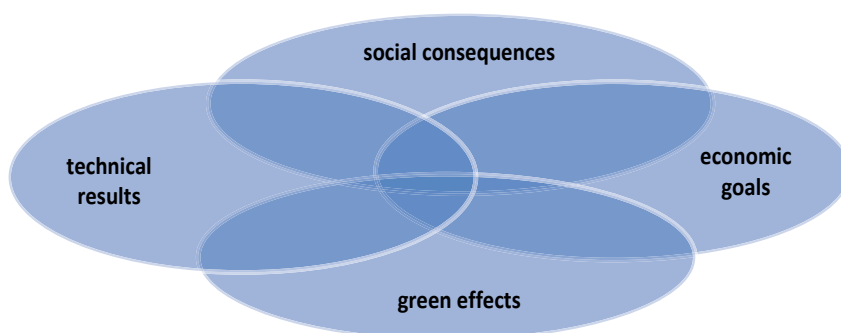
Regardless of who is a manager of the regeneration project the majority of management problems must be solved solely by a leader throughout the entire process. Thus, the answer to the question how the process is coordinated and how different problems are and should be solved according to the law is crucial.

However, there is one, very important aspect, which is omitted in the definition mentioned above. This is a crucial economic problem how it should be financed? If there is a brown field, then a project leader, a new owner, a developer, will finance it using his/her own resources, banking credits and other funds that are usually used to finance investment projects. It can also be supported partly by public money or sub-public funds if the law creates such an opportunity. Usually it concerns an infrastructure of the nearest of the site. Roads, sewage system, water pipelines going to the regeneration area can usually be built from public sources.

If an area of intervention is a residential area or a city centre then mostly public money is used in the regeneration process. From different kinds of public money almost all of it can be used on special conditions: local, regional and central budget, special sources created on different levels, sources from European funds and so on. Private money is also needed, required and expected.

Local authorities usually feel responsible for changing deprived areas towards a new and better than earlier. It is crucial that a full regeneration project ought to achieve and fulfil economic tasks, technical results, social effect and green (eco) effects, as is shown in Figure 3.2. However, in the various projects proportions between the achieved objectives can be different.

Figure 3.2. Outcomes of full regeneration project



Source: Bryx M., Lipiec J., Ruzdka I., *Green Urban Regeneration Projects*. E-book, CeDeWu, Warsaw, 2015, p. 22.

5. Delimitation of deprived areas

The definition of the regeneration process in deprived areas of cities, presented in the chapter 4, possesses a universal character. It tries to show all the important aspects of regeneration process, however the meaning of the different parts of the definition may vary significantly and depends on the types of deprived area mainly.

There are two different kinds of such areas:

- brown fields, rather homogenous, because they belonged to one main owner or operator, like the army, industry, railway etc., and the owner used it in a more or less identical way;
- districts of cities that are mixed-use areas, where diverse activities take place. For instance – different businesses and services, housing and

leisure, industrial and service properties, churches, monuments and pieces of heritage, with different users, tenants, owners, visitors and tourists, we generally call them “stakeholders”. Because of these mosaic of kinds of people, businesses and interrelations these areas are more complicated to regenerate and may cause more challenges for regeneration management teams.

The above division of deprived areas is rather sharp. But in Poland and in a few other post-socialist countries there is something between these two categories. Usually, it is named in English as a residential area, but more precisely the name referred to an area is – an area of blocks of flats. This is a specific effect of socialist affordable housing – blocks of a several dozen flats or more, built in the same technology of concrete slabs and in the same shapes.

It created big areas with numbers of flats usually located in empty lands in city outskirts thus they sometimes were called – bedrooms for cities. These areas are much more homogenous than city centres because they are rather not services but only places to live (sleep). Although they are more homogeneous than city centre they cannot be classified as brown fields because there is no “post”, they are constantly used according to their earlier assignment. What is more – they are still full of people living there, however, mostly excluded from normal life. Thus, these specific, degenerated areas are closer to the second mentioned above categories – a community of people without opportunities for normal life and development as these from a city centre. These areas are full of different interrelations but made mainly by the citizens living there and partly by not a big number of other stakeholders of the area. They cannot be classified as brown fields because these flats there are still and constantly used as a city centre but these blocks need to be renovated. Thus we think that they should be treated more similarly to city centres than to empty brown fields.

A delimitation of a deprived area in the city is a crucial problem of cities’ regeneration. It settles how many people living in the city are treated as these who live in degraded areas and as a result of it the number of citizens who should be included in a regeneration process. It has a huge influence on city finances, development programmes, present and future condition of living and, generally speaking, on the face of the city in the future.

The general rules for determining the areas of crisis are strictly defined by the rules of converging prepared and implemented by the EU. The result of it is a unified approach to deprived areas within the entire European Union. The

principles of delimitation are governed by 4 important European Union Laws. However, member countries have their own detailing of these rules¹⁴.

In the Polish law, due to the document called “Guidelines for the development of local revitalization programmes”, the rules concerning the general criteria of the designation of a deprived area, are included in the 16 separate regional operational programmes. They were exactly the same in every region of the country in spite of the regional differences. According to them, urban areas had to meet not less than 4 of the criteria chosen by the Regional Managing Institution, on the regional level. Among them were in Art. 47 section 1 of the Regulation 1828/2006, namely:

- High levels of poverty and exclusion;
- High long-term unemployment;
- Unfavourable demographic trends;
- Low levels of education, significant skills deficiencies and high dropout schooling;
- High levels of crime and violations;
- High level of environmental degradation;
- Low level of economic activity;
- High number of immigrants, ethnic and minority groups, or refugees;
- Comparatively low level of housing value;
- Low levels of energy efficiency of buildings.

¹⁴ For example, in Poland these rules reflected in the regulations, namely:

1. Parliamentary Act of 6 December 2006 on the principles of development policy (Journal of Laws of 2009 No. 84, item. 712 and No. 157 poz.1241) No. 227, item. 1658, as amended. d.);
2. Guidelines of the Ministry of Regional Development in programming activities on housing (MRR/H/18 (2) / 08/08) of 13 August 2008;
3. Regulation of the Minister of Regional Development of 9 June 2010 on the granting of aid for the revitalization of the regional operational programmes (Journal of Laws No. 117, item. 787);
4. Guidelines for the development of local revitalization programmes under the Regional Operational Programmes. In addition, the area of revitalization should be determined in accordance with the principles of regional policy, in terms of:

Principles of organization as:

- a. Principles of programming – rolling programme, subject to updating and completing;
- b. Rule of partnerships – projects implemented in the area of crisis in the partnership;
- c. Compatibility rule – complementary projects in three areas: spatial, economic and social, to enable the achievement of synergies;
- d. Policy of coherence – projects consistent, enabling the achievement of the so-called; economies of scale;

Principles of regional policy financing:

- e. Concentration – maximizing spending in the designated area in order to increase the potential effects of revitalization activities;
- f. Additional rule – potential beneficiaries must spend their resources as part of the required investment. Public sources complement them.

However, the narrow view on this issue, or their practical applications in different cities, suggests that only two of them are closely related to the concepts of green city. There are low energy buildings and degradation of environment. Selected and described criteria and indicators for the intervention in residential areas, are based on the specificity of Polish determinants and the availability of statistical data reflecting changes in the socio-economic situation and condition of infrastructure and houses clearly, than on a need of creating green or sustainable city. It clearly visible in 4 criteria chosen by the Polish Government, which are crucial for possessing money from the EU sources. They are follow:

- High levels of poverty and exclusion;
- High levels of crime and violations;
- A low level of economic activity;
- A comparatively low level of housing value;

In accordance with the principle of addition, the rule on subsidizing housing projects funded by the European Regional Development Fund, the activities of revitalization in blocks of flats are allocated to no more than 3% of the ERDF under the operational programme.

The reference values of each indicator are derived from public statistical data, namely: The Statistical Yearbook of Voivodships (Regions) (data for 2006), other data from The Central Statistical Office, The National Census (data for 2002), police statistics (database 'Themis' data for 2006).

According to these rules and programmes it was relatively easy to plan, finance and manage projects concerning block of flats. More complicated were cities' centres, but there are a few interesting examples of perfect regeneration. The eligible project can be financed from the EU sources transferred by the Special Regional Institution. The expenditures for two areas were accepted as eligible:

- Renovation/modernization of multifamily residential buildings (blocks of flats);
- Adaptation of buildings owned by public authorities or other non-profit entities.

All brownfields, post-military, post-industrial and others, are the simplest to determine as their delimitation should occur due to the defining features of the area. If such a zone finished its activity, it means – there are no jobs and no function is realized, no production is made or no service was provided, so, therefore, this is a really dead area. Structures located there are not used and sometimes they are robbed from their parts which are able to be sold, mainly

scrap, and fall into increasing disrepair. Although it is a crime, but on the other hand, this is the only chance for excluded people to grab some small sources for their living.

Usually, the only chance for a brownfield is to change an owner and create new conditions to count on the fact that a new business idea will be realized there by a new dynamic person/company with a vision and determination to have a success. For unemployed people, excluded from the local society, new jobs and the opportunity for income provide enormous chances to be returned to normal life. Of course the local authority does not need to be passive in the process. They can, or even should, create some incentives for the new owner to make this future business efficient. In this scope of their powers, the local authorities can create these relations freely; however they are under the pressure of their voters.

All these aspects of new jobs possibilities for people living in the deprived areas or had worked earlier for the companies which collapsed are the base of their normal lives and the first problem that have to be solved by the local authorities. It is undisputable that only employed people who earn money for their living can think or implement the concept of green city mentioned on the second paragraph of this chapter. Therefore, we rather cannot criticize the government that in these chosen criteria of regeneration processes it concentrated on the problem of new jobs, poverty and exclusions

6. Uniqueness and its usefulness for a city

Uniqueness is very important in building and implementing a city development strategy in which regeneration projects should be located. It creates recognizable face of a city and allows building the future on the base.

It is rather obvious that every city is different. There are a number of reasons for that, but the basic and the most important was always location of a city. By location we should understand not only a geographical place, but also its historical and cultural relationships with the nearest areas and the region in which cities were built in the past and are being created constantly. They both make a city because of activities, passions and efforts of many people living there and supporting themselves as well as their city growth during the past ages and now.

Uniqueness is a feature of a city which must be cultivated and developed to give a city its own characteristic and recognisability from other cities, not only in the region but all over the world. Everyone is able to identify many unique

cities, whose names remind him/her of something special. Most often it applies to the big, especially capital cities. Paris, Vienna, Stockholm, Helsinki, Tokyo or Warsaw are associated with some selected features. This is due to the facts that they were repeatedly reported in various literatures, constituted a tourist attraction, are the capitals of their states and spend a lot of money on their marketing. But there are also regional cities famous all over the world¹⁵ and very small cities also widely known in the world¹⁶.

Uniqueness is crucial in building and implementing a city development strategy. Usually, it is not easy to point out a feature or features that can build the extraordinary face of a city. Nowadays it always means that a face of a city is build due to the concept of green city in which the quality of life growths and different aspects of cooperation between citizens and common undertakings have constantly occurred.

Every famous city is struggling to maintain its unique position; however, apart from competition, cooperation and collaboration are particularly required. Sometimes a few cities have the same special characteristic, and try to use them together in a perfectly organised way, as it can be said about the European Route of Brick Gothic which has been created by 30 cities from 3 states: Denmark, Germany and Poland, and by which the associated towns promote themselves together. And at last, because of their common features they are associated under a common name, they lead unified and common policy concerning their heritage, because they are responsible individually for themselves and for the whole Route as well¹⁷. It confirms that cities cannot only compete but cooperate as well. To build and implement a strategy, especially common for a few or more cities, is not a routine job but a kind of creativeness and their common will for cooperation is absolutely necessary.

When we think or discuss about European cities, we must also notice and discern that there is a phenomenon which can be called the European City Network. Despite their dissimilarities, these cities are examples of similarities based on the history of European cities, the assumptions of planning, the law which came from the Middle Ages and even earlier, specifying the rules of operation and development of cities. We can say that each of them is different

¹⁵ As Barcelona (Cataluña), Wrocław (Lower Silesia), Bilbao (Basque Country), Florence (Tuscany) and many others.

¹⁶ Billund (Denmark) known as the capital city of Legoland, Salzburg (Austria) the city that is alive with the glory of its most famous citizen, one of the greatest composers in history – Wolfgang Amadeus Mozart. In Poland it could be Nowa Huta (an original urban assumption realized in the fifties of the last century; today a district of Cracow) Wadowice (birthplace of Pope John Paul II).

¹⁷ <http://www.eurob.org/index.php/Cities>, (accessed 11 Mar. 2015).

and unique but they are also very much alike. Cities, forming a less or more formal network, have a classical urban structure and an original heritage.

A traditional medieval or an ancient city was stretched around a central point, which was the central market square (agora) of the city, mostly with a City Hall located there, surrounded by the city defensive walls. In later times, when the importance of defensive walls of the city declined then a spill began on an individual basis, taking into account local capabilities.

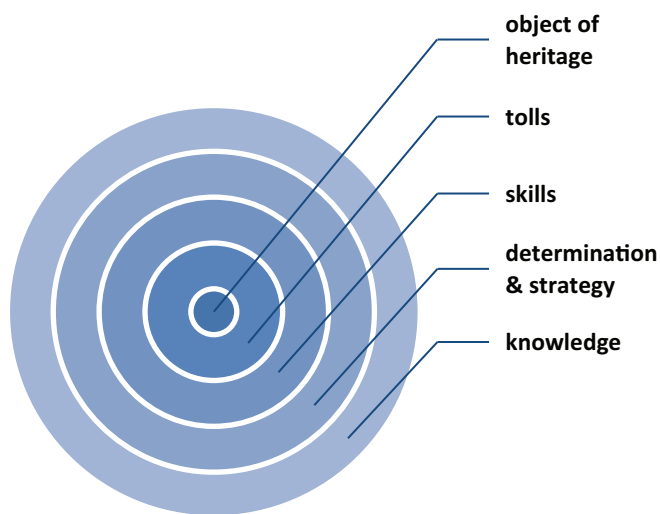
These traditional cities were built hundreds of years ago and a number of them have survived intact. Now, they are tourist attractions because of their urban and architecture uniqueness and heritage but also simplicity and friendliness. This tourist movement is an important source of the cities incomes, the economic base for the standard of living of their citizens. Although a lot of changes have been introduced to cities (and our) lives they remain units working accordingly to the similar principles and rules of co-operation.

Monuments are the hallmark of the city and make up its originality and uniqueness. However the heritage, which is the result of the job of a man and his/her activities, is a testimony to a bygone era or event and can be a property or movable property which should be written to the heritage register. The preservation of the heritage is in the public interest because of its artistic, scientific, historical or emotional value¹⁸, and because it can be used to build a new, original and unique face of a city.

It is expected that tangible and intangible assets will be comprehensively protected and made available to residents and tourist in a sustainable way. At the beginning of the 21st century even the World Bank accepted the idea that cultural heritage can be used to fight against poverty and exclusions, especially in these developing countries that are economically poor but endowed with a rich and diverse heritage. What is important – it concerns not only developing countries but every country, region or local community which wants to use a tangible or intangible heritage to revitalize its deprived areas. Conditions of using heritage as part of the strategy or the regeneration of the city depend on a kind of heritage, determination skills and available tools which is presented on the Figure 3.3.

¹⁸ Similarly it is presented at the Oxford Dictionary: <http://www.oxforddictionaries.com/definition/english/heritage>, (accessed 04 Feb. 2014).

Figure 3.3. Conditions of using heritage



Source: Bryx M., Lipiec J., Rudzka I., *Green Urban Regeneration Projects*. E-book, CeDeWu, Warsaw, 2015, p. 64.

As shown in the Figure 3.3, knowledge is a basis to take any skilful action before using a heritage object in the development (regeneration) plans of the city. Knowledge of the monument, on its history and contemporary usefulness leads to the decision what can be done with it remembering that its historical value should be protected. How it should be prevented and how it can be highlighted, these questions are crucial in the process of building a strategy for a city and its deprived areas. Also knowledge on the best practices from all the world allows to exhibit a monument (heritage object) and make it attractive for tourists. Knowledge of city marketing is also required. It is not enough to know how a lot of the heritage and how to use and exhibit it but the third kind of knowledge that should be implemented in the city strategy of development is answer to a question what could be done to encourage people to visit the object in the city. Because everybody knows that the object can be a magnet for tourists and thus can generate incomes for habitants, service providers and the city. But this is only the opportunity which can be competently or incompetently implemented. Knowledge is shown as the biggest circle on the figure 8 because we can use knowledge of all people involved in the process of creating a city strategy. This is a phase of a wide public debate in which there are no limits for different people to present their ideas concerning the problem. The more people get involved at this stage, the more interesting and the more complete ideas can be accepted for execution.

The second, smaller, circle is a city strategy and determination in its implementation. Determination is necessary to transform the idea of using the heritage as the most important element of the city strategy and to prepare a suitable action plan.

When the action plan of the deprived area of a city is accepted, its implementation requires the specific skills. In fact – they are needed even earlier but essential at this period. Professionally trained people can cope with the implementation of the idea. They must present an integrated approach to the idea that often was created intuitively earlier by non-professionals. This approach requires expertise in tools possible to use to realize a project. Selecting the right tool for the implementation of the action plan is extremely important, especially because cities use public funds and must be particularly cautious with their spending. Majority of action plans prepared by professionals due to inhabitant expectations achieve successes. This is not only because all the procedure shown above is made in a perfect way but also because the demand for visiting interesting, well-prepared for tourists needs places with delightful heritage objects, constantly grows in the Global Village. This is a big chance for the ambitious cities.

Thinking about uniqueness of every city we must remember that the main goal of urban policy in Europe is to create frameworks and instruments facilitating, encouraging and supporting the cities' cooperation. The equally important factor for European authority is to provide the commitment and innovation needed to tackle and resolve many of common cities' problems. One of the tools used by European Commission that can encourage cities' authorities to build and implement green concept of their cities is the European Green Capital Award (EGCA). By this competition UC not only recognize but especially disseminate the idea of green cities among European cities. The award is given to only city in every year, which is leading its development on sustainable way and aspires to create friendly urban living.

The main goal of cities themselves is to fulfil the content of the frameworks by using instruments according to their own strategies, using their uniqueness and capabilities in accordance with their social responsibility. The status of towns is varied..., but we can say – the bigger the significance of the city, the bigger the responsibility, not only for one place on the map, but for the network as well.

7. Common purposes of green cities and green regeneration projects

It has been suggested that the main objective of every authority is not only to improve the quality of life of city inhabitants, but also to fight against civilisation challenges. These two tasks are not separated. This objective can be divided into a few main goals, but all of them are parts of an idea of a green city which has been described earlier. The definition of a green city implies and emphasizes that not only the local authority, but all residents are responsible for urban policy, and especially for the care for the green aspects of the city.

The responsibility of local authorities for social situation of their citizens grows systematically because the awareness of citizens and their elected representatives increases as well. It concerns not only the habitants but all people visiting a city occasionally or regularly. Urban policy which has been created by collecting a few subjects together should be stronger, more expressive, and as a result – more successful. Such a policy is directed not only to the inner towns but also to the suburbs and to the other towns in search of synergy between them.

A crucial point is that not only authorities but citizens must have a deep social consciousness of civilization challenges and willingness to support all actions connected with them. There is no city social responsibility without the commitment to this policy of all inhabitants. Thus both parts – citizens and their elected representatives are responsible for a city strategy and its implementation, and the strategy must include solutions for deprived areas and the challenges of the 21st century.

The tasks of green regeneration projects are the same as the tasks of responsible city development, because the projects have to be parts of the city development strategy. They concern and include the main aspects of the goals of city development (health, education, work, leisure) and the basic components of the environment: air, water, space, urban greenery, but also some social aspects of the regeneration issue.

As it has been said – the objective of a city development is an improvement of the quality of life in the city area. Thus the green city is responsible more or less for at least health, education, jobs and the rest of its citizens which determine a level of social life of habitants. Normally, we imagine that the city actions in these fields are related directly to those stated goals, namely:

- Health; it is associated with support for the sick people, especially with the management of health services in the city area;
- Education; it is usually associated with the maintenance of schools providing services for people at a different age and with questions

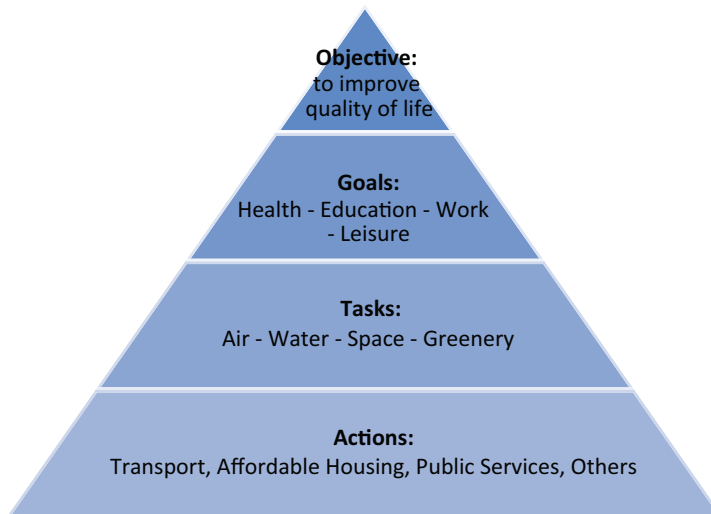
concerning free education, and to what age it should be free and for whom?

- Work; it is associated with the creation of new jobs.
- Leisure; it is associated with special places or utilities and methods of free time spending.

All these city's strategic goals mentioned above are only fair and refer specifically to the degraded areas. These relationships are visible in short, but especially in the long term. To achieve these goals specific actions should be undertaken by local authorities. The basic elements of the environment must be protected or created in a suitable way to achieve the above mentioned goals. The key of them are as follows: water (and sanitation), air, greenery and public spaces.

With the provision of these four components of the urban environment at the appropriate level they are the main necessary components of sustainable life for people living in every city. They require different actions carried out by the municipal authorities in various aspects of city life. Investments and the maintenance of urban systems: water supply, sewage, streets, public and private transport, public spaces, affordable houses, and in recent years a wide access to the internet and through it to a variety of useful applications are absolutely essential. All these actions allow to achieve the main objective and the other goals of the city (Figure 3.4).

Figure 3.4. Pyramid of the city strategy and revitalization purposes



Source: Bryx M., Lipiec J., Rudzka I., *Green Urban Regeneration Projects*. E-book, CeDeWu, Warsaw, 2015, p. 43.

These purposes, actions, tasks and goals are exactly the same for different deprived areas and for the city as a whole where they are located. However, the neglected areas need stronger social components because their lack is particularly felt inside these territories. To educate and train people from these areas and finally – to build communication between them and others habitants – this is a way of changing their lives and a face of a city.

8. Uniqueness and global challenges in a city strategy and its Local Development Plan

Principles and goals of regional strategies concern cities because cities are specific parts of the region; small spaces, in comparison with an area of a region, in which most of the regional population live. A region is not an abstract category but is real, physical and all its parts are physically touchable and a regional strategy is its own, not a sum of city strategies. The latter are built independently on a local level, but include key decisions written into a regional and central strategy because they are made according to the mainstream of different planned changes which will try to improve a face of the region and its citizens' life.

This is particularly true of activities in the region against the civilization challenges, especially caused by climate change, and building sustainable, green region. The strategy of the region is a place that needs to enter green cities' strategies. All levels of planning and government have the same main purpose – to improve their citizens' quality of life, but the structure of planned actions, methods of implementation and the ways of influence on lower level of governance can be different.

Strategies are not documents created to lie on shelves, but just to be implemented. Every implementation requires financial resources. The local authority can take money from its own budget, and from external resources. The most important of them are regional and central budgets which predict the sources to finance or co-finance goals included in regional and central strategies. If the local strategy is compared with the strategy of the region, it can count on funding from regional sources. The municipal government can also use private resources, but one activity does not exclude another. We can say the local city strategies can be or should be similar or partly included in the regional strategy but must not be subordinated precisely to the goals of the regional strategy. Both these kinds of strategies are created, according to the law, by special units that cooperate in their field of activities.

Preparing a local strategy every team/unit in a city starts from the analysis of the current situation in the city and in the region. Thus, first of all, it must find answers these all civilizational challenges facing the region and its cities and allow a space for each city to build their own strategy including specific features of the place.

Therefore a uniqueness and building an individual face of a city is one of important features of a city in creating its strategy. What can it be and how should it be developed and used for the city development strategy? These decisions are very crucial for the inhabitants. To make a decision means to make a choice of a shape and a face of the city and its future expenditures. Sometimes a question comes – should a city make marketing of its uniqueness and attracts tourists or it should spend its money fighting against unemployment? A phenomenon of unemployment is the crucial problem for inhabitants at deprived areas. The dilemma is extremely important for a local government too. It is the ideal solution when one manages to combine these two actions. If the action to attract city to people from abroad turns out as a success there will be jobs in two areas: in existing and in new services for tourist.

These new jobs in an extended marketplace create a permanent base for people lives for a long time. So, spending money on rather a seemingly different task than fighting unemployment, a city can have better results than spending it in an artificial, inconsistent with market principles, way. It is not easy to build such a specific solution but it is possible¹⁹. It requires very special interpersonal skills to explain it to inhabitants and gain their support for such an action. However, the uniqueness of the city is the most important factor that can be used in preparing a strategy and in a long period it better serves to the residents.

Thinking about uniqueness means remembering neglected areas as spaces that must be changed. Their specific features can help to build a strategy for them and for a city as a whole. The ways of changes these areas are parts of city strategy as well. A city cannot develop better quality of life for their habitants if it does not decide on future of these deprived areas.

According to the Polish law, Polish cities, as a lot of others in the world, have no mandatory obligation to build their strategies, but they do this because they simply need to have such documents and the visions of their development. Every Polish city is obliged by the law to prepare mandatorily a Spatial Development Study, which must cover the whole area of the rural or urban community. They also require a Spatial Development Plan which covers only the

¹⁹ It is not easy but it is possible. For example: *Holon – the city of children*. (The story of the city of Holon, General Strategy, Marketing and Branding), presented on 32 INTA Congress in Riga in 2008 & <http://www.holon.muni.il/English/Children/Documents/holon%20the%20children's%20city.pdf>, (accessed 31 Jul. 2015).

area(s) which are assigned for development. Although it is not mandatorily required, all local authorities prepare these plans. They are created only for urbanized parts of commune, thus only a part of the space is covered by these plans. Both documents must be accepted by the local government council.

What is the main difference between these two documents?

- A Spatial Development Study covers all the space of a local community and shows different assignments of areas: agricultural, forestry, waste, industrial, and post-industrial, urban for development or redevelopment. If the area is assigned for development, the study also shows their kinds: industrial, service, residential, storehouses, public investment (schools etc.). What is important: a study suggests, but also obliges. It does not allow for other kind of investment than that which is set out therein. Of course, it can always be changed by the authority which accepted it, but in the same long-term procedure.
- A Spatial Development Plan crystallizes ways in which development areas need to be specifically utilized. Therefore the plan does not cover areas whose purpose is to be unchanged. So, if (in the study) there is a suggestion that somewhere there will be a residential area, the plan specifies many details such as e.g. kinds of buildings (height, dimension, kind of materials, type of roofs etc.), streets, pavements, bike paths, parking lots among them, public spaces such as a kinder garden(s), school(s) or parks etc. And every plan creates obligations not only because it was harmonized with the neighbourhood, agreed with citizens in a special procedure, discussed in a city hall and finally accepted by the local council, but because it is an obligation to execute in the way presented inside. There are some commitments that must be realized and there is money in the local budget to finance them. Of course, every plan can also be changed in the same way in which it was enacted. But, a change of plan is often more troublesome and politically complicated than to pass the first version.

At least we can say that a Spatial Development Study is a spatial reflection on a local strategy. A Spatial Development Plan is an action plan for a local government²⁰.

²⁰ At this moment we should come back to the matter of uniqueness of a city. Most of the studies and plans of cities assess, especially in the neighbourhoods of big cities, that there will be created a new residential area. As a result there is twice more spatial place for residential areas than the country has now. It means that we can build flats for the next 40 million people, but the demographic growth is very close to zero, and there will be almost the same number of people for the next several years. This example shows that spatial planners usually treat every city in the same way. It means that inside a local authority there must be at least the person with a vision of city development.

At least we can say that a Spatial Development Study is a spatial reflection on a local strategy. A Spatial Development Plan is an action plan for local government²¹.

Reassuring, we can say: cities are not obliged to have their strategies. But they are obliged to have the studies, which, speaking very clearly, is a spatial blueprint of strategy. Sometimes spatial planners create their vision of city development repeating what was accepted in different cities. It does not lead towards the uniqueness and originality of place. A search for an originality of a space (a city) means that deprived areas should be included in this process. These areas are different and create unrepeatable opportunities of planning their development. Any action planned for any area inside a city, including a deprived area, must be written in the city action plan. In Poland, recently, when a special act of regeneration is being prepared by the Ministry of Infrastructure and Development there is a discussion how an action plan should be tied with existing plans of city development.

Mostly there are different approaches to the revitalization projects depending on a kind of regenerated area. Brown fields are usually put up for sale. The scale of the impact of the city is limited here. Usually, the cities are not the owners of such sites. They can only act politically with the owner or the trustee in bankruptcy to help to sell the area to an investor having an idea and money for its implementation²². Another situation is in the residential area (blocks of flats). People living there and their property managers are very interested in renovating these houses. To possess money from European Union funds, the city has to prepare a Local Regeneration Plan. In this plan, first of all, the crisis area must be delimited and meet the criteria for assistance.

Unfortunately, according the criteria accepted by the Polish government there are no these which concern to green urban concept. This is a mistake,

This vision can be drawn in details by professionals, but first of all must exist in one head. Then, it is possible to build the original strategy and plan taking into account the originality and uniqueness of the city.

²¹ At this moment we should come back to the matter of uniqueness of a city. Most of the studies and plans of cities assess, especially in the neighbourhoods of big cities, that there will be created a new residential area. As a result there is twice more spatial place for residential areas than the country has now. It means that we can build flats for the next 40 million people, but the demographic growth is very close to zero, and there will be almost the same number of people for the next several years. This example shows that spatial planners usually treat every city in the same way. It means that inside a local authority there must be at least the person with a vision of city development. This vision can be drawn in details by professionals, but first of all must exist in one head. Then, it is possible to build the original strategy and plan taking into account the originality and uniqueness of the city.

²² A city may help to find an investor and provide him special incentives. It can also invest in new roads or sewage system or water pipelines or education, train or retrain people according to the developer's needs or according to the services programmed in the project. It can encourage somebody to invest in a brown field if a city is friendly to an investor. As a rule, the city tries to persuade brown field owners to go to auction.

which is planned to be fixed in the EU next programming period. The second condition is to clearly define also the objectives and tasks of socio-economic development. Number of newly created jobs, in a consequence – people who create demand for products and services, or the methods of training, raising or retraining are the basic elements of the plan of revitalization. Their consequences will be visible as an increase of investors' interest in this area of activity and allow to realize a green concept of urban development

The other important condition is to draw up a cost estimate of the whole plan of action with the awarding of the sources of financing. This is a necessary condition for the involvement of public money, obtain funds, but also for developers and investors who should believe that this program is real and effective and they can participate in it.

9. Financial principles of Local Self-Government Units

Development and redevelopment processes take place in specific areas – the urban spaces. Their specificity lies in the fact that human life was lined by artificial constructions which have become a natural environment of human beings. These spaces are more or less adjusted to the differentiated needs of the residents of both their personal and collective, is more or less ordered and architecturally beautiful. The changing social needs and personal and external conditions cause constant interference of a man in these spaces, and this requires possession and disbursement of funds.

In Poland, in the light of the Local Self-Government Act, the basic territorial unit running its own financial economy is a municipality (a commune)²³. According to the law it can be distinguished: rural communes (municipalities), urban – rural municipalities, and towns and cities that can be divided into smaller subsidiaries administrative areas (districts). Municipalities are also combined into units of a higher order – counties (second level of local government administration) and province (region or voivodeship) – the third level of local government administration. As on 1 January 2015, Poland has 16 provinces, 314 counties, 66 cities on the county status and 2478 municipalities²⁴.

According to the law, residents of municipalities form a self-governing community²⁵. The objective of a municipality is to satisfy the collective needs of

²³ Parliamentary Act of 8 March 1990 about the commune self-government (Dz. U. 1990 No. 16 poz.95).

²⁴ <https://administracja.mac.gov.pl/adm/baza-jst/843,Samorzad-terytorialny-w-Polsce.html> (accessed October 2015)

²⁵ Parliamentary Act of 8 March 1990, *Ibid*.

inhabitants of every community. Its main goals strictly connected with green urban and to regeneration projects, are as follows:

- maintenance of space order, effective management of local areas, environmental protection,
- maintenance and development of municipal social housing,
- maintenance of municipal buildings and public facilities,
- maintenance and development of greenery and other public spaces²⁶.

Every municipality owns and manages its own assets, which includes property and other property rights belonging to a municipality and its associations and other communal property units, including municipal companies established under the law²⁷. Every community runs independently its financial activity based on the municipal budget; however, it is monitored by a Regional Account Chamber. A budget for the next calendar year is presented to a municipal council not later than by 15 November of the year preceding and must be accepted by it not later than by 31 March of a financial year.

Municipalities carry out two types of tasks:

- their own goals, due to their own plans and financed from its own revenues
- and tasks assigned by a country or regional government for which they receive special funding.

The municipalities own financial resources, used in accordance with their own action plans, which include:

1. Taxes, fees and similar revenues,
2. Income from municipalities' assets,
3. Proceeds from self-taxation of residents,
4. Legacies, write-offs, donations, and
5. Other incomes.

The municipality can also spend money obtained from a regional or central government but these financial flows are strictly dedicated to special municipalities' tasks imposed by these donators.

In other words, according to the Constitution, municipalities own revenues that include all revenues of local government units with the exception of general and dedicated subsidies, the purpose of which is clearly defined inside the law and the municipality expends them only in accordance with their intended

²⁶ Parliamentary Act of 8 March 1990, *Ibid.*

²⁷ Parliamentary Act of 8 March 1990, *Ibid.*

purpose. Shifting these funds for other important goals is impossible due to the law.

In the first and most important group of revenues, taxes and fees, we can indicate:

- Personal income tax – 39.34% of total income tax from individuals domiciled in the municipality, goes to the municipal budget,
- Corporate income tax – 6.71% of CIT paid by corporations registered in the municipality, goes to the municipal budget,
- Other, as follows: agriculture tax, forest tax, land tax, property tax, local taxes and fees including i.e. fee for a dog, gift tax, legacy tax, tax on means of transport, civil law activities tax (CLAT) and similar, in a 100% goes to the municipality budget.

The group called “other incomes” includes:

- Funds from foreign sources, non-refundable,
- Funds from the budget of the European Union,
- Other measures set out in separate regulations.

The group of revenues called other includes a different kind of fees charged under various types of inhabitants activities (stamp, fair, operational, environmental, etc. charges). As well as interest on late receivables carried and transmitted by other entities. As well as interest on receivables carried and transmitted too late by other entities.

Income taxes and property tax make up the largest pool of budget revenues.

Municipalities, in addition to their own funding needs from taxes and subsidies, may incur long-term liabilities and short-term in the form of credits and loans. These issues are regulated by the Public Finance Act²⁸. It is the primary source of funds, when the revenues from taxes and fees are insufficient for balancing expenditures.

Local government units may take out loans and issue securities for:

- coverage occurring in a budget deficit of local government during the transition year;
- to finance the planned deficit budget of the local government;
- repayment of earlier obligations with respect to the issue of securities and loans and credits;
- pre-emptive financing of activities financed from the European Union budget.

²⁸ Parliamentary Act of 27 August 2009 on Public Finance (Journal of Laws of 2009 No. 157, item. 1240).

Contracted loans and securities issued, with intended for the purpose referred to in paragraph 1 point 1 shall be repaid or redeemed in the same year in which they are incurred or issued.

Municipalities may also issue securities as bonds. According to the basic principles the issuer of the bond states that it is an owner of the bonds and commits to a specific benefit – monetary or non-monetary terms of the buyer. Bonds have their maturity date, interest rate, type and level of security. Due to maturity date of bonds we distinguish long, short and medium-term bonds. Because of the interest rate, there can be zero coupon bonds or indexed. Because of the accompanying security, bonds can be fully, partially secured or unprotected. All of these can be issued in a private placement or public issue.

To raise additional funds by the municipality through the issuance of municipal bonds the execution of additional municipality tasks that do not have been covered from other sources of financing is allowed, and security for municipal assets is generally considered to be good.

The possibility of a bond issue was given to local government units by an Act of public finance. Implementation of the issue is always preceded by a resolution of the municipal council, and the necessity arises from the Law on Bonds²⁹. Cash obtained by issued bonds can be spent by a local authority on different tasks according to the emission tasks, e.g. a community contribution to different projects or it can finance a whole planned project.

As part of the municipality budget, i.e. a balanced revenues and expenditures plan for the year, the municipality should take care that it does not exceed the allowable limits of debt. Until the end of 2013 alongside two limits apply;

- The amount of debt could not exceed 60% of the annual budget.
- The amount of handling all credits and loans could not exceed 15% of the annual budget expenditures³⁰.

According to the legislator these limits represented the scale of municipality safety of financial liquidity.

The most common cause of exceeding the permissible limit of 60% was over planned revenues in relation to real revenues achieved by municipalities. Exceeding the other existing limit (15% rate), based on instalments of loans, credits, bonds and others plus interest and the costs of guarantees and

²⁹ Parliamentary Act of 29 June 2005 about Bonds (Journal of Laws 1995 No. 83, item. 420).

³⁰ Parliamentary Act of 30 June 2005 about Public Finances (Journal of Laws of 2005, No. 157, item 1240) article 169.

warranties, and resulted from an improper estimation of current expenditure³¹. The debt of local government units is shown in Table 3.1.

Table 3.1. The number of local government units, which exceeded the debt limits

Local government units	2013	2012	2010	2008
Counties	5	5	0	0
Cities on a county status	6	7	2	0
Towns & urban-rural municipalities	37	41	28	1
Rural municipalities	40	41	40	2
Together	88	94	70	3

Source: Who is drowning in debt. Ranking indebted local governments, The Community, (Kto tonie w długach. Ranking zadłużonych samorządów, Wspólnota), the electronic edition:http://www.myslowice.pl/data/newsFiles/nr_19_ranking_-_zadluzenie_samorzadow.pdf (accessed 15 Jun. 2015).

Shown in Table 1, 88 local government units, are negligible fraction of the amount of these units. However, it is important that, in accordance with the law, they balanced on the verge of bankruptcy and the possibility of providing services to their residents was weakened. Criticism of this approach by local governments resulted in amendments to the Act by Parliament. The new law, in force since early 2014, created another indicator calculated individually for each local government. Article 242 of the Law on Public Finance introduced the principle of the analysis of current expenditure and revenue. Current expenditure should not be higher than planned current revenues, plus the budget surplus from previous years and free funds. An important change is that the expenditure incurred on projects co-financed from the EU sources have not been classified as current expenditure, if these measures had not been transferred to local governments during the financial year.

The new rules of the Act on public finances make access to the enactment of local budgets from the correct, consistent with the actual state budgeting, resulting from the various charges. The consequence of exceeding the new indicators will be no possibility of adoption of the budget by the local governments. To adapt to the new rules LGUs received a grace period of a few years.

According to a recent study made by the National Council of Regional Chambers of Audit, in the years 2014–2015 only 27 LGUs out of 2809 have not projected expenses associated closely with maintaining relations expenditure and revenue, as it was point out in the Act. It confirms that local governments show more and more responsibly approach to shaping their budgets, revenues,

³¹ http://samorzad.infor.pl/sektor/finanse/rachunkowosc_budzetowa/693521,2,Budzet-jst-na-2014-r-a-przekroczenie-indywidualnego-wskaznika-zadluzenia.html, (accessed 26 Dec. 2014).

expenses and debts. This approach will engender the possibility to invest and grow in their territories.

One of the innovations in the financial system of the municipality is participatory budgeting. Its aim is to increase the share of residents of the municipality in the decision making process of the local budget expenditures. A special amount of the budget is reserved and waits for inhabitants' decision on the possible disbursement of the amount for financing the tasks selected by the local community. Residents, through electronic channels of communication, create a list of project important for local community and then the community by direct vote chooses these projects to be funded, which are considered as the most important. In this way it begins to socialize the idea of managing public funds. Since the government we move to governance.

10. Local governments' green bonds as new class investments in the Climate Agenda

A new class of investment opportunities has emerged in the market in the most recent years. These investment opportunities are green bonds whose objective is to contribute to the mitigation of the climate agenda. In fact, these financial instruments are not new in the market because discussions on them have been intensified with the growing awareness of the climate compelling need for action. As their objective is to make an impact on the environment, then they are alternatively termed as green investments, clean investments, sustainable investments, etc. Without regard to the term used, green bonds connote environmental investments which attract environmentally aware investors.

Investments in the climate mitigation require an affordable and long-term financing that in many cases exceeds public finances. It means that the private financing has to contribute to this class of investments to achieve an impact on the climate. That is particularly evident in countries with illiquid financial markets. As a consequence, multinational institutions as the World Bank have to be involved to address and satisfy the climate needs. In particular, it is estimated that around USD 1 trillion of cumulative investments will be required by 2030 to meet the UN Secretary-General's "Sustainable Energy for All" objectives³². The need of these enormous investments in addressing climate issues calls for a new investment framework and new products to attract investors. The engagement of local governments seems to be pivotal in addressing both the most compelling

³² <http://www.un.org/wcm/content/site/sustainableenergyforall/home/Initiative>, (accessed 18 Mar. 2015).

environmental issues and attract investors by offering them attractive investment products as green bonds. Investments in green require a long-term orientation and an adequate risk/return proposition. This will also require a reduction in cost of financing that investors take into account in their investment decisions. Multiple financial mechanisms may be offered to satisfy these needs as guarantees, export credits, etc. The growing interest in green investments contributed to the emergence of green bonds. In this article, we analyze green bonds by outlining motivations for green investments and then overviewing vehicles for green investing. Next, green bond principles are outlined and explained. Finally, we refer to two brief cases of green bonds: (1) Municipality bond (Stockholm's County Council), and (2) Company bond (GDF Suez).

The interest of investors in green assets has been growing over the years mainly due to the involvement of the key worldwide actors as the World Bank, the European Bank for Reconstruction and Development (EBRD) and leading financial institutions. As this field of investment becomes in the nascent phase, the definitions and market standards constantly evolve over time. In fact, there is a multitude of green definitions and green approaches therefore some clarifications need to be provided prior to addressing investment issues.

The green investments may be conducted either in a *direct* or *relative* way. Green investments may be made directly as in clean technology while in the latter case they may mean companies' engagement in lower energy consumption as compared to market peers. We follow Eyraud et al. (2011) in defining green investments. They define the green investment as "the investment necessary to reduce greenhouse gas and air pollutant emissions, without significantly reducing the production and consumption of non-energy goods". As a consequence, there may be at least three kinds of green investments to satisfy these definitional criteria: (1) Low-emission energy supply (including renewable energy, bio fuels and nuclear); (2) energy efficiency (in energy supply and energy-consuming sectors) and (3) carbon capture and sequestration (including deforestation and agriculture) (Eyraud et al., 2011). These investments may relate to finished goods, services and technologies or processes. In particular, the latter category is important because as the final product may meet green criteria then the technology used to produce that product may not be necessarily green. In an ideal situation, the green orientation is exhibited at every organizational value chain, i.e. from raw materials till finished goods.

There is a multitude of green investment motivations that may drive investors to be green oriented. In essence, they may be based on their preferences ("green") and/or expectations (risk/return). Financial institutions may prefer expectations to preferences while non-profit organizations the reverse. Financial institutions are also driven by compliance and fiduciary duties (see Table 2 for more details on green motivations).

Table 3.2. Motivations for green investing

Financial considerations	Extra-financial considerations	Reputation	Compliance and fiduciary duty
<ul style="list-style-type: none"> Standard return criteria – expected returns of green companies or assets 	<ul style="list-style-type: none"> ecological 	<ul style="list-style-type: none"> reputation of the investor and the investee companies 	<ul style="list-style-type: none"> domestic law and regulation (e.g. in the form of SRI policy, ESG disclosure)*
<ul style="list-style-type: none"> Standard risk criteria – volatility, downside risk, value-at-risk (VaR), default risk, etc. 	<ul style="list-style-type: none"> scientific 	<ul style="list-style-type: none"> pressure by politicians, media, NGOs, etc. 	<ul style="list-style-type: none"> international conventions (e.g. UN Global Compact)
<ul style="list-style-type: none"> Standard diversification criteria – (possibly lower) correlation of green assets with other assets 	<ul style="list-style-type: none"> ethical, religious 	<ul style="list-style-type: none"> ‘intangible asset’, e.g. ‘community investing’ 	<ul style="list-style-type: none"> voluntary industry codes and principles (e.g. UN PRI, Carbon Disclosure Project (CDP), Global Reporting Initiative (GRI))**
<ul style="list-style-type: none"> Long-term risk consideration – non-standard risk criteria, (e.g. integration of tail-risk or black swan events, reduction of catastrophic risks by reducing long-term carbon emission) 	<ul style="list-style-type: none"> political, social 	<ul style="list-style-type: none"> marketing tool 	<ul style="list-style-type: none"> disclosure regulation
<ul style="list-style-type: none"> Internalization of (negative and positive) externalities (or ‘universal ownership’)** – via taxes and subsidies – via collective action of investor groups 	<ul style="list-style-type: none"> other ‘norm-based’ 		<ul style="list-style-type: none"> good governance codes for institutional investors and companies; corporate social responsibility (CSR).
	<ul style="list-style-type: none"> ‘double bottom-line’ or ‘triple bottom-line’ 		<ul style="list-style-type: none"> part of fiduciary obligations

* National SRI legislation for pension funds is reported to exist in at least eight countries in Europe: United Kingdom (2000), Germany (2001), Sweden (2001), Belgium (2004), Norway (2004), Austria (2005) and Italy (2005). France (2001) and Denmark (2008) have ESG reporting requirements for companies. Spain is working on SRI legislation. Elsewhere, Australia (2001) and Canada (2008) can be added.

** See Appendix 2 for more detail on investor initiatives.

*** The Universal Owner hypothesis is based on the idea that there is „no place to hide“ as (negative) externalities of investee companies will affect portfolio returns sooner or later in some form, e.g. taxes, insurance premiums, inflated input prices or the physical cost of disasters. See, e.g. Urwin (2011), PRI (2011a).

Source: Inderst, G., Kaminker, Ch., Stewart, F. (2012), *Defining and Measuring Green Investments: Implications for Institutional Investors*, “Asset Allocations”, OECD Working Papers on Finance, Insurance and Private Pensions, No.24, OECD Publishing, p. 16.

The Table 3.2 presents different green motivations which are not mutually exclusive. The most common financial considerations when investing in green are risk/return tradeoffs with the long-term horizon. The latter consideration was particularly postulated after the most recent crisis of 2008-2009. In addition, the environmental economics has developed after the concept of universal ownership had gained an interest some years ago. The universal ownership proposes that companies are to address externalities because they will affect them sooner or later and influence their earnings. Companies may focus their attention to green investments as a result of compliance and fiduciary duties. They may follow domestic law and regulation guidelines or global principles out of which the most resonating are the United Nations Principles for Responsible Investment (UNPRI) and the Global Reporting Initiative (GRI). The UNPRI formulated six principles on employing ESG (Environmental, Social and Governance) issues by institutional investors. The latter organization captures the environmental impact on living and non-living natural (eco) systems. This impact is measured by tracking inputs (e.g. energy, water) and outputs (e.g. emissions, waste). In addition, companies may comply with the codes of good governance. These codes have risen to prominence after the Cadbury Report's issuance in 1992. They have evolved over times to capture different needs, e.g. societal, environmental or reach different entities as non-governmental organizations, non-public firms or family firms. In green bond investment, the ESG disclosure is particularly relevant. Under the "E" issues companies are encouraged to reveal their non-financial performance in terms of the environmental engagement as greenhouse gas (GHG) emissions and energy efficiency undertakings. Amenec et al. (2010) conducted an extensive survey in Europe in which they asked about motivations for green investing among other things. The majority of respondents have replied that their motivation was a responsibility for the planet and society (81.91%). However the second motivator for that engagement was marketing reasons and company image (47.87%). The third reason for green investment was purely expectation of high returns out of these investments (36.17%).

The green investment field has evolved in the most recent times and green bonds have pioneered in the market in 2008. These investment opportunities were triggered as the desire of aware investors to contribute to climate change mitigation. The key motivator behind green investments is a reduction of carbon dioxide which is the primary pollutant to the atmosphere. In addition, the different green investment opportunities might be captured by investors as water, infrastructure, etc. Investors may use different investment vehicles to address particular green problems (see Table 3.3).

Table 3.3. An overview of vehicles for green investing

Asset class	Type of vehicle	Description	Example	
Equity	Indices	Include only stocks of companies that have “good environmental practices”	Screening	1. FTSE4Good Environmental Leaders Europe 40 Index 2. S&P Global Eco Index
			Thematic	3. WilderHill New Energy Global Innovation Index 4. S&P Global Water Index 5. FTSE KLD Global Climate Index
	Mutual funds		1. Calvet Large Cap—screening large-cap stocks with good reputation for environmental consciousness 2. Winslow Green Growth—small-cap fund investing in eco-friendly companies 3. Guinness Atkinson Alternative Energy—investing in natural resources	
	ETFs		1. PowerShares WilderHill Clean Energy Portfolio (PBW) 2. Claymore/LGA Green ETF (GRN)	
Fixed-income	Bonds	Bonds are usually issued by federally qualified organisations to raise capital to solve environmental problems	1. European Investment Bank—Climate Awareness Bonds 2. U.S. Treasury—“Green Bonds” 3. SEB & Credit Suisse—World Bank green bonds to support low-carbon development in developing countries	
Alternatives	Real estate	Real estate investment that is environmentally acceptable.	Micro: energy efficiency, recycling, etc. Macro: reducing greenhouse gases, carbon footprinting, less resource depletion, etc.	
	Infrastructure/private equity	Funds that invest in, e.g., environmental technology infrastructure	1. Miaoli Wind Macquarie Int’l Infrastructure Fund 2. Carlyle Infrastructure Partners (CIP)	

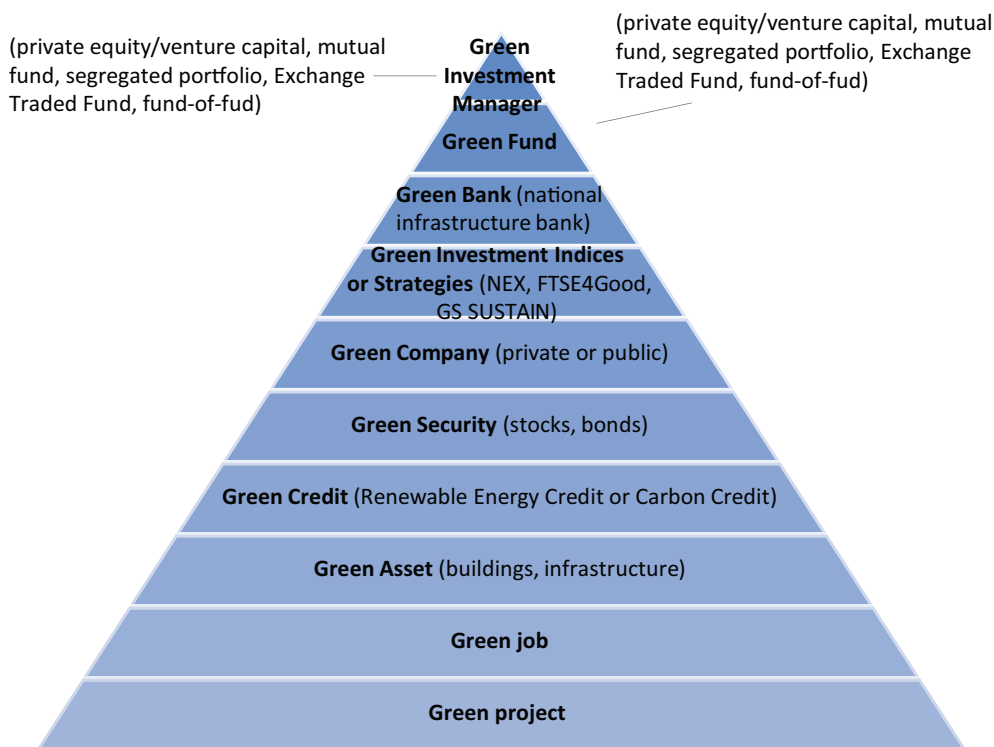
Source: Amenc N., Goltz F., Tang L. (2010), *Adoption of Green Investing by Institutional Investors: A European Survey*, EDHEC-Risk Institute, November, p. 18.

The equity investments mostly relate to sustainable investing. These investments may use a wide variety of vehicles as screening or thematic investments out of which environmentally aware companies and listed equities are the most frequently used by green investors. Indices are listed as primary

vehicles for green investments as they are the most transparent and used as reference for mutual funds or exchange traded funds (ETFs). The screening indices focus on screening companies' efforts made on behalf of environment. Two categories of screening indices spread over the world: Environmental, social and governance (ESG) and Socially Responsible Investing (SRI). In addition, there are regional preferences of green indices, e.g. investors prefer responsible investments in Europe, while in USA community-based investments. These indices were a hot topic among investors however the most recent crisis of 2007-2008 swept away almost all of them from the market. Thematic investments revolve around environmental themes such as investments in water, agriculture, etc. Investors may opt for different themes, however they may favor cleantech (30%), water (21%), global health (13%), sustainable forestry (13%) or microfinance (13%) (PRI, 2011). Investors may also use fixed-income investments as green bonds to impact environment. As these vehicles gained an immense interest among investors in the most recent times, we decided to provide some cases in the next sections of this article.

Green investments may also be tapped into an alternative investing. This are primarily real estate and infrastructure investments however investors may also use private equity, hedge funds or commodities. In particular the latter category explicitly refers to green as it focuses on natural and agricultural resources. The private equity industry has intensified its investment activities in cleantech or renewable energy companies (these terms are interchangeably used for green). Real estate industries increasingly focus their attention on the energy efficiency of buildings. The alternative investments are perceived by investors as short-term investments therefore they may not be seen as green investments as the primary focus.

In addition to discussing motivations behind green investments and vehicles that investors may use for satisfying their motivations, we present the green investment pyramid (see Figure 3.5). This pyramid prioritizes green opportunities available to investors. It refers to an involvement of the community's money for green projects as the background green opportunity and then moves upward to reach the green investment manager.

Figure 3.5. Green investment pyramid

Source: Inderst, G., Kaminker, Ch., Stewart, F. (2012), *Defining and Measuring Green Investments: Implications for Institutional Investors*, "Asset Allocations", OECD Working Papers on Finance, Insurance and Private Pensions, No. 24, OECD Publishing, p. 13.

In fact, the Figure 3.5 exhibits different categories of investments apt for green bonds. Green bonds may be used as special green projects or infrastructure projects with asset-backing features (e.g. clear energy projects). In addition, many companies also decide to issue corporate bonds labelled as green. Municipalities also have found out green investments as an attractive investment vehicle to address local infrastructure needs (e.g. the city of Gothenburg in Sweden). The Green Investment Bank set up by the UK Government may be referred as the dedication to the green economy at the governmental level. The priority investments of this bank include: offshore wind sector, energy efficiency, waste and bioenergy, community-scale renewables and other sectors³³. A green fund and green investment manager are found at the top of the pyramid. The

³³ <http://www.greeninvestmentbank.com/investment-sectors>, (accessed 11 Mar. 2015).

engagement of these investment actors may be exhibited by using in many more investment ways as those outlined in the Table 2. In fact, almost all investment actors monitor this emergent green investment market and if investors show an interest in this kind of investments then they try to offer them relevant products. The latest financial crisis revealed that many banks had become short of capital and overregulated therefore they have refrained from investments in emerging markets. This situation has made a way for green bonds' issuances not only in the emerging markets but also spread over those developed markets.

11. The cases of green bond issuances

In many countries investors may choose between stocks and bonds or invest in both securities. Institutional investors would rather focus on bonds as they prefer more secure assets in the long-term horizon. In recent times they have been offered a special class of bonds – climate or green bonds. The birth of the market for green bonds was possible due to the cooperation between the World Bank and the Swedish Bank – Skandinaviska Enskilda Banken AB (SEB). In essence, the difference between green bond and general bond rests on the purpose. Green bonds are used by municipalities and companies to address climate changes. In addition to the pivotal role of the World Bank and SEB in creating the market for green bonds, other international financial institutions followed suit as the European Bank for Reconstruction and Development, the European Investment Bank, the Asian Development Bank and US Treasury with its Clean Renewable Energy Bonds (CREBs) programme.

Green bonds are defined as: “fixed-income securities issued (by governments, multinational banks or corporations) in order to raise the necessary capital for a project which contributes to a low carbon, climate resilient economy” (Della Croce et al. 2011, p. 31). As mentioned above, the financial construction does not differentiate between a green bond and a general bond, the definition makes clear what kind of bond may be categorized as green. In addition, the green bond principles have been set up as the voluntary guidelines for issuers. According to these guidelines, four types of green bonds have emerged in the market: (1) green use of proceeds bond, (2) green use of proceeds revenue bond, (3) green project bond, (4) green scrutinized bond (GBP, 2014). Green bonds (1) and (2) are typically earmarked for green investments. The difference between them rests on the debt recourse as these bonds may recourse to the issuer or revenues. Green bonds may be also issued as the underlying financing for green projects. In this case they recourse to the project's balance sheet. The

green scrutinized bond may either be an earmarked bond or proceeds from the issuance may directly go to the underlying project. In both variants debt recourse is backed by projects that are grouped together. The list of green bonds issuances to date may be retrieved from the World Bank's dedicated website³⁴. Based on the data provided on this website, we may describe some common characteristics of green bonds. The majority of green bonds issued to date (80% as of March 18, 2015) bear the fixed coupon that varies between 0.25% and 10%. However, the average coupon equals 3.5%. The longest maturity date is 2045. After providing some overviews of green bonds, we focus on two particular examples in the next section.

We outline two green bond issuances in this section: a bond issued by a municipality and the other one by a company. In particular, we refer to the Stockholm County Council (Stockholms läns landsting – SLL) which placed a green bond to serve its all municipalities. The other bond refers to the GDF Suez which operates in the energy spanning its operations around the world. We decided to use these particular cases because Stockholm is amongst the first issuer of the municipality bond to reach out municipalities and GDF Suez one of the worldwide largest issuers. In addition, both have received positive second opinions.

Stockholm County Council is responsible for serving its municipalities by providing public healthcare, transportation and regional planning. SLL is comprised of 26 municipalities with over two million inhabitants. Its dedication to environment resulted in becoming the Sweden's greenest county council in 2013. In addition, the environmental objective of SLL is ambitious: reduction of greenhouse gas by 75% until 2020 as compared to the level of 1990. Charlotta Brask, the environmental director of SLL, has said the following about the environmental challenges: "All residents of Stockholm County are affected by the programme's environmental targets. 75 percent of public transport will have to rely on renewable fuels by 2016. And by 2020 the County Council's total greenhouse gas emissions should be at least 75 percent lower than in 1990"³⁵. However, Stockholm County Council goes further in its vision by declaring: "Stockholm County Council uses only renewable energy and fuels and in the most efficient way. The County Council's consumption of medical gases does not affect the climate. Planning and execution of both core businesses of buildings and infrastructure minimize environmental impact."³⁶ In satisfying this green dedication, SLL decided to issue green bonds worth of SEK 1.1 billion in 2014

³⁴ <http://treasury.worldbank.org/cmd/htm/GreenBondIssuancesToDate.html>, (accessed 18 Mar. 2015).

³⁵ <https://www.sll.se/om-landstinget/miljo/>, (accessed 19 Mar. 2015).

³⁶ Miljöutmaning 2016, Stockholms läns landsting.

earmarked for environmental projects. The purpose of this issuance was to reduce energy consumption and carbon footprint. In particular, they were dedicated to improve public transportation and buildings and waste and water management, i.e. Roslagsbanan (urban railway) expansion and new construction and renovation of Södertälje Hospital. SRI investors bought 67% of the bond placement. The major investors in these green bonds were Fondförsäkrings AB SEB Tryggliv, Västmanland County Council and Storebrand SPP.

GDF Suez is a multinational company headquartered in France that operates in electricity and gas resources. *GDF Suez* was founded in 2008 and with the revenues of € 74.7 billion as of 2014 is a global energy player. The company has a very ambitious goal of becoming a leader in the energy transition in Europe. In addition, *GDF Suez* by focusing on innovations and new businesses intends to capture the rising trend in deploying of renewable energy worldwide. In terms of environmental challenges, the company intends to decrease CO₂ emissions by 10% until 2020 as compared to the reference year of 2012 while increasing the reliance on renewables by 50% until 2015. The *GDF Suez* is committed to ESG by incorporating these issues at the highest corporate level. This is effectuated by setting up the Committee for Ethics, the Environment and Sustainable Development as the board committee. At the executive level, the company has set up the Environmental and Societal Responsibility Executive Committee. In addition, General Management Committee holds at least two meetings a year dedicated to ESG issues and investment committee take them into account as the second regard in the largest investments. Regarding ESG criteria in the company investments contributes to improvements in risk management and value creation in the long-term horizon.

GDF Suez has decided to issue green bond worth of € 2.5 billion (May 12, 2014) to achieve its environmental challenges related to renewable energies (e.g. wind farms and hydroelectric plants) and energy efficiency (smart metering and integrated heating networks powered by biomass plants). Investors were offered two tranches of this bond: (1) 6-year tranche of € 1,200 million with a 1.375% annual coupon, and (2) 12-year tranche of € 1,300 million with a 2.375% annual coupon³⁷. This has been the highest bond issuance to date among corporations. The demand for this bond has tripled the supply when placing the bond in France, Germany and UK. ESG investors bought out 64% of the placement. Gérard Mestrallet, CEO of *GDF Suez*, has addressed the importance of issuing this green bond as follows: “This unusually large issue will serve the strategic priorities and sustainable growth strategy of *GDF SUEZ* in renewables and energy efficiency in Europe and throughout the world. Last

³⁷ *GDF Suez, GDF Suez successfully issues the largest Green Bond to date*, Press Release, 12 May 2014.

week, this strategic priority was confirmed by GDF SUEZ winning the competitive tender for offshore wind farms in France. Projects financed by this bond issue will enable the Group to address the great energy and environmental challenges we face: meeting energy needs, ensuring security of supply, combating climate change, and optimizing natural resources³⁸.

The worldwide population growth impacts the environment and greenhouse gas emissions. It is estimated that GHG will increase by 50% if no actions are undertaken (OECD, 2012). Eventually, the GHG increase will lead to irreversible climate changes and greater poverty. Therefore the call for action has been propelled by many market actors including the finance industry. This was particularly evident with green bond issuances that had emerged to accelerate the climate mitigation needs. Although the call for action for the climate had been yet expressed under the UN Framework Convention on Climate Change in Rio in 1992, the green investments have gained an interest only in the most recent times. In particular, investors were grasped by the green bonds initiated in 2008 as the joint cooperation between the World Banks and the Swedish Skandinaviska Enskilda Banken. Many other institutional investors have followed suit.

This article set out some guidelines for green investments. We began with discussing motivations behind green bonds and referred to findings that 81.91% of investors were driven to this kind of investments because of the responsibility for the planet and society. Then we discussed the vehicles for green investing including green bonds and illustrated them on the green investment pyramid. Finally we referred to two cases of green bonds placed by Stockholm County Council and GDF Suez. We chose these cases because they were outstanding in serving municipalities (Stockholm) and impressive volume (GDF Suez). Both were positively opined, however by different rating institutions.

12. Summary

Regeneration projects should be planned and realized as a part of a city's strategy and be concentrated on changes that should be done at deprived city area(s). Neglected territories inside cities are created by different reasons but in post-socialist countries the most important of them was a radical change of an economy environment, called a transformation economy. The global economy and the global competition caused or revealed that a part of socialist industry was not able to face up to competitors from the world.

³⁸ *Ibid.*

Irrespective of the detailed reasons in every city, these areas with bankrupted companies, higher than average unemployment, lack of development opportunities, general sense of hopelessness and lack of future among habitants forcing local (and higher) authorities to intervene there. Not everywhere the phenomenon occurred with the same intensity, but in the countries that underwent the economic transformation there have been a lot of extreme examples.

In developed countries where cities have grown in a sustainable way rather to be green and friendlier to their habitants and visitors the general goal of a revitalization project is to improve a quality of habitants' life. It is the goal of each revitalization today, also in the post-socialist countries. It means that new functions and new activities are implemented in these neglected areas. It also means that habitants living there must be trained or educated to be recruited by new companies located in these areas. Urban revitalization or regeneration is not only a newly organized space or renovated buildings but mostly it is a big social and economic change in habitants' life at a deprived city's area.

An accomplishment of the change of a deprived area is a long, complicated and expensive process. As there are different deprived areas: homogeneous as post-industrial or heterogeneous like a city center the roles and relations between a developer of an area and a local authority are different in every case. But generally – an activity of each of these both partners in the regeneration process is particularly important and their cooperation is crucial to achieve the revitalization tasks and goal.

Building an action plan for a neglected area some conditions must be fulfilled, but generally the plan must be done in accordance with a general strategy of a city development. It should include a specificity of the area e.g. heritage to build a development strategy for the specific area. It also includes expectations of habitants (not only of the area but of the city as well) but all these visible and accepted needs are confronted by financial sources and managerial skillfulness.

In the most countries of market-oriented economy it is expected that a developer will finance a chosen project because of its future profits. Citizens, newly employed by him/her, will spend a part of their salaries and wages to improve their living conditions and environment. There are also projects financed by NGO's or special foundations, etc., as it was in New York with a spectacular High-Line project.

For post-socialist countries which accessed the European Union the Union created special funds which sources can be used by these countries to overcome a lack of money and solve problems occurred at these deprived areas. These European sources are supplemented by money from cities' budgets, bank

credits or some special undertakings as e.g. municipal bond issues. Between different kinds of the latter “green bonds” are specially predisposed to be used for these projects.

The authors have tried to show at the above text that all details concerning regeneration projects – their tasks and goals, methods of preparation those, ways of use, uniqueness in building a strategy for the area, method of financing them and other aspects, must be taken into account when an integrated action plan for degraded areas is being created. We concentrated rather to show main rules of revitalization projects and conditions in which they are created than to give a ready-made recipe, because every place is different and has its own conditions, tasks, and even habitants’ ambitious. A lot of positive examples are presented in different materials, published as the best practices, etc. However, to prepare and implement any revitalization project not only the knowledge but a determination of a local authority and society is required. This willingness to act, knowledge and awareness of conditions allows to manage the best project among the possible solutions.

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PART 4

Green Business Models in Highly Innovative Projects as a Tool to Reinforce Sustainable Development

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1. Introduction

The idea of sustainable development is a legally binding constitutional rule in Poland dating back to 1997, as the Polish Constitution in Article 5 states that “The republic of Poland (...) ensures environmental protection, being guided by the rule of sustainable development.” In the most common understanding, sustainable development is related mainly to environmental issues. However, the idea is a much broader concept than only environmental protection; it also includes concerns for future generations, for the quality of life, for equity between people, and for social and ethical dimensions of human welfare¹. Last but not least, it also focuses on inter-generational equity understood as a belief that people in the future, a vulnerable group that cannot defend itself now, deserve an environment which is at least as good as the one we currently enjoy, if not better.

Miller and de Roo start their book with a dedication: “To children and grandchildren everywhere – who provide a major reason for pursuing sustainable urban development²”. This clear and significant statement emphasizes the core elements of sustainable growth: responsibility, next generations and their future on the earth. A working definition provided by the World Conservation Union, UN Environment Programme and World Wide Fund for Nature (1991) stated that

“sustainable development means improving the quality of life while living within the carrying capacity of supporting ecosystems.”

Writing the present text in July 2015, we face much more frequent heat waves all across Europe, and some of the newest scientific reports saying

¹ Expert Group on the Urban Environment, European Commission, *European Sustainable Cities*, Brussels, March 1996, p. 21.

² *Integrating City Planning and Environmental Improvement*, D. Miller, G. de Roo (ed.), Ashgate Aldershot, 2004, byword (dedication).

climate change is likely to blame for the situation³. Climate change has become one of the most significant challenges of the 21st century as it may badly affect living and cultivation conditions, being as well a major threat to glaciers. For these reasons governments and international organisations now pay much more attention to a climate change and the ways of preventing this unfavourable trend. Every policy, including urban planning, will have to take climate change issue into account in the years ahead. Interestingly, more and more companies perceive sustainability as an opportunity to gain a competitive edge and create real value⁴: decrease costs, achieve innovation, access to new markets, brand loyalty, investor value and risk mitigation⁵.

The three main aspects of sustainability (people, planet, profit) are covered by a definition of eco-innovations provided by Reid and Miedzinski in 2008. They describe an eco-innovation as:

“the creation of novel and competitively priced goods, processes, systems, services, and procedures designed to satisfy human needs and provide a better quality of life for everyone with a whole-life-cycle minimal use of natural resources (materials including energy and surface area) per unit output, and a minimal release of toxic substances”⁶.

Eco-innovations are thus viewed as a tool enabling the reduction of ecological footprint, ultimately resulting in more sustainable development. Ecological footprint, also called the environmental shadow, is a concept that can be used to measure and express the quality and pattern of consumption of resources. It is defined as the “land required to feed a city, to supply it with timber products and to reabsorb its carbon dioxide emissions by areas with growing vegetation”. It is a useful tool for comparing the resources consumed by cities and all the environmental consequences of urban living and consumption in a single consolidated statistic. According to Rees and Wackernagel, who developed the concept of ecological footprint, the ecological locations of human settlements no longer coincide with their geographical locations. If cities want to achieve sustainability, they need to strive to reduce their dependence on external land areas⁷.

³ www.reuters.com/video/2015/07/03/people-animals-seek-heat-relief-across-e?videoId=364814121&videoChannel=117760 (accessed 8 Jun. 2015).

⁴ A. Sommer, *Managing Green Business Model Transformations*, Springer-Verlag Berlin Heidelberg 2012, p. 3.

⁵ UL Environment, *Assa Abloy: Investing in Sustainability Opens the Door for Business Opportunity. Designing for a More Sustainable World*, 2014, p. 1.

⁶ A. Reid, M. Miedzinski, *Eco-innovation. Final report for sectoral innovation watch*, Brussels, 2008, p. 2.

⁷ UN-HABITAT, *Urban Planning for City Leaders*, Nairobi 2013, p.4; P. Roberts, J. Ravetz, C. George, *Environment and the City*, Routledge. London, New York 2009, p. 10 and H. Girardet, *Creating Sustainable Cities*, Schumacher Briefing No. 2, Green Books, Bristol 2011, p. 27.

Cities are the focus of attention in this discussion because our world is now becoming more urban than rural. Cities are thus at the very centre of the fight against global warming. Building on Barber's comments, we would go so far as to state that cities can save the world (even if right now they are responsible for the majority of its climate-related problems). Barber argues that nation-states are obstreperous and fail us on the global scale. At the same time, a miracle of "glocality" happens with governing through voluntary cooperation and shared consensus at the city level⁸. Cooperation between local authorities, communities and companies may lead us to achieving a more inclusive economy, favourable to sustainable growth and development. Green innovative projects, often supported by various governmental agencies or funds, and developed locally, are favoured to reinforce that shift towards vibrant, inclusive, responsive and environmentally-responsible economy.

Given that cities⁹ are responsible for 80 percent¹⁰ of all greenhouse gases (GHG), Condon argues that the solution to the GHG problem should come from cities as well. According to Condon, deep change in the way cities are built and retrofitted may be the best weapon in fighting global warming¹¹.

This implies that cities should become more sustainable in the years to come. The core characteristics of a sustainable city are described in Table 4.1.

⁸ B.R. Barber, *If Mayors Ruled the World. Dysfunctional Nations, Rising Cities*, Yale University Press, New Haven&London, 2013, p. 3-6.

⁹ Note that, according to the European Commission, the areas of housing, mobility and food supply have the highest environmental impact throughout their full life cycle, accounting for around 70-80% of environmental impacts arising from all products over their life cycles. Cf.: European Parliament, *Eco-innovation: putting the EU on the path to a resource and energy efficient economy*, Brussels 2009, p. 16.

¹⁰ Pollution production in cities (being a side effect of industrial production) is high, but this is not entirely the fault of city dwellers; it is also a result of consumers outside the city. Likewise, overall pollution may be lower (or at least easier to control) if it is concentrated in cities rather than dispersed widely. On the other hand, city dwellers are focused on a quality of life in their places, and being a source of pollution, may be rather unimportant to them. Further, cities may be organised in more or less sustainable way, and they may be more or less people-friendly. Therefore, goals such as good public transportation systems or urban green spaces, among other examples listed in Table 1, are crucial to reshaping our cities into more sustainable entities, even if they come at what may appear to be a high opportunity cost. Moreover, in order to shift our economies and cities into becoming more eco-friendly, we should implement a whole life costing approach into our decision making processes, rather than looking simply through the more narrow lens of opportunity cost. Under the latter perspective, green urban space and efficient public transport, among other examples, may be perceived only as financial costs and as a loss of opportunities, but in fact the whole life costing approach may show that they may prevent higher long-term costs generated in health care, criminal justice, or other sectors.

¹¹ P.M. Condon, *Seven Rules for Sustainable Communities. Design Strategies for the Post-Carbon World*, Island Press, Washington, Covelo, London 2010, p. 2.

The role of green projects in achieving that goal cannot be overestimated. Furthering various eco-innovations has a potential to a sound solution for making our cities sustainable in multiple ways, including: good quality public transport, reduction in traffic volume, low pollution, local non-fossil energy generation, local food production, decrease of ecological footprint and liveability (Table 4.1).

Table 4.1. Characteristics of a sustainable city

Core characteristic	Description
Physical properties of the city	Containment Sufficient density to support services Adaptability
Provisions of the city	Readily available, good quality public transport Reduced and dispersed traffic volume Pedestrian walkways and provision for bicyclists Hierarchy of services and facilities Access to green space
Environmental and ecological conditions	Low pollution, noise, congestion, accidents, crime Available private outdoor space Range of green space habitats for nature Local, non-fossil fuel energy generation, including micro-generation Urban farms Local food production and consumption Small ecological footprint
Socio-economic conditions	Social mix that reduces social stratification Degree of local autonomy Degree of local economic self-sufficiency, including local firms 'Liveability' – good quality of life
Visual-formal quality	Positive 'image' of the city and its constituent parts Sense of 'centrality' Sense of 'place' (distinctiveness)

Source: prepared by the authors, based on: A. Tallon, *Urban Regeneration in the UK*, Routledge, London and New York 2013, p. 166.

However, eco-innovators face numerous obstacles while implementing their projects. Innovative entrepreneurs are often not creditworthy because banks perceive them as people with inappropriate financial experience and to be limited by lack of business skills. As a result, eco-innovators trying to commercialise their ideas face problems with raising long-term capital. In other words, they stumble on the "Macmillian gap." The amount of the capital raised from private sources (i.e.: their own private assets, micro-loans from friends and families, their companies' retention earnings – if any, crowdfunding, etc.) is

lower than the required investment expenditures for starting the project/activity.

This situation, common during the seed, early development and start-up stages, is a consequence of divergent expectations and requirements of surplus capital owners and eco-innovators. Surplus capital owners prefer picking the low-hanging fruit, i.e., investments with proven technology and efficiency implemented by mature companies.

Potential investors are cautioned by the possibility of higher investment risk in the case of eco-innovative early stage projects, due to relatively inexperienced managers and an uncertain market for their products (especially if the proposed technology is highly innovative). They also suffer from information asymmetry related to the core of the innovative idea. This may be overcome by detailed due diligence which is, on the other hand, another financial burden for early-stage entrepreneurs desperately seeking finance.

Moreover, some types of finance may result in losing control on the project. The choice of financing sources is thus a strategic decision as entrepreneurs have to consider several criteria when they are planning the most appropriate finance montage for their ventures.

Eco-innovators sometimes use business models similar to typical companies. However, some studies reveal that the models used may be more or less likely to cope with the barriers related with eco-innovations. The concept of green business models was introduced a few years ago as a positive answer leading to more sustainable and low-carbon development. Green business models are defined as

“business models which support the development of products and services (systems) with environmental benefits, reduce resource use/waste and which are economic viable. These business models have a lower environmental impact than traditional business models”¹².

They vary in size and shape and they have potential to:

- result in lower environmental impact
- generate solid business cases and jobs
- serve as a catalyst for innovation in search for delivering the same or better services with the use of less resources
- support company branding
- increase motivation amongst workers¹³.

¹² *Green Business Models in the Nordic Region. A key to promote sustainable growth*, 2010, p. 8.

¹³ *Ibidem*, p. 6.

Therefore it is vital to present the core elements of green business models as well as the main factors determining the best choice of a model. Those tasks are the main goal of the present chapter.

The first part of the text, dedicated to some barriers in backing green projects financially, constitutes a background for a typology of business models used for eco-innovative undertakings. This part will be expanded by illustrative case studies. Then we will examine factors that need to be taken into consideration by an entrepreneur wishing to achieve an appropriate finance montage.

The financing gap may be closed with the aid of public policies and instruments. In fact, during last few years the role of state-led interventions is growing: venture funds raised in Europe by government agencies accounted for 10% of all venture capital (VC) in 2007, but in 2011 the ratio had already increased to 34%¹⁴. Besides VC, various types of interventions are in use by European governments, including direct financing (grants, loans and guarantees) and incentives (fiscal or tax incentives). The role of those supply-side instruments in shaping green business models will be also discussed and evaluated in this paper.

2. Barriers for financing green investments

The text is dedicated to the new entrepreneurs that are innovators and that seek financial support in order to implement their green ideas (eco-innovations). We are not interested in analysing the situation of large-scale, well-established companies that are also active in the market of eco-innovative projects and that spend a vast amount of money on R&D. The reason for that is that they operate in a completely different (often more favourable) environment. Their entrepreneurial history and assets accumulated to-date facilitate the reduction of financial gap.

By contrast, young companies and start-ups by definition have no track record, they can often offer only limited collateral, and their relationships with lenders are either not-yet-established or not-long standing. As a result, general rules that normally apply to financial decisions about how to most efficiently back a given project with financial resources do not seem to apply in the case of innovative eco-projects, especially at the seed and start-up stages.

¹⁴ Presentation by K. Wilson, *Financing for Innovative Young Firms and the Role of Policy*, Investment, Enterprise and Development Commission 5th Session, Geneva 29.04-3.05.2013, OECD, p. 7.

Based on the study of Bertrens and Statema, it is worthwhile to underline that the crucial barriers in access to finance for eco-innovations are related to financial institutions (external barriers) and they include:

- financing tools that are inadequate or inappropriate to finance projects of smaller scale or innovative nature,
- insufficient engagements of finance suppliers with eco-innovative industries,
- uncertainty towards governmental regulations¹⁵.

What is the source of those differences in perception of green projects versus typical investments? The main reason lies in the nature of eco-innovative projects. They are, among others, characterized by:

- a different investment profile (higher set-up costs and often lower maintenance costs – resulting in a different return on investment profile)
- externalities (the collective benefits of eco-projects may be higher than benefits captured by an innovator itself),
- infrequent decision making (due to limited experience regarding similar projects, the decision-making process demands high involvement and high cognitive effort)¹⁶.

It is also illustrative to group the barriers to more widely spreading eco-innovations as follows:

- finance (lack of money flow),
- information (lack of knowledge flow),
- lifestyle/behaviour (cultural/social norms, anti-environmental behaviour)¹⁷.

Providers of external sources of capital are aware of those barriers and incorporate them into business case analyses while assessing eco-innovative projects.

Various market imperfections also hinder eco-innovators. Externalities perceived from a different points of views are the most important to underline here. Those aspects consist of:

- misaligned incentives or benefits: sometimes the innovator bears the majority of costs (and all risks) while benefits from the project are captured by community, competitors or public authorities,

¹⁵ C. Bertrens, H. Statema, *Business models of eco-innovations. An explorative study into the value network of the business models of eco-innovations and some Dutch case studies*, EIM, Zoetermeer 2011, p. 9.

¹⁶ *Ibidem*, p. 6 and 18.

¹⁷ European Parliament, *Eco-innovation...*, *op. cit.*, p. 36.

- wait and see syndrome. Large companies are unlikely to invest in eco-innovation unless the technology become proven,
- unregulated market with significant externalities may generate prices not reflecting the whole social cost or benefits. That leads to an inefficiency of the market.

It may be rational to be the “second mover” in order to benefit from the pioneer’s efforts (i.e., capturing positive externalities), but this may place innovators in a difficult and risky situation. Higher set-up costs are strictly related to the risk taken by entrepreneurs: when they start to innovate, all core elements of a project (technology, product or service, materials used, market) are new and undiscovered. This must result in higher risk level.

In order to transform externalities from being a barrier into an incentive for pioneers, governments of local authorities (depending on the scope of a given project) should provide regulations leading to internalizing and valuating external benefits. In other words, thanks to public regulation, a given externality can be incorporated (internalized) into a business model (as in the Cargohopper case, see the description in the box below), and in this way the market becomes more efficient.

**Cargohopper, the city of Utrecht (the Netherlands)
– how to internalize externalities in a business model?**

Cargohopper is a concept of eco-friendly city distribution by electric road train (“truck train”). All required energy is produced by solar panels while driving. One Cargohopper replaces 5 to 8 standard vans.

Cargohopper needed substantial investments and the financial barrier was thus the most important one as the project could not meet the requirements set by banks. However, the city of Utrecht had an interest in promoting an eco-friendly truck system for package delivery, and could support Cargohopper by introducing strict regulations concerning city distribution. That move resulted in internalizing the externalities in the business model of Cargohopper (i.e., the company could capture benefits as it was the first eco-friendly city distribution provider and it could therefore profit from having a competitive advantage). The city gave the company a permission to use bus lanes, permits to go anywhere in the city, and an exemption for the company from delivery time window restrictions (that apply to the other delivery companies operating with conventional trucks).

The Cargohopper systems have now expanded to Amsterdam and Enschede, and the Alke’ company offers zero-emission transport solutions in various modes of use, often customized (from electric ambulances, through waste collection vans, and even a portable ice cream shop), in sectors such as: tourism, industry, commerce, service and agriculture.

Source: prepared by the authors, based on: <http://www.notechmagazine.com/2009/10/cargohopper.html> [11.07.2015]; <http://velomondial.blogspot.com.es/2011/05/cargo-hopper-utrecht.html> [11.07.2015]; <http://www.alke.com/> [11.07.2015] and C. Bertrens, H. Statema, *Business models of eco-innovations. An explorative study into the value network of the business models of eco-innovations and some Dutch case studies*, EIM, Zoetermeer 2011, p. 39.

Another barrier that must be mentioned is the higher transaction costs for receiving information advice and support.

Moreover, the social basis (trust, support) for eco-innovative products is very important. The typical preconceived association is: “green = expensive”, and this is a stigma, especially in lower-income countries where consumers are not so environmentally-aware. Lifecycle thinking is not widespread and consumption/lifestyle patterns will (perhaps) change in the years to come. This implies that marketing activities concerning eco-innovative solutions need to be complex, nuanced, and carefully thought through.

The most significant elements of green business models determine the ways in which they can be financed. We will describe this issue in more detail in the following section of the text.

3. Core components of green business models

According to some research¹⁸, green entrepreneurs/inventors are often too focused on the environmental effects of their projects or their “save the world” mission, and therefore they tend to disregard the general rules shaping the market economy, which in turn may negatively affect their investments.

A well-designed business model of a new company or a project can solve two problems at the same time. First of all, it allows the business to survive (and even thrive) long after the initial launch of the product or service – which is often supported from the external sources. Secondly, a carefully shaped business model can also help the innovators to find external funding from private sources such as Business Angels (BA), VC or even crowdfunding platforms.

Innovators sometimes get external support (e.g., a grant, subsidy or donations) in order to prepare a working prototype of the project; however this funding is usually not designed to support the product launch to the market. In this “launch stage,” external private funding is needed, and that in turn requires an existing and well-prepared business model. Funding from private sources is available to projects or companies with excellent prospects. In search for external private funding, the environmental effect of the project is often relatively unimportant to a funder. The most important issue for capital providers is a certainty of loan repayment. In case of BA or VC the essential requirements are adequate returns on investment and future company’s future

¹⁸ Cf. C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 8 and EIM and Oxford Research for the European Commission, DG Environment, *Financing Eco-innovation*, January 2011, p. 44.

growth. Based on one of the findings of Bertrens' and Statema's research, eco-innovative companies or eco-innovative products/services often use traditional business models in their operations. In many cases that is sufficient to operate a successful business with positive or at least less negative effects to the environment than the competitors. However, due to the previously mentioned barriers faced by eco-innovators, following proven paths does not guarantee expected results.

Therefore, eco-innovative companies – especially young and small ones – are pushed to search for new solutions in order to develop green products or services, bring them to the market, and assure the growth in revenues and popularization of the product or service necessary to generate environmental and economic effects together. In order to achieve this, they have to innovate not only in terms of their product or service, but also in the way of doing business by preparing a suitable business model. As the experts interviewed by Bertrens and Statema noticed, eco-innovative companies use more complex revenue models more often than traditional companies¹⁹.

New green business models are also introduced by mature, well developed companies in order to promote new product or service lines which can be branded as eco-friendly, to limit waste production, or to create the image of an eco-friendly corporation. Such business models can apply to wide range of products, which do not have to be innovative. In such cases, the business model with its innovative solutions limits the negative environmental impacts of the company's operations and generates positive economic effects at the same time. These green business models were studied by Kristian Henriksen²⁰ and her team based on case studies of companies from the Nordic countries. They were able to meet the expectations of companies' CEOs by reaching targets in both fields – economic and ecologic – although usually in small scale in comparison with the entire company's operations. The same research also showed that the vast majority of these business models were financed using the company's own financial resources.

In order to distinguish elements of green business models used by both types of companies, it is useful to refer to the components of a business model proposed by Osterwalder & Pigneur²¹ – the so called "Business Model Canvas". It is one of the most commonly used frameworks to describe the business model, and is used not only by Kristian Henriksen but also Bertrens and Statema and other researchers. These components are presented in Table 4.2.

¹⁹ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 30.

²⁰ K. Henriksen (et.al), *Green Business Model Innovation, Empirical and literature studies*, Oslo, October 2012, p. 19.

²¹ A. Osterwalder, Y. Pigneur, *Business Model Generation*, 2009.

Table 4.2. Business Model Canvas

Key Partnerships <ul style="list-style-type: none"> the network of suppliers and partners that make the business model work 	Key Activities <ul style="list-style-type: none"> the most important activities a company must do to make its business model work 	Value Proposition <ul style="list-style-type: none"> the bundle of products and services that create value for a specific Customer Segment. 	Customer Relationships <ul style="list-style-type: none"> the types of relationships a company establishes with specific Customer Segments. 	Customer Segments <ul style="list-style-type: none"> the different groups of people or organizations that the company aims to reach and serve by its products or services.
	Key Resources <ul style="list-style-type: none"> the most important assets required to make a business model work 		Channels <ul style="list-style-type: none"> how a company communicates with and reaches its Customer Segments to deliver a Value Proposition. 	
Cost Structure <ul style="list-style-type: none"> all costs incurred to operate a business model 			Revenue Streams <ul style="list-style-type: none"> the cash a company generates from each Customer Segment 	

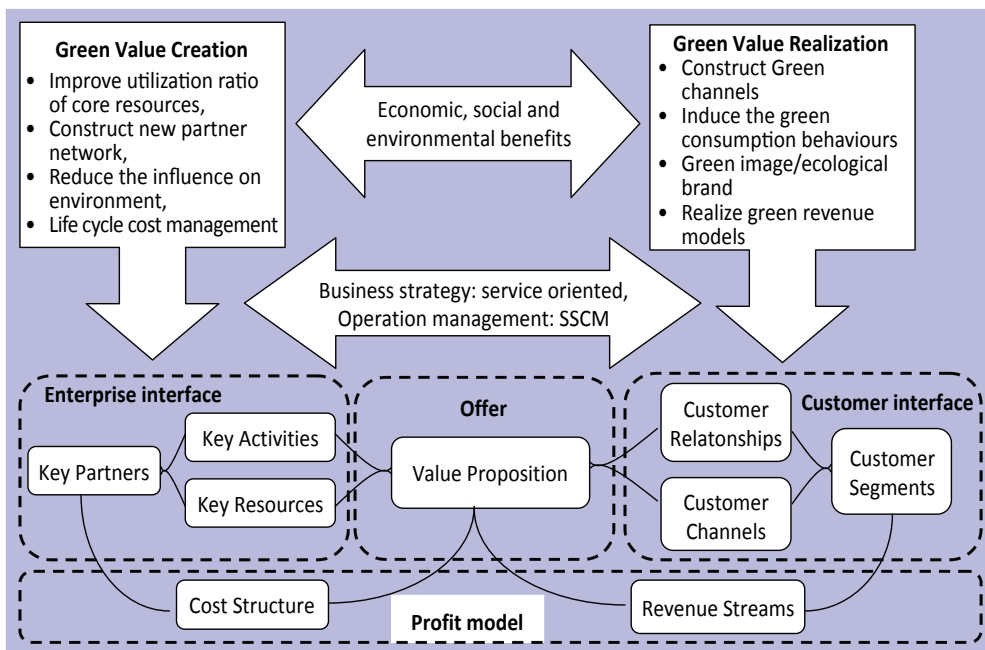
Source: Kristian Henriksen (et.al), *Green Business Model Innovation Conceptualization report*, October 2012, Osterwalder & Pigneur, 2009; pp. 18-19.

Based on the Business Model Canvas, Hao Jing and Bao S. Jiang created the framework of a green business model (see Figure 4.2) focusing on a green value creation and green value realization as the core logic in the development of new business models²².

Proper compilation of core business model elements gives a company a chance for a successful operation and long term survival in the market by specifically supporting green value creation and green value realization. All components are connected and interdependent, however some of them are of bigger importance than others in shaping green business models by helping the business to overcome the obstacles often faced by eco-innovative companies. The role of particular elements in shaping green business models will be analysed via our literature review (see below: Figure 4.1).

²² H. Jing, B.S. Jiang, *The Framework of Green Business Model for Eco-Innovation*, Journal of Supply Chain and Operations Management, Volume 11, Number 1, February 2013, p. 40.

Figure 4.1. The framework of a green business model



Source: Jing, Hao, and Jiang, Bao S. *The Framework of Green Business Model for Eco-Innovation*, Journal of Supply Chain and Operations Management, Volume 11, Number 1, February 2013, p. 39.

Value Proposition constitutes an offer directed to the market. Its shape decides if a product or service meets and satisfies the needs of Customer Segment. Without a proper value proposition the business model is deemed to failure, as the product or service does not provide sufficient incentive to the customers to be purchased by them. Eco-innovative products and services face higher initial costs as well as higher uncertainty due to the challenge of having innovative solutions replace old habits of customers. Due to that, the value proposition of a new green product or service has to be sufficient to overcome those barriers. Otherwise the customers will not experience (or perceive) a sufficient difference in product or service efficiency, and although there is a rising awareness of the need to protect the environment many eco-innovative products cannot succeed in the market through altruism alone. As research shows, the fact that the product is green usually is not enough.

This problem, among others, is faced within the field of renewable energy production processes. The utility of purchased energy is the same for green or for black energy²³ from the point of view of the final consumer. If the green

²³ Energy produced thanks to the combustion of fossil fuels.

energy is more expensive, the incentive of “improving the world” targeted at final consumers’ limits the possibilities to expand the market. This lack of incentives in many western countries was improved by Feed in Tariffs (FiT) schemes²⁴, but it shows also that without regulatory support the value proposition of green energy is so far insufficient.

Proper value proposition is crucial for innovators in an early stage of development, as they will need it as one of main arguments to convince the potential funders – especially Business Angel or VC, but also a bank. The environmental effect may be sufficient to get proper public support in order to create working prototype, as public institutions focus often only on the environmental potential of the innovative product²⁵. However, the environmental effect alone is usually far too little to commercialize the innovation, and this requires additional investments.

3.1. Enterprise interface of the green business model

The business model canvass is divided into four interfaces as presented in the figure above. The enterprise interface is responsible for the process of green value creation which includes changes in key activities, key resources and key partners²⁶. Green value creation concerns reduction of a company’s adverse influence on the environment by such actions as improving the utilization ratio of core resources, constructing new partner networks, and managing product’s life cycle.

Key Activities are the most important activities undertaken by a company in order to make its business model work. The issue is not only about what to do, but also how. In eco-innovative companies, especially those focused on efficiency improvements, the range of key activities is much wider than in typical companies, or even other innovative companies. Among them there are such activities as case analysis and advisory in a pre-sale phase, and monitoring with performance measurement in the post-sale phase. The scope of activities directly influences the costs which have to be covered by the company, which puts additional pressure on the economic results of an enterprise. The breadth

²⁴ It is a regulatory mechanism designed to support development of renewable energy technologies by providing long term purchase contracts for energy produced from renewable sources. Long term contracts guarantee the income at certain level, the prices are connected in larger extent with the costs of energy production using supported technology. The level of support is usually different depending on the used production technology – the more advanced technology, the lower support provided.

²⁵ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 34.

²⁶ Jing, Hao, and Jiang, Bao S., *The Framework of Green Business Model for Eco-Innovation*, *Journal of Supply Chain and Operations Management*, Volume 11, Number 1, February 2013, p. 43.

or scope of the company's key activities influences both its fixed and variable costs. To cover these costs, companies require higher revenue streams, which puts additional pressure on the price of eco-innovative products and services and on the economic performance of companies.

Key Partnerships is understood as the network of suppliers and partners that make the business model work. This element is especially crucial in case of business models focusing on "greening" the value chain, or the supply chain. It is often the challenge for eco-innovators to convince their partners – especially subcontractors or suppliers – to act in a different way than they are used to. Similar challenges can be faced with reference to distribution channels and marketing²⁷. This key partnerships element is especially important in green business models introduced by producers and focused on improving the production side of the business.

Key Resources – are the most important assets required to make a business model work, and they include physical resources (land, buildings, and infrastructure), intellectual resources (knowledge, brand, and data bases), human resources and financial resources. In the case of green projects, the high up-front costs are often the result of big needs in several areas – especially in terms of physical and intellectual resources, which translate in turn into higher financial needs, and put pressure on the cash flow of the project. Eco-innovative products or services are often aimed at limiting the use of resources by their target customers, but at the same time their implementation requires some additional resources. The challenge is to design green business models in a way that lowers the needs for key resources and thus help overcome the initial barriers related to high implementation costs – typical for eco-innovative companies.

3.2. Customer interface of the green business model

The second group of elements – customer segments, channels and customer relationships – create the customer interface, which aims at the realization of green value by constructing new distribution and information channels, introducing green consumption behaviours, creating an image of a green/ecological brand, and the realization of green revenue models.

Customer Segments are created by the different groups of people or organizations that the company aims to reach and serve by its products or services. The value proposition can be directed to the needs of the existing

²⁷ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 8.

customers, but the main challenge is to present the value proposition in a way which will allow customers to be gathered from different segments by inducing their green consumption²⁸. In order to expand the customer segment, the eco-innovative companies also have to develop proper customer channels and focus on building proper customer relations. The challenge is get through to customers who are not only eco-fans, but who belong to larger groups following traditional perceptions of utility. Getting to the proper customer segment is a challenge for companies, particularly in their early stage of development, due to their limited capabilities of using organized marketing and also their limited budget for that purpose.

Customer Relationships, understood as the types of relationships a company establishes with specific Customer Segments, have a great potential in developing green business models. Because of their typical approach based on the total cost of ownership and life cycle cost management, eco-innovative companies are well positioned to establish long-lasting customer relationships, which have the potential to become an important competitive advantage for them. However, such aspects as continuous monitoring, multiple contacts, and ongoing maintenance for provided equipment, result in higher costs of company operations. Nonetheless, well established customer relations can guarantee a basic level of income and be a source of strength in search for external funding.

Channels are a way a company communicates with and reaches its Customer Segments to deliver a Value Proposition. In green business models, new channels can be and are built not only to reach other customer segments but also for the purpose of reducing the waste and the influence on environment during the delivery phase of products/services²⁹.

3.3. Profit model of the green business model

The final group of business model elements, and crucial in terms of funding, is the profit model. It includes two elements – Cost Structure and Revenue Streams – which have to be balanced in order to make the business model work in a long term.

Revenue Streams, their level and frequency, determine the expected returns on the investment, and the project's ability to cover variable and fixed costs and generate profits. There are many types of revenue models designed so far for

²⁸ *Ibidem*, p. 44.

²⁹ Compare: Jing, Hao, and Jiang, Bao S., *The Framework of Green Business Model for Eco-Innovation*, Journal of Supply Chain and Operations Management, Volume 11, Number 1, February 2013 p. 43, and K. Henriksen (et.al), *Green Business Model Innovation, Empirical and literature studies*, Oslo, October 2012, p. 26.

regular businesses which differ significantly from typical sales of goods or services. Those are, among others, such models as Subscription System, User Model, Service Model, Market Data Broker Systems³⁰ and many others. They all aim at developing the revenue side of a project, taking into consideration the characteristics of the market and clients preferences. These models were designed to overcome some obstacles inherent in the traditional sale model.

However eco-innovative companies do not operate in a single eco-innovative market, but have to fit into many markets based on variable conditions. Therefore, they have to overcome the barriers within every particular market, as well as the unique additional barriers faced by eco-innovations. In their business models, eco-innovative companies have to avoid simplistic revenue models, as they offer complex solutions or products which operate on a different basis than the traditional products in the same market. Therefore, eco-innovators have to adjust the revenue streams by implementing more complex revenue models – often connected with the efficiency and effectiveness of the proposed solutions. Such revenue models may be perceived as more risky, and requiring longer time to generate revenues from the point in time when the costs are incurred. The separation (lack of direct dependence) of revenue streams from the incurred costs constitutes a source of the additional risk from the project funding point of view as well. One of the ways to overcome this unfavourable dependence is to manage the Cost Structure.

Eco-innovative companies can benefit from multiple governmental support programmes which aim at managing externality issues and support the switch to a sustainable economy. Such sources of revenues are also included in revenue stream calculations. Public support for green projects is available at all stages of their development in the form of funding for R&D, various tax incentives, and also regular subsidies during the company's operational stage as in the case of FiT. However, building the structure of Revenue Streams based on public support programmes and not based on the market rules puts the company in an unfavourable situation in the eyes of potential private investors, who perceive such business models as more risky.

The Cost Structure is understood as all costs incurred while operating a business model. It determines the financial needs of a company. As in case of revenue streams, it matters not only how high the costs are, but also how they are distributed in time, what they depend on, and if they are connected to tangible or intangible assets.

³⁰ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 26.

High up-front costs are perceived as one of the main barriers faced by eco-innovative projects, and therefore have to be taken into consideration while creating the green business model. Many companies work on a business model designed to limit the costs required in the initial stage of the business, or transfer them to other partners, or change their character from investment costs to operational costs. In other cases, the implementing companies tend to cover a wider range of costs than in typical business models in order to convince potential customers of the benefits offered by eco-innovations.

The cost structure is crucial for early stage eco-innovative companies. While challenged by the need for external financing, they have to design their cost structure with respect to potential financial supporters' point of view. Cost structure is important from the private investors' viewpoint – as they estimate the risk connected with the investment. This issue matters equally to public institutions providing support programmes, which have very limited types of coverable expenditures and costs.

In the next section various types of business models used to implement eco-innovations will be presented. The description will be supported by illustrative case studies in order to discuss the crucial elements making these models viable.

4. Typology of business models used to implement eco-innovations

The definition of a green business model cited earlier in this text is multidimensional and therefore many business models fall into this category. The research shows different results in terms of origins of green business models. According to the Bertrens and Statema study, so far the majority of green products and services are being launched to the market using traditional business models slightly adjusted to the characteristics of the new products. Such business models are based on cost savings identification, on cutting down on waste, or on improving on energy use. These are the so-called quick wins and are usually supported by simple business models. In turn, the analysis of 100 case studies conducted by SustainAbility in February 2014 shows that 75% of studied business model innovations contributing to sustainability were developed from scratch³¹.

Building on the literature review, we will examine green business models, primarily assessing their ability to overcome the aforementioned barriers faced by eco-innovative products and eco-innovative companies.

³¹ SustainAbility, *20 Business Model Innovations for Sustainability*, Oakland, February 2014, p. 49.

Business models may be systematized depending on their impact and utility to small and early stage companies which face the greatest market barriers.

The first group of green business models generates positive environmental effects in comparison with classic business models but it is used mainly in regard to all types of goods and services, not necessarily eco-innovative ones. In case of these business models, the focus is put on the cost structure and business elements gathered in the enterprise interface. They are being implemented mainly by large or medium sized companies, and their main drivers are the producers cost-savings, which may, but do not have to be, transferred to the final consumer. Although the environmental effect is often not the main aim of these business model innovations, the influence of new working patterns on the environment may be significant, due to the operating scale of the implementing party. Such green business models are listed and briefly characterised below:

- Industrial Symbiosis (IS),
- Take Back Mechanisms (TBM),
- Green Supply Chain Management (GSCM),
- Physical to Virtual (PtV),
- Cradle to Cradle (C2C),
- Design Build Finance Operate (DBFO),
- Waste Regeneration System (WRS),
- Resource Saving Companies (RSCO),
- Functional Sales/Product Service Systems – FS/PSS.

Industrial Symbiosis (IS)

IS focuses on business opportunities in better utilizing resources used in the production process. The idea of this business model is to utilize one party's side product as a resource in the activity of another business partner. To be operational in the large scale, IS requires location of cooperating parties within the same area or industrial complex. It is used almost exclusively by large companies present in large industrial sites, but may be engaged also in local municipalities, thus contributing to improvement of environmental performance of the entire region. The main economic benefits consider both cooperating parties and are connected with lower resource costs and lower waste disposal costs – which translates directly to lower pressure on the environment. IS influences mainly such elements of business models as Key Partners (by providing new strategic relationships) and Key Customers, and the result influences the profit model. It changes the Cost Structure by reducing waste disposal and raw material costs, and in some cases changes the Revenue Stream by providing income from the sale of side products. The well-known examples

of IS in the world are Kalundborg in Denmark and in Kwinana Eco-Industrial Park in Australia. These examples show that such a business model has limited chances to be implemented by companies in the early stage of development, but can contribute to the environmental development of local communities. The business model assumes the creation of a win-win situation in terms of limitation of operating costs of both engaged parties, but it also creates a sort of dependence between them which to some extent raises the risk of operations.

Industrial Symbiosis – Kwinana Eco-Industrial Park in Australia

The Kwinana Industrial Area is by far the largest and most diverse industrial area in the state of Western Australia. In 1991 the companies operating in the core industries present in Kwinana established Kwinana Industries Council, which originally was created to organize the required air and water monitoring collectively for the industries in the area. Now KIC is focused on a much broader range of problems and makes efforts to identify positive interaction between the companies within the area – the local government and community. Their actions led to launch of 47 synergy projects (2005) in such field as by-product synergies and utility synergies. Each synergy can involve multiple resource flows. As in the case when a by-product is being returned after processing to the initial producer, or forwarded to another company for further processing. Several examples of such symbiosis were described by Dick van Beers (et. al), and one of them concerns the cogeneration energy plant and pigment plant: “a cogeneration facility (40 MW), owned by Verve Energy, provides superheated steam and electricity for the process needs at the Tiwest pigment plant. (...) The cogeneration plant gets its water (potable and demineralized) and pressurized air from the pigment plant, and the facility returns its wastewater to Tiwest’s wastewater treatment plant.

Source: D. van Beers, G. Corder, A. Bossilkov, R. van Berkel, *Industrial Symbiosis in the Australian Minerals Industry The Cases of Kwinana and Gladstone*, Journal of Industrial Ecology, 2007, Volume 11, No. 1, p. 55.

Take-Back Mechanisms (TBM)

TBM is a business model which puts the responsibility of waste management of used goods on their producer. It limits waste, landfill and costs not only to manufacturers but also retailers and consumers. The economic effect is experienced mainly by producers, who, by gathering used products of a previous product series or generation, limit further production costs by re-use of some raw materials. This also limits the secondary market for previously produced goods. The most common take-back mechanism may be the recycling of bottles and aluminium cans. In such cases there is a slight incentive directed to a final consumer in the form of returnable deposit for each bottle or can. Similarly, as in case of IS, the TBM is used by and suitable for large companies with well-developed distribution channels where the idea can be materialized. It introduces changes mainly in the enterprise interface of business model elements by redefining Key Partners and Key Resources. However, implementation of such a business model requires some systemic changes in

operations which in turn adds new positions to Cost Structure. At the same time, the mechanism used by some electronic equipment producers serves also as a tool to shape Customer Relationships by binding the clients to a particular brand thanks to price discounts for clients who will give back the old electronic equipment. As with IS, TBM has limited usefulness to young and small companies, as it would be a struggle to come out with a proper Value Proposition to the customers who do not know the product's brand yet. While implementing TBM, a company needs to calculate potential savings in raw material purchase as well as the costs of collecting used products.

Green Supply Chain Management (GSCM)

GSCM incorporates into a business model an integrated concept of greening activities in the supply chain focusing on upstream flow, including cost reductions of and innovation in raw materials, components, products and services³². This idea has limited use as it is difficult to apply without negative impact on the Cost Structure of the companies. It has been used as an idea by IKEA in their IWAY, but still remains a code of conduct and not an official strategy. It results in large shifts in the Key Partners element of business model, however, due to high expectations it may negatively influence the Cost Structure of the business model. GSCM constitutes a chance for smaller companies to join such a business model of a larger company operating in the market in the role of subcontractor or supplier of intermediate products in a B2B relation.

GSCM introduced by the large companies is however a chance for smaller eco-innovative companies to cooperate in the role of supplier or subcontractor. Participation in a green supply chain can assure stable stream of revenues and be perceived as perfect collateral in search for external funding. At the same time adjusting own activities in order to fit into large company's supply chain poses high risk of dependence on a single source of revenues.

Physical to Virtual³³ (PtV)

PtV is a concept of elimination of a brick and mortar infrastructure in the company's activity in order to limit the resources needed to supply a customer with a product or service. At the same time the operating costs of a company are significantly limited, and the experience so far shows it to be a major incentive for companies. In times of rapid development of online services and sales it is

³² K. Henriksen (et.al), *Green Business Model Innovation, Empirical and literature...*, p. 16.

³³ SustainAbility, *op. cit.*, p. 24.

hard to treat such a business model as especially innovative, although with each year a wider range of services and products is available online – which suggests that the business model is implemented by an ever larger number of companies.

Similar business approaches are being implemented towards sale of goods, especially virtual goods such as video games, music, movies or IT programmes – which previously used physical items in the sale process (e.g., CDs, DVDs) but also some services. Here, electronic invoices may serve as a good example. They are being implemented and promoted by many service providers with the catchword of being an “environment friendly” solution but at the same time they generate visible savings in the Cost Structure of a company.

In both cases the economic benefits of a shift from physical to virtual are accumulated by the producer or distributor, and environmental benefits play a secondary role, although they are a result of lower use of raw materials and limited waste production.

Moving company activity online in its first stage of development is simple, and treating it as an eco-innovative action would be inappropriate in spite of the significant cost reduction it provides in comparison with traditional activity. Currently this approach is very common for companies in the early stage of development. However, there is still potential in moving some activities typically carried out with physical contact into the virtual world. One example of this is Sungevity, which managed to gain competitive advantage and deliver additional value proposition to its customers while generating additional potential for growth.

Physical to Virtual – Sungevity – PV installations provider– USA

Sungevity is American company which used elements of PtV business model in their activity. They provide solar installations to residential buildings together with financing schemes. In the ordering process the company uses a central office with proper IT infrastructure which allows the customers to receive a reliable price quote within 24 hours from the inquiry. The company uses local subcontractors only for installation work based on centrally pre-prepared offer and plans.

Thanks to limiting the number of physical offices and cooperation with local subcontractors the company was able to expand rapidly across American market and to other countries.

Source: SustainAbility, *20 Business Models Innovation for Sustainability*, p. 24, <http://www.sungevity.com/>

Cradle to Cradle (C2C)

C2C is an innovative business model that assumes total or major limitation of waste generation in the entire life-cycle of a product by designing it in a way that it is fully recyclable and can be used again as a raw material in production – therefore it is sometimes called Closed-Loop Production. Such business

models are used by small, medium and large companies, and usually refer in the first phase to a single product line in order to estimate its costs and profits balance. In addition to limitation of raw material use, C2C provides opportunities to reach new Customer Segments by offering value propositions appreciated by more environmentally-conscious clients. C2C became popular in the carpet industry, and several carpet companies use this business model in order to acquire raw materials for further production. Similarly to TBM, this business model mainly influences the cost structure – including both potential gains via limitation of required raw materials and losses via the costs of collecting the used products. Application of the C2C business model has limited impact on the financial side of the project, therefore it has very limited potential to improve the financing structure.

Design, Build, Finance, Operate (DBFO)

DBFO is a business model used in built environment sectors, especially in the construction sector. This business model was designed not as an innovative green business model, but similarly to more typical business models and their commonly used definitions. DBFO is used by companies to undertake capital intensive long-term construction projects where private finance, construction, service and/or maintenance are bundled into a long-term contract of typically 20-30 years. DBFO is in some extent similar to Product Service System (PSS), which will be described later. However, it is used for individual projects and the product (construction) is transferred to the purchaser. Such a business model requires high funding capabilities from the side of selling party, therefore it is rarely (if ever) implemented by early stage companies. However, in contrast to previously described green business models, DBFO supports building confidence and trust of customers in new, eco-friendly solutions. This way, thanks to higher financial and responsibility engagement of the delivering company, it is possible to overcome some of the main barriers faced by eco-innovative companies and products.

From the environmental point of view, long term contracts used in this business model also give incentives to product providers to improve the quality of the construction project so that the product total life-cycle costs are lowered.

The following group of business models is more suitable and more often used by eco-innovative companies in their early stage of development in order to launch their products or services to the market. They are often similar to business models of non eco-innovative companies, but adjusted in a way to point out the strengths of new green product or services and to overcome or solve some issues faced by the eco-innovative companies. The main adjustment

addresses the revenue streams by using special revenue models. We will discuss the strengths and weaknesses of these models from the point of view of an adapting company based on the case studies, and analyse them in terms of their influence on the company's financing capabilities.

Waste Regeneration System (WRS)

WRS is a business model similar to C2C and is based on the re-use or recycling of waste and transforming it into new products. This business model is focused on valuing waste, or using it as an input for a new product to be sold on the market³⁴. It can be implemented by large companies but also by small, innovative companies as in the case presented in the box below.

The main limitation in the use of such a business model results from the limited sources and ideas to use waste in order to turn it into a sterling product. The challenge is also to convince the waste producers to separate particular waste from the general waste and design economically reasonable collecting scheme.

Waste regeneration system – utilization of a waste coffee grounds bio bean – UK

Bio-bean is a young British company started in London by an architecture student Arthur Kay. It produces biomass pellets from waste coffee grounds, providing an alternative to fossil fuels. Bio-bean works within the existing supply chains to collect and aggregate waste coffee grounds produced by coffee factories, coffee shops, transport hubs and offices. Then the waste coffee grounds are recycled into biomass pellets, which are used to heat buildings. There are also advanced plans to start production of bio-diesel using the same raw materials. The company operates currently an approx. 2,000 sq. m coffee waste recycling factory, with the operational capacity of processing 50,000 tonnes of waste coffee grounds per year.

Bio-bean activity reduces waste collection costs of waste producers and eliminates waste disposal gate fees. Additionally the company creates local, renewable energy. The company business model is still changing. Currently it charges the companies providing waste coffee grounds for collection of waste, but the fee is lower than for typical waste disposal. So far the company has identified three main sources of coffee waste it plans to tap into:

- retail coffee outlets, such as high street chains and independent coffee shops;
- instant coffee production sites,
- coffee waste aggregators – such as shopping centres, airports and train operators.

The profit model of a company assumes income from the waste providers – so the raw materials for energy production come at a lower price or their collection generates not only costs but also some income – which lowers the operating expenses. At the same time income is generated by sale of the products (pellets and diesel) which are available for the customer at a lower price than similar products produced using ordinary production process.

Source: prepared by the authors, based on <http://www.bio-bean.com> (accessed 24 Jul. 2015), <http://www.mrw.co.uk/the-bean-machine/8663726.article> (accessed 24 Jul. 2015).

³⁴ A. Beltramello, L.Haie-Fayle, D Pilat, *Why New Business Models Matter for Green Growth*, OECD Green Growth Papers, 2013-01, OECD Publishing, Paris 2013, p. 31.

The economic sustainability of such a business model results in the long term from the dependence between the market price of final product (in our case study – biomass pellets) and the costs of waste acquisition and processing. In this case study, the processing infrastructure constitutes a significant part of cost structure – which requires financing in the initial phase of operations. The value proposition directed to final customers is purely economically-based, which in the first place suggests the use of private sources of financing.

RSCO – resource saving companies

This is a group of similar business models classified as incentive based mechanisms³⁵. Their main assumption is to provide additional value proposition to the customers in the form of a cost reduction guarantee by a limitation of resource use (materials, energy) achieved thanks to the products offered by the company. The main aim of such a business model is overcoming the mistrust in regard to new, innovative eco-products, which often prevents potential buyers from “switching to green”. Companies using such a business model transfer a risk connected with the product performance from the buyer onto themselves by binding the payment with the performance of the sold solution.

Among resource saving companies there are: Water Saving Companies (WSCo), Material Saving Companies (MSCo), and the most popular – Energy Saving Companies (ESCO). Implementation of such business models requires from the offering company much more efforts including acquiring external funding based on its own collateral and financial history. In contradistinction to the business models from the previous group, RSCO includes changes in all elements of the business model, especially the customer interface and the profit model. Companies using this business model need to be prepared to acquire significant funding in order to deliver the products, and at the same time focus on a long term return on investment based on regular energy savings.

This business model overcomes one of the major obstacles faced by eco-innovative companies – the issue of trust in new solutions. However, it increases the financial risk on the side of the implementing party, and increases the initial financial needs, by distributing revenue streams over longer period of time, which, in turn, results in such business models being less suitable for early-stagers.

Some companies using this business model (especially in the ESCO form) base their actions on an energy audit, and an analysis of individual cases in

³⁵ K. Henriksen (et.al), *Green Business Model Innovation, Empirical and literature studies...*, p. 8.

order to find systemic non-hardware solutions to reduce the use of resources. In such a case, the main costs are connected with the labour costs of professionals, and, to a lesser extent, with infrastructure investments. This allows young eco-innovative companies to enter the market, equipped with necessary knowledge and ideas.

ESCO solution

In recent years, a new approach to energy-efficiency investments has been developed. It is based on the concept of energy performance contracting (EPC). EPC is an alternative financing mechanism designed to accelerate investment in cost effective energy savings or renewable energy measures. An EPC provider typically conducts a comprehensive energy audit for the client, then designs and constructs a project that meets the client's needs, and arranges the necessary financing. The EPC provider guarantees that the improvements will generate energy cost savings sufficient to pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the client³⁶. This scheme is now becoming very frequent in Poland in thermo-modernization projects (e.g. Radzionków, Karczew, Ruda Śląska, Bytom, Dęba Wielkie, etc.). It is used in the legal form of public-private partnerships (PPPs), as described in the box below.

PPP in thermo-modernization: Radzionków case study

The goal of the project was to decrease heating energy consumption by more than 54% and decrease electricity usage by more than 39% in education buildings in the municipality of Radzionków. The private partner, Siemens, guarantees the level of energy savings. If that level is not achieved, Siemens is obliged to pay substantial compensation to the municipality. Because of that mechanism, the goal of a public partner (i.e., the required level of efficiency) also becomes the goal of a private partner. A report after the first year of operation indicated that the project was meeting the energy saving objectives designed in the PPP agreement.

Source: prepared by the authors, based on *Raport Partnerstwo publiczno-prywatne w Polsce w latach 2009-2011*, Ministerstwo Rozwoju Regionalnego, maj 2012, pp. 152-153 oraz P. Zamel, *Zwiększenie efektywności energetycznej obiektów użyteczności publicznej realizowane w formule performance contracting z wykorzystaniem partnerstwa publiczno-prywatnego – krajowe doświadczenia Siemens sp. z o.o.*, Forum PPP Nr 1/2012, p. 30-32, Biuletyn PPP Nr 2/2012, pp. 68-71.

³⁶ <https://www.bre.co.uk/eventdetails.jsp?id=6921> (accessed 15 Mar. 2014).

Functional Sales/Product Service Systems – FS/PSS

FS/PSS is a group of some of the most popular and diverse incentive-based green business models. In FS/PSS *“the provider offers the customer to pay for the functionality or result of the product instead of buying the product itself. The structure of the business model gives the provider the incentives to optimise and maintain the product to ensure life cycle cost efficiency, which in turn reduces the environmental impact”*³⁷.

This business model creates an incentive to improve the product output and to extend the life-cycle by increasing product’s durability and decreasing requirements for spare parts. The PSS business models may differ in detail, and there are also special business models originated from this general idea such as ESCO.

Tukker³⁸ presents three main of PSS models:

- Product Oriented PSS: this is a PSS where ownership of the tangible product is transferred to the consumer, but additional services, such as maintenance contracts, are provided.
- Use Oriented PSS: this is a PSS where ownership of the tangible product is retained by the service provider, who sells the functions of the product, via modified distribution and payment systems, such as sharing, pooling, and leasing.
- Result Oriented PSS: this is a PSS where products are fully replaced by services, such as, for example, voicemail replacing answering machines³⁹.

Similarly as other previously discussed business models, FS/PSS puts higher pressure on the product provider by transferring much of operational risk from the buyer and additionally puts a financial burden on the providing party.

³⁷ T. Bisgaard (et.al), *Green Business Model Innovation, Conceptualisation, Next Practice and Policy*, Nordic Innovation Publication Oslo 2012, p. 34.

³⁸ *Eight types of product-service systems: eight ways to sustainability? Experiences from Suspronet*, TNO, in *Business Strategy and the Environment*, 2004.

³⁹ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 28.

Renewable energy production – photovoltaic installation

There are several business models based on the idea of functional sales when it comes to photovoltaic. All fit into the Functional Sales business model group, however they differ slightly, which translates also to changes in their Cost Structure, Revenue Schemes and Key Resources.

Sun Edison PPA Agreement

Sun Edison is a company providing PV installation which introduced the Power Purchase Agreement which is a form of financial agreement regarding the purchase of renewable energy at a fixed price for the period of up to 20 years. Based on the signed contract the customer does not have to pay any up-front costs to be able to use the energy from the PV installation. In return the customer gives the space for installation and pays only for the energy produced by it. Sun Edison remains the owner of the installation and in fact provides only a service of energy production and delivery to the final consumer. The PV installation provider remains their owner, therefore it is the providing company who collects any benefits resulting from the government support programmes for renewable energy production.

A Shade Greener

A Shade Greener is a British company providing renewable energy produced using the PV installations located on the final consumer buildings/locations. As in case of Sun Edison, the company does not sell the PV installations but installs them on the roofs of potential customers and sells the produced energy. The customer does not pay for the installation, and additionally gets some income resulting from the rooftop lease agreement. Likewise, A Shade Greener also remains the owner of the installed PV panels and is entitled to receive any governmental support provided to renewable energy producers. The hosting party may, but does not have to, buy the energy produced from the PV installation, however the price is not fixed as in the previous case. The customer enjoys the use of green energy, and the system provider earns a profit on energy sales, but also on the use of public support schemes.

Source: <http://ashadegreener.co.uk/>, <http://www.sunedison.co.uk/residential-and-commercial/commercial-ppa.html> (accessed 24 Jul. 2015).

The FS/PSS business model gives a chance to overcome the barrier connected with uncertainty and high up-front costs from the point of view of a final consumer. At the same time, the service provider has to organize the long lasting funding in order to develop the activity – which can be a challenge. The given case studies include the lease agreement and power purchase agreement which can constitute collateral for potential bank financing. If the financing is available, such a business model allows for rapid expansion, and for holding the income at a high level for a longer time.

* * *

According to Bertrens and Statema, the following factors influence the choice of a business model for eco-innovations:

- the complexity of the innovation: the (expected) time scope of the innovation in relation to the question of whether or not the innovation is disruptive;

- the market conditions: market characteristics such as the capital available, the risk profile, support from legislation, the available market information (difficult in general, but often lacking in the cases where system innovations are introduced);
- the social basis (trust, support) underlying the innovation: an important necessity for a success business model⁴⁰.

Those determinants lead us to the issue of some other external factors that may influence the business model and its efficiency.

5. External factors influencing the business models and investment's efficiency

In the paragraphs above we discussed the core elements of a green business model and analysed typology and case studies of different business models which are being used to launch green products and services into the market or to limit a company's ecological footprint.

The analysis took into consideration mainly characteristics of goods or services offered using these business models. The companies with their business models and products operate in densely populated environments and have to take into consideration the activity of Key Partners. While constructing the business model companies need to take into consideration current market conditions, as *it can be said that market conditions can make or break a successful business model*⁴¹.

In case of eco-innovative products or services we cannot speak of a single market for eco-innovations⁴², as eco-innovative products are placed among regular products in a wide range of markets. Therefore each eco-innovation has to compete with regular products in each individual market.

The challenge faced by eco-innovative companies is similar to other companies, they have to compete on such elements as price, quality and scope of service provided. None of these elements takes into consideration the positive effect which eco-innovative products have on the environment. It remains a positive externality of such products which is hardly commercialized, and often cannot compensate for the often higher purchase price of eco-friendly products or services.

⁴⁰ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 32.

⁴¹ *Ibidem*, p. 33.

⁴² EIM and Oxford Research for the European Commission, *op. cit.*, p. 10.

Some companies try to overcome the issue of higher up-front costs by developing and promoting the idea of Total Cost of Ownership (TCO). This attitude points out the operating costs of a product during its total life cycle, including waste management. This way companies try to show positive economic effects of eco-products and try to convince customers to pay higher up-front costs. The obstacles met in the process of popularization of the TCO approach result in a large extent from the way companies and local authorities are organized and also by the way the tax system is organized. Large companies as well as local authorities operate on the basis of annual budgets, which assume some limits for expenditures for particular aims, which are usually calculated based on the market analysis of typical products. If there is a budget limit, the company or the local administration often cannot pay more up-front in order to save in the coming years, as they would exceed the budget limits. Large companies and public administrations are also often organized in such a way that other departments are responsible for purchase of goods and services, etc., for the operational use. Therefore the purchasing department does not have the incentive to spend more on equipment which will generate better performance for operational department. Finally, when it comes to taxes, the operational expenses limit the taxable income, while the purchase of assets can limit the taxable income with amortization, which in many cases limits the cost efficiency of a product in TCO approach.

As it is shown in many publications⁴³, regulations are the best tool invented so far to compensate for positive externalities and penalize the negative external effects on the environment. Eco-innovations, and eco-innovative companies become increasingly supported by new approaches to regulation, taxation or market design. Their role is to make the companies internalize the costs (or benefits) of externalities, i.e., to incorporate them into their accounts.

Regulations play the role of the “stick” – by punishing polluters – but they are used also as “carrots” – directly by making eco-innovative products more competitive in the market, thanks to some financial aid, or indirectly by creating better conditions and stimulating demand for some type of goods.

The role and strength of regulations is shown in the case of Cargohopper, which could compete with other, traditional distribution companies thanks to regulatory requirements set by local authorities. If the price of service remained

⁴³ Compare: E. Kesidou, P. Demirel, *On the drivers of eco-innovations: Empirical evidence from the UK*, “Research Policy” 2012, vol. 41, no. 5.; J. Horbach, C. Rammer, K. Rennings, *Determinants of eco-innovations by type of environmental impact – The role of regulatory push/pull, technology push and market pull*, *op. cit.*, Frondel, N. Ritter, C.M. Schmidt, C. Vance, *Economic impacts from the promotion of renewable energy technologies: The German experience*, “Energy Policy” 2010, vol. 38, no. 8.

the only aspect influencing the decision of local authorities, traditional distributors would probably win the competition. However the price would still not include the environmental costs of the use of traditional not zero emission cars. The case of Cargohopper shows the impact of regulations on the economic potential of eco-innovations, and there are far more examples of such influence.

A Shade Greener company (described before) was able to offer individual consumers the PV installations for free, and was able to sell those customers the solar energy at a lower than market price thanks to the income generated from Feed In Tariffs paid by the British government and thanks to the sale of green certificates generated by the production of energy from renewable sources. In such a case, the main income was not generated by the sale of the solar energy, but by the benefits resulting from regulations that are currently in force in the UK. When the rates for FiT dropped, A Shade Greener had to give up such a business model, and focus on revenues from actual customers⁴⁴.

The cases above show the strength and force of regulations in creating, shaping and destroying the market for eco-innovations. If we add to typical regulations public support in the form of subsidies and grants, it becomes clear that local and national governments have extremely important roles to play, and their actions influence the entire eco-innovative sector. This potential can have both positive and negative effects, as a small change in the regulatory framework can strongly influence the market of eco-innovations by lowering or destroying the demand for some goods in a moment. Therefore, it is also understandable that eco-innovators point out regulatory shifts as among the main barriers in developing sustainable business models for eco-innovations. Similar attitudes were also shown in the study by Bertrens and Statema, where the recommendations for good green business models have been prepared. A good green business model should:

- use revenue models which are self-supportive (i.e., preferably not depending on subsidies);
- be developed by hard and continuous work;
- be based on partner networks;
- use active ambassadors which are crucial to open up new markets⁴⁵.

While going through the types of business models described earlier, it can be said that many of them – if properly calibrated in terms of revenue streams and cost structure – can overcome the dependence on regulatory support. Such business models as Industrial Symbiosis, Take-Back Mechanism, Cradle 2

⁴⁴ <http://www.solar-facts-and-advice.com/solar-rooftop-leasing.html> (accessed 24 Jul. 2015).

⁴⁵ C. Bertrens, H. Statema, *Business models...*, *op. cit.*, p. 8.

Cradle, and Waste Regeneration Systems depend mainly on the price of raw material (resources); as the price of raw materials increases, the profitability of such business models should increase as well.

Business models such as Design, Build, Finance, Operate or ESCO and other resource saving companies depend mainly on the price of energy or other utilities. These are in many countries still regulated and often set at a lower than sustainable level. In such cases, deregulation can have more positive than negative aspects.

The cases of Cargohopper, A Shade Greener and many others show that the highest risk in regard to dependence on current regulations concerns the Functional Sales/Product Service Systems – FS/PSS. This is the most widespread business model and available in multiple combinations, therefore not all companies which implemented it are affected by regulatory changes in single field. Therefore it seems however that these business models are generally quite resistant to regulatory fluctuations. It makes them seem well designed when compared to typical business models based on sales of products or services.

6. Business models in overcoming the market failures

The effectiveness of a business model in overcoming market failures faced by eco-innovative entrepreneurs depends not only on its form, but also on the external conditions listed above. Nevertheless, the previously listed business models have potential, and were designed among other reasons to overcome some market failures and/or market barriers faced by eco-innovations, and by eco-innovative companies in the market. Below we present a summary of these business models, categorized by the types of market failures they address (using the three previously defined fields: finance, information and lifestyle/behaviour) and separated by area (producer-based failures, consumer-based failures, and general market failures)⁴⁶.

⁴⁶ The general market failures listed in many publications include: positive and negative externalities, imperfect information or information failure (causing issues with consumption of merit and demerit goods), public goods consumption, market monopoly dominance, factor immobility, and equity (fairness) issues.

Table 4.3. Market failures addressed by the business models

Business Model	Market failures, imperfections or barriers addressed by the business model:		
	Producers/Services or goods suppliers	Consumers/Users	General
Industrial Symbiosis (IS)	<ul style="list-style-type: none"> • information – inter-party coordination problems and information asymmetries 	n/a	<ul style="list-style-type: none"> • limitation of negative environmental externalities • factor immobility – location of companies near the source of raw materials
Take Back Mechanisms (TBM)	<p>lifestyle/behaviour – addressing the goods ownership issue and responsibilities</p>	<ul style="list-style-type: none"> • lifestyle/behaviour – creating new behaviour standards and expectations • lifestyle/behaviour – differentiation of eco-products from regular products 	<ul style="list-style-type: none"> • waste limitation, • limitation of public goods consumption
Green Supply Chain Management (GSCM)	<ul style="list-style-type: none"> • information – inter-party coordination problems and • information asymmetries in the supply chain • lifestyle/behaviour – creating good practice examples 	n/a	<ul style="list-style-type: none"> • limitation of negative environmental externalities
Physical to Virtual (PtV)	<p>finance – limitation of required financial resources</p>	<p>lifestyle/behavior – transfer of services and products to virtual reality</p>	<ul style="list-style-type: none"> • limitation of resources consumption • limitation of public goods consumption
Cradle to Cradle (C2C)	<p>lifestyle/behaviour – transfer of higher responsibility for material use to producers</p>	<p>lifestyle/behaviour – creating new behaviour standards and expectations</p> <ul style="list-style-type: none"> • lifestyle/behaviour – differentiation of eco-products from regular products 	<ul style="list-style-type: none"> • limitation of resource consumption • waste limitation

Table 4.3. Cd. Market failures addressed by the business models

Business Model	Market failures, imperfections or barriers addressed by the business model:		
	Producers/Services or goods suppliers	Consumers/Users	General
Design Build Finance Operate (DBFO)	<p>lifestyle/behaviour – transfer of higher responsibility for product efficiency and durability to producers</p>	<ul style="list-style-type: none"> • information – addressing the risk aversion and information asymmetries between the consumer and service provider • finance – limitation of required financial resources • lifestyle/behaviour – differentiation of eco-products from regular products 	<ul style="list-style-type: none"> • limitation of resource consumption • limitation of negative environmental externalities
Waste Regeneration System (WRS)	<p>lifestyle/behaviour – transfer of higher responsibility for material use to producers</p>	<ul style="list-style-type: none"> • lifestyle/behaviour – differentiation of eco-products from regular products 	<ul style="list-style-type: none"> • limitation of resources consumption • waste limitation,
Resource Saving Companies (RSCO)	<p>lifestyle/behaviour – transfer of higher responsibility for product efficiency and durability to producers, transfer of financial risk to producers</p> <ul style="list-style-type: none"> • finance – changing cash-flow patterns in time 	<ul style="list-style-type: none"> • information – addressing the risk aversion and information asymmetries between the consumer and service provider • finance – managing timescale for infrastructure replacement and investment return • lifestyle/behaviour – differentiation of eco-products from regular products 	<ul style="list-style-type: none"> • limitation of negative environmental externalities

Table 4.3. Cd. Market failures addressed by the business models

Business Model	Market failures, imperfections or barriers addressed by the business model:		
	Producers/Services or goods suppliers	Consumers/Users	General
Functional Sales/ Product Service Systems – FS/PSS.	<p>lifestyle/behaviour – transfer of higher responsibility for product efficiency and durability to producers</p> <ul style="list-style-type: none"> • finance – changing cash-flow patterns in time 	<p>information – addressing the risk aversion and information asymmetries between the consumer and service provider</p> <ul style="list-style-type: none"> • lifestyle/behaviour – overcoming the dominant design and patterns in the economy • lifestyle/behaviour – differentiation of eco-products from regular product, • finance – changing cash-flow patterns in time 	<ul style="list-style-type: none"> • limitation of negative environmental externalities • waste limitation • limitation of public goods consumption • limitation of resource consumption

Source: Own work.

As demonstrated by the table, the majority of business models address market failures in the field of lifestyle and behaviour, either on the part of final consumers, on the part of producers or service providers, or (mainly) on the relation between these two groups. By contrast, financial aspects are addressed mainly by the Business Models such as RSCO, FS/PSS and DBFO which are focused on transferring the risk from final consumer to product/service provider.

7. Conclusions

It appears that shaping a business model in a green way influences mostly Value Proposition, Cost Structure, Key Partners and Key Resources⁴⁷. Those elements have to be thus carefully set-up while constructing a business model. On the other hand, owing to the fact that eco-innovative solutions are vulnerable to externalities, the role of governmental support and regulations is substantial, and entrepreneurs can decide if they are likely to “grab profits” from the regulations (in other words – if they want to become beneficiaries of the

⁴⁷ K. Henriksen (et.al), *Green Business Model Innovation, Empirical and literature studies*, Oslo, October 2012, p. 19.

regulations or if they rather prefer to structure their company to be independent and not reliant on subsidies. The choice may vary, depending on the stability of regulations in a given state and the level of trust that companies have towards governments).

Regardless of a choice of a business model, every entrepreneur will finally face the question about achievable financial sources. The research undertaken by us in preparing the *Green Project Funding* e-book led to a conclusion that some types of finance resources are more achievable for eco-innovative startups than the others. For instance, microloans, seed funds in the form of VC funds, and business angel financing may be fundamental sources of capital for those kinds of companies and projects.

In fact, eco-innovative startups face so many difficulties in securing finance that the question is not “how expensive it might be to raise finance” but rather “is it at all possible to obtain finance for my project”? As mentioned before, the tendency to focus on the nature of innovation, and underestimation of the effects of market rules may adversely influence eco-innovative projects. For that reason, the awareness of advantages and shortcomings of various green business models is crucial, and may limit the number of failures in eco-innovative undertakings.

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PART 5

**Selected Aspects Regarding Development
of Urban Entrepreneurship**

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1. Introduction

This part deals generally with selected aspects (perspectives) regarding urban entrepreneurship. It is interesting to observe that numerous urban areas all over the world intensively seek how to develop their competitiveness for the future. Quite often this would mean development of favourable conditions for entrepreneurs. In many cases, sustainable projects or eco-innovations would emerge.

In the first part of the text, Ewelina Szczech-Pietkiewicz discusses the phenomenon of entrepreneurship and its importance for development in the context of urban competitiveness. To illustrate the theoretical discussions, the short case of Barcelona will be presented.

In the second part of the text, which was written by Katarzyna Negacz, we continue the discussion on how entrepreneurial activities are linked to sustainable development in urban areas. The idea of sustainable development and sustainability opportunities in the city is presented. This is followed by considerations on the case study of Taipei city. We emphasize that even relatively unsustainable city, as Taipei in the 1990', may be transformed and create green possibilities.

Finally in the third part, Marcin Wojtysiak-Kotlarski touches upon entrepreneurship and socially responsible investments in urban context presenting the case of start-up scene in UK (Tech City in London).

Motto

"The world isn't flat," writes Edward Glaeser, "it's paved." At any rate, most of the places where people prefer to dwell are paved. More than half of humanity now lives in cities, and every month 5m people move from the countryside to a city somewhere in the developing world. (...) Mr Glaeser, a Harvard economist who grew up in Manhattan, (...) calls cities "our species' greatest invention": proximity makes people more

inventive, as bright minds feed off one another; more productive, as scale gives rise to finer degrees of specialisation; and kinder to the planet, as city-dwellers are more likely to go by foot, bus or train than the car-slaves of suburbia and the sticks”.

“What makes some cities succeed while others fail? Successful places have in common the ability to attract people and to enable them to collaborate. Yet Mr Glaeser also says they are not like Tolstoy’s happy families: those that thrive, thrive in their own ways. Thus Tokyo is a national seat of political and financial power. Singapore embodies a peculiar mix of the free market, state-led industrialisation and paternalism. The well-educated citizenries of Boston, Milan, Minneapolis and New York have found new sources of prosperity when old ones ran out”.

“Mr Glaeser is likely to raise hackles in three areas. The first is urban poverty in the developing world. He can see the misery of a slum in Kolkata, Lagos or Rio de Janeiro as easily as anyone else, but believes that “there’s a lot to like about urban poverty” because it beats the rural kind. (...) The second is the height of buildings. (...) He likes low-rise neighbourhoods, (...) but points out that restrictions on height are also restrictions on the supply of space, which push up the prices of housing and offices. That suits those who own property already, but hurts those who might otherwise move in, and hence perhaps the city as a whole. The third, related, area is sprawl, which is promoted, especially in America, by flawed policies nationally and locally. Living out of town may feel green, but it isn’t. Americans live too far apart, drive too much and walk too little”¹.

Start-ups are the future as they would grow into tomorrow’s big global companies. *“My students can be too focused on working in large investment banks and consulting firms, but we think the future is on the innovation side”².*

¹ Three excerpts are taken from an article published by “The Economist” in early 2011. The article reviews a new book titled “The Triumph of the City” by Edward Glaeser, a Harvard University professor, who is regarded as one of key global experts on urban issues. See more in: A Tale of Many Cities, An enthusiastic guide to the blessings of human proximity, Feb. 10th, 2011, <http://www.economist.com/node/18111592>, (accessed 01 Dec. 2014).

² C. Wiertz, *Reader in Marketing*, Cass Business School, London, UK and co-founder of Unrulyversity, a pop-up free university within London’s Tech City.

2. Entrepreneurship as a determinant of urban competitiveness: risks of the approach. Case of Barcelona

2.1. Introduction

In the beginning we aim to present the phenomenon of urban entrepreneurship in a broader context of urban competitiveness. We focus firstly on the idea that concentration on entrepreneurship in urban strategic planning might provoke certain risks, mainly concerning neglecting inhabitants' needs and blind reflection of rankings requirements. The focus on entrepreneurship is coming from the assumption that sustainable urban development (sustainable cities) builds on at least three concepts: natural environment, social conditions and the economy. Hence, entrepreneurship represents the engine of economic growth with urban areas creating conditions for its functioning. Economic aspects of eco-growth (or sustainable growth) add to the reflections on natural environment protection or green growth concepts.

Consequently, at the beginning of the text, selected aspects regarding the phenomena of urban competitiveness will be presented, with a special focus on the importance of entrepreneurship. Further parts of the text will shift attention to the traps of implementing an urban competitiveness strategy based mainly on development of entrepreneurship. Presentation of such risks will be made using the case study of Barcelona and the changes in its competitive strategy. The approach in the case study, i.e. focus on economic development aspects, is also strongly connected to the sustainable growth concepts. Firstly, because of the economic component of sustainability, furthermore – because the traps of competitiveness, described in the case study, have their reflection in the quality of natural environment of the city.

2.2. Concept of urban competitiveness

Competitiveness in relation to territorial entities is a new concept in economics, and even more so when it comes to urban areas. Despite the fact that research on urban competitiveness is relatively fresh, and lack of consensus over the existence of territorial competition at all (see P. Krugman's approach of lack of territorial competition), there seems to be a multitude of definitions of the concept. One of the most general, but also directed especially towards cities, is that of Storper who states that urban competitiveness is:

“the ability of an economy to attract and maintain firms with stable or rising market shares in an activity, while maintaining stable or increasing standards of living for those who participate in it.”³

This definition points out that goals of urban entrepreneurship must be balanced by requirements of standards of living (in this way the definition suggests some notions of urban sustainability). Such an approach was then commonly assumed by the European Commission and is also present in M. Porter’s studies of competitiveness of cities. In Porter’s approach competitiveness is identified with productivity (of labour and of capital) but it is increased – or maintained – in order to increase standard of living. According to Porter:

“True competitiveness (...) is measured by productivity. Productivity allows a nation to support high wages, attractive returns to capital, a strong currency – and with them, and a high standard of living.”⁴

2.3. Entrepreneurship as urban competitiveness determinant

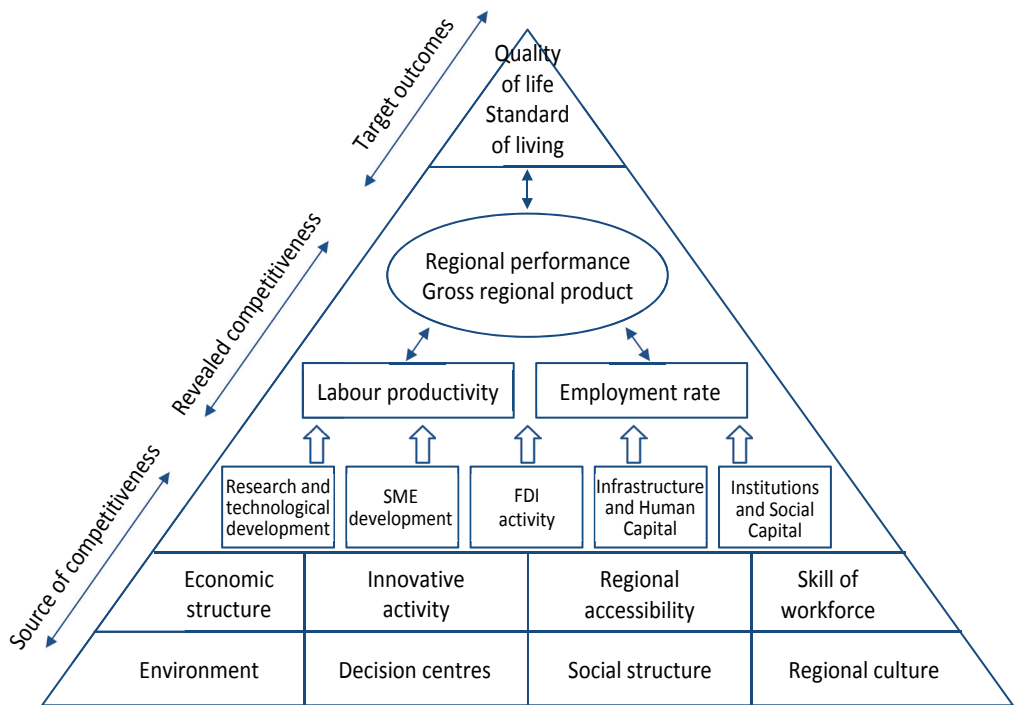
One of the most comprehensive models of competitiveness in the territorial dimension, is the “Pyramid Model” of regional competitiveness (Figure 5.1).

The “pyramid model” of competitiveness places gross regional product at the centre of analysis. Therefore, we can assume that an increase in regional economic performance is the major goal of competitive strategies. However, the analysis of means to achieve this goal gives interesting results, as competitiveness is to be obtained by growth of: labour productivity, employment rate and quality of life. The reason for including both productivity and employment rate is to prevent a situation when productivity is raised by means of employment downsizing and closure of firms. Therefore, productivity must be balanced by maintaining or increasing the rate of employment. Given the thesis of this paper, the impact of quality of life seems especially important. The analysis of competitive strategies practice proves that this aspect of urban development is the most commonly neglected. Even though economic conditions create certain elements of sources of competitiveness, there are also determinants such as natural environment, social structure, institutional environment, and social capital.

³ M. Storper, *The Regional World. Territorial Development in a Global Economy*, New York, Guilford, 1997, p. 20.

⁴ M. Porter, *What is competitiveness?*, “Notes on Globalization and Strategy”, No 1, January-April 2005, IESE.

Figure 5.1. The “pyramid model” of regional competitiveness



Source: Gardiner, Martin, Tyler (2004) *Competitiveness, Productivity and Economic Growth across the European Regions*, p. 7 based on: Lengyel (2000, 2003), Begg (1999), EC (1999), Jensen-Butler (1996).

A typology of urban development strategy, created by Savitch and Kantor⁵, identifies market-oriented strategies, and they constitute the majority of such. Authors, based on a 30-years observation of 10 cities in developed countries, divided urban strategies to four groups:

- (a) growth strategies,
- (b) community development initiatives,
- (c) regionalism, and
- (d) national urban policy.

First of the types is the only one where economic growth is the major strategic goal while municipalities are given choice of means, according to city's

⁵ H.V. Savitch, P. Kantor, *Urban Strategies for a Global Era. A Cross-national Comparison*, The American Behavioral Scientist, April 2003, pp. 1002–1033.

cost-advantage analysis. This type of strategy is the most common and might be related to the entrepreneurial city model.

Market-oriented strategy is also at the centre of urban competitiveness according to the paradigm of OECD⁶. The entrepreneurial city paradigm, promoted by the OECD can be most briefly summed up as a shift from city managerialism, which is primarily concerned with effective provision of social welfare services to citizens, to entrepreneurialism, which is strongly characterized by proeconomic-growth strategic approaches, risk-taking, innovation and an orientation toward the private-sector. The shift has been caused by the observation that providing additional services and transfers to groups of population with special needs is not curing the root-cause of the inner-city problems, i.e. the lack of economic infrastructure there. Therefore, actions were taken to regenerate decayed areas with means of economic activity.

The underlying assumption of the “entrepreneurial city” paradigm is that with the irreversible trend of global economic integration, the only way that cities can secure competitive advantages over their perceived competitors in an ever intensifying inter-city competition is by pursuing entrepreneurial strategies.

Features of “entrepreneurial city” paradigm include:

- Goal of local economic development. Urban polity is hence focused on initiating economic growth rather than controlling and managing it.
- Role of the municipality is therefore initiatory. In terms of spatial development, it is assumed that it will take a form of “positive planning” which created economic growth with pro-active means.

The role of the public sector is decreased and stress should be put on making a full use of market mechanisms with less public interventionism (market-driven approach).

- Strengthened cooperation with the private sector (the public sector should be a proprivate-sector). The OECD’s model includes strategic alliances created by public and private sectors and public-private-partnerships as a fundamental framework of cooperation to compete globally.
- Policy planning is characterized by a private business approach: risk-taking, inventiveness, promotional and profit motivation. Also, methods from the private sector are advised, as well as strategic planning in the urban policy.

⁶ OECD, *Competitive Cities: a New Entrepreneurial Paradigm in Spatial Development*, 2007.

The excessive attention to entrepreneurship in competitive strategies might also be a consequence of confusion about the nature of territorial competitiveness. The two dimensions of territorial competitiveness might be characterized as:

“Competitiveness of companies localized in a given territorial entity, in open global economy,

Competitiveness of territorial entities themselves in attracting capital, creating jobs and bringing profit, in attracting highly qualified human capital, capable of creating innovation and implementing advanced technology and managing corporations.”

Therefore, it is tempting to assume urban competitiveness as the sum of competitiveness of companies operating in a given city. This approach is then transformed in activities concentrated on individual companies, business environment and private sector needs, whereas the second dimension of competitiveness – and hence the urban policy – is neglected.

2.4. Case-study of Barcelona

To present the possible traps of focus on the business sector in city development, a brief case study of Barcelona will be described in the following part of the paper.

Barcelona, like many other European cities and regions, suffered from the financial and economic crisis in terms of job losses, slower business growth, and drop of infrastructure investment, stalled office space take-up and retail investment, and further downfall of underdeveloped sectors. Therefore, Barcelona’s Municipality (Adjustment de Barcelona) took on an entrepreneurial path in order to use capacities and opportunities they can offer to international firms, as well as use all the possible resources to attract as much business and capital as possible.

The authors of *“Business-friendly and investment-ready cities. City government and the local business growth and investment climate”* rank Barcelona somewhere in the middle of the analyzed cities. The sources of Barcelona’s competitive advantage are seen in the following factors: connectivity: high-speed rail and very good air connections (especially with the rest of Europe, Latin America and China),

- infrastructure provision,
- high-quality office space localized in the city centre,

- growing human and physical capital,
- cultural assets,
- concentration of regional talent at affordable costs.

Possible barriers for investors concern mainly institutional environment of entrepreneurship, like e.g. lack of tax and incentives framework, however these are shaped often at the national level (Table 5.1).

Table 5.1. Business-friendliness of selected European cities in 2011-2014

	General business friendliness			Tax incentives, policy framework			Workforce availability				Space and staff costs			Business infrastructure						
	ID Business Friendliness 2014 (position within city size category)	European Cities Monitor – 2011 Access to Markets, Customers, Clients	Overall	ECM 2011 – tax and incentives climate	EU-2012 – Institutional Effectiveness	Overall	ECM-2011 Qualified Staff	ECM-2011 languages spoken	EU-2012 Human Capital	AON People Risk Index 2012	Overall	ECM-2011 – office space value for money	ECM-2011 – Staff costs	Overall	ECM-2011 – office space availability	ECM-2011 – Internal Transport	ECM-2011 – External Transport	ECM-2011 – tele-communications	EU-2012 – Physical Capital	Overall
Brussels	8	4	19	12	27	13	7	2	43	27	30	14	26	10	11	17	5	9	24	40
Stockholm	11+	19	13	19	23	12	6	4	26	15	34	21	18	11	17	4	23	4	1	39
Paris	4	2	19	17	44	9	2	6	4	36	34	28	30	5	13	2	2	2	20	41
Barcelona	11+	19	6	16	50	9	12	17	29	49	19	11	11	14	6	6	12	20	9	39
Hamburg	11+	8	8	23	35	9	18	17	32	39	23	24	27	7	26	17	16	13	1	32
Vienna	11+	23	5	33	39	5	28	27	30	37	17	31	25	6	32	20	21	24	9	26
Total cities	11+	36		36	62		36	36	63	68		36	36		36	36	36	36	64	

Source: G. Clark, G. Kippenberg, R. de Jong, (2014) *Business-friendly and investment-ready cities. City government and the local business growth and investment climate*, Urban Land Institute, p. 21.

Business friendliness of cities, as presented in table 1, is based on survey-data which may bias the results by a degree of subjectiveness. However, even though there are business friendliness indices available (with World Bank's index to start with), most of them is prepared at national level. „Doing business” index has been prepared at subnational level for a very limited number of states (e.g. Poland) and Spain is not among them. Therefore, survey-based data is used to show major trends and differences between chosen cities.

Further analysis of quantitative results of the research prove that Barcelona is evaluated as the best location for investment when it comes to office space availability and labour costs. Barcelona significantly outperforms other cities in this category.

The municipality's strategy to attract more international business to Barcelona includes several elements: to reduce bureaucratic deadweight costs, to establish greater clarity on 'rules of business', to increase trust and investor confidence, to empower the city's strategic geographic location as a business hub, to create a more welcoming environment for international businesses and talent.

Urban policy towards entrepreneurship, both international and domestic, includes several initiatives. The main priority is given to the following instruments: reform of the internal management process, including: the 'Politics and Management Deal', and the 30-day customer payment commitment; streamlining bureaucratic processes; expanding e-government services, including: electronic business registration (PAIT), electronic processing of building permits, environmental permits, simplification of obtaining building permits; establishment of local service points.

Barcelona seeks to differentiate itself from its regional context, characterized by severe aftermath of the economic crisis. Barcelona in this context ranks relatively well, with growth and unemployment rated closer to the EU average than to the data for Spain. The strategy is therefore focused on: reducing the regulatory and administrative burden facing businesses, creating a more welcoming environment for international talent and investors, and establishing a reputation for effective and transparent city management.

Position of Barcelona as a business location is consistent with Municipality's strategic goals. Latest evaluation of Cushman & Wakefield – an annual list of the best European cities in which to locate a business – ranked Barcelona as no. 4, a significant jump from previous 11th place.

Barcelona is experiencing a steady growth of international investment. In 2012, Barcelona was the 3rd European urban region for FDI attraction, with

a 16% year-on-year increase, and it ranks among the top 10 world urban areas for FDI projects received over the 2008-2012 period⁷.

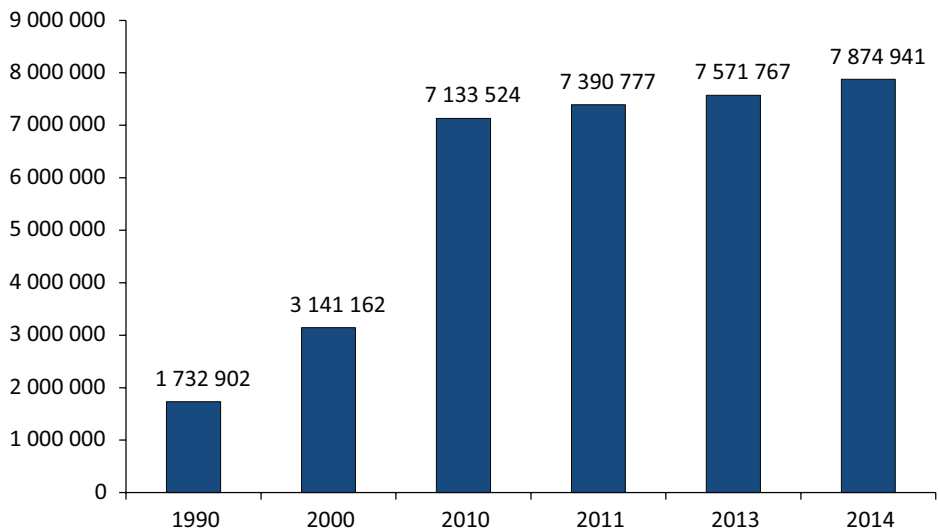
On the other hand, there is a question of other urban competitiveness goals, namely quality of life and standard of living. Interesting results are brought by analyzing Barcelona's performance as a smart city. Assuming that a smart city harmonizes and balances areas of: economic growth, human capital, mobility, environment, governance and quality of life. The author built an index to measure individual cities' achievements in these respect⁸. The results obtained for Barcelona turned out to be rather unsatisfactory (2.51 on a 1-5 scale). Moreover, the worst performing areas were natural environment and management (governance). Explanation for this fact to some extent lays in the composition of the index. In the "smart-management" part of the evaluation, the data used for the analysis came mostly from surveys: Barcelonans were asked if city's resources are used efficiently, whether the city's administration is helpful, and if they are satisfied with the state of public city spaces. Therefore, the answers reflected inhabitants' attitudes toward city governance. The results in this area of the research were by far the worst, and natural environment was indexed nearly as low.

The major factors in natural environment state were related to the competition of inhabitants and tourists over city space. This should not be a surprise given the rapid growth of a number of incoming tourists over the last decade (Figure 5.2). In the city of ca. 1.7 million population, yearly turnover of tourists reaches 7.5 million people (up from 3.1 million in 2000!).

Recent trends in tourism are not beneficial in this matter, as Barcelona and its inhabitants witness a significant increase in mass-cruisers coming to the city's port. Such a type of tourism seems the most destructive for urban tissue, and – as addition to city's fame for weekend trips – creates a major obstacle in quality of life and environment management. Therefore, Barcelona's competitive strategy seems neither harmonized nor balanced.

⁷ G. Clark, Kippenberg, R. de Jong, *Business-friendly and investment-ready cities. City government and the local business growth and investment climate*, Urban Land Institute, 2014, p. 38.

⁸ Compare with: E. Szczech-Pietkiewicz, *Poland's urban competitiveness in the European context*, "The Polish Review", University of Illinois Press, 2013, vol. 58 no. 2, pp. 15-36.

Figure 5.2. Barcelona tourism sector growth (total tourists)

Source: G. Clark, G. Kippenberg, R. de Jong, *Business-friendly and investment-ready cities. City government and the local business growth and investment climate*, Urban Land Institute, 2014, p. 34 and *Tourism statistics in Barcelona and regions. Synthesis* <http://professional.barcelonaturisme.com/imgfiles/estad/Est2014.pdf>, p. 9.

3. Sustainable development in the city – the case of Taipei

3.1. Introduction

The goal of this subchapter is to present activities linked to sustainable development in the urban area on a selected example of Taipei city. In the first part, I briefly introduce the idea of sustainable development and sustainability opportunities in the city. Second part is based on the case study of Taipei city, especially transportation system, waste management system and heritage preservation park. The main conclusion is that even relatively unsustainable city, as Taipei in the end of the 20th century, may be transformed.

3.2. Implementation of sustainable development in urban areas

In the second part of the 20th century, the idea of sustainable development shaped and began to appear more often in research and policies. The definition was coined in the Brundtland Report in 1987 which defined it *as the development that meets the needs of the present without compromising the ability of future*

*generations to meet their own needs*⁹. Previously, the term was used in a different context, mostly related to the natural resources in national economies. Since 1987, international community have undertaken numerous actions to include elements of sustainable development in global strategies, including for example an action plan called Agenda 21 (Rio de Janeiro, 1992) or the European Union Sustainable Development Strategy (2005). In Taiwan, milestones were adoption of Taiwan Declaration on Sustainable Development (2003) and Taiwan Agenda 21 (2004) by the Council for National Sustainable Development, Executive Yuan. These documents assisted in prioritizing goals for sustainable development in urban areas.

One should differentiate sustainable urban development and sustainable urban transformation. R. Camagni defines sustainable urban development as follows *a process of synergistic integration and co-evolution among great subsystems making up a city (economic, social, physical and environmental), which guarantees the local population a non-decreasing level of well-being in the long term, without compromising the possibilities of development of surrounding areas and contributing by this towards reducing the harmful effects of development on the biosphere*¹⁰. On the opposite, sustainable urban transformation is *structural transformation processes, both multidimensional and radical change, which can effectively direct urban development towards sustainability*¹¹. This concept includes inter-related elements as shown in the Figure 5.3.

In case of Taipei, both concepts were adopted. Although sometimes sustainability-related initiatives sometimes are introduced organically, like Huashan 1914, most often this process needs to be managed. W. Pęski enumerates tools assisting sustainable development management in the city which include elements indicated in the Figure 5.4.

Authorities in Taipei used most of them. These tools may be applied to multiple areas of urban development. Some of the most important are as follows¹²:

- science and technological parks;
- small and medium enterprises' clusters;
- urban real estate sector;
- unused urban areas;
- housing neighborhoods;
- technical infrastructure (public supply of water, energy, heating, etc.).

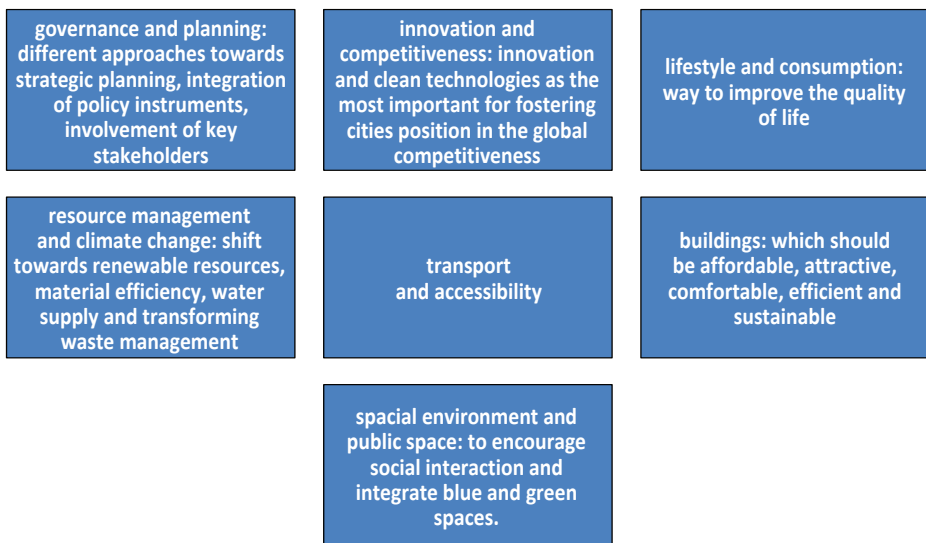
⁹ *Our Common Future*, UN WCED, 1987.

¹⁰ R. Camagni, *Sustainable urban development: definition and reasons for a research programme*, "International Journal of Environment and Pollution", 1998, 10 (1), pp. 6-26.

¹¹ K. McCormick, et al., *Advancing sustainable urban transformation*, "Journal of Cleaner Production", 50, 2013, p. 4.

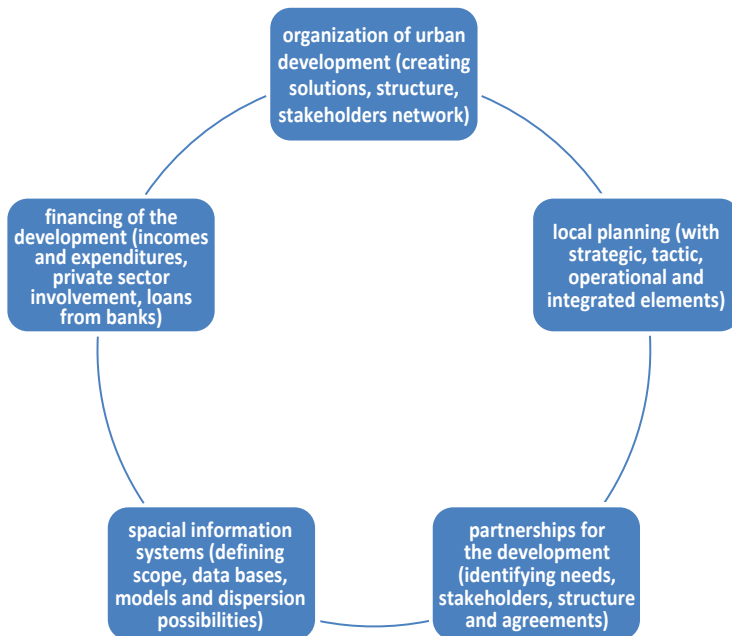
¹² See: *Ibidem*, pp. 159-271.

Figure 5.3. Elements of sustainable urban transformation



Source: Own work based on K. McCormick, et al., *Advancing sustainable urban transformation*, "Journal of Cleaner Production", 50, 2013, p. 4-5.

Figure 5.4. Tools for sustainable urban management



Source: W. Pęski, *Zarządzanie zrównoważonym rozwojem miast*, Arkady, Warszawa, 1999, pp. 65-133.

In the next part of this subchapter, the author presents examples related to unused urban areas and city's infrastructure. Abovementioned points reflect three interrelated spheres of sustainable development, economic, environmental and social, which has to be considered in a long-term perspective and holistic approach.

One third of world's urban population lives in the informal neighborhoods which makes sustainable urban development a major challenge and goal¹³. Reddevelopments of existing places or setting new urban neighborhoods are two approaches which lead to transformation of a city into sustainable urban form. The level of this transformation is measured by some specific criteria¹⁴. The research done by C. Luederitz found that sustainability criteria are based on various elements¹⁵. Most often researchers concentrate on ensuring sufficiency and effective choices for all, development of mutual awareness and collective responsibility as well as preserving opportunities and capabilities for the future generations. The second priority is given setting relations between people and ecosystem and avoiding waste production. Reducing extractive damage, followed by the ensuring the minimum level of income is among the least chosen criteria. R. B. Gibson highlights eight criteria for achieving a higher level of sustainability which apply to most of cities¹⁶: system integrity, livelihood sufficiency, intra- and intergenerational equity, sustainable use of resources, democratic government, precaution and adaption and long-term integration. C. Luederitz presents also nine integrated principles for sustainable urban neighborhood development which are as follows¹⁷: develop harmonized coupled human-environment systems, sustainable urban metabolism, environment-caring building design using local and sustainable materials, cater for a livable and vibrant neighborhood, provide compact development and integrated sustainable mobility, cater for resilient neighborhoods, ensure democratic governance and empower neighborhood residents, satisfaction of human needs, consider neighborhood impact on the wider environment. All the actions mentioned above may be taken provided that the basic needs are fulfilled¹⁸.

¹³ United Nations, *The millennium development goals report 2011*, New York United Nations, Department of Economic and Social Affairs, Population Division, 2011.

¹⁴ C. Luederitz et al., *A systematic review of guiding principles for sustainable urban neighborhood development*, "Landscape and Urban Planning" 2013, No. 118, p. 41.

¹⁵ *Ibidem*, p. 45.

¹⁶ R.B. Gibson, *Sustainability assessment: Basic components of a practical approach*, "Impact Assessment and Project Appraisal", 24(3), 2006, p. 171.

¹⁷ C. Luederitz et al., *op. cit.*, p. 46.

¹⁸ More information on theoretical framework may be found in: M. Wojtysiak-Kotlarski, E. Szczech-Pietkiewicz, K. Negacz, *New Models of Urban Entrepreneurship. Context for Development*, E-book, CeDeWu, Warszawa 2015.

Current topics for sustainable urban transformation mostly concentrate on governance and planning, collaboration and learning, infrastructure and resilience, buildings and surroundings. For many cities, remaining challenges include complexity, scale and context-dependency of the cities, variety of regimes in all sectors, altering the composition of well-experienced old solutions, sustainable and unsustainable niche technologies, internal rules of existing build environment, transition to no growth in building stock and mobility, landscape conditions, finally back casting the utopian sustainability¹⁹. Introducing sustainability into each city requires adopting a certain strategy²⁰. Some fields where the strategies are applied are listed in the Figure 5.5.

Figure 5.5. Areas of Sustainable Urban Strategy



Source: Own work based on Figure 3. *Composing Urban Policies and Performance Indicators, Urban Sustainability Indicators*, V. Mega, J. Pedersen, European Foundation for the Improvement of Living and Working Conditions, Dublin, 1998, p. 17.

¹⁹ C. Luederitz et al., *op. cit.*, pp. 41-46.

²⁰ For Taipei, an interesting strategy was developed by Learning Cities Network. See: The development strategy of Taipei Eco-City, http://lcn.pascalobservatory.org/sites/default/files/the_develop_strategy_of_taipei_eco-city.pdf (accessed 17 October 2015).

While a number of urban and suburban areas is increasing at a fast pace, more and more people call for the smart growth to reduce excessive energy consumption of urban organisms with low density²¹. It translates into decreasing costs of infrastructure and services, better access to urban facilities, creation of sustainable green jobs, amended social integration and higher life quality especially of poor areas²². Some solutions appear in the cities organically, as they naturally seek for most efficient and energy-saving solutions in construction or transportation²³. However, some projects name themselves sustainable even that the city is an unsustainable product *per se*²⁴. The major problem is that modern societies despite high awareness of sustainability principles replicate unsustainable patterns which translates into new phase of eco-politics called ‘post-ecological politics’²⁵ which include political actors using the goodwill of their voters claiming ecological virtues²⁶. Many are aware of unsustainability and that sustainable urban development does not bring the necessary radical change. In the recent years the politics mostly shifted to climate change reduction measures thanks to Stern report and IPCC²⁷. As it says *never before had environmental policy been based on such unambiguous categorical imperatives, derived not from contested aesthetic or ethical norms, but based on the soundest and most authoritative science available*. Discussion is used to secure some particular interests²⁸. Hong Kong is a good case as it is governed by an executive-led system and at the same time have democratic society. It shows that sustainable urban development is also a challenge from the political point of view.

²¹ O. Mindali, A. Rowe, I. Salomon, *Urban density and energy consumption: A new look at old statistics*. *Transport Research Part A: Policy and Practice*, 2004, 38(2), 143-162. Q. Chen, Q., et al., *Sustainable Futures for Linden Village: A model for increasing social capital and the quality of life in an urban neighborhood*, “Sustainable Cities and Society”, 2014, <http://dx.doi.org/10.1016/j.scs>, (accessed 30 Feb. 2015).

²² C.S. Acey, T.H. Culhane, *Green jobs, livelihoods and the post-carboneconomy in African cities*. *Local Environment*, “The International Journal of Justice and Sustainability”, 2013, <http://dx.doi.org/10.1080/13549839.2012.752801>, pp. 1-20.

²³ N.B. Grimm, et al., *Global change and the ecology of cities*, “Science”, 2008, 319(5864), <http://dx.doi.org/10.1126/science.1150195>, pp. 756–760. C. Luederitz, D. J. Lang, H.Von Wehrden, *A systematic review of guiding principles for sustainable urban neighborhood development*, *Landscape and Urban Planning*, 118, 2013, pp. 40-52.

²⁴ J. Wu, *Urban sustainability: An inevitable goal of landscape research*, “Landscape Ecology”, 2009, 25(1), <http://dx.doi.org/10.1007/s10980-009-9444-7>, pp. 1-4. P. Desai, *Creating low carbon communities: One planet living solutions*, “Globalizations”, 2008, 5(1), <http://dx.doi.org/10.1080/14747730701587462>, pp. 67-71.

²⁵ I. Blühdorn, *Sustaining the unsustainable: symbolic politics and the politics of simulation*, “Environmental Politics”, 2007, 16 (2), pp. 251-275; I. Blühdorn, *Locked into the politics of unsustainability*. “Eurozine” 30, October 2009.

²⁶ P. Higgins, *From sustainable development to carbon control: urban transformation in Hong Kong and London*, “Journal of Cleaner Production” 50, 2013, p. 56.

²⁷ N. Stern, *The Economics of Climate Change: the Stern Review*, University of Cambridge Press, Cambridge. 2007. IPCC (Intergovernmental Panel on Climate Change), *Climate Change 2007: the Physical Science Basis*, IPCC Secretariat, Geneva, 2007.

²⁸ P. Higgins, *op. cit.*, p. 57.

3.3. From congested, littered and abandoned to easy commuting, clean and culture thriving city – case of Taipei

The case of Taipei shows how the city with major sustainability issues reaching back to rapid economic development in 20th century may become a center for sustainable solutions in 21st century.

Taipei is a capital of Taiwan R.O.C is located in the East Asia inhabited by 2.6 million people²⁹. Taiwanese economy experienced a dynamic growth in recent 50 years. It was accompanied by industrialization, liberalization and democratization. Having been one of the least developed countries in 1962 (according to GDP per capita, USD 170), Taiwan changed rapidly reaching an average level with USD 18,458. The real annual growth reached on average 8% in past three decades. Thanks to this, Taiwan is enumerated as one of Four Asian Tigers or Asian Dragons. In 2011, Taiwanese economy is the 19th largest economy in the world³⁰.

The case of Taipei city evolution will be analyzed through three aspects – transportation system, waste management system and heritage preservation. These projects are examples of how the capital addressed three main problems of the 1990s to become best practices.

3.3.1 Transportation system – Easy cards

With the highest population density in Taiwan and location in alluvial basin surrounded by the mountains, Taipei is highly influenced by pollution generated by transportation systems. It is served by two airports (Taoyuan and Songshan) and close to major port (Keelung). Population of Taipei actually felt down between 1980 and 2000 which resulted from the families moving to suburban areas and increasing transportation demand in fact³¹.

In the end of 20th century Taipei faced major problems with transportation system. From 1980, the number of motor vehicles changed from 533 thousand to 1,626,000 in, a tripling in 20 years, private cars increased from 105 thousand to 559 thousand, and for motorcycles rose from 351 thousand to 959 thousand³² (Figure 5.6).

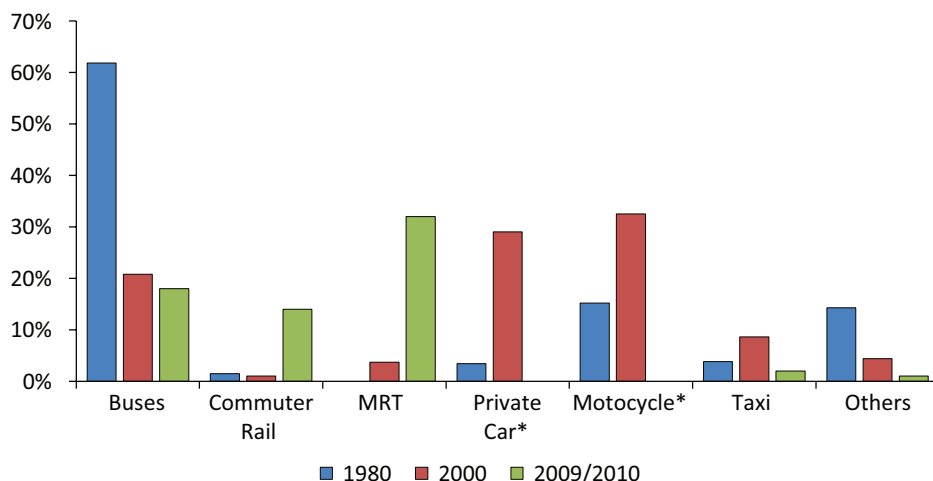
²⁹ Ministry of the Interior, Taiwan/R.O.C., Monthly Bulletin of Interior Statistics, April 2011.

³⁰ E. Kaliszuk, *The EU-Taiwan FTA – What Does it Mean for Poland?*, Instytut Badań Rynku, Konsumpcji i Koniunktur, Warszawa, 2011, p. 8.

³¹ Cheng Min Feng, *Integrated Strategies for Sustainable Urban Transit: A Case Study of Taipei*, <http://ngo.cier.edu.tw/policy/2.7.pdf>, p. 145.

³² *Ibidem*, p. 147.

Figure 5.6. Modal split in Taipei in 1980, 2000, 2010



* In 2009/2010 private transportation, including both motorcycles and private cars, totaled to 46%.

Source: Own work based on Cheng Min Feng, *Integrated Strategies for Sustainable Urban Transit: A Case Study of Taipei*, <http://ngo.cier.edu.tw/policy/2.7.pdf>, p.149; *Passenger Transport Mode Shares in World Cities*, <http://www.lta.gov.sg/ltaacademy/doc/J11Nov-p60PassengerTransportModeShares.pdf>, 2010, p. 69.

In the first decade of the 21st century a lot has changed. The city developed MRT which operates 5 lines. There are exclusive bus lines which increase efficacy of the system and ticket prices are low. Since 2002 the city has implemented an integrated ticketing system based on Easy cards which works for all types of public transport and has an easy value-adding system. The transit system has been improved (a freer system where a bus route is parallel with a MRT route)³³. The You Bike, bike rental system, and multiple bike lines cover much of the city and enable comfortable commuting.

Currently, there are three institutions which focus on sustainable transport systems in Taipei: Taipei the City Department of Transportation (DOT), concentrated on switching from private to public transport measures, the Department of Urban Development (DOUD) focused on land use planning, the Department of Environmental Protection (DOEP) responsible for air quality control. There are also three approaches for moving towards sustainable transportation system in Taipei³⁴:

³³ *Ibidem*, pp.154-156.

³⁴ Tzay-An Shiau, *Evaluating sustainable transport strategies with incomplete information for Taipei City*, "Transportation research part D: transport and environment", 17.6, 2012, p. 427.

- strategies for promoting the use of clean energy: clean fossil fuel, biomass, and electric vehicles;
- shift from private to public transportation;
- long-term sustainable concepts in land use planning: reduction of travel demand by implementing idea of compact city.

3.3.2 Waste management – PAYT

High population density and warm and humid climate pose a significant challenge for waste collection and management systems. Therefore, in 2000 a new system for waste collection was introduced in Taipei.

Pay As You Throw (PAYT) model is used in Taipei. Citizens and companies buy special blue bags and put waste in them. The city services collect only waste in these special bags. This model encourages recyclable materials. Those do not have to be placed in the blue bags and are collected free of charge. There are divided into seven groups: PET bottles, glass bottles, plastics, aluminium and ferrous metals, paper, food scraps, clothing. This scheme is called “Per Bag Trash Collection Fee”³⁵.

The system brought some measurable results in waste management which include³⁶:

- the amount of waste decreased from 3,695 tons before 2000 to 1,619 tons of waste per day in 2010,
- recycling rate increased from 2.4% to 43% (2010),
- Taipei’s landfill is now an ecological park,
- residents pay on average NT\$51 a month in 2010 in comparison to NT\$144 in 2000.

3.3.3 Heritage preservation

In 1997 the Golden Bough Theatre found an abandoned factory in the middle of Taipei. The factory Taipei Winery (later, Taiwan Governor-General’s Monopoly Bureau, Taipei Wine Factory), built in 1914, belonged to one of the most famous wine producers of 1920s. It changed ownership and names in 1940s, later in 1960s and 1980s.

³⁵ J. Ross, *What I Picked Up About Trash in Taipei*, <http://www.washingtonpost.com/wp-dyn/content/article/2007/11/29/AR2007112901887.html>, December 2, 2007, (accessed 15 Jun. 2014).

³⁶ *Waste Management in Taipei*, <http://shallowpawprints.blogspot.com/2011/04/waste-management-in-taipei.html>, (accessed 20 Mar. 2015).

The theatre restored a part of the factory and began performing plays which was noticed by the local community. Soon more artists came to the place to perform. As a result in 1999 the Association of Culture Environment Reform Taiwan, a non-profit NGO aimed to fully restore building as an art center. The factory was called the Huashan Creative Park and renovation began in 2005. Later in 2007 responsibility for the renovation was passed to 2007 the Taiwan Cultural-Creative Development Co. Ltd and the place changed its name to Huashan 1914. Since then it has become a centre for various cultural initiatives, including for example the Simple Life music festival and the BiBo student design expo³⁷.

Huashan 1914 hosts a number of permanent exhibitions, shops and restaurants which are related to Taiwanese history and culture. It is also a centre for local community activities and events. It hosts major exhibitions linked to indigenous arts and crafts of Taiwan, e.g. Aboriginal Aesthetics of Pacific in 2011. During the weekends, there is an open-air market which offers traditional jewellery, hand-made craft products and Taiwanese snacks. It collaborates with Songshan Cultural and Creative Park in Taipei.

Bi-Ling Yeh highlights its value for the cultural ecology which comes from the development of a success creative park³⁸. The place is an example of a cultural tourism area which plays major research, education, exhibition functions³⁹.

3.3.4. Conclusion

Selected examples indicate that the city with major sustainability issues may change to the greener growth. Solutions applied in the city transportation system show how integrated public transport may contribute to minimizing traffic and congestion. Waste management system encourages recycling through economic stimulants. Heritage preservation project connects social development with urban regeneration. These examples highlight the role of public and private cooperation in achieving sustainable urban development.

According to the Development Strategy of Taipei Eco-City: *The ultimate goal of "Sustainable Taipei Eco-City" is to build a capital featured on Environment Recycling, Social Progress and Economical Technology Improvement. Sustainable*

³⁷ What's the story, <http://www.huashan1914.com/en/story.html>, (accessed 20 Mar. 2015).

³⁸ Bi-Ling Yeh, *The value creation and governance of ecology system in creative park: The case of Taiwan*, Centre for Creativity & Innovation Studies (CCIS), Nat. Cheng-Chi Univ., Taipei, Taiwan.

³⁹ Chao-Yi Wang, *Cultural Participation, Consumption and Opportunities: A Case Study on the collaboration between Huashan 1914 Creative Park and Songshan Cultural and Creative Park*, [文化創意產業系] 碩博士論文.

Taipei Eco-City is Taipei City's future vision⁴⁰. This statement shows future direction for the analyzed programs and key objective for authorities and inhabitants.

4. Entrepreneurship and socially responsible investments in urban context. The case of start-up scene in London, UK

4.1. Entrepreneurship – again a hot topic on academic agenda

Undoubtedly, entrepreneurship is perceived by academics, business practitioners and many other commentators as a driving force for economic growth and development. A traditional view of entrepreneurship is related to individuals who aim to pursue and interesting business idea they are devoted to. Probably no one would argue that entrepreneurs have an immense role in current societies.

However, even if entrepreneurship has become a kind of “buzzword” for professionals of economics and management, there still remain various approaches to defining entrepreneurship. For instance, Stokes et al. emphasize that entrepreneurship may be analyzed from three different angles (perspectives): entrepreneurship as a process, entrepreneurship as behaviors and entrepreneurship as outcomes⁴¹.

In the process angle the definition of entrepreneurship will claim that entrepreneurs take part in the process of pursuing opportunities and creating something new with regard to the resources and capabilities they control or may control⁴². In the behavior focus, we would undermine that ability to perceive opportunities, develop new ideas and successfully present them to the market⁴³.

Entrepreneurs are people who plan to achieve big success in their lives. They want to be next Richard Branson or Steve Jobs who are a kind of role models for

⁴⁰ *The development strategy of Taipei Eco-City*, http://icn.pascalobservatory.org/sites/default/files/the_develop_strategy_of_taipei_eco-city.pdf (accessed 17 October 2015).

⁴¹ D. Stokes, N. Wilson, M. Mador, *Entrepreneurship*, Cengage Learning, Andover 2010, pp. 6-9.

⁴² Compare with: D. Stokes, N. Wilson, M. Mador, *Entrepreneurship...*, *op. cit.*, p. 7 and literature mentioned there: H.H. Stevenson, J.C. Jarillo, *A paradigm of entrepreneurship: entrepreneurial management*, "Strategic Management Journal", 1990 (11); R.D. Hirsch, M.P. Peters, *Entrepreneurship*, Fifth Edition, McGraw-Hill, London 2002.

⁴³ Compare with: D. Stokes, N. Wilson, M. Mador, *Entrepreneurship...*, *op. cit.*, p. 7 and literature mentioned there: S. Wennekers, R. Thurik, *Linking Entrepreneurship and Economic Growth*, "Small Business Economics", 1999 (13), pp. 27-55.

other business people. Recently, the gender aspect of entrepreneurship emerged – one observe the growing role of female entrepreneurs. Such amazing people want reach their business goals; very often they fascinate and want to be followed by others. “One thing that most of these people have in common is the fact that they all worked really hard and in the end, they were really well rewarded for that”⁴⁴.

Interestingly, such examples of successful entrepreneurs lived their lives during different times, in various geographical regions, not only in affluent economies, but also in poor regions. For instance, in the past one could give example of Andrew Carnegie (1836-1919), an American steel industry business tycoon, who was admired for developing one of the biggest early US business empires.

Successful entrepreneurs quite often feel obliged to give some of their wealth back to the societies with the help of which they grew up and grew strong business wise. Andrew Crnegie, for instance, is famous up till current time numerous initiatives which support various activities, which are more than welcome by the society. Andrew Carnegie established over 20 different, and mutually unaffiliated, organizations – such as Carnegie Mellon University, Carnegie Hall or Carnegie Institution of Science – to support everything from teaching and peace, to heroes and science⁴⁵.

Currently many observe the rise of entrepreneurial activities which take place rather in a corporate context. In other words, entrepreneurship has recently become not just an exercise carried out by individuals, but is becoming popular in well-established, mature companies. Corporations open up their boundaries these days. They are open to co-operation, even with competitive rivals. Incumbents are try to promote various activities, which are all example of new approaches to entrepreneurship (corporate venturing, intrapreneurship, spin-offs, etc.).

Entrepreneurs tend to set up new businesses. They search for the unknown, try something new, are not afraid of related risks and uncertainties. Costs related to a given business are set, are known to the entrepreneur, whereas revenues remain uncertain. Entrepreneurial decisions to set up a new venture are not only related to the reward (revenues of a business higher then cost, if simplifying).

Additionally to the reward, risk aspect must be taken into account. Casson suggests this in the following passage: “*Perhaps the greatest risk to an individual*

⁴⁴ See more in: J. Dunlop, *30 Most Influential Entrepreneurs Of All Time*, <http://www.incomediary.com/30-most-influential-entrepreneurs-of-all-time-2>, (accessed 03 Apr. 2015).

⁴⁵ See more about Carnegie Institution of Science, for instance, at: www.carnegiescience.edu, (accessed 04 Apr. 2015).

in becoming an entrepreneur, however, is uncertainty about whether he has the ability or not. An individual with ability is exposed to a much lower probability of loss than is one without it"⁴⁶. Plenty of individuals start this fascinating, entrepreneurial journey, which is – at last – to the benefit of the economy, which may grow and develop faster.

4.2. Socially responsible investments – a new and promising trend in business

Risky entrepreneurial activities are linked with innovation. Joseph Alois Schumpeter, a much respected author in this field, has no doubt that entrepreneurship and innovation are drivers of economic development⁴⁷. Generally speaking one may say that innovations are causing progress of humanity. Innovation may be defined from different angles. As regards production innovations, they could mean some renewal of elements in the production process⁴⁸. Innovations are about first commercial use of a product or service.

It is probably important to remind in this context a traditional classification of innovations as introduced by Schumpeter. He suggested five different sorts of innovations: (1) introduction of a new product or a new product quality; (2) introduction of a new production method; (3) the opening up of a new market; (4) the opening up of a new source of raw materials (...); (5) the creation of new organizational structure of an industry (breakdown of monopoly)⁴⁹.

Soon, innovation may be copied by others who also compete in a given sector. This may cause pressure on profits, which may soon begin to disappear. Profit is a reward for entrepreneurs on a micro-level, but – as aggregated to the whole economy – entrepreneurial activities, especially in the context of poor countries, may lead to pulling countries out from poverty.

One might think – thereby – that it is just the financial aspect of entrepreneurial activities and innovation that matters. This would be a big mistake. Interestingly, especially in countries with most developed economies and financial markets of the world – namely, in United States and in United Kingdom – we observe a growing popularity of a trend where both financial aspects and social impact are important. Socially responsible investments are an interesting phenomenon in this context.

⁴⁶ M. Casson, *The Entrepreneur: An Economic Theory*, Second Edition, Edward Elgar Publishing Inc., Cheltenham 2003, p. 198.

⁴⁷ J.A. Schumpeter, *Theory of Economic Development*, 1934.

⁴⁸ J. Sundbo, *The Theory of Innovation: Entrepreneurs, Technology and Strategy...*, *op. cit.*, p. 19.

⁴⁹ J.A. Schumpeter, *Theory of Economic Development...*, *op. cit.*, p. 43.

Socially responsible investments – sometimes also called sustainable or ethical investing – refer to investment strategies which are aimed at achieving both financial return and social good in the economy. The new category of socially responsible investors emerged recently. Their investment strategies encourage corporate practices promoting environmental stewardship, consumer protection, human rights and diversity (so called positive screening); on the other hand, businesses involved in tobacco or pornography are avoided, not allowed (negative screening). Such areas of concern regarding environment (E), social justice (S) and corporate governance (G) lead to popular acronym – ESG issues⁵⁰.

Interestingly, emerging or converging economies do not seem to be putting this idea of socially responsible investments into practice. Globally, such issues are important and somehow changing the corporate scene. For long time already, academics have stimulated the discussion on corporate goals. The big question remain what is (or should be) the goal of the corporation⁵¹. Traditional answer to this intriguing question was profit. Now, a new approach to this problem emerges.

Corporations are no longer governed just by owners (traditional view) or by managers (with oversight of owner and other supervisory bodies or non-executive directors). Shareholder perspective is being these days replaced by a stakeholder one. Businesses must balance a bundle of different, quite often conflicting, expectations formulated by different stakeholder groups. But anyhow – expectations of local communities, environmentalists or other stakeholders of this kind – were rather neglected.

The situation is hopefully changing however as many commentators notice the there is a fundamental mistake to claim that rationality on the micro level (the pursuit of corporations for profit) leads to a rationality on a global level. This is discussed often by academics who are sensitive to the long-term future of our planet⁵². There should be a new consensus discussed and developed, which would have to balance the corporations' pursuit for success with constraints regarding the environment of our planet.

Recently, there has been also a new term emerging, i.e. impact investing. Below, we are quoting a short passage from “Forbes” explaining the idea. *“Poverty, homelessness, crime, unemployment continue to plague even the*

⁵⁰ M. Wojtyśiak-Kotlarski, E. Szczech-Pietkiewicz, K. Negacz, *New Models of Urban Entrepreneurship. Context for Development*, E-book, CeDeWu, Warszawa 2015.

⁵¹ See more in: M. Wojtyśiak-Kotlarski, *Teoria Przedsiębiorstwa a koncepcje zarządzania i praktyka biznesu*, Warszawa 2011.

⁵² See for instance: W. Szymański, *Czy globalizacja musi być irracjonalna?*, Oficyna Wydawnicza SGH, Warszawa 2006.

wealthiest of nations. Imagine if in addition to existing efforts, we could leverage trillions in private capital and bring the same level of focus and entrepreneurial dynamism that we see in the private sector to meet the pressing needs for better schools, more job opportunities, improved public services, safer streets? We don't have to imagine. It is already happening – and it is called impact investing. The idea is simple enough – to invest in efforts that not only provide a return on investment, but also target specific social needs⁵³.

The future of investments is changing. Start-up scene all over the world will be taking this into account even more.

4.3. Support for entrepreneurship in specific urban context – the case of Unrulyversity within Tech City, part of a start-up scene in London

Interestingly, start-up scenes develop practically in all cases, maybe just except for Israel, in urban contexts. Traditionally, start-up scenes were formed in rather cosmopolitan environments, i.e. countries or regions, which are (were) extremely friendly for foreigners willing to win their rosy future around entrepreneurship. Silicon Valley in California, New York or Boston are good examples. Recently, there have been new places growing up, gaining importance as new but important entrepreneurial hubs. Helsinki, Berlin and London are good examples. Warsaw may be perceived – hopefully – as a successful start-up scene of the future. In this text, selected information regarding London will be further presented and discussed.

Tech City in is a technology cluster located in London, basically between the junction of Old Street and City Road in Central London and Olympic Centre at Stratford in East London, with key sites within a hipster area of Shoreditch⁵⁴. Tech City location was not a very attractive part of London to live or work, but this situation seem to be slowly changing. After Silicon Valley and New York, it is considered as third-largest technology start-up cluster in the world. The Old Street Roundabout may now be named Silicon Roundabout⁵⁵.

Tech City idea is strongly backed by both representatives of government and city authorities. Prime Minister Cameron is of opinion, for instance, that Tech City would “(...) help to create the right framework, so it's easier for new companies to start up, for venture capital firms to invest, for innovations to

⁵³ R. Cohen, M. Bannick, *Is Social Impact Investing The Next Venture Capital?*, <http://www.forbes.com/sites/realspin/2014/09/20/is-social-impact-investing-the-next-venture-capital/>, (accessed 10 May 2015).

⁵⁴ See more at: www.techcityuk.com, (accessed 10 May 2015).

⁵⁵ *A longer, more developed version of this case study may be found in: M. Wojtyśiak-Kotlarski, E. Szczech-Pietkiewicz, K. Negacz, New Models of Urban Entrepreneurship..., op. cit.*

flourish, for businesses to grow”, whereas Boris Johnson, the mayor of London, is very optimistic claiming “(...) that London will eventually produce one of the great global leaders in tech like Facebook or Amazon or Google or whatever. It is just a matter of time”⁵⁶.

The number of tech start-ups which have been developed within Tech City, London is impressive. Below just a short list of companies linked to the area are mentioned: Last.fm, SoundCloud, TweetDeck (bought by Twitter for £25m), Dopplr, Skimbit, Fotango, weartical.com, Squiz, Techlightenment, Kizoom, BrightLemon, Redmonk, MOO, Songkick, Livemusic and WAYN⁵⁷.

As London’s Tech City is a cluster, one would expect initiatives linking business and academia. Cass Business School, which is located in proximity to Shoreditch area, is especially active in this regard. There has been The Unrulyversity Idea set up, which is a cooperation of Cass and a social media firm – Unruly Media, a unique and unusual partnership between a creative digital agency and a higher education institute. City Unrulyversity is a free pop-up university, which aims at assisting Tech City entrepreneurs⁵⁸.

The Unrulyversity undertaking was initiated and is passionately driven by Dr Caroline Wiertz from Cass Business School and Sarah Wood, co-founder and Chief at Unruly. Interestingly, the initiative allows for two-way exchange of ideas and experience. It is not that just entrepreneurs are provided with world-class knowledge, but also experience and current challenges regarding business practice enrich the academic world. The Unrulyversity sessions are interactive and focus not only on sharing knowledge, but also on discussing ideas and challenging assumptions, which are traditionally regarded as valid.

The Unrulyversity initiative is now two years old. Caroline Wiertz commented on those two years the following way: *„City Unrulyversity is now firmly rooted in the Tech City scene. Since it was launched in January 2013, the average number of entrepreneurs attending each session has more than trebled from 20 to 65. Around one third of these own or work for a start-up and another third are in the process of setting up a new venture. (...) City Unrulyversity helps entrepreneurs to fill gaps in their skills and knowledge. With its mix of academic theory and practical business advice, it’s helping many entrepreneurs to grow their early stage*

⁵⁶ See more in: J. McGregor, *Tech City – believe the hype?*, May 1st, 2013, <http://www.theguardian.com/technology/blog/2013/may/01/tech-city-funding-uk-startups>; see also: [_http://www.bbc.com/news/technology-26480383](http://www.bbc.com/news/technology-26480383), (accessed 10 May 2015).

⁵⁷ See also: <http://www.theguardian.com/business/2011/nov/27/tech-city-digital-startups-shoreditch>, (accessed 10 May 2015).

⁵⁸ www.unrulymedia.com/city-unrulyversity, (accessed 11 May 2015).

companies and expand their network of contacts.”⁵⁹. The Unrulyversity sessions “(...) are developed with input from the start-up community and covers a wide range of business, design and tech topics”⁶⁰.

4.4. Final remarks

The aim of the subchapter regarding Barcelona was to present threats related to prioritizing entrepreneurship in urban competitiveness strategies. Based on a brief literature review, conclusion can be made that standard of living (quality of life) growth is the overall goal of urban development. Even if productivity is pointed out as a leading outcome of a competitiveness strategy (as in case of cited literature), it is assumed that productivity is a measure of standard of living.

On this theoretical base, conclusions can be drawn for a case-study analysis. Barcelona was chosen due to the shift in its development strategy. Post-crisis economic situation was one of the conditions causing a more business-friendly approach. Even though, a pro-business strategy is supported by reliable organizations and institutions recommendations (as cited in the paper new OECD paradigm in urban development), it seems that lack of people-friendly priorities might be a significant obstacle. Keeping in mind both literature and empirical research outcomes, it is justified to recommend including a standard of living goals in urban competitiveness plans based on the reasoning presented. Hence, it seems particularly important to keep all components of sustainable development (i.e. society, natural environment, and the economy) on equal levels when it comes to competitive strategies. Prioritizing one on the expense of other (as the economic development in the described case study) may cause severe imbalances in the development.

The second case of Taipei shows that cities which went through the fast growth may implement sustainable solutions which are profitable for both city authorities and inhabitants. These include even most fragile issues being transportation system or waste management system. Applied solutions include incentives for users which encourage following the rules. Third example presented in the subchapter of sustainable development concept implementation represents a bottom-up movement of local group and community which has been supported by the authorities. It enables creation of a local art centre which

⁵⁹ <http://www.cass.city.ac.uk/news-and-events/news/2015/february/happy-birthday-city-unrulyversity/>, (accessed 11 May 2015).

⁶⁰ *Ibidem*.

further supports heritage protection and promotion and increases incomes of local businesses offering craft and regional products.

The most general conclusion from the third subchapter states that urban environment is crucial for development of new business ventures. Edward Glaeser wisely claims the following: *“The urban ability to create collaborative brilliance isn’t new. For centuries, innovations have spread from person to person across crowded city streets. (...) Today, (...) Bangalore and New York and London, all depend on their ability to innovate. The spread of knowledge from engineer to engineer, from designer to designer, from trader to trader, (...), and urban density has long been at the heart of that process”*⁶¹.

Innovative start-ups of the future will more and more often be developed around ideas which promote and implement social good within business models. Socially responsible business practice has its roots in Christianity. Nowadays, as Europe has recently become very secular, this trend meets some obstacles and reluctance. Nevertheless, this is a big opportunity also for current capitalism to revitalize and win new spirit and character. Academics must hence notice those processes and support them. Some of universities or business schools are already out there.

* * *

Undoubtedly, there are numerous examples that cities enable creation of intellectual explosions, in which one smart idea generates others⁶². Urban future seems to remain bright⁶³. *“The enduring strength of cities reflects the profoundly social nature of humanity. Our ability to connect with one another is the defining characteristic of our species”*⁶⁴.

⁶¹ E. Glaeser, *The Triumph of the City*, Pan Books, London 2012, p. 8.

⁶² *Ibidem*, p. 56.

⁶³ *Ibidem*, p. 268.

⁶⁴ *Ibidem*, p. 268-269.

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Summary

*I like to see a man proud of the place in
which he lives. I like to see a man live so
that his place will be proud of him.*

(Abraham Lincoln)

In the era of globalisation where every aspect of innovation is viewed in the light of local, regional, national and international competition, eco-innovations as the key factors determining comparative advantage of cities have become particularly important. In our modern times, it is an ability to absorb new pro-ecological solutions improving the quality of life in cities that determines their intelligent and sustainable development. Eco-innovations, inseparably linked to almost every sphere of social and economic life, require closer cooperation between academic entities, business circles, social partners, local government authorities and inhabitants. The outcome of such cooperation with universities provides us with information not only about the impact of eco-innovations on the city development and their inhabitants' quality of life but also about competitive advantages of cities and their capacity to absorb the results generated by different scientific and technological disciplines.

The book demonstrates that the implementation of eco-innovations is not by itself sufficient to improve wellbeing and life satisfaction of urban area population, commuters or visitors. What counts is the effectiveness of eco-innovations. The effectiveness of implemented eco-innovations is a key issue here, particularly significant for the development of innovation policies in a city. Such effectiveness is understood as an ability of cities and economic entities doing business within their limits to turn such eco-innovations into measurable outcomes, i.e., benefits improving the quality of life in accordance with the principle of intelligent and sustainable development. Such advantages must be beneficial to both partners.

As highlighted in the book, nowadays, innovation policies do not concern solely national or regional levels. More and more often do large cities and urban areas tend to establish special departments, the responsibility of which is to

create favourable conditions for the development of eco-innovation and innovative eco-businesses. A current model of the contemporary city development stresses the importance of innovative businesses, innovative entrepreneurs and innovative goods and services produced by them. Such an approach is in compliance with regional innovation strategies for smart specialisation (RIS3) based on the Europe 2020 Strategy. According to the Strategy, by 2020, Europe is expected to become a 1/ smart, 2/ sustainable and 3/ inclusive economy. These three mutually complementary EU priorities are expected to increase a level of employment, productivity and social inclusion. Innovation, one of the priorities, is becoming a key factor determining development strategies of modern cities. City, national and regional authorities in the whole Europe have been developing smart specialisation strategies in an entrepreneurial discovery process so that the European Structural Investment Funds could be used more efficiently and synergies between different EU, national and regional policies, as well as public and private investments, could be increased. The book shows that such undertakings have brought positive results, especially in respect of eco-innovations. In the near future, smart specialisation strategies for cities will be effective instruments for resolving social, environmental, climatic and energy issues such as demographic changes, resource efficiency, energy security and climate change resistance. The priority for cities will still be the preservation of harmony between the urban environment, the natural environment and city eco-systems.

The 21st century cities will have to compete for talent, ideas and capital. At the same time, their limited budgets will require them to concentrate their modest resources on some areas and fields which have potential to create sustainable jobs and encourage smart and genuine growth. If cities develop proper development strategies they may have an opportunity to strengthen their position through the promotion of new eco-innovative solutions and in this way, to discover their smart eco-potential.

They, however, should remember about their heritage and cultural diversity resulting from their long history. In the globalising and “spinning” world, the 21st century cities have to skilfully link the present with the future, not forgetting or breaking with the past. Let the train referred to in the preface take us smoothly from an “ordinary city” station to an “eco-innovative city” station where, hopefully, we will live longer, better and happier lives.

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