



DOI:[https://doi.org/10.14505/jemt.v7.4\(16\).05](https://doi.org/10.14505/jemt.v7.4(16).05)

## Application of Creative Ecology Theory to Concepts of Smart and Sustainable City as Possible Solution to Urban Development Problems – Case of Riga

Kristína BACULÁKOVÁ  
University of Economics, Bratislava, Slovakia  
[kristina.baculakova@euba.sk](mailto:kristina.baculakova@euba.sk)

### Suggested Citation:

Baculáková, K. (2016). Application of creative ecology theory to concepts of smart and sustainable city as possible solution to urban development problems – Case of Riga. *Journal of Environmental Management and Tourism*, Volume VII, Winter, 4(16): 594 - 600. DOI:10.14505/jemt.v7.4(16).05

### Article's History:

Received October, 2016; Revised November, 2016; Accepted December, 2016.  
2016. ASERS© Publishing. All rights reserved

### Abstract:

Problematic of environment protection in the urban development is becoming crucial as the cities are growing faster and face the problem to maintain the quality of life of its citizens. In recent years, cities started to adopt plans for smart and sustainable development, which should combine effective solutions for all aspect of urban problems. In our paper, we choose the case of Riga, Latvia. It's urban development plan belongs to one most highly-rated in Europe. We try to evaluate the plan according to the principles of newly introduced concept of creative ecology and analyse if the city's plan really offers feasible solution for variety of recent urban problems.

**Keywords:** creative ecology; smart and sustainable cities; Riga; urban environment.

**JEL Classification:** O18.

### Introduction

Our cities are facing the growth of their citizen caused not only by population growth, but even more by the urban migration. Cities have always been centers of life, job possibilities, culture and facilities. Therefore, life in the city is attractive. Nowadays, it is even crucial to move or travel to the city to get the desired job. Although environmental threads are not the main factor for migration into cities, they are becoming more and more significant. As the cities are growing faster, they face the problem to maintain the quality of life of its citizens.

The main problems concern healthy and pleasant life – fresh air and pollution level, CO<sub>2</sub> emission, energy consumption, waste management. These factors can become the reason to the reversal movement – migration out of the cities caused by the unpleasant environment. Therefore, it is the main topics of modern urban planning to prevent undesirable environment development. Modern city should connect smart ways of doing things with sustainable technologies. However, to re – create the city to become smart and sustainable requires developing wide scale of all the aspect. Therefore, it is a long – term process. It has already started in most of the European cities. However, the level of progress is very different.

In our paper, we have chosen Baltic city Riga as a case study. Historically, the city was of great importance, member of hanseatic union, it was also the capital of Swedish empire. Nowadays, it can be considered as a small European capital. Due to its importance as a capital city, which is full of possibilities (Ozolina *et al.* 2005), people are coming to study or find a job in Riga. However, most of their citizens are moving to suburbs or outside the city to the nearby villages. And it is not only because of the nature of Latvians, who have strong relation to nature. The biggest environmental problem that Riga has is its problem with air pollution. This pollution is still above the average level in EU (The Baltic Course 2015). Paradox is also the fact, that even though Riga is very close to the sea, there is no see breeze and fresh air blowing to the city because of its geographic position of locked bay.

Riga has already implemented long – term development plan Sustainable Riga 2014 – 2020. In the paper, we will focus on main environmental issues of the city and the measures which is Riga planning to adopt. Our main

goal is to evaluate city's plan according to the principles of creative ecology. Using these principles, we would like to point out its strengths and weaknesses propose possible solution for improving the life in the city.

## 1. Smart and sustainable cities

In recent years, concepts of smart and sustainable cities are getting to the fore. Cities are growing bigger and they are no longer able to provide satisfying quality of environment for their citizens. Concepts of smart and sustainable cities are designed to help to solve the problems of city's energy production and consumption, transport and mobility and information and communication technology. But how can we even define smart city? To become a smart city is surely not only about using smart technologies. It can be identified by six features: sustainable economy, sustainable mobility (transport), a well-managed and resource-sparing environment, wise people, high life quality and smart governance. A city becomes smart when investment in its residents and in the social sphere, as well as in the traditional (transport) and state-of-art (information and communication technologies) infrastructures ensures sustainable economic development and high quality of life through different social group participation and involvement, and smart resource management (Riga City Council 2010). ITU developed definition of smart city as: "A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects." (Riga City Council 2014)

Smart cities can be also characterized by having: smart economy (competitiveness), smart people (social and human capital), smart governance (participation), smart mobility (transport and ICT), smart environment (natural resources), smart living (quality of life) (Giffinger *et al.* 2007).

Smart economy means innovative and competitive production, flexibility and ability to transform to sustainable processes. Smart people are creative, flexible, and open to life-long learning and also actively participating in public life. Smart governance is first of all transparent. It is the key element providing public and social services. Smart mobility is locally accessible, safe, innovative, energy efficient and sustainable. Smart environment has attractive natural conditions – this means with certain level of pollution, cares for environmental protection and has sustainable resource management (Giffinger *et al.* 2007). Coexistence of all this factors then contributes to smart living. To life smart means to live in environment with good conditions for human's health, to feel individual safety and social cohesion and to have certain satisfying housing quality, cultural possibilities, education facilities and for the city also tourist attractively.

While the population of cities is growing, the urban areas are facing several problems. These problems are very complex and depend on each other. Most crucial are: energy problems, CO<sub>2</sub> emissions, water management, waste management, urban public transport, housing problems, revitalization of abandoned building and areas, green areas.

European Union focuses more on urban problems as well. It is estimated, that by the year 2020, 80% of people will be living in cities. Therefore, it is important to deal with the environmental conditions in the European cities. There are several environmental policies, however, within the 7th Environmental Action Program, there is the Priority Objective entitled Sustainable Cities: Working together for Common Solutions. The goal of the program is to achieve, that every single European by 2050 will be living well and within the limits of the planet. Majority of the cities is nowadays already working on some kind of smart programs. In this process, EU has the position of legislation creator and also helps with several supportive projects (European Commission 2016).

## 2. Methodology

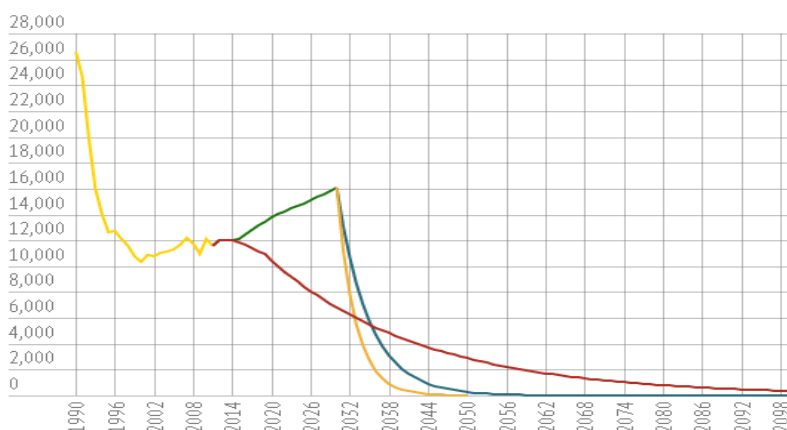
Riga, capital of Latvia was founded in 1201 and it is considered to be the pearl of Baltic's. It is the largest city in the Baltic States, famous mostly for its architecture in Art Nouveau Style (Jugendstil). City is the member of Hanseatic League and it is included in the list of world cultural heritage. Riga is known for its rich water resources, Dauagava River plays important role in city's transport, cargo flows and active leisure possibilities for its citizens. Near Riga, there's a Baltezers lake and the city of Jūrmala with the sea. Besides water, key element of the city is the greenery. Several parks provide space for recreation and sport and complement the urban construction. Riga promotes itself as a smart and sustainable city, however, we would suggest, that city is now on its way to become smart and sustainable. City council prepared extensive development plan until 2020. Characteristics of Riga, which are developed in development strategy, are shown in the following table:

Table 1 – Riga: characteristic, strengths & weaknesses

TYPE	CHARACTERISTIC	STRENGTHS	WEAKNESSES
Water	Daugava river, canal, lakes, beach in Jūrmala.	Good quality of drinking water, recreation, water transport.	Daugava divides city – transport problems.
Greenery	15 main parks and gardens, green territories, Kemerī national park	Recreation and relaxation, health, pollution elimination	Lot of abandoned open space with untreated greenery.
Architecture	Art Nouveau style, medieval city centre	Tourism, cultural heritage, authenticity and integrity	
Energy	Heating due to cold climate zone	District heating, about 70 % by state own plants in Riga.	CO <sub>2</sub> emissions, air pollution.
Transport	Public transport, bridges over Daugava, airport, port, bus and train station.	Transit city to Baltic states, reachable airport and main stations, buses, trolleys and trams.	Pollution, traffic jams, transport in the city centre.

Source: own processing according to Riga smart city: Sustainable energy action plan 2014 – 2020

From the environmental point of view, there are three major problematic elements – energy, transport and waste. Riga’s CO<sub>2</sub> emissions are above the global average number per head – about 9 tons per year per capita (Zala Briviba 2015). Sometimes, the air quality and freshness is impacted by city’s location. Even despite there are rich water resources surrounding the capital, there’s no fresh air blowing to the city. Riga is closed in the bay. Latvia adopted very ambitious plan – to reduce emission by 50 – 60 % to 2030 (compared to 1990). In 2012 as compared to the base year (1990) the total CO<sub>2</sub> emissions in the city of Riga have decreased by 51.85 % (Riga City Council 2010). However, the prognosis until 2030 is not very optimistic.



Source: Green Liberty. 2015 Climate Policy - radical

Figure 1 – Prognosis of the CO<sub>2</sub> emission in Latvia thousands of tons

Yellow line captures historical and actual data. Green line is the prognosis of emission by 2030, and it is, unfortunately increasing. The blue and the orange line represent then the decrease by 2050 and 2100.

Riga’s plan to reduce emissions has three key points. First is to reduce energy use. This should be done by introducing energy saving methods or energy efficiency improvements. Second point is to replace fossil fuels in heating and transport with renewable resources, which are environmentally balanced and do not lead to high CO<sub>2</sub> emissions. Thirdly, there’s a need to replace traditional ways of transport in the city centre to create zero mobility emissions. About 36 % of CO<sub>2</sub> emissions are caused by motor vehicle transport, 27% by district heating, and the rest by fuel consumption and electrical power consumption. Number of registered cars in Riga (which have the biggest share on transport emissions in the city) increased by almost two times between periods 1990 – 2008 (Riga City Council. 2014). The biggest heating consumers are households, then service sector, and only on the 4<sup>th</sup> place industry.

City developed three categories of measures for reducing CO<sub>2</sub> emissions and calculated possible scenarios for the future taking into account factors such as population numbers, private consumption by the residents, number of households, total housing area, projected new housing construction, etc. (Riga City Council. 2014). Measures are divided into three categories:

- energy efficiency measures (production of heat with the use of condensation economisers, absorption type heat pump and wood chips – all in JSC “Rīgas siltums”); (Zajacs *et al.* 2014)
- measures for use of renewable energy (use of solar collectors, geothermal energy, heat energy produced by boilers operating on pellets);
- measures in the transport system (bio fuel and hydrogen powered vehicles).

Another problem is city's waste management. Not only the amount of waste, but also its separation, collection and transport are highly debated. Riga developed very successful way of waste recycling. In the past, the dump grew near the city and people came to the dump to retrieve the trash. Initially, they were paid for valuable things they have found, but later, when the city wanted to manage the landfill in better and ecological way, the people should leave. So, they started to work undeclared. It took a time to persuade the people not to return every day for gaining some money from trash, but the city succeeded. Finally, EKO Getlini – new high technology and environmental friendly ecological waste management company was established. Getlini is responsible for collecting and managing the waste for all companies and residents based in Riga and surrounding areas.

The non-recyclable waste is deposited in biodegradable cells, which are highly insulated, that means, no harmful substances can penetrate to the land. Gas and water from the waste are further processed. Gas is transformed to energy and water is purified. Getlini belongs to largest and most sophisticated producers of green energy in Latvia. But the company is interesting and unique thanks to one more aspect – production of eco-tomatoes in the greenhouse complex, which uses the energy from waste. Tomatoes are planted in mineral wool and pollinated by colonies of bumblebees. No harmful plant protection is used in Getlini. Grown tomatoes belong to one of the most popular in Riga.

Transport is generally one of the biggest energy consumer and polluter. Public transport in the city is dominantly powered by electricity. Trams and trolleys operate most of the transport. Riga already introduced low-floor multi section trams, which have higher passenger capacity. Buses use fuel with over 3 % addition of bio-fuel. Further transport plans involve:

- support of electrical cars and e-bikes;
- replacement of public transport busses with hydrogen and emission free vehicles Riga became member of Hydrogen Fuel Gas Association HyER and city's public transport provider Rīgas satiksme made research on use of hydrogen technologies in the public transport system); creation of bicycle lanes network.

#### 4. Implementing creative ecology into Riga's plans

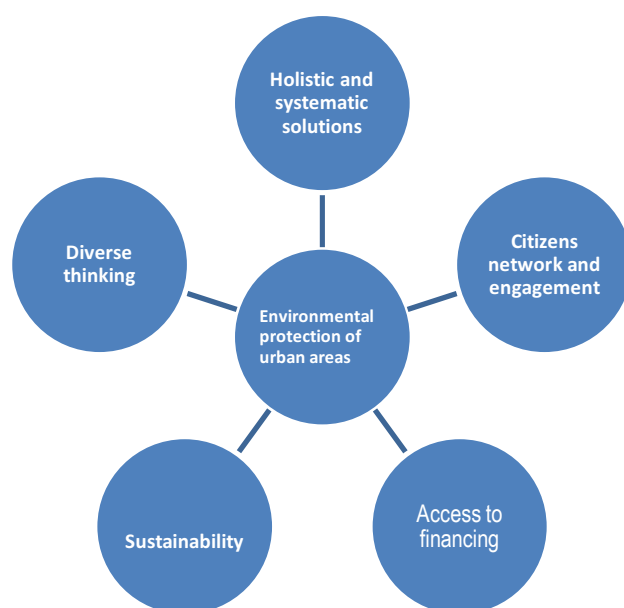
In the next part, we try to apply the concept of creative ecology on the case of Riga and try to implement some of its principles into suggested measure of development in Riga development plan 2014 – 2020.

What is creative ecology? The concept was introduced in 2009, when John Howkins wrote his book *Creative Ecologies – Where thinking is a proper job*. Originally, Howkins identifies the creative mindset as basic for human life. He analyses the habitat of humans, the places where we live in, our environment and relationships between communities and their environment (Howkins 2010). The creative ecology model moves away from industrial, discipline-centric understandings of artistic practice and instead places focus on the system of relationships present in the community and beyond (Creative Coalition 2014). The main idea behind his concept is creativity.

Creativity is a cornerstone for all human activities – starting from our environment to making relationships and doing business. Since then, creative ecology has been understood in several very different ways. It can be pure business concept, it can be concept of human environment and relationships within and it can be ecological concept connected to environmental protection. We see creative ecology in broader sense. As human beings, we should use the main principles of creativity to create pleasant and sustainable environment not only for us, but for another living organism on this planet. “The spread of this approach is motivated by a desire to strengthen the resilience in various systems, replacing former goals of sustainability, which no longer seem achievable or relevant when change is accepted as a constant.” (Creative Coalition 2014).

Can we use creativity in the process of urban development? Can creativity contribute to solving environmental problems of the city? We are constantly failing in the process of environment protection and therefore, the successful development plans should be considered within the framework of basic characteristics of creativity. These are: diversity, implicit thinking, unstable environment (changes), learning, feedback, networks, access, autonomy (low dependence), complex, system, quality, collaboration (Howkins 2010).

Based on this, we created 5-point approach illustrating, in what way creative thinking could be used in the process of protecting and improving conditions of our environment.



Source: own processing

Figure 2 - Complex 5-point approach to urban environmental problems

Riga's current sustainability development plan consists of five main aspect of interests, namely energy consumption reduction, society involvement, financial support tool, EU support and legislative documents. Energy consumption is currently the most critical problem. The biggest energy consumer is heating. City introduced several smart and sustainable solutions, e.g. heat pumps. There are two heat pumps solutions – air or deep drilling. Air heat pumps are nowadays widely used in Riga, but they only serve as an additional source for heat. The biggest weakness is that there are no data about how many heat pumps have been installed and their maintenance and technical reparations are strictly in the hands of private owners.

The most energy efficient solution seems to be installing deep drilling heat pumps. Such a pump has already been installed in Mežaparks. However, for this solution to be effective, Riga need to build a network of these pumps. Another reasonable source for heat are sun energy (where Riga has the highest potential of all northern cities like Helsinki, Stockholm, Copenhagen), thermal energy (deep drilling) and waste heat production.

Another aspect of the plan is society involvement. Riga understood the importance of citizen's engagement. The city put focus on the cooperation with non – governmental organisations and stakeholders, represented by residents and professional societies. Civic awareness should be built through various thematic venues like seminars, discussion, campaign and the use of information and propagation material on social networks. This aspect is more easily attainable, as Latvians are known for their national consciousness and relationship to nature (Turība University 2016).

The ability to reach the goals set in the plans depends on how successfully government can deal with providing financing. The main source of finance of the planned activities is Horizon 2020 and EU structural funds. Horizon 2020 will be used for three main priorities, namely Information and Communication Technologies; Secure, clean and efficient energy and Smart, green and integrated transport. Other financial possibilities include cooperation mostly with other Baltic countries. However, when assessing the complexity of creative solutions, there is a lack of cooperation with private sector. For Latvia, as a small Baltic country with soviet history, it is really hard to find the finance, since the public-sector finance still covers on-going poorer living standards as a result of the crisis, which had major impact on Latvia.

We can assess strengths and weaknesses of current Riga's Smart and Sustainable city plan with our 5-point approach to urban environmental problems. We agree on the fact, that Riga's current S&S city plan's strengths outweigh the weaknesses. From the complex point of view, city implemented almost all of the key characteristics of creative ecology theory. The plan is based on holistic and systematic solutions, which are long-term sustainable. The most important for the city is the reduction of energy consumption. As there are several major consumers, there must be different solution for each of them. One of the most unique and successful project is EKO Getlini. Energy reduction solutions are ambitious, but we can't precisely analyse and monitor their effectiveness, therefore, we are not able to evaluate their benefits in the long period. People are being regularly



involved in decision process through citizens' forums, discussions and campaigns in the region near Riga. Unfortunately, city itself is missing such platform.

The biggest problem and thread for plan and solutions to be implemented is financing. Although Riga is cooperating with other municipalities even outside Latvia, reliance strictly on European money can be uncertain and can result in shortage of finance. However, it is the fact, that municipality itself does not have money for implementing the ambitious plan and government must deal with the problems of nationwide character (post-crisis recovery). Latvia belongs to the poorest country in EU reaching only about 40% of average EU GDP. Strong regional disparities cause the government and money flow in the poorest regions, e.g. Latgale (Adams 2016). It is therefore crucial to engage the private sector and encourage business to financially support these urban changes.

The biggest strength of the city (besides historical architecture) is the green and blue territory, which represents 39% of the city area (ca 304 km<sup>2</sup>). It includes various types of places such as parks, city canal, beaches (Lucavsala beach represents multifunctional space that is used for venues like festivals, concerts and sport activities), port and promenade near Daugava River<sup>3</sup>. These places must be preserved, since they represent the key element of the city's image. Following table concludes main strengths and weaknesses.

Table 2 – Riga: Characteristic, strengths & weaknesses

Creative approach/ aspect	Holistic and systematic solutions	Citizens network and engagement	Access to financing	Sustainability	Diverse thinking
STRENGTHS	<ul style="list-style-type: none"> <li>▪ Several types of alternative energy sources;</li> <li>▪ Modern factory for waste management, which can serve as a "good practice" for the future.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Citizens 'forum in Jurmala and Salaspils [9];</li> <li>▪ Project of 8 European municipalities <i>Together for territories of co-responsibilities</i>.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Balance among economic, social and natural environment aspects;</li> <li>▪ Change from very liberal and fragmentary scattered planning in the past;</li> <li>▪ City's green territories (parks, Lucavsala beach);</li> <li>▪ Old city centre closed for transport.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 3 main pillars creating smart city:</li> <li>Society</li> <li>Urban</li> <li>Environment</li> <li>Economy</li> </ul>
WEAKNESSES	<ul style="list-style-type: none"> <li>▪ No data on effectivity;</li> <li>▪ Missing network of deep drilling pumps.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Missing platform directly in Riga city.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Only EU financing mentioned;</li> <li>▪ In strategy for 2030 financing schemes are missing at all.</li> </ul>		

Source: own processing

## Conclusion

According to publication Comparative Study of Smart Cities in Europe and China 2014, (China Academy ICT 2014) Riga belongs to the group of cities where the quality of sustainable plan is above average. This report also includes Riga into the group of cities with pilot S&S city plans<sup>4</sup>. However, it only ranked on a very basic level regarding financing possibilities. This represents the biggest threat in the process of implementing. It will be therefore interesting to monitor, if Riga will be able to implement the plans until 2020. It will be necessary to encourage private sector and business to invest in the city development. Private sector-led urban development projects are quite unknown in continental Europe, but they have been realising in Netherland or UK (Heurkens 2012).

The private actors can be divided into several groups, but for the urban development, mostly developers, housing associations and investors are important. While developers and housing association focus on the sales

<sup>3</sup> Besides these, there are surrounding places like Jurmala or Kemeru national park, which do not belong directly to territory of Riga, but they are very connected with the city, because most of the Riga's citizens visit these places for recreations. Also, tourists visiting Riga almost always visit these surroundings.

<sup>4</sup> Together with Amsterdam, Copenhagen, Malmö, Barcelona, Frankfurt, Tallinn, Lyon, Bristol etc.

market (and therefore are necessary by solving the housing situation in the city), investors focus mostly on the rent market and choose the attractive places for modern urban construction. Cooperation with private investors and developers has positive effect as well as possible risk. Involving private sector means sharing investment risk, information, product knowledge, project management, experience. On the other hand, private investors often lack transparency, they are focused on own revenues, lack the end user's knowledge. (Heurkens 2012).

Since Riga is missing the financial resources, cooperation between public and private sectors can be satisfying solution. PPP projects as a form of cooperation have been already quite successful in Netherlands. "A PPP is an institutionalized form of cooperation between public and private actors who, on the basis of their own indigenous objectives, work together towards a joint target, in which both parties accept investment risks on the basis of a predefined distribution of revenues and costs." (Ozolina *et al.* 2005). There are several forms of PPP, combining the role and share of participation between subjects, so it is upon the city and private investor to decide. Cities like Amsterdam, Copenhagen or Bristol can be source of inspiration for Riga's future.

## References

- [1] Adams, N. 2016. *Regional Development and Spatial Planning in Enlarged European Union*. London. Routledge.
- [2] Giffinger, R. *et al.* 2007. *Smart cities: Ranking of European medium-sized cities*. Available at: [http://www.smart-cities.eu/download/smart\\_cities\\_final\\_report.pdf](http://www.smart-cities.eu/download/smart_cities_final_report.pdf) (accessed 06-09-2016)
- [3] Heurkens, E. 2012. Private Sector-led Urban Development Projects: Management, Partnerships and Effects in the Netherland and UK. *Architecture and the Built Environment. Series 4*. 1-480.
- [4] Howkins, J. 2010. *Creative Ecologies: Where Thinking is a Proper Job*. Transaction Publishers.
- [5] Jekabsone, I., and Sloka, B. 2015. Sustainable Local Development from Perspective of Citizens: Salaspils Municipality (Latvia) Case1. *European Integration Studies*, 9: 100-112. Available at: <http://dx.doi.org/10.5755/j01.eis.0.9.12799> (accessed 16-10-2016)
- [6] Nijkamp, P. *et al.* 2002. A comparative institutional evaluation of Public-Private Partnerships in Dutch urban land use and revitalisation projects. *Urban Studies*, 39(10): 1865-1880. Available at: <http://dx.doi.org/10.1080/0042098022000002993>
- [7] Ozolina, L. *et al.* 2005. *Spatial Plan of Riga Planning Region. Part II. Perspective*. Available at: [http://www.rpr.gov.lv/uploads/filedir/Ter\\_plaanojumi/Rigas%20planosanas%20regions/Eng/2\\_Rigas%20Plan%20Reg\\_Perspektiva\\_2005\\_ENG\\_48lpp.pdf](http://www.rpr.gov.lv/uploads/filedir/Ter_plaanojumi/Rigas%20planosanas%20regions/Eng/2_Rigas%20Plan%20Reg_Perspektiva_2005_ENG_48lpp.pdf) (accessed 28-10-2016)
- [8] Zajacs, A., Zemitis, J., Tihomirova, K., and Borodinecs, A. 2014. Concept of Smart City: First Experience from City of Riga. *Journal of Sustainable Architecture and Civil Engineering*, 2(7). Available at: <http://dx.doi.org/10.5755/j01.sace.7.2.6932> (accessed 13-10-2016)
- \*\*\* Creative Coalition. 2014. *Creative Ecology: a new model for resilience in creative communities*. Available at: <https://static1.squarespace.com/static/548f65afe4b06603e52a8dd1/t/54c85d38e4b0106c529f4ade/1422417208911/Creative+Coalition+-+Creative+Ecologies+.pdf> (accessed 23-10-2016)
- \*\*\* European Commission. 2016. *EU Policy on the Urban Environment – Overview*. Available at: [http://ec.europa.eu/environment/urban/index\\_en.htm](http://ec.europa.eu/environment/urban/index_en.htm) (accessed 01-10-2016)
- \*\*\* China Academy ICT. 2014. *Comparative Study of Smart Cities in Europe and China 2014*. Beijing. Springer.
- \*\*\* ITU. 2014. *Smart sustainable cities: An analysis of definitions*. Available at: [http://www.rdpad.lv/wpcontent/uploads/2014/11/ENG\\_STRATEGIJA.pdf](http://www.rdpad.lv/wpcontent/uploads/2014/11/ENG_STRATEGIJA.pdf) (accessed 15-10-2016)
- \*\*\* Riga City Council. 2010. *Riga Smart City Sustainable Energy Action Plan for 2014 – 2020*. Available at: [http://www.rea.riga.lv/files/RIGA\\_SMART\\_CITY\\_SEAP\\_2014-2020\\_EN.pdf](http://www.rea.riga.lv/files/RIGA_SMART_CITY_SEAP_2014-2020_EN.pdf) (accessed 07-09-2016)
- \*\*\* Riga City Council. 2014. *Sustainable Development Strategy of Riga until 2030 and Development Programme of Riga for 2014-2020 SUMMARY*. Available at: [http://www.rdpad.lv/wp-content/uploads/2014/11/ENG\\_STRATEGIJA.pdf](http://www.rdpad.lv/wp-content/uploads/2014/11/ENG_STRATEGIJA.pdf) (accessed 15-10-2016)
- \*\*\* The Baltic Course. 2015. *CO<sub>2</sub> emissions in Latvia above average global indicator*. Available at: <http://www.baltic-course.com/eng/energy/?doc=102746> (accessed 16-09-2016)
- \*\*\* Zala Briviba. 2015. *Klimata politika – radikāla prokrastinācija*. Available at: <http://www.zalabriviba.lv/klimats/klimatapolitika-radikala-prokrastinacija-2/> (accessed 16-09-2016)

Reproduced with permission of copyright owner.  
Further reproduction prohibited without permission.