

# City Ranking for the Öresund Region

A way forward to improve environmental performance and regional collaboration

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EUROPEAN  
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Interreg IVA

ÖRESUND – KATTEGAT – SKAGERRAK

ENERGIÖRESUND



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## Abstract

The world around us is urbanising at a faster rate than ever. Today more than 70 per cent of the European population lives in urban areas, especially small and medium-sized cities. Often, cities are the centres of economic growth. In the context of urban pollution and climate change, cities are at the core of European policies due to their ability to be the 'places' where solutions and innovations emerge. Cities compete with each other to attract investors and inhabitants, and showcase their best features. In this aspect, ranking systems provide a tool to benchmark their work, divulge comparative advantages, and define future targets and developmental strategies. This research is aimed at understanding the existing environmental ranking systems in Europe and investigating how these ranking systems can help cities in the Öresund region to improve their environmental performance and regional collaboration.

The qualitative research is based on a methodological triangulation involving literature review, semi-structured interviews, and observations to consolidate the findings. A comparative analysis technique is applied to scrutinize the existing environmental ranking systems, revealing their shortcomings and significant features with respect to the Öresund region. Based on this systematic analysis, the author has proposed an outline for a customised city ranking for the Öresund region, a system that is based on a two-tier structure and constructive post ranking mechanisms. This ranking system could assist regional municipalities to benchmark and improve their environmental performance in close cooperation with other local authorities. Eventually, the ranking system could contribute towards building a network of municipalities leading to sustainable urban development. It is also an important tool in the efforts of making the Öresund region Europe's first CO<sub>2</sub> neutral and climate smart region by 2020.

**Keywords:** City ranking, Öresund region, sustainable urban development, environmental performance.

## Executive Summary

**The undertaken research tries to address the importance of city rankings in urban politics. It scrutinizes the existing ranking systems to ensure their suitability to improve environmental performance and regional collaboration of municipalities in the Öresund region.**

Environmental pollution and climate change are some of the most important concerns we face in the present time. The magnitude of these global challenges is proliferated by ever-increasing population and rates of urbanisation all over the world. In Europe - one of the highly urbanised continents on the planet - more than 70 per cent of the population lives in urban agglomerations. In response to unrestrained human activities and population density, cities are the places where environmental resources are under pressure, affecting the standard of living. At the same time, population density in urban areas provide opportunities to develop more compact infrastructure for efficient service provision.

Undoubtedly, cities are competing with each other towards improving their position within national and European urban systems. This demands monitoring and measuring a city's performance. In this regard, city rankings are considered as an instrument where the participating cities get an opportunity to divulge their comparative advantages and portray particular facets. These ranking systems seem to be beneficial in defining future targets and developmental strategies for the cities. Since their inception, ranking systems are a topic of public discussion, media attention and an important component of urban politics. However, there is a need to evaluate the existing ranking systems to explore their rationale and value for a city. Additionally, in the context of the Öresund region, it is necessary to scrutinize these ranking systems and study their effectiveness for promoting local and regional 'environmental sustainability'.

This analytical study aims to contribute to the development of a customized set of environmental indicators for the Öresund region. Insights into the views of participating cities on existing ranking systems, the potential to modify these systems to suit regional conditions, and ways to communicate environmental performance with the help of indicators are key aspects of this research. In response to the above mentioned background the undertaken study investigates the following research question:

**How can ranking systems contribute to improve the environmental performance in the Öresund region, so it becomes the first CO<sub>2</sub> neutral region in Europe?**

In order to answer the research question, a qualitative method is undertaken. The author by and large uses an inductive approach of reasoning, which moves from observations to a broader generalization leading to development of a customised ranking system. The research method can be divided into three main phases comprising data collection, data analysis and synthesis. Data collection is extensively based on methodological triangulation that involves semi-structured interviews, personal observations and reviewing documents related to ranking systems in Europe. A comparative method is used in order to analyse the collected data. The use of a comparative method for the existing ranking systems contributes to the research by generating knowledge about commonalities, presence and/or absence of relevant indicators to realize regional goals. Additionally, the effectiveness of the compared ranking systems in improving environmental performance of the participating municipalities is explored. In this study, four city ranking systems: Smart Cities (a ranking of European medium-sized cities), the European Green City Index (EGCI), the European Green Capital Award (EGCA) and Miljö Aktuell's Sweden's Greenest Municipality (SMK); are compared to understand their development, different ways of data collection and processing, ranking, and dissemination

methods. The comparison reveals the shortcomings and appropriate features of the rankings in context of the municipalities in the Öresund region. The synthesis section in this work is built from this analysis and with inputs from the author to develop a new and suitable city ranking system for the Öresund region. The synthesis involves development of environmental criteria, which can assist municipalities in the Öresund region to improve their environmental performance and enhance regional cooperation.

The Öresund region aspires to be the most attractive, energy efficient, dynamic and first ever carbon neutral region in Europe. In order to achieve these targets it is necessary to measure and communicate progress at regular intervals. This will help to comprehend the trend of the local municipalities towards achieving the set goals. Apart from Miljö Aktuell's SMK there is no other major, nation-wide city ranking system available in Sweden. On the other hand, there is no national level city ranking system in Denmark. However, municipalities from both the countries are members to a number of national and international city cooperation networks. The city cooperation networks provide a platform to share experience, transfer knowledge and develop collaboration between member cities. However, a regional ranking system is of importance that is useful for local authorities to improve strategies, concentrate their efforts on weaknesses, and appreciate the good work of forerunners in the region.

The existing ranking systems are homogeneous in nature, limiting participation of the cities. The winners and the top performers in the ranking system use it for marketing the best city features and to attract investors. On the contrary, cities ranked lower in the rankings often tend to ignore the results and eventually stop participating in the ranking systems. Except for the EGCA, all other ranking systems have poor post ranking mechanisms as they do not have procedures and mandates to share experiences and knowledge or assist low ranked municipalities to get better in their performance. It is observed that municipalities in the Öresund region perform better as compared to other regions in Europe. However, ranking systems developed to cover larger geographical areas tend to measure non-specific or inappropriate indicators for some cities, limiting their use to improve performance of the participating cities. In the background of shortcomings mentioned earlier, developing a customised city ranking system for the Öresund region is inevitable.

The research at hand proposes an outline for a regional ranking system that aims to help local municipalities to improve their environmental performance. Moreover, the ranking system involves six categories covering twenty four environmental components of a city. A set of measurable indicators specific to the region can be developed as a future scope. However, the most significant features of the suggested ranking system are as follows:

- The ranking can be displayed using 2 levels:  
*Level 1:* This level is based on a common set of indicators from the selected categories. All Municipalities, irrespective of their size, population and character shall be able to follow them. The ranking will involve Municipalities opting for Level 1 only.  
*Level 2:* Municipalities after being able to evaluate themselves with the indicators assigned in Level 1 can try to evaluate their performance with Level 2 indicators. Level 2 indicators are comparatively difficult to calculate.
- Rankings should be displayed every year. Cities involved in knowledge sharing, technology transfer and joint programmes with other cities will get extra points.
- Mechanisms for feed back or counselling for the participating municipalities after rankings are published is important.
- Cities that are doing well in a particular field can be matched with another city having difficulty in that field. This idea can be called as 'Sibling Cities'.

- The ranking system shall award the best performing city of the year; recognise the progressive city in the past year and a city doing extraordinary environmental work.

In order to materialise the proposed ranking system, four key stakeholders from the region have been identified namely: the Öresund Committee, local authorities in the region, city and business networks, and the academic partners. Finally, the author believes that the proposed ranking system is an important tool in the efforts to contribute to the Öresund regional vision. Moreover, it could help to strengthen regional cooperation by developing teamwork and stronger networks between the cities. Overall, this research suggests that ranking systems can play an important role in environmental performance and regional cooperation if the systems and processes are well-designed and context-specific.

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## Abbreviations

CO <sub>2</sub>	Carbon dioxide
CoM	Covenant of Mayors
EC	European Commission
EAP	Environment Action Programme
EEA	European Environment Agency
EGCA	European Green Capital Award
EGCI	European Green City Index
EIU	Economist Intelligence Unit
ERDF	European Regional Development Fund
EU	European Union
GHG	Greenhouse Gas
ICLEI	International Council for Local Environmental Initiatives
ICT	Information and Communication Technology
RUS	Regional Development and Cooperation in the environmental system
SALAR	Swedish Association of Local Authorities and Regions
SCB	Statistics Sweden
SCC	Smart Cities and Communities
SEKOM	Sveriges Ekokommuner
SKL	Sveriges Kommuner och Landsting
SMK	Sveriges Miljöbästa Kommuner
UN	United Nations
UNFPA	United Nations Population Fund
UNHABITAT	United Nations Human Settlements Programme
URBACT	Urban Development Network Programme
USA	United States of America
WWF	World Wildlife Fund
ÖSCH	Öresund Smart Cities Hub

# 1 Introduction

Global climate change and pollution are some of the most important environmental challenges the populace is facing in the twenty first century. Human civilization created history when the global population crossed seven billion in 2011 (UNFPA, 2011). This landmark can be seen as an achievement considering the human ability to adapt and modify their surroundings or as a failure in the view of depletion of resources and environmental degradation worldwide. Unparalleled urban transformations were observed during twentieth century in response to changing global economy and in the last few decades the global urban transition favoured urban growth. In 2008, for the first time ever more than half of the people on the earth lived in urban areas (UNHABITAT, 2009). Cities all around the world are growing at an alarming rate. According to the UNHABITAT (2009), over 70 per cent of population is estimated to live in urban areas by 2050. Accomplishing sustainable urban development in cities with increasing urban populations poses a major challenge to urban planners and decision makers all around the world.

## 1.1 Context

### ***Europe and Urbanisation***

Europe is one of the first and most urbanised continents on earth. Today, approximately 70 to 75 per cent of the European population stays in urban agglomerations and it is anticipated to reach 80 per cent by the year 2020 (EEA, 2006; European Union, 2011). Like all other cities in the world, European cities are expanding and as a result the boundary between city and rural area is disappearing. However, unlike cities in the United States of America (USA) and China, European cities are more polycentric (European Union, 2011). As per European Union (2011), 143 million Europeans stay in 23 cities with more than 1 million population and 345 cities of more than 100,000 inhabitants. Only 7 per cent of the European Union (EU) population stays in cities of over 5 million residents. The majority (approximately 56 per cent) of the urban population and 38 per cent of the European population stays in small and medium-sized cities and towns with inhabitants ranging between 5000 to 100,000 (Colourful Cities, 2012). These small and medium-sized cities are of extreme importance to avoid depopulation of rural areas and urban drift, which is crucial to achieve regional development (ESPON, 2006; Gómez & Medina, 2010), cohesion and sustainability in Europe (European Union, 2011). Not to mention, growth and development of small and medium-sized cities in western Europe is arguably the most balanced urban growth system in the world (Knox & Mayer, 2009).

Small and medium-sized cities with their ability to provide workers, consumers, business areas and trade environments, play a pivotal role in realizing economic growth. These cities, spread across the continent, are at the centre of local and regional economies. Cities are open and dynamic systems which consume, transform, assimilate and release materials and energy. Their interactions with humans and other ecosystems are essential for providing healthy and quality life. However, in response to unrestrained human activities and population density, cities are the places where environmental resources are pressed and health effects of environmental degradation are observed (SOER, 2010). Cities which are growing faster than the surrounding areas negatively affect the environment and standard of living for the people (*ibid.*).

### ***Urbanization, contributing to problems as well as solutions!***

Cities have often been blamed by a number of researchers for causing environmental problems and a major source of greenhouse gases (GHG) contributing to global warming (Dodman, 2009; Hoornweg *et al.*, 2011; Newman, 2006; Satterthwaite, 2008) for a long period of time. With reference to the role of cities in climate change, the Executive Director of the

United Nations Centre for Human Settlements (UN-HABITAT) quoted that “cities are accountable for 75 per cent of global energy consumption and 80 per cent of greenhouse gas emissions” (United Nations, 2007). The Clinton Foundation (n. d.), along with the C40 cities climate leadership group (C40 Cities, 2011) reported that these emissions are extremely high considering the fact that land mass occupied by cities on the planet is only 2 per cent.

Due to high population densities in cities, pollutants are generated in smaller areas. These pollutants are not able to disperse or dilute easily resulting in air pollution, water pollution and waste generation in the cities. Many cities in the world are unsustainable considering their high levels of resource consumption, waste generation and pollution (Miller & Spoolman, 2012). Levels of pollutants are usually higher in the cities as compared to the rural areas. Due to the massive industrial activities during twentieth century and excessive vehicular pollution, the majority of the European urban population has been exposed to air pollutants with concentrations above permissible limits (SOER, 2010). Noise levels in cities is also another key issue, as a large proportion of the EU population living in the urban areas is constantly exposed to the road traffic noise. Continuous exposure to high levels of noise can contribute to non-auditory effects including sleep disturbance, endocrine imbalance, irritation, cardiovascular disorders etc. (Babisch, 2002 & 2006; Bluhm & Eriksson, 2011).

According to the European Commission (2012), 68 per cent out of the total European population lives in urban areas and consumes 70 per cent of the fossilised energy. This energy consumption is alone responsible for 75 per cent of EU’s total GHG emissions. Transportation and housing sectors together consume 60 percent of energy (Eurostat, 2011) and account for significant amount of GHG emissions from the urban areas. Urban traffic resulting in congestion is responsible for 40 per cent of CO<sub>2</sub> emissions (European Commission, 2007), the majority of which is generated from use of private cars<sup>1</sup>. Having said that, cities also play a crucial role in reduction of CO<sub>2</sub> emissions and the battle against climate change. The population density in urban areas provide opportunities to develop energy efficient housing structures, various modes of public transportation and compact city infrastructure for efficient service provision (European Union, 2011). This helps to keep the energy consumption and demand for transportation under control. Cities once held responsible for the source of environmental problems, are now considered as centres of solutions to mitigate them.

### **City rankings and urban development**

Taking into consideration the above mentioned background, it is obvious that the European cities, especially medium and small cities, will play a central role in bringing the Europe 2020 strategy<sup>2</sup> to reality. The importance of local and regional governments as well as cross border cooperation cannot be underestimated in the process of achieving sustainability, all inclusive and smart growth throughout the continent. There is a competition between European cities towards improving and benchmarking their position at national and European urban system (Haindlmaier & Riedl, 2010). Cities aim at improving their competitiveness and their position continuously (Begg, 1999). The trend to become a leader and, pioneer and ‘branding’ cities enhances the explicit local action, which provides cities with comparative advantages in attracting investors and inhabitants (Hodgkinson, 2011). Use of city rankings can be of great help in evaluating trends in urban development. Increasing competitiveness is valuable for

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<sup>1</sup> Urban transportation has an indirect effect on European economy. Traffic congestions mostly occurring in city centres, due to overcrowding of vehicles costs Europe nearly 100 billion euros every year, or 1% of the EU’s GDP.

<sup>2</sup> Europe 2020 is the European Union’s ten-year growth strategy. The strategy aims at a growth which is smarter, more sustainable and more inclusive. Regional and local authorities are responsible for policy areas linked to the Europe 2020 strategy and play crucial role in achieving targets set under Europe 2020 Strategy (European Commission, 2010).

participating cities as it is a 'zero sum game'<sup>3</sup> where cities simultaneously grow and benefit from each other resulting in by and large national growth (Parkinson *et al.*, 2004).

## 1.2 Problem definition

Various national, international and regional ranking systems targeting a range of urban components have been in place for over a decade. It has been observed that since their inception the ranking systems are a topic of public discussion, media attention and an important component of urban politics. Under the competitive circumstances in urban politics, city rankings prove to be an important tool to attract public interest. Nowadays, city rankings are considered as an experimental base where the participating cities can divulge their comparative advantages and portray particular facets. These ranking systems have proved to be beneficial in defining future targets and developmental strategies for cities (Giffinger *et al.*, 2010). Participating cities look at these systems as an element of their marketing strategy to brand its best features (Tayebi, 2006). Higher position in a reputed ranking system can help cities to improve their image at an international level.

Generally, the ranking systems are criticized for their scale and selection of indicators used for analysis (Nissen *et al.*, 2011). Sometimes city rankings with larger geographical scope compare cities belonging to contrasting geo-climatic regions, diverse socio-economic backgrounds and different city compositions, often ending up producing inconsistent and unfair results. Examination of the existing city ranking systems revealed that most of these are designed for large capital cities, denying the representation and importance of small and medium-sized cities. The methodological errors arising due to the incompatibility of indicators often affects the credibility of the ranking systems.

### **Research Gap**

There is a necessity to evaluate the role of the existing ranking systems in urban politics, the objectives behind their development, the methodology used and the set of indicators measured in them. It is equally important to investigate their role, if at all, in influencing future urban strategies at the local level. From an urban policy perspective it is also essential to explore the rationale and value of such ranking systems for a city. In general, why is it important to discuss and take into consideration the ranking systems in the first place? From a general public perspective and for the people interested in contributing to local development, it is necessary to understand how these ranking systems can be integrated with everyday life. In addition, it is necessary to testify whether these ranking systems reflect the reality on the ground or are they only useful for branding and marketing cities.

City rankings can potentially contribute to achieve sustainable urban development. However, sustainability is a broad concept shaped by the integration of environmental, social and economic aspects, fostering an action-oriented approach to deal with problems (Jäger, 2009). In particular, environmental sustainability is defined as the maintenance of natural capital along with the two fundamental environmental services namely, sources and sinks (Goodland, 1995). Considering the urban environmental problems, it becomes necessary to scrutinize the existing ranking systems and study their effectiveness for promoting local and regional 'environmental sustainability'. It is also relevant to test the possibility of developing a regional ranking system addressing environmental sustainability issues with a set of indicators that can be useful for local authorities to monitor and improve their environmental efforts.

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<sup>3</sup> Former Prime Minister of Italy C. A. Ciampi argues that competitiveness is a Zero sum game where increase in competitiveness in one country does not come at the expense of another. Same is true for cities or regions (Begg, 1999).

## **Research focus**

Against these research gaps, the aim of the undertaken thesis is to contribute to the environmental sustainability of the Öresund region by proposing a customised ranking system. The research is also expected to contribute to three larger cross-border cooperation projects - Energi Öresund, Urban Transition Öresund and Öresund Smart City Hubs (ÖSCH) - between Sweden and Denmark. The projects are funded with European Unions' Interreg IV A<sup>4</sup> financing in the Öresund region, with the focus on encouraging and supporting cross-border cooperation (Interreg IV A, 2012). The research also hopes to facilitate collaboration between these Interreg projects working on similar themes. The project partners involved in Energi Öresund and Urban Transition Öresund are listed in Appendix 1.

In order to maximise the value of this research, the author decided to focus only on the environmental sustainability in the Öresund region and not particularly concentrating on the social and economic aspects. Having said this, the author is aware of the fact that it is not easy to overlook the social and the economic components of urban sustainability issues. However, for the feasibility purpose, the study takes into consideration ranking systems dealing with the environmental aspects of cities and use of environmental indicators only. A core focus of the research is to contribute to the knowledge that will assist the Öresund region to become the first CO<sub>2</sub> neutral and climate smart region in Europe and develop a ranking system to measure and communicate the progress towards reaching this goal.

Insights into participating cities' views on existing ranking systems, potential to modify these systems to suit regional conditions and ways to communicate environmental performance with the help of indicators contribute to an in-depth understanding. It is imperative to know Öresund Committee's views on using ranking systems as a tool to evaluate the regional development. Such understanding helps to evaluate the effectiveness of ranking systems in achieving overall sustainable urban development. This analytical study also helps in realizing the need to develop a customized set of indicators for the Öresund region. This indicator system shall represent local environmental aspects and help in improving the environmental performance of the involved municipalities. The term 'environmental performance' is extensively used in this research referring to the measurable results observed in the cities after implementing a set of indicators based on it's targets and visions (Srebotnjak, 2006).

### **1.3 Research Questions**

In response to the background mentioned in the above sections and the identified research gaps, the undertaken study will respond to the following research question:

**How can ranking systems contribute to improve the environmental performance in the Öresund region, so it becomes the first CO<sub>2</sub> neutral region in Europe?**

- **Sub-question 1:** What are the implications of the existing environmental city ranking systems in the Öresund region?
- **Sub-question 2:** How can environmental ranking systems influence environmental actions of local authorities?

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<sup>4</sup> The Interreg Programmes are financed through European Regional Development Fund and are aimed at stimulating cross-border cooperation in the EU. About 52 Interreg IV A programmes is in operation in Europe between the period 2007 and 2013. The Energi Öresund, Urban Transition Öresund and Öresund Smart City Hubs are the projects running in order to promote sustainable economic growth in the southwestern part of Scandinavia.

In order to answer sub-question 1 and sub-question 2, an extensive literature survey including methodologies of ranking systems and academic literature was conducted. It also helped to establish the role of environmental indicators or ranking systems in environmental actions taken by the participating Municipalities. Interviews with the local authorities were arranged to support the literature and be familiar with their views about the existing ranking systems. This was complemented with observations, thus completing the triangulation necessary to authenticate the findings.

## 1.4 Methodology

The research used a qualitative approach to explore the proposed research questions. The methodology symbolized several characteristics of qualitative research recommended by Rossman & Rallis (1998) considering the methods of data collection and data analysis. The methods of data collection were interactive and humanistic involving interviews and personal communication. The data collection methods were based on open-ended observations, interviews and documents.

The research is interpretive (Creswell, 2003), where the author has interpreted the data collected through literature review and personal communications. The author by and large used an inductive approach of reasoning, which moves from observations to a broader generalization to develop conclusions. Throughout the research, a complex reasoning was used that is holistic and iterative, which involved moving back and forth from data collection and analysis to problem definition and vice versa. Like every other qualitative research, research questions and information gathered for synthesis advanced with the work. Overall, the research was designed in a way that it can be divided into four research phases. This includes: a) topic selection and initial literature survey, b) literature review and data collection, c) analysing the information gathered, and d) developing an outline for a customised ranking system with convincing discussion (see Table 1-1).

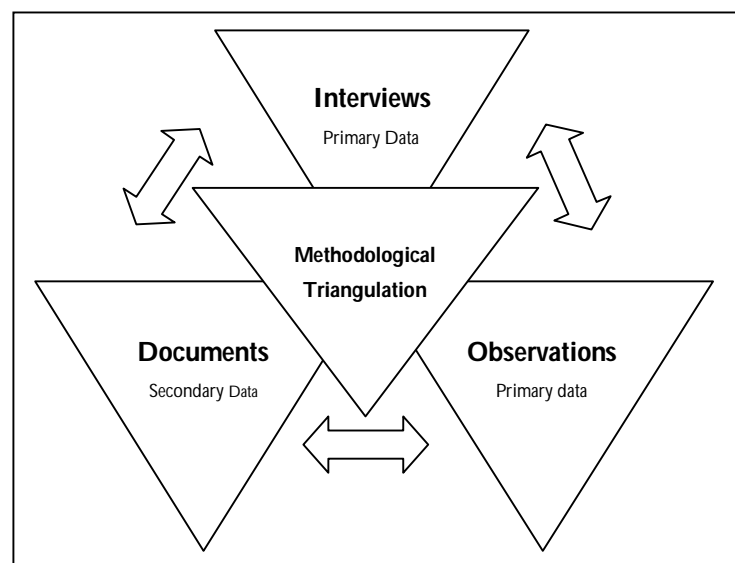
*Table 1-1 Methodology used for the research work*

	Research Phase 1	Research Phase 2	Research Phase 3	Research Phase 4
	Data collection		Data analysis	Synthesis
<b>Task</b>	Topic selection and initial literature survey	Literature review and data generation	Analysing the information gathered	Developing a set of criteria with convincing discussion
<b>Motive</b>	To explore the ranking systems and their methodologies, identifying suitable analytical framework	To scrutinize EU policies on sustainable urban development, environmental ranking systems in Sweden, Denmark and Europe	To identify gaps in the existing ranking systems	To develop a set of indicators, which will help Municipalities to improve their environmental performance
<b>Method</b>	Discussions with project partners and superficial survey of literature, Websites, Ranking reports	Academic journals, EU policy documents and reports, Methodologies of ranking systems, Semi-structured interviews	A modified generic qualitative research procedures for data analysis using comparative analysis	Own interpretation and understanding of findings from previous research phases
<b>Outcome</b>	Background and development of research gap and research question	Answers sub-question 1 and further helps to build analysis	Analysis helps to answer sub-question 2 and embark on Research phase 4	Answer to the main research question and future implications of the work

However, research phases 1 and 2 can be combined together to constitute the first research step called data collection, research phase 3 as data analysis and research phase 4 develops into a synthesis. Henceforth, research steps are used to describe methodology instead of research phases. For the analytical part of this work, the author focuses on a comparative analysis of the different ranking schemes that have been studied. The emphasis is on better understanding these schemes and how they can be improved.

### **Data collection**

The research was extensively based on methodological triangulation (Denzin, 1978), a method that involved multiple ways of data collection such as interviews, observations and documents (see Figure 1-1). Use of methodological triangulation is expected to add credibility and validity to the results obtained in qualitative research. Data collected from the literature review was validated and new information was collected from personal and telephone interviews and observations.



*Figure 1-1 Illustration of methodological triangulation*

- **Documents or literature review (Secondary data collection):** In order to understand the ranking systems for cities in the context of sustainable urban development an extensive literature survey was carried out. The information was gathered from books, online newspaper articles and periodicals, academic writings and articles published in peer reviewed journals, reports, documents and papers published by various international and intergovernmental organizations, national agencies along with EU documents. Methodologies of existing ranking systems were obtained from the internet by following the linked web-pages.

- **Interviews (Primary data collection):** Interviews formed an extremely important part of data collection in this research. A potential list of interviewees consisting of authorities responsible for environmental work in municipalities in the Öresund region, researchers studying ranking systems, institutions and organizations working with development of indicator or ranking systems and people involved in publishing rankings were outlined soon after the commencement of research. Supervisors and the project coordinator at Energi Öresund proved to be of immense help in this regard. The potential interviewees were contacted through emails and their availability and interest to contribute to the research was inquired. A set of questions along with short description of the project was also attached with the email.



The interviews were conducted in person, visiting the interviewee whenever possible. An interview protocol as described by Creswell (2003), was used. The interviews were recorded, concluding with a short written summary. A semi-structured method of interview was used to understand the views of the interviewees about the existing ranking systems and their role in environmental sustainability. A modified set of questions was used to interview people working with ranking systems. These questions are targeted to understand the methodology and rationale behind the choice of indicators used in the ranking system. While conducting interview, written notes were prepared to help remember key points addressed by the interviewee. 'Chain sampling' method was used to contact further interviewees. A list of basic questions used for the semi structured interviews of local authorities is listed in Appendix 2.

- **Observations (Primary data collection):** According to Marshall & Rossman (1989), "the systematic description of events, behaviours, and artefacts in the social setting chosen for study" is observations. Observations were important part of data collection in qualitative research as it was a process that allowed the researcher to learn by exposing himself to the surrounding situation. Observations also helped to increase the validity of the information gathered through literature review. In order to retain the information in an organized format, descriptive and reflective notes were prepared. These notes proved useful to record the observational data that otherwise would be difficult to recall. Attending meetings of project partners of Energi Öresund as a participant observer helped this research to find an institutional support and guidance from the patrons.

In addition, the author attended the European Commission's launch conference titled 'the Smart Cities and Communities European Innovation Partnership' in Brussels, Belgium in July 2012. The high level conference was chaired by bureaucrats from the European Commission, city officials and industry representatives along with academicians and delegates working in sustainable urban development. The conference invited energy, transport and ICT industries to work together with cities to pool the resources and demonstrate innovative, efficient technologies for urban areas (European Commission, 2012 a). The financial support offered by the EU under the smart cities and communities initiative will undoubtedly motivate city officials to bring sustainability issues higher on the urban development agenda. Enthusiasm of the representatives to make cities a better place to live and cooperation extended by industries gave immense encouragement to continue research in this field.

### **Data Analysis**

Data analysis was an important component of the research design as it involved preparing, processing and making sense of the information collected through primary and secondary sources (Creswell, 2003). It demanded a deeper understanding of the collected data in order to make interpretations and form conclusions. Data collected through documents, observations and interviews was used in the phase 3 of research work to analyse city ranking systems. The data was analysed using the comparative analysis method.

The comparative method contributes to the knowledge about ranking systems that is descriptive and interpretive (Thorne, 2000). Considering the limited number of relevant rankings and award systems, the comparative method proves to be the best choice for systematic analysis (Smelser, 1973). The comparative analysis threw light on the presence and/or absence of relevant indicators to realize regional goals. Moreover, the use of comparative analysis for the existing ranking systems contributed to the research by generating knowledge about commonalities (Thorne, 2000) and differences between them. Ragin (1987), in his book 'The comparative method' argued that comparative method takes into deliberation all the relevant information and every probable phenomenon that can be compared. As a result, the comparative analysis helped to reveal the effectiveness of the city ranking systems

and awards in improving environmental performance of the participating municipalities. Understanding of the existing ranking systems in this way was valuable for developing a relevant and effectual ranking system for the region.

Methodologies and objectives of selected ranking systems with the indicators used to rank the cities formed the basis for comparison. Interviews with the local authorities and discussions with people involved in developing indicators supported the analysis by providing valuable inputs. These ranking systems were analysed using comparative methods and tested against selected criteria to find their suitability for the Öresund region. The comparison of ranking systems, complemented with outcomes from interviews and observations helped to reflect upon their appropriateness for the Öresund region. At the same time it identified the plausible modifications to ranking systems for the Öresund region. The outcomes of research phase 3 contributed to generate inputs for the synthesis phase.

### **Synthesis**

The last phase of the research process was the synthesis. In common terms synthesis is to combine separate elements in order to develop a new set of ideas. It complemented the analysis and at the same time helped in proposing new ideas or modifications in the existing system. The synthesis section in this work was built upon the preceding analysis of existing ranking systems. It was developed by combining separate parts of the analysis with inputs from the author to develop a new and suitable set of criteria for city ranking system in the Öresund region. Analysing existing ranking systems on the basis of certain criteria lead to a better understanding and appropriateness of these ranking systems with regard to the Öresund region. The proposed components of the ranking system are based on author's interpretation of literature and information gathered from interviews. The synthesis involved development of environmental criteria, which can assist municipalities in the Öresund region to improve their environmental performance that can support them to achieve environmental sustainability. The suggested framework for the ranking system will help cities in the Öresund region to contribute to their vision to become the first CO<sub>2</sub> neutral region in Europe.

### **1.5 Limitations of the study**

This thesis is limited only to the environmental aspects of cities and does not focus on the social and economic perspectives, which unquestionably, are inseparable components of sustainable city development. The proposed outline of ranking system, at the end of the research, was developed keeping in mind the conditions in the Öresund region. There is no clear evidence that implementing a city ranking system results in better cities, nevertheless, the author claims that such systems are a part of concerted efforts towards improving environmental performance of cities and achieving sustainable urban development on the whole. A further limitation was the unfamiliarity of the author with the local languages; Swedish and Danish. The majority of the relevant documents published by municipalities and national ranking systems were in local languages thereby restricting their access to an international audience.

### **1.6 Target Audience**

The first and foremost beneficiary of this work is the Öresund Committee – the political collaboration in the Öresund region, which intends to become Europe's first CO<sub>2</sub> neutral region. This work shall assist the Öresund Committee to fill up gaps in assessing feasibility of employing such a system in the region. The work shall prove beneficial to projects Energi Öresund, Urban Transition Öresund and Öresund Smart Cities Hub in the Öresund region by contributing to sustainable urban development. Furthermore, the intended audience for this research is mainly the municipal authorities and local politicians as means for understanding

the importance of environmental city rankings. The study will also help them to understand how environmental indicators used in ranking systems can help their environmental sustainability efforts. Researchers interested in the field of city rankings and developing environmental indicators can find this work useful to learn and follow the development of regional ranking systems. The research also targets the general public who are an integral as well as living component of the cities. The research is not focused on compiling existing ranking systems and developing a new one, but beyond that it aims to convey the significance of environmental indicators in improving environmental performance of cities. It plans to emphasize the importance of the cities in achieving regional targets.

## **1.7 Disposition**

Chapter 2 lays out the background covering European urban policies, importance of cooperation between cities, discussing city ranking systems considering benefits and the limitations, a detailed review of selecting city ranking systems in Europe, and environmental ranking systems in Sweden and Denmark

Chapter 3 analyses the selected existing ranking systems using comparative method. Comparison of ranking systems and identifying their shortcomings in order to realize the vision of the Öresund region forms a major part of this chapter. The analysis is expected to answer whether or not there is a need to develop a new system for the Öresund region.

Chapter 4 discusses what a new system for the Öresund region could look like and what could be the components of it, from where the data could be collected for the ranking system, and in what way it could prove beneficial for the Öresund region.

Chapter 5 concludes the study with reflections on the research and areas for further research and action for the relevant stakeholders. The chapter ties together all the research and analysis conducted and summarises the key findings.

## 2 Background

This chapter contributes to the understanding of various European policies targeted at urban development and introduces the cross-border cooperation in Europe with reference to the Öresund region. In later sections of the chapter the importance of cooperation between cities and city ranking schemes is presented.

### 2.1 EU urban policies and initiatives

Cities are the drivers of economic growth and they play an important role in the overall development of the European region. The EU is actively involved in urban development assisting cities and regions to become competitive. Over the past two decades the EU has produced a number of policy documents, community initiatives and programmes to support urban regeneration, encourage innovation and share experience contributing to sustainable urban development (European Communities, 2009). This is recommendable taking into consideration the absence of legal basis for urban policy in the treaties establishing the EU (European Commission, 2010). European Cohesion Policy - an expression of the EU's solidarity with its less-developed regions through the structural funds plays a crucial role in sustainable development of European cities (*ibid.*). The 'mainstream' Cohesion Policy Programming period (2007-2013) integrates the urban dimension into programmes and projects that are co-financed by the European Regional Development Fund (ERDF) (European Commission, 2007).

The EU's commitment to strengthen local action can be experienced through various initiatives and policies developed over the past decades. The first ever, Urban Pilot Projects under the Urban Pilot Programmes, initiated by the European Commission (EC) between 1989 and 1999 to exchange knowledge and innovation, marked a remarkable development in the European urban policy framework (European Communities, 2009). The Urban Pilot programmes were followed by two generations of URBAN Community Initiative programmes URBAN I (1994-1999) and URBAN II (2000-2006). The URBAN initiative targeted physical regeneration, local economic development, environmental issues, mobility and public space, local employment and cultural initiatives within small and medium-sized towns and cities by developing and implementing innovative strategies (European Communities, 2003; European Communities, 2009).

As a part of Europe's cohesion policy, prioritizing competitiveness, growth and employment, the Urban Development Network Programme (URBACT) promotes sustainable urban development in European cities. URBACT is a network of over 300 cities, working together to develop sustainable and pragmatic solutions to urban challenges throughout Europe (URBACT, n.d.). The URBACT programme is jointly financed by ERDF and the Member States themselves. The URBACT I Programme (2002-2006) was conducted under the URBAN II Community Initiative. The URBACT II Programme (2007-2013) with the local, national and regional authorities aims at improving urban development policies and reinforcing integrated urban development in Europe (European Communities, 2009).

The EC adopted 6<sup>th</sup> ten-year Environment Action Programme (EAP) in 2002 to set out the framework for environmental policy-making in the EU for the period 2002-2012 (European Commission, 2012 b). One of the seven thematic strategies developed under the 6<sup>th</sup> EAP constitutes the 'Thematic Strategy on the Urban Development' was adopted in 2006 with an objective to improve the quality of the urban environment by reducing their adverse environmental impacts (European Commission, 2006). However, the Thematic Strategy does not contain legislative measures to achieve its targets. With the 6<sup>th</sup> EAP in its final year, EC continues its ambitious environmental work under 'Europe 2020 Strategy' for smart,

sustainable and inclusive growth. Many European policies aimed at urban development are formulated under the umbrella of 'Europe 2020 Strategy'.

One of the most recent and all-inclusive EU initiatives to promote urban development is the 'Smart Cities and Communities' undertaken by the urban energy efficiency component of the Strategic Energy Technology (SET) Plan in 2011. The 'Smart Cities and Communities' initiative supports cities in taking ambitious measures to achieve reductions of GHG emissions through sustainable use and production of energy, mobility and use of information and communication technology (European Commission, 2012 a). The smart cities initiative makes use of Europe's research and innovation in order to improve the urban environment with joint forces from industries. The initiative builds upon local as well as regional and cross border co-operation to share knowledge and technology in addition to, learning from experiences. To facilitate the economic growth and improving quality of urban life, the sense of cooperation and competitiveness between European cities is increasing.

## 2.2 Öresund region: a cross-border cooperation

With the aim of stimulating cross-border cooperation between the Member States, the EU initiated an Interreg programme in 1990 (European Union, 2011). The Interreg Programme is EU's structural tool to realize the Cohesion Policy. Interreg is co-financed by ERDF with the intention of diminishing national borders to achieve development in all the EU Member States. At present Interreg IV is operational between the period 2007 and 2013. The three strands, Interreg IV A, Interreg IV B and Interreg IV C correspond to cross-border cooperation between adjacent regions, transnational cooperation involving national, regional and local authorities and interregional cooperation respectively (European Commission, 2012 c). In the direction of strengthening regional development through Interreg programmes and attaining economic stability, various regional and cross border cooperations were established throughout Europe.

One such regional cross border cooperation between Sweden and Denmark was established in 1993 by the local and regional authorities, together with the national authorities. An official platform; the Öresund Committee was established for regional political cooperation between the southern Sweden province of Skåne and Zealand, Lolland, Falster, Møn and Bornholm islands of Denmark (Öresundskomiteen, n.d. a) (see Figure 2-1). The Öresund Committee, since its inception, is engaged in strengthening the cooperation and taking care of political interests of both the countries (See Appendix 3 for members of the Öresund Committee). While doing so, the Öresund Committee also aims to strengthen the position of the Öresund region at national and international level so as to increase the economic, cultural and social growth in the region. To be able to cooperate within the region so as to compete internationally and realize its aims, the Öresund Committee has formulated an Öresund Regional Development Strategy- ÖRUS (Öresundskomiteen, 2010). The ÖRUS extends up to 2020 and envisions the Öresund region as the most attractive, carbon neutral and climate-smart region in Europe (ÖRUS, 2010).

The Öresund region is one of the most dynamic and progressive regions in Europe. It hosts about 3.7 million inhabitants living in the rural and urban areas surrounded by industries, forests, agriculture land and coastlines. In addition, the region possesses Northern Europe's largest conglomeration of highly skilled workers contributing to the regional development (Öresundskomiteen, n.d. b). Two countries separated by the strait of Öresund are permanently connected with the Öresund bridge since June 2000. From the time of its inauguration, over 182 million people have crossed the bridge (Öresundsregionen, n.d.), whereas, approximately 18,000 commuters travelled daily between Sweden and Denmark in 2010 (Tendens Øresund, 2011). The Öresund bridge is contributing to the regional development. Taking advantage of

these strong points the Öresund region aims to be one of the most attractive and competitive regions in Europe. The region is a part of a larger Öresund-Kattegat-Skagerrak Programme involving Sweden, Denmark and Norway financed under the Interreg IV Programme (Interreg IV A, n.d. a). Various projects developed under the umbrella of Interreg IV A Programme aim at achieving sustainable urban development, promoting integration and economic growth in the Öresund region (Interreg IV A, n.d. b). All projects are carried out with close cooperation of Universities, municipalities, private companies and industrial organisations in the region, leading to synergy. Energi Öresund, Urban Transition Öresund and Öresund Smart Cities Hub are the projects which essentially deal with sustainable urban development and developing smart cities.



Figure 2-1 Map of the Öresund region

Source: Modified from [tendensoresund.org](http://tendensoresund.org)

The Energi Öresund project works with strategic energy planning in the region. The project focuses on identifying the possible methods of excess energy storage and planning low energy consumption in buildings to ensure optimal energy usage. In addition, it aims at establishing cooperation with local companies to contribute to the region’s green economy (Energi Öresund, 2011). The project takes into account CO<sub>2</sub> emissions from burning of fossil fuels and efforts are taken for the development and deployment of renewable energy sources in the region. This will contribute to the regional aim to become the first carbon neutral region in Europe. The Urban Transition Öresund project considers cities at the centre of sustainability issues and works towards adaptation and elevation of the sustainable urban development in the region (Urban Transition Öresund, 2011). The project is based on analysis and learning from case studies and pilot projects and eventually testing the results in the cities- the living labs. The Öresund Smart Cities Hub (ÖSCH) project works in close cooperation with local

authorities, stakeholders and academic institutions to solve societal challenges. Such collaboration of smart cities in the region will prove beneficial to discover innovative solutions (ÖSCH, 2012) to achieve sustainable urban development. Assisting neighbouring cities to overcome urban problems by knowledge sharing shall contribute to reinforce regional development and encourage competitiveness.

While accomplishing sustainable economic growth in the region, the above mentioned projects, undoubtedly contribute to the social and environmental sustainability. These projects can be used to identify the best environmental practices implemented by a city in the region so as to replicate those in other cities with due modifications. At the same time, progress of environmental sustainability in the cities can be monitored, measured and assessed with the help of various indicators. Using indicators over a period of time helps in interpretation of environmental conditions and determining a trend (Moldan *et al.*, 2012). Local and national authorities often use such indicators to work out future plans and frame urban policies by analyzing trends. In addition, such indicators help to raise accountability of the local governments (OECD, 2003). The ability of indicators to be able to compare municipalities and regions based on their performance is exploited to develop various ranking systems - explained in further sections.

### 2.3 Environmental indicators

An old management adage, “you cannot manage what you do not measure!” is of extreme importance when it comes to knowing whether something is getting better or worse. It can directly be applied to the process of achieving personal, national and regional targets and goals. Measuring the process with the help of performance indicators and comparing it against benchmark leads to the evaluation of the progress (Reh, 2006). Evaluation, carried out in this way, helps the moderator to manipulate the course of action to reach the goal. It is also useful to locate the weak links which need more attention and vice versa. Therefore, indicators<sup>5</sup> are essentially an important part of any system to communicate information about the progress of the actions taken in realising policy targets.

A number of inter-governmental organisation such as the Organisation for Economic Cooperation and Development (OECD), World Bank, UN organizations; UN-HABITAT, and, UNEP have developed a set of indicators to measure the environmental performance at local and national level. In order to monitor the recent environmental trends and progress towards the EU’s key environmental goals, 30 key environmental indicators have been developed for the EU under the 6th Environment Action Programme (European Commission, 2012 d). In European Environment Agency’s (EEA) technical report, Smeets & Weterings (1999) mention that, in relevance to policy making, environmental indicators are used to;

- a. provide information on environmental problems,
- b. assist in policy development and prioritising action, and
- c. monitor the effects of policy responses.

The United Nations Environment Programme (UNEP) categorises indicators into five groups namely; state of the environment or descriptive indicators, impact or stress indicators,

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<sup>5</sup> OECD (2003), defines an indicator as a parameter, or a value derived from parameters, which points to, provides information about, describe the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value.

sustainable development or performance indicators, environmental health or efficiency indicators and environmental-economic indicators (UNEP, 1993). Descriptive indicators describe the present situation with respect to environmental problems, whereas performance indicators measure the differences between the current environmental situation and the desired situation. Efficiency indicators provide an idea about relation between separate elements and help to understand whether the system is improving as a result of the undertaken measures. Environmental-economic indicators evaluate cost benefits. The performance indicators are of importance for the ranking systems as they monitor the effects of measures taken. They also help to comprehend whether the objective will be achieved or not and communicate areas which need additional efforts (Smeets & Weterings, 1999).

Maclaren (1996) stated that sustainable urban development is the process by which sustainability can be attained. Moreover, she argued that depending on the present economic, environmental and social conditions, the concept of urban sustainability tend to differ. A set of indicators can be of great assistance to measure the community's progress towards sustainability goals. The sustainability indicators are characterised as integrating indicators, forward-looking indicators, distributional indicators and multi-stakeholder input indicators (Maclaren, 2004). These indicators are equally useful to evaluate the urban environmental conditions. The characteristics of the urban sustainability indicators are described further in Table 2-1.

Table 2-1 Urban sustainability indicators in reference to urban environment

Type of indicator	Sub-types	Description
<b>Integrating</b>	Composite indicators	These indicators attempt to portray linkages among the environmental, social and economic dimensions of sustainability. It combines two or more individual indicators
<b>Forward-looking</b>	Trend indicators Predictive indicators Conditional indicators	It describes historical trends and provides indirect information about future sustainability Predictive sustainability indicators rely on mathematical models for the future state and development of variables describing environment This type of indicator attempts to overcome the difficulty that predictive indicators have in forecasting, by developing a range of forecast and predictions
<b>Distributional</b>	Distributional indicators	The indicators should be able to take into account the distribution of conditions within population or across geographical regions. The indicators that can distinguish between local and non-local sources.
<b>Multi-stakeholder input</b>	Multi-stakeholder input indicators	These indicators seek input on sustainability concerns and priorities from a broad range of stakeholders

Source: Developed from (Maclaren, Urban Sustainability Reporting, 2004).

## 2.4 City ranking systems

Evaluating and measuring performance is a widespread idea that originated from assessing economic activities. Recently, the concept has been applied to measure the performance of complex and dynamic entities like cities and regions. Use of such assessment methods has unquestionably raised a sense of competition between cities. Cities and regions aim to get higher positions in order to attract investors and inhabitants. Garhammer (2008) points out that introducing competition ensures the best performance from the participants and this can



be applied to cities. He explains that this is experienced in a number of University ranking systems; however, the introduction of competition does not always reflect the quality of education and research in those Universities. Giffinger & Haindlmaier (2010), argue that the use of ranking systems can be an effective instrument to identify strengths and weaknesses of cities which can further be used to improve their competitiveness. City rankings also affect public emotions, draw media attention, attract stakeholders, and stir political discussions.

Begg (1999) identified that high economic and technological changes in European cities over the last decades lead cities to compete with each other for economic development. Responding to competitiveness and developing strategic approaches to meet specific targets has become an important aspect of the urban politics. Comparing cities on the basis of certain criteria helps in benchmarking. City rankings also provide an empirical base to disclose comparative advantages and in showcasing specific profiles of the city (Giffinger & Haindlmaier, 2010). These ranking systems are obviously beneficial to urban development owing to the fact that they attract public attention and stimulate discussions on urban policies. Rankings are considered as a competitive instrument, which encourage cities to position themselves compared to other counterparts. Moreover, the ranking systems are expected to encourage a learning and knowledge sharing process between the cities resulting in regional development (Giffinger *et al.*, 2010). The ranking systems can possibly encourage cooperation between 'similar' cities resulting in a city network to facilitate development.

Having said this, there are a number of researchers who have addressed the drawbacks of ranking systems. Quite a few academics criticize ranking systems for their methodology and their focus. It is often seen that the choice of indicators influences the results, favouring certain participants and yields unexpected outcomes. There is no clear academic evidence proving rankings actually help cities to improve their performance. In response to the role of ranking systems in initiating competition, Turok (2004), argues that competition is necessary for firms, which aim to achieve economic benefits from their activities. Competition provides selection mechanisms and at the same time offer incentives to improve their performance. However, cities and regions do not seem to work the same way as firms. He strongly believes that competition between cities and regions can generate substantial human costs and widen social inequalities if there are consistent losers (Turok, 2004).

Giffinger *et al.* (2010) argue that rankings often take into account simplified indicators and tend to neglect the intricate city interactions. In addition, it is difficult to understand the methodology behind the ranking system and due importance is given to the final rank. Most of the ranking systems are static and do not take into consideration the ongoing developments or future plans. Ranking systems are usually ignored by the cities that are ranked lower in a ranking system. This contradicts to the objective of sharing knowledge and learning from others' experiences since there is no dialogue between the participants or mechanism to facilitate cooperation. Rankings tend to follow a generalistic approach ignoring the fact that participating cities can have unique features that are not considered in the ranking system (Fertner *et al.*, 2007). Steffen (2009) claims that the indicators measured in any city ranking do not tend to be good indicators to judge overall urban development in a city. He proposes that a city should be judged on the basis of its own efforts and not by comparing it with the neighbouring cities.

There are, undoubtedly, mixed views about city rankings' contributions in achieving sustainable urban development and enhancing regional cooperation. At the same time, it is a herculean task to develop an all inclusive, flawless ranking system satisfying all aspects and viewpoints. Nevertheless, public acceptance of ranking systems is observed to follow an upward trend, which can be experienced in media and emergence of new national and

international ranking systems in Europe. It is necessary to make use of these ranking systems to promote cooperation, knowledge sharing and establishing feedback system so as to achieve regional development and targets.

## 2.5 Existing ranking systems in Europe

Considering the rate of urbanization, cities and urban areas are at the centre of developing future strategies. With the majority of the European population staying in urban areas, cities undoubtedly, contribute to most of the environmental challenges. At the same time a number of cities are motivated and making efforts to improve urban environments so as to develop healthier and sustainable living areas (EGCA, 2012). With the objective of rewarding these efforts, sharing good practices and inspiring other cities to be a part of this new trend, many awards and ranking systems came into existence. Awarding cities for their unique initiatives or special policy measures to improve urban quality of life is increasing in European urban politics. Often it is observed that cities compete for certain awards and participate in various ranking systems so as to communicate their unique features to the outside world. As these ranking systems and awards are new in urban politics, not much academic literature is available on comparisons of various ranking systems and their effectiveness. The awards and ranking systems need separate attention as they are different in their approaches, objectives, methodology involved, and indicators used (Giffinger *et al.*, 2007).

It is often observed that cities get dissimilar ranks in different ranking systems. The majority of the existing city ranking systems can be distinguished on the basis of their main theme under consideration, objective, target audience, geographical expanse, type of cities under consideration etc. In spite of their different approaches, all awards and ranking systems aim to create sustainable urban communities. Cities in the Öresund region frequently take part in various awards and ranking systems. However, the pre-requisites of a ranking system, suitability of indicators and the time required to invest in order to participate in these ranking systems are some of the important obstacles the cities face (Birkedal, 2012; Nielsen, 2012; Svensson, 2012). A set of European awards and ranking systems were selected for this study, based on their familiarity within the region and popularity. The ranking systems summarised in the Table 2-2 are further analysed in chapter 3.

Table 2-2 Overview of selected Awards and Ranking Systems for European cities

No.	Ranking system	Main theme	Developer	Spatial scope	Objective	Criteria	Indicators
1	<b>Smart Cities: Ranking of European medium-sized cities</b>	Overall city planning and use of modern technology in everyday urban life	Vienna University of Technology, University of Ljubljana and Delft University of Technology in 2007	European medium size cities with a population between 100,000 and 500,000 inhabitants	Compares characteristics and identify strengths and weaknesses of medium-sized cities	a. Smart Economy b. Smart People c. Smart Governance d. Smart Mobility e. Smart Environment f. Smart Living	31 factors describing 6 criteria and in total 74 indicators are considered
2	<b>European Green City Index</b>	Assessing the environmental impact of Europe's major cities	Project conducted by the Economist Intelligence Unit, sponsored by Siemens in 2009	30 leading European cities	Comparison of 30 major European cities in terms of their environmental performances and policies against others' overall, and within each category.	a. CO <sub>2</sub> Emissions b. Energy c. Buildings d. Transport e. Water f. Waste and land use g. Air Quality h. Environmental governance	14 qualitative and 16 quantitative indicators describing 8 categories
3	<b>European Common Indicators</b>	Monitoring environmental sustainability at the local level	Ambiente Italia Research Institute, Milano, Italy in 2003	144 Signatories from 22 countries across Europe. Data coming from 42 Urban areas were processed	To promote the use of the European Common Indicators at local level as a supporting tool for the implementation of environmental legislation, creating better conditions for the positive engagement of a wide number of participants	a. equality and social inclusion b. local governance/empowerment/democracy c. local/global relationship d. local economy e. environmental protection f. cultural heritage/quality of the built environment	Total 10 qualitative as well as quantitative indicators
4	<b>European Green Capital Award</b>	Improving the European urban living environment – and thus the environment as a whole.	An European Commission initiative conceived from the Tallin memorandum signed by 15 European cities and the Association of Estonian cities in 2006	European cities can apply for the award. City should have more than 200,000 inhabitants	To provide an incentive for cities to inspire each other and share best practices, while at the same time engaging in friendly competition.	Environmental components of urban environment	In all 12 indicators used to describe environmental state of the city

In addition to the European ranking systems mentioned in Table 2-1 there are several national level ranking systems developed by private organizations and Universities all over the world. Corporate Knights' 'Sustainable Cities in Canada', GE International's 'Sustainable Cities Index Britain', Columbia University, Tsinghua University, and McKinsey & Company's 'The Urban Sustainability Index China' and Australian Conservation Foundation's 'Sustainable Cities Index Australia' are some of the popular ranking systems developed in the last couple of years. Various city ranking systems such as Siemens' Green City Index, Natural Resources Defense Council's (NRDC) Smarter Cities, and America's 50 Greenest cities have marked their presence in the U.S.A. The methodologies and indicators used in these ranking systems are unique in accordance to the national context.

As said earlier, ranking systems are developed around a specific theme, which forms the basis of ranking. The theme is subdivided into a number of components, which makes it easier to break down the complexity of the theme under consideration. Further, these components are sometimes subdivided into specific criteria or categories that help in better understanding. Finally, the ranking systems are built upon a number of definite quantitative or qualitative indicators which can be measured or data can be generated respectively with the help of surveys and proxy information. A diagrammatic representation of a typical ranking system can be seen in the following Figure 2-2.

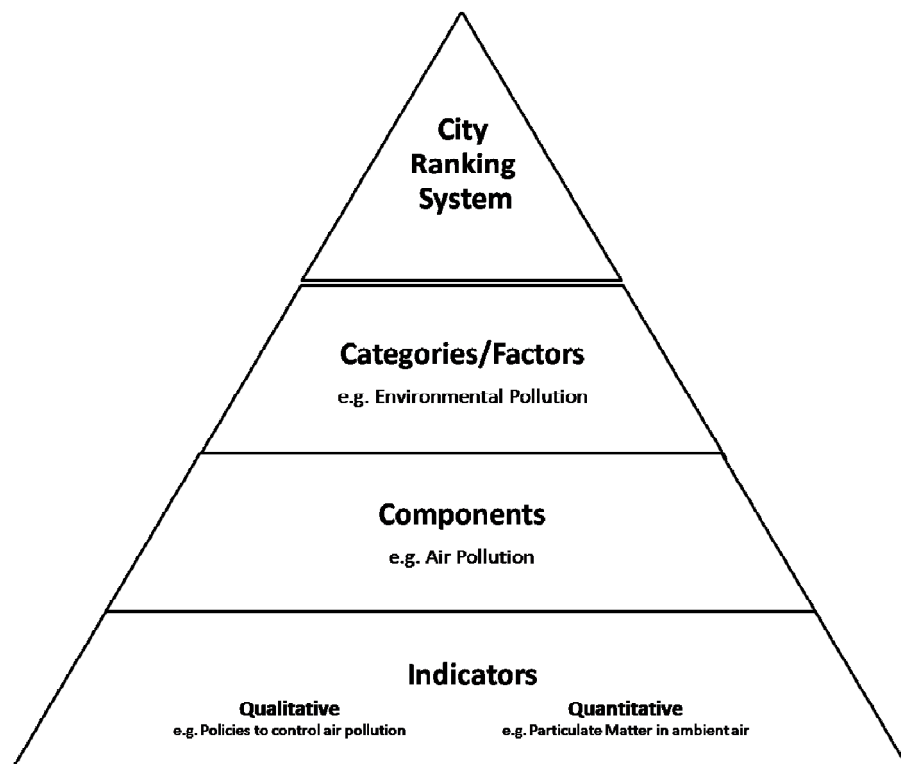


Figure 2-2 Generalised Structure of a Ranking System

## 2.6 EU initiatives to promote cooperation between cities

The Aalborg Charter (1994) of the European cities & towns towards sustainability provides a framework for sustainable development at local level and emphasizes the role of local authorities in engaging in Local Agenda 21 processes. Further in 2004, the delegates from the local governments adopted the 'Aalborg+10 Commitments'. The signatory cities voluntarily agreed to undertake a baseline environmental review of their city and identify targets for actions on environmental issues. The Aalborg charter instigated a sense of cooperation between the local authorities in order to achieve sustainability through experience sharing and

learning from local examples. Various networks of the local authorities and city officials active in urban environment issues prove beneficial in attaining sustainable urban development in the European cities and towns. Some of the important city networks engaged in the urban environment issues are described below.

**The Covenant of Mayors (CoM)** is an agreement for municipalities within the EU who wish to take efforts to mitigate climate change effects by achieving and exceeding the European target of 20 per cent reduction of CO<sub>2</sub> emissions by 2020. The European Commission launched the CoM in 2008 to support efforts made by the local authorities in the implementation of sustainable energy policies. The purpose of the Covenant is to highlight the climate change work being done at the local level. The CoM involves local and regional authorities, willing to increase energy efficiency and use of renewable energy sources in their jurisdiction (Covenant of Mayors, n.d.). The Covenant is signed by 4,215 local authorities from all over Europe who, within one year of signing the covenant, need to submit the baseline emission inventory as well as set out their 'Sustainable energy action plan' enlisting the key actions they want to take. A number of Swedish and Danish Municipalities are signatories to the Covenant and are committed to make efforts towards exceeding targets set under Energy 2020 strategy by the EU. A three year Covenant CapaCity project started in 2011 aims to develop sustainable energy communities by supporting local governments with implementation of a Sustainable Energy Action Plan. The project also aims at supporting municipalities to sign the Covenant of Mayors.

**International Council for Local Environmental Initiatives (ICLEI)** is an association of over 1220 local government members committed to achieve sustainable development. It is engaged in capacity building by providing technical consultation, training, and information (ICLEI, 2008). It builds a platform to share knowledge, and support the local governments in implementing sustainable development (ibid.). It is also the only sustainable city network that operates worldwide. In Europe, approximately 200 local governments are members of ICLEI. The member cities get an opportunity to connect with the other committed and ambitious cities in the world in order to share experiences, advice and knowledge and also get involved in collaborative projects (ICLEI, 2012). ICLEI is involved in different local sustainability initiatives and campaigns like the European Sustainable Cities and Towns Campaign<sup>6</sup>, Cities in Europe 2020 and many more.

**EUROCITIES** is a network of the major European cities founded in 1986. There are more than 140 local governments of large cities are members of Eurocities. The EUROCITIES awards are handed out to its members to recognise their outstanding achievements in improving the quality of life for citizens. The EUROCITIES work on three key policy sectors recognized by the EU such as climate, economy and inclusion (EUROCITIES, n.d.).

**Eurotowns** is a network of towns and cities in Europe with population ranging between 50,000 and 250,000. As mentioned earlier in this study, medium-sized towns play a significant role in the economic and social development of Europe. Also considering the fact that majority of the European population stays in towns and cities, Eurotowns ensures their interests in the EU policies and legislation (Eurotowns, n.d.). Since its establishment in 1991, 18 towns joined the network.

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<sup>6</sup> The European Sustainable Cities and Towns Campaign gave the European Sustainable City Award four times (1996, 1997, 1999, 2003) to recognise the significant work done by the local authorities, raise awareness on local sustainable development, highlight examples of good practices and encourage exchange of experience in European cities (Sustainable Cities and Towns Campaign, n.d.).

### 3 Analysis

This chapter investigates the plausible contribution of the city ranking systems and awards in realizing the vision of the Öresund region - to become the first carbon neutral region in Europe. Additionally, scrutinising the objectives, indicators and outcomes of the existing ranking systems with the help of inputs from the interviews assist to divulge the shortcomings.

From the literature, it is evident that the Öresund region aspires to be the most attractive, energy efficient, dynamic and first ever carbon neutral region in Europe. Undoubtedly, there is a strong interregional competition within Europe, necessitating the need for all the stakeholders and local governments in the Öresund region to work together (ÖRUS, 2010). However, local municipalities are contributing to the national and regional ambitious targets by implementing various local projects. At the moment, a number of urban development and sustainability projects are operational in the Öresund region under the umbrella of Interreg Programme, coordinated by the Öresund Committee. In addition, local authorities acquire financial support to realize local projects contributing to the overall urban development through various finance schemes of the EU, provided by means of city networks. In regional context, it is necessary to measure and communicate the progress of the municipalities internally as well as externally. The measurement and communication of the progress at regular intervals is extremely essential to comprehend the tempo of the region towards achieving the set goals (OECD, 2008). This understanding helps the regional authorities to improve strategies, concentrate their efforts on the weaker sections and appreciate the good work of forerunners in the region. Use of key sustainable development indicators is extremely helpful to monitor, evaluate and report the progress (Mascarenhas *et al.*, 2010). The Swedish local municipalities are leading the way in developing sustainability indicators to monitor the progress (Mineur, 2007).

#### 3.1 City ranking systems & local cooperation in Öresund region

The Öresund region represents two of the most environmentally proactive countries in Europe, Sweden and Denmark, who are also recognized for their strong environmental performance (Nørgaard, 2011 & Repinski, 2011). Being sovereign nations they have different sets of laws and regulations, varied ways to achieve national targets and policy implementation measures (Öresundskomiteen, n.d. b). Sustainable urban development or meeting climate and energy targets is not exception to this. From the conducted interviews it is interesting to observe that there are no national level ranking systems measuring environmental performance of the cities in Denmark. However, Danish municipalities voluntarily participate in the International ranking systems. All the Swedish municipalities are ranked using a set of environmental criteria developed by a Swedish environmental journal (MiljöAktuellt). Additionally, there are few more voluntary environmental ranking systems popular in Sweden. It is very common in both the countries to seek a cooperation between municipalities to solve complex environmental tasks. A number of Swedish ranking systems and City partnership initiatives in Sweden and Denmark are further discussed in detail.

### 3.1.1 Sweden

In June 2012, Sweden's largest environmental journal, MiljöAktuellt (meaning Environmental News), in collaboration with Miljöbarometern<sup>7</sup> (meaning Environmental Survey) for the fourth year presented Sweden's greenest municipality ranking. The ranking system is considered as the most comprehensive review of the local environmental initiatives (MiljöAktuellt, 2012) and is extremely popular among citizens and politicians. Interviews with the city officials confirmed the popularity of this ranking system amid citizens and its influence on politicians. In the year 2012, 96% of the Swedish Municipalities participated in the ranking system (MiljöAktuellt, 2012). More and more politicians are willing to develop better environmental policies so as to strengthen city's position in the ranking system.

The MiljöAktuellt's Sweden's Greenest Municipality (SMK) ranking system is developed in close collaboration with the National Board of Housing (Boverket), Energy Agency (Energimyndigheten), Marine and Water Authority (Havs- och vattenmyndigheten), Swedish Association of Local Authorities and Regions (SALAR) (Sveriges Kommuner och Landsting/SKL) and researcher Christel Cederberg. The ranking also takes into consideration local environmental efforts audited by organizations like Organic Food Centre (Ekomatcentrum), Green Motorists (Gröna Bilister) and Keep Sweden Tidy (Håll Sverige Rent). The purpose of the ranking is to draw attention on municipalities that are performing well and have achieved progress in their environmental efforts, and at the same time bring attention of the municipalities that are lagging behind and need further action (MiljöAktuellt, 2012).

In order to participate and acquire a rank in SMK in 2012 ranking, the municipalities had to respond to a questionnaire developed by the MiljöAktuellt that consisted of 20 questions about the municipality's environmental work. Further, SALAR's points were calculated through inspection of Swedish municipalities and their environment and health related work. Municipality's work towards more sustainable motoring was judged by 'Gröna Bilister' so as to award points. Ekomatcentrum's assessment of municipalities on the basis of the proportion of organic food considering the cost of purchased food in large households, added further points to the tally. In addition, involvement of municipalities in the network of Municipalities such as Swedish Eco-municipalities (Sveriges Ekokommuner), Climate Municipalities (Klimatkommunerna), signing the Covenant of Mayors agreement and participating in 'sustainable community' projects and Energy Agency's Sustainable Municipality programme (Uthållig kommun) gave extra points to the Municipalities. Participation in World Wildlife Fund's (WWF) Earth Hour, in trash picking day and green flags coordinated by Håll Sverige Rent were also added to the final score. Thus, the final aggregated score was expected to give an idea of the local environmental initiatives taken by the Swedish Municipalities.

Apart from MiljöAktuellt's Sveriges Miljöbästa Kommuner (Sweden's Greenest Municipality, SMK) ranking, apparently there is no other major nation-wide city ranking system available in Sweden. On the other hand, municipalities are joining hands together with other municipalities through various city networks. The trend of using web based reporting tools such as **Miljöbarometern** (Environmental Survey) for reporting their environmental and sustainability efforts is emerging. About 17 Swedish Municipalities have used this tool. Four Municipalities from the Skåne region namely; Kristianstad, Helsingborg, Landskrona and

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<sup>7</sup> Miljöbarometern is a digital tool for municipalities and organizations who want to report their environmental and sustainability efforts on the Web, it also helps in monitoring and reporting environmental goals. The environmental survey simplifies the strategic environmental work and facilitates work with the environment and sustainability in municipalities and companies (Miljöbarometern, n.d.). Miljöbarometern is providing an online tools for the local governments and businesses to report their environmental efforts.

Malmö have published their environmental work using the Miljöbarometern tool. The tool is extremely helpful for those in search of information about the state of environment in their municipality or willing to know more about the municipality's environmental efforts (Miljöbarometern, n.d.). Environmental monitoring is carried out by the Municipalities to measure their progress towards achieving the set targets and objectives using a variety of indicators.

**Swedish Association of Local Authorities and Regions (SALAR)** is actively involved in developing indicators to measure, monitor and evaluate environmental objectives of the Swedish Municipalities. Moreover, SALAR represents Sweden's 290 Municipalities and make efforts to promote and strengthen the local self-government (SALAR, 2012). For comparison between cities, SALAR is currently active in developing and publishing indicators for Energy efficiency in publicly owned buildings and transport (Hagnell, 2012). SALAR has published a number of reports on underpinning the importance of local action on various challenges like climate change, energy security, and key indicators to monitor energy.

**Sveriges Ekokommuner (SEKOM)** (Sweden's Association of Eco-Municipality): The Eco-Municipality concept was launched in 1980 in Finland and three years later introduced in Sweden. The Swedish Association of Eco-Municipalities is a voluntary, non-profit organization of municipalities that works for the management of common strategic issues important for long-term sustainable development (SEKOM, n.d.). SEKOM promotes the sustainable development of society based on an ecological approach in addition to the socio-economic perspectives. The Eco-Municipalities observe four sustainability criteria and 12 key indicators in order to continue progress towards a sustainable society (SEKOM, n.d.). Today there are 84 members of SEKOM.

**Klimatkommunerna (Climate Municipalities)** is one of the 12 associations of local authorities, counties and regions that are actively working with the local climate work in Sweden. The Climate Municipalities is a part of NET-COM project coordinated by Energy Cities, the European association of local authorities discovering their energy future (NETCOM, n.d.). The members of Climate Municipalities aim at reducing GHG emissions and the association supports Municipal efforts to manage climate change issues at local level. Four major Municipalities of Skåne namely; Helsingborg, Kristianstad, Lund and Malmö are members to the Climate Municipalities and are engaged in spreading information, sharing experiences on local climate work and raising climate awareness among the citizens (Klimatkommunerna, n.d.).



Table 3-1 Swedish Municipalities contacted for the study

Municipality	Participation in award	Participation in Ranking system	City Cooperation Network member	Special achievement or Awards won
<b>Helsingborg</b>	Earth Hour City Challenge	MiljöAktuellt's SMK, Sveriges bästa miljöbilskommun, Sveriges bästa elbilskommun	ICLEI, Covenant of Mayors, Climate Municipalities	Green Car Municipality (2011), Sweden's Greenest Municipality by MiljöAktuellt (2009)
<b>Kristianstad</b>	Earth Hour City Challenge	MiljöAktuellt's SMK	ICLEI, Covenant of Mayors, Climate Municipalities	Rewarded for the biogas production from food waste.
<b>Lund</b>	Earth Hour City Challenge	MiljöAktuellt's SMK	ICLEI, Covenant of Mayors, Climate Municipalities	Bicycle Association's bike promoting municipality (2012), Second best bicycle-friendly municipality in (2012), European Mobility Award (2011), Sweden's Greenest Municipality by MiljöAktuellt (2011), Fair trade city since 2007
<b>Malmö</b>	European Green Capital Award	MiljöAktuellt's SMK	ICLEI, Covenant of Mayors, Climate Municipalities	European Commission's RegioStars Awards (2012), Best Cycling Community (2012), Award for sustainable procurement (2012), prize for long-term sustainability (2011), Sweden's most climate-smart Municipality (2011), Prize for sustainable transport in the Öresund Region (2011), European Green Capital Finalist (2012 & 2013), Sweden's Greenest Municipality by MiljöAktuellt (2010)

Source: Own compilation from the data received from interviewees

### 3.1.2 Denmark

As mentioned earlier in the section 2.5, there is no national level city ranking system in Denmark. Interviews with the city officials revealed that Danish Municipalities believe in cooperation and there is a slight hesitation with the competition, which comes inevitably with the ranking systems (Brødsgaard, 2012; Driscoll & Ullum, 2012 & Nielsen, 2012). However, Danish municipalities do participate in international ranking systems and receive awards for their environmental performance. Copenhagen, the Danish capital city and a leading municipality in the Scandinavia has won the European Green Capital award for the year 2014. Copenhagen got the award for its achievements in eco-innovation and sustainable mobility, its commitment to act as a role model for the green economy, and for developing an exceptional

communication strategy for the city (European Commission, 2012 e). The city is also recognised as the Greenest Capital for the year 2012 by the Dual Citizen's Global Green Economy Index (GGEI, 2012).

Albertslund Municipality for its energy-efficient renovation programme of the existing housing stock, from the late 1950s won the Nordic Energy Municipality 2011 award from the Nordic Council of Ministers. Albertslund is known for the development of methods and realistic technical solutions for making energy-efficient renovation of old houses that are cheaper and profitable for the Municipality to implement. An energy retrofit project that combines energy-efficient and cost-effective technology in addition to improved indoor air quality and balanced construction methods is known as an Albertslund Concept (Albertslund Kommune, 2011).

**'Green cities'** is a committed environmental cooperation of the Danish municipalities initiated in the year 2000 for a better environment and sustainable communities. Today, there are six Danish Municipalities working in close collaboration to maintain and intensify work for an environmentally sustainable development (Green Cities, 2012). Albertslund, Allerød, Ballerup and Copenhagen are the four out of six member municipalities which are part of the Danish side of the Öresund region. Members of the Green cities cooperate with other municipalities on 10 major sustainability issues i.e. soil, groundwater, air, climate, nature, noise, chemicals, waste, planning and anchoring and 16 objectives (Green Cities, 2010). The member municipalities set high targets and undergo an official audit every year to consolidate their commitment. The 'Green cities' is revising its strategies and is expected to publish them in September 2012 (Brødsgaard, 2012). An interesting Carbon 20 project supported by EU LIFE+ resources runs between 2011 and 2013. The project aims to strengthen the cooperation between local governments and companies to reduce 20 percent CO<sub>2</sub> reductions before December 2013 (Carbon 20, 2011).

**The Gate 21** is a collaboration of Danish municipalities, private companies and research institutions working together to develop a sustainable society and green business opportunities in Denmark. Innovative projects through public-private partnership are created in construction, urban planning, transport, energy and resources sectors (Gate21, n.d.). Fifteen Danish municipalities along with six knowledge institutions and a number of private companies are involved in various Gate 21 projects developed under public-private partnership. Albertslund, Ballerup and Copenhagen Municipalities are partners in Gate 21 and work towards building sustainable communities in Denmark.

**A Climate Community** agreement with the Danish Society for Nature Conservation requires the joining municipality to reduce CO<sub>2</sub> emissions by minimum 2 per cent every year through its own activities. Consequently, the work on CO<sub>2</sub> reduction can be expanded to the entire municipality. So far, 73 out of Denmark's 98 municipalities have signed the agreement. Signatories of a Climate Community can receive help to undertake concrete initiatives for climate at the local level (Klimakommuner, n.d.). In addition to reducing the carbon footprint of the municipal operations, initiative inspires Danish municipalities to become more energy independent and environmentally friendly.

Table 3-2 Danish Municipalities contacted for the study

Municipality	Participation in award	Participation in Ranking system	City Cooperation Network member	Special achievement or Awards won
<b>Albertslund</b>	-	Green Cities, ICLEI	Green Cities, Climate Community, ICLEI, Energi Øresund, Covenant of Mayors, Gate 21	Nordic Energy Municipality (2011), Dansk Energi's ELFORSK-prize (2009), Climate Cup Byprisen (2008), Nordic Nature and environment Prize (2007), Climate Star Award (2002)
<b>Ballerup</b>	-	-	Green Cities, ICLEI, Gate 21	-
<b>Copenhagen</b>	European Green Capital Award 2009 and 2014  Siemens' EGCI in 2009	Copenhagen participates actively in an international city ranking concerning street cleaning, and ranking exercise concerning user satisfaction with the city's parks.	Green Cities, Covenant of Mayors, Euro Cities, C40 Cities Climate Leadership Group, ICLEI, Gate 21	European Green Capital Award (2014), Greenest Capital (2012), Rated twice as the best city in the world for cycles in 2009, first by the online magazine Treehugger and then by the Dutch Cycling Federation.  Rated the most livable city in world by the British magazine Monocle in 2008
<b>Helsingør</b>	Nordic Climate Municipality	-	Covenant of Mayors, Electricity Saving Trust, Climate Municipality, Climate Partner with DONG Energy	-

Source: Own compilation from the data received from interviewees

### 3.2 Comparative analysis of city ranking systems

A comparative analysis is used in this research process in order to understand the possible association and differences between various ranking systems and awards.

Taking into consideration the recent emergence of city ranking and award systems in urban development little academic work has been carried out in comparing them. Owing to the limited number of ranking systems and specific themes and objectives behind their development make them distinct from each other, primarily needless to compare. In order to get detailed insights into the objectives, methodologies and dissemination methods Giffinger *et al.* (2007) have compared the city ranking systems. Similar attempts have been made earlier by Schönert (2003), when he compared different city-rankings in Germany. However, comparative method has been widely used to compare University rankings. The followers of University ranking systems are of the opinion that irrespective of the objectives, these ranking systems provide information to stakeholders, who can later engage in interpretation and evaluation of the ranked data (Hendel & Stolz, 2008). Marginson (2007) argues that, rankings are meta-performance indicators and they do more than reflect an institution's profile. Moreover, they encourage politicians and stakeholders in triggering policy changes.

Table 3-3 compares the selected European ranking as well as award systems.

Table 3-3 Comparison of selected city ranking and award systems in Europe

Ranking/ award system	Spatial dimension	Temporal dimension	Developer	Methodology	Data sourcing	Criteria	Indicators	Post ranking mechanisms	Relevance to the Öresund region
<b>Smart cities Ranking of European medium- sized cities</b>	Seventy European medium- sized cities with 100,000 and 500,000 inhabitants	Carried out in 2007	Academic institutions	Selection of cities is based on population and data availability. Z- transformation method was used for standardisation of data. Results are aggregated by finding an average without weighting indicators.	Data derived from public and freely available databases such as ESPON, EUROSTAT and Urban Audit – a European database on cities. Data ranges between 2001-2007	Factors such as economy, social aspects, governance issues, transport, environment and quality of life style are used to determine the 'Smart'ness of the city.	Ranking used 74 indicators out of that 48 based on local or regional data and 26 on national data	Results were made available on the internet and published through newspapers. Cities used these results for marketing purposes	The ranking system is useful for medium- sized city's positioning compared to larger cities and such ranking is useful for cities to benchmark.
<b>European Green City Index (EGCI)</b>	30 leading European cities from 30 European countries.	Published in 2009	Research conducted by the Economist Intelligence Unit (EIU) and sponsored by the private company Siemens	Quantitative indicators were normalized on a 0 to 10 scale. Collected data was benchmarked against international or European directives and cities. Qualitative data was analysed by EIU analysts by scoring on a 0 to 10 scale. Index is prepared by adding scores of all indicators. Even weighting was assigned to each category score.	Data is collected by the EIU from official sources, such as municipal statistics departments & city governments. Data is mostly from the year 2007. Estimates were produced for data gaps from national data.	The index used eight categories covering some important aspects of environment such as CO <sub>2</sub> emissions, energy, buildings, transport, air, water, waste and land use and environmental governance.	The indicators used by the EGCI are comprehensive and are useful to depict present environmental condition of the city and also take into account plans and policies for future development.	The index was published on the website and highly ranked cities are using this ranking for city marketing. The index is one of the highly discussed European city index.	Indicators measured and the methodology used to rank the capital cities of Europe is very impressive.

Ranking/ award system	Spatial dimension	Temporal dimension	Developer	Methodology	Data sourcing	Criteria	Indicators	Post ranking mechanisms	Relevance to the Öresund region
<b>European Green capital Award (EGCA)</b>	The EGCA is open to all EU Member States, Candidate Countries & European Economic Area countries	Since 2010 award is given annually. Application process for 2015 is taking place.	European Green Capital Secretariat of the European Commission (EC)	The applications are assessed by the EC's panel of experts on 12 award categories. Panel's final report is submitted to the Jury, who shortlist a number of cities. The shortlisted cities present their vision, action plans and communication strategy to the Jury. Based on this, the jury selects a winning city.	Cities voluntarily apply for the award so they collect all the relevant data required to answer the indicators	A descriptive set of environmental criteria of the city which not only confirms the city's environmental performance, also expects the city to be a role model for other cities, even within Europe.	The indicators include various features of environmental performance of the city. It also considers the future plans, policies and eco-innovation processes in the city.	Extremely prestigious and popular award in Europe. The winner city acts as a role model and shares knowledge with other cities leading the way from front.	EGCA is considered as a platform to share ideas, experiences and best practices in sustainability and environmental protection through competition between Cities.
<b>Miljö Aktuellt's Sweden's Greenest Municipality (SMK)</b>	The ranking system takes into account Swedish municipalities.	The ranking started in 2009 and since then every year a winner city declared.	The ranking is developed by periodical 'Miljö Aktuellt' in collaboration with the Swedish Government offices and Association of local authorities and regions.	Participating municipalities answer the questionnaire. Points are added further to the initial score by considering municipal efforts in environmental management and commitment by joining various city cooperation networks.	Participating municipalities are expected to answer a questionnaire with supporting data.	The questions are based on environmental performance of the Swedish Municipalities and their environmental commitment. It also considers city's affiliation with various city networks.	Twenty questions related to state of the local environment are used to test environmental performance of the city in previous year.	The results are published in the 'Miljö Aktuellt' periodical and local newspapers. This allows municipalities to benchmark themselves.	Considering the local indicators and ranking municipalities of different character and population is encouraging.

Source: Own compilation from the methodologies of the ranking systems.



### 3.3 Interpretation based on categories used for comparison

As mentioned earlier, Schönert (2003) and Giffinger *et al.* (2007) have compared German city ranking systems and international city rankings based on their objectives, methodologies and dissemination methods respectively. Such a comparative analysis of existing ranking systems is extremely essential in order to identify their relevance and suitability to the study area. In this research, four city ranking and award systems are compared to understand their development, different ways of data collection and its processing, ranking, and dissemination methods. Arguably, dissemination or post ranking period is an important phase of the ranking system. The ways in which results of the ranking are evaluated, interpreted and presented decide the success and impact of a ranking system (Giffinger *et al.*, 2007). In this study, Table 3-3 sheds light on the complex process of the ranking systems and help to understand the background processes involved in it. The ranking systems under comparison are selected on the basis of either, their relevance to the Öresund region, objectives or the main theme behind the ranking system and availability of detailed methodology. The ranking systems chosen for the comparative analysis vary in their geographical scale and types of cities ranked. This is an important consideration, taking into account the differences in cities belonging to the Öresund region. Moreover, there are no conflicts between the ranking systems within a country. These ranking system work in parallel to each other addressing various themes of the environment by evaluating a mixture of indicators.

One of the important criterion while selecting these ranking systems was the presence of environmental components such as transport, status of physical environment, built environment and environmental governance in the ranking systems. The spatial scope of these ranking systems is limited to Europe. However, size of the cities and population are neglected on account of different sizes and characters of cities in the Öresund region. The region is extremely diverse consisting of large capital city like Copenhagen, a small student city- Lund, an industrial city- Ballerup and a multicultural city like Malmö. It also includes smaller municipalities and some of the fore-runners in environmental work such as Albertslund and Kristianstad municipalities. Helsingør and Helsingborg municipalities are often seen in national and international news due to their unique environmental actions.

The selected ranking systems are recently developed, the earliest being developed and published in the year 2007. This implies that these systems are obviously in accordance with the latest European urban policies and are following urban sustainability indicators. Moreover, it is interesting to notice that the selected ranking systems are developed by the researchers from academic institutions, in collaboration with consultancy and private business groupa, the European Union and finally, joint forces of local and national authorities along with national agencies. The Smart cities and European Green City Index (EGCI) were published in the year 2007 and 2009 respectively. EGCI received huge popularity, media attention and political acceptance at city and regional level and even today the EGCI is discussed in a number of EU conferences like Smart Cities and Communities. Compared to that, European Green Capital Award (EGCA) and Miljö Aktuell's Sweden's Greenest Municipality (SMK) rankings are published annually. The annual monitoring and measurement of environmental indicators are useful to assess the performance of the individual municipalities and development of a region in totality.

One of the most laborious phases of the ranking systems could possibly be the methodological tasks of data sourcing, data processing and developing a final ranking. Data generation and compilation is a costly affair, both economically and time wise. Along with the criteria used and indicators measured, ranking systems differ in their methodologies. At some point in time, these ranking systems have been criticised for their selection of

indicators (Nissen *et al.*, 2011). However, there is no international consensus on how to measure and what to measure (what to include and what to exclude) for a ranking system. Methods used to source data and practices employed to tackle unavailability of data determine the reliability of the ranking system. Additionally, keeping the methodology as simple as possible increases the transparency and accountability of the ranking system. Both Smart cities and EGCI sourced data individually from public data bases. Annual awards like EGCA expect cities to voluntarily apply for it. Nevertheless, preparation for such awards demand immense political determination, strong local actions and time to develop an application. Investing so much work force every year could be a daunting task for cities. The approach used by the MiljöAktuellt relies on data collection from municipalities. This is sometimes crucial for smaller municipalities as they do not have the ability or expertise to measure data for all indicators. Sometimes, certain indicators do not suit the municipality making it difficult to complete the application.

An important feature of the ranking systems is the dissemination phase, where ranking is published and public opinion is formed. Use of advertisements, publishing ranking on internet, local newspapers and promotion campaigns help in instigating public discussions around ranking. Better performing cities often engage in publicising the results, thus amplifying popularity of the ranking system. In the post ranking phase, it is observed that rankings do not target in promoting networking between the participating cities. Higher position in the ranking system often affects city components in a positive way. It motivates city officials to implement new projects, inspires politicians to set higher targets and also helps to strengthen the image of the city on national level. However, there are no feedback mechanisms to make sure that the low ranked cities are consulted and provided with necessary guidance to improve their performance. It is interesting to note that one of the important criteria in selection of the winner in the EGCA is the city's ability to be a role model, aiming to induce cooperation, knowledge sharing and learning between the cities.

### 3.4 Relevance to the Öresund region

No ranking system is yet established that considers a diverse group of cities. So considering the Öresund region, this will indeed be an unique effort. In this regard, combining all the relevant indicators and developing a new tailor-made system for measuring the environmental status and progress of the municipalities in the Öresund region will be exclusive. From the comparative analysis, it is clear that a ranking system can be developed by academic institutions, combined efforts from businesses, regional authorities or in collaboration with local authorities, national agencies and various associations working on urban issues. Learning from the success of the EGCI, it is evident that involvement of a business corporation in a ranking system can be mutually beneficial. In context of the Öresund region, the set-up is ready in the form of the Öresund Committee and public-private partnership through a number of Interreg projects.

MiljöAktuellt's initiative of incorporating city cooperation networks to assess the local authority's environmental commitment is particularly a novel idea. Considering the diverse nature of municipalities in Öresund region, data generation and normalisation is crucial, however, this can be managed through the Öresund Committee. Analysis of ranking systems shows that no other ranking except MiljöAktuellt, considers 'food' related indicators as one of the categories. Many municipalities do commendable work in various environmental fields, but most of the times, due to rigid structure of the ranking systems, there is no possibility to communicate that work. As a consequence municipality's significant environmental efforts are overlooked. Interviews conducted with the city officials from the Swedish municipalities revealed that due to popularity, media attention and public acceptance



of the established ranking systems like MiljöAktuellt's Sweden's Greenest Municipality, politicians make sure that the issues raised in the ranking system are given priority in the city's environmental policies. In this way, environmental politics in the city revolves around a ranking system to ensure that the municipality is placed higher in the rankings.

The comparison along with interviews revealed that although the existing ranking systems aim at building cooperation, sharing knowledge, developing network as a part of successful dissemination, they fail to deliver and implement the same. Low ranked cities find it shameful and consequently drop-out from the ranking system. To avoid this, a feedback mechanism can be established for the rankings in the Öresund region. Assessing temporal development of environmental efforts and future plans of the municipality are equally important in addition to measuring the current state of the environment. Comparing larger municipalities with smaller ones in the region can lead to mutual exchange of ideas and promote network activities. Table 3-4 shows the main features and notable shortcomings of the compared ranking systems with respect to the Öresund region. This has been explained further explained in detail in the synthesis section.

*Table 3-4 Compared ranking and award systems with respect to the Öresund region*

No.	Ranking/Award System	Salient features	Shortcomings
1.	<b>Smart cities: Ranking of European medium-sized cities</b>	<ul style="list-style-type: none"> <li>- Pioneering attempt to rank medium-sized cities</li> <li>- Data was sourced from public database like ESPON and EUROSTAT</li> </ul>	<ul style="list-style-type: none"> <li>- Selection of indicators can be improved</li> <li>- Weightings are not used</li> <li>- Indicators show the present state and not the future of a city</li> </ul>
2.	<b>European Green City Index</b>	<ul style="list-style-type: none"> <li>- Excellent set of indicators covering main environmental criteria</li> <li>- Clear methodology</li> </ul>	<ul style="list-style-type: none"> <li>- Indicators related to organic food and consumption are missing</li> <li>- Denies representation to non-capital cities</li> </ul>
3.	<b>European Green Capital Award</b>	<ul style="list-style-type: none"> <li>- Cities apply for the award by answering a questionnaire</li> <li>- Winner has an ability to be a role model and share best practices and knowledge</li> <li>- Applications are evaluated by the panel of experts</li> </ul>	<ul style="list-style-type: none"> <li>- Descriptive questions</li> <li>- Cities need to put in enormous workforce and time</li> <li>- Winning city cannot apply for award for the next 10 years</li> </ul>
4.	<b>Sweden's Greenest Municipality</b>	<ul style="list-style-type: none"> <li>- Data is collected from participating municipalities</li> <li>- Environmental commitment is measured along with state of the environment</li> <li>- Rankings are available in different municipality groups</li> </ul>	<ul style="list-style-type: none"> <li>- Indicators do not suit smaller municipalities</li> <li>- No room to accommodate municipality's unique efforts</li> <li>- Questions can be answered with either Yes or No</li> </ul>

*Source: Own compilation based on comparative analysis.*

Taking into account, the absence of national city ranking systems as a tool to disclose environmental efforts of the municipalities in Denmark, local authorities are required to make additional efforts. As a result, Danish municipalities have established direct contacts with the local residents and industries through various initiatives. However, the interviewees in Danish municipalities think that there is a need to benchmark local performance with

other municipalities in the region through a ranking system. They also added that cities need to become competitive and share best practices, build networks and work in close cooperation. The author strongly believes that there is a need to develop a regional ranking system, which can be used to promote cooperation and share knowledge so as to improve the environmental performance of the local communities. The proposed ranking system will develop a competitive environment in the region, and contribute to regional development.

## 4 Synthesis

This chapter illustrates the development of a tailor-made environmental city ranking system that can assist municipalities in the Öresund region to improve their environmental performance. The customised ranking system is built upon findings from the previous section and knowledge gained through interviews and the literature survey.

### 4.1 Evaluation and communication of environmental efforts

Use of methodological triangulation in this research helped to establish an understanding of the environmental problems in the Öresund region. It is clear that the region has set ambitious targets to become a climate smart region and stand out to be the most attractive region in Europe by 2020 (Öresundskomiteen, 2011). The Öresund Committee over the years has strengthened its role as a political interest organization to develop the welfare of the Öresund region. The Committee is coordinating a number of projects under Interreg IV that will help the region to achieve sustainable urban development. The Committee has also developed a regional strategy, ÖRUS for the Öresund region so that all the stakeholders through joint efforts can boost growth through cooperation (ÖRUS, 2010). ÖRUS is an active tool and it requires the Committee to monitor the development and track implementation of the strategies that can provide inputs in revising it every year.

The regional strategy penetrates down to the local administrative bodies in the Öresund region. Municipalities function as an interface between citizens and national and regional objectives. Often they develop local targets in accordance with the national and regional vision and actively participate in the process of their development. The municipalities are regarded as the living labs where innovative ideas and infrastructure are created and validated with stakeholders' participation (ENoLL, 2010). Thus, municipalities play a crucial role in realising the regional objectives while meeting the local expectations through a variety of programmes and initiatives. These local efforts contribute to regional development as a whole. Having said this, it is evident that all municipalities cannot develop in the same way owing to the diverse city make-up. Taking this into consideration, a set of indicators is of great assistance to measure progress, monitor improvement and evaluate the course of action.

#### ***Using environmental indicators***

Swedish municipalities often make use of readily available indicators and data published by the national organisations such as *Statistiska centralbyrån* (Statistics Sweden, SCB) and *Regional Utveckling och Samverkan i miljömålssystemet* (Regional Development and Cooperation in the environmental system, RUS) to monitor their environmental performance. The SALAR also provides municipalities and county administrative boards with various indicators to measure their performance. Additionally, the municipal authorities design their own set of indicators to calculate the progress and for the purpose of internal communication of the local environmental initiatives. Interviews shed light on the fact that developing indicators, collecting and processing data is a costly affair. Therefore, municipalities tend to measure only important indicators that are necessary to report the progress at national level. With the institutions and organisations in place to assist municipalities to measure their performance, it is less burdensome for the Swedish municipalities.

On the other hand, the author did not come across any similar institution involved in measuring environmental indicators in Denmark, neither was it revealed during interviews with the Danish municipal authorities. However, Danish municipalities measure the

environmental data at local level, which is used to evaluate their environmental performance. An excellent database, Green Accounts, to monitor the city's resource consumption and environmental impacts has been developed by the Albrtslund Municipality (Brødsgaard, 2012). The database covers CO<sub>2</sub> emissions from the municipal buildings and their activities, various institutions like day care centres and public premises, private houses and emissions from the housing block, and businesses (Green accounting, n.d.). Surprisingly, the interviewees revealed that the Danish municipalities do not have to report their environmental performance at the national level. There is no national indicator system where all municipalities can fill in data that can further be processed. However, municipalities involved in city networks find themselves engaged in reporting environmental indicators to their respective networks.

### **Using ranking systems**

As discussed earlier in chapter 2, ranking systems are considered as an important tool to measure and communicate performance. Additionally, ranking systems also bring about a sense of competition to be the best amongst the participants. Nevertheless, ranking systems are very popular in the world and they are frequently used to benchmark environmental performance. Recently, Sweden's Greenest Municipality (SMK), a city ranking system developed by MiljöAktuellt to assess the environmental performance of the Swedish municipalities has become extremely popular. The ranking is very much discussed in the media and politicians are concerned about their municipality's rank with respect to others in the country. Interviews made known that this ranking system is so influential that environmental practices for some municipalities revolve around it. Indicators used in the ranking system are dealt with priority so as to improve the rank. Such a strong influence of the ranking system on environmental actions of a municipality is undoubtedly debatable. In spite of that the ranking system is successful to motivate and help the Swedish municipalities to raise environmental standards at local level. Besides the SMK, municipalities' participation in other international or European ranking systems is fairly low. This could be due to the fact that indicators used in the international ranking systems are sometimes not suitable for the local context.

Unavailability of a city ranking system in Denmark requires local governments to monitor their own performance. Instead city networks, collaboration between municipalities and industries at local and national level is noticeable. As a result, there is no direct competition between the cities and that possibly makes benchmarking with other municipalities difficult. To overcome this problem, the city networks in Denmark like Euro Cities and Carbon 20, promote knowledge sharing and exchange of ideas, which otherwise is not achieved through city ranking systems. Developing a ranking system for Danish municipalities can be challenging considering the variety of indicators used by different municipalities. Nevertheless, city networks can potentially contribute to provide a set of indicators for a group of municipalities.

Taking into consideration the importance of indicators and ranking systems to monitor, evaluate and communicate environmental performance, the author emphasises the need to develop a ranking system for the Öresund region. The investigation of the different evaluation methods in Sweden and Denmark lead to the conclusion that proposing a customised and comprehensive ranking system for the region is necessary. In this process, the regional commitment and strong determination of local municipalities to improve environmental performance play a major role. Furthermore, based on the literature and analytical considerations, the author proposes a ranking system that will help municipalities in the region to benchmark their performance, encourage exchange of best practices, offer

platform to build network with other cities and share knowledge by creating a pool of resources.

## 4.2 Structure of a ranking system for the region

The interviews with the local authorities and a comparative analysis of the existing ranking systems facilitated the identification of shortcomings and suitable qualities with respect to the Öresund region. This knowledge is used to propose a ranking system for the region, explained further in this section.

Table 4-1 The proposed ranking system in nutshell

Ranking aspect	Description
Who should be in-charge?	The Öresund Committee
Objective	To improve the environmental performance of the cities in the Öresund region so it becomes the first CO <sub>2</sub> neutral region and climate smart region in the Europe
Who should participate in development of the ranking system?	Academics, representatives from municipalities and representatives from the Öresund Committee
How often the ranking should be carried out?	Once every year
How will the ranking look like?	The ranking can be displayed using 2 levels: <i>Level 1:</i> This level is based on a common set of indicators from the selected categories. All Municipalities, irrespective of their size, population and character shall be able to follow them. The ranking will involve Municipalities opting for Level 1 only. <i>Level 2:</i> Municipalities after being able to evaluate themselves with the indicators assigned in Level 1 can try to evaluate their performance with Level 2 indicators. Level 2 indicators are comparatively difficult to calculate. Municipalities can decide whether they want to evaluate their performance with <i>Level 1 or Level 2</i> .
How will the application process look like?	Municipalities will complete either a <i>Level 1</i> or <i>Level 2</i> applications involving certain <i>Qualitative</i> and <i>Quantitative</i> set of questions concerning indicators. The application might not involve descriptive answers if not necessary.
Methodology	A. The Öresund Committee will appoint a panel of experts from the respective field who will evaluate the data submitted by municipalities and normalise it on the scale of 0 to 10. B. The normalised data will be weighed as per pre assigned weightings (if any). C. Procedures need to be developed for un-attempted questions.
How the rankings will be displayed?	Best performing city of the year Progressive city recognition Extraordinary environmental work recognition
Main features of the ranking system	Rankings will be displayed every year but cities involved in knowledge sharing, technology transfer and joint programmes with other cities will get extra points. There will be a feed back or counselling session for the participating municipalities after ranking is displayed. Cities that are doing something good in a particular field can be matched with another city having difficulty in that field. An idea can be called as 'Sibling cities'.

As described in Table 4-1, the Öresund Committee, as a platform for the regional political collaboration, should be in charge of the ranking system. The Committee shall initiate the development of ranking system with the help of University partners, members from the Öresund Committee and city representatives. This will make sure that the local as well as regional objectives are given equal importance. Academicians and field experts shall handle the theoretical development of the ranking and evaluation of the applications after its inception. The ranking shall be displayed every year. This is due to the fact that if a ranking is published only once (like the Smart city and EGCI) then it sheds light only on the present status of environment in the participating cities. On the contrary, an annual ranking will explain the path of development and gradual improvement in the environmental performance of the participating cities. It also helps to follow the progress of the environmental work in the regional municipalities over the years. Such a trend analysis is essential to modify and negotiate policies aimed at urban development.

As mentioned in Table 4-1, the proposed ranking system shall be divided into two tiers. This is to encourage the participation of smaller municipalities in ranking. It has been observed that smaller municipalities often do not have the right expertise or resources to measure all the indicators or answer all questions of the conventional ranking system. This limits their ability to participate in the ranking systems and benchmark their performance. Further there will be a separate set of indicators for *Level 1* and *Level 2* cities. The ranking will be displayed only on the basis of *Level 1* indicators, which are common and easy to evaluate for all the participating municipalities. A set of *Level 2* indicators shall help ambitious municipalities to benchmark their performance and showcase their exceptional environmental work. It is believed that over the time the set standards become obsolete as most of the participants have already achieved a certain level of performance. Applying the same logic, it is expected that over the period of time, the *Level 1* and *Level 2* indicators shall be revised and reset. This is essential to maintain the high environmental performance standards for the region. Thus, the main aim of the ranking system shall be benchmarking environmental performance of the cities and increase a sense of cooperation in the region.

The proposed ranking system shall include qualitative as well as quantitative indicators developed by the Öresund Committee. The municipalities shall collect data on some indicators and submit it along with the application. A ranking development team of experts shall be appointed to ensure that all the data required to measure the indicators are easily available for all municipalities. The team shall also specify the details, sources and the quality of the data required for the ranking, whenever possible. They shall also be responsible to delineate the procedures for applying weightings to the indicators in the ranking categories, data normalisation methods and procedures to deal with un-attempted questions. This forms a foundation of the methodology for the ranking system.

Like other conventional ranking systems, the proposed ranking system will also felicitate the best performing city in that year. 'The best performing city' in the region will be selected on the basis of city's performance against the selected indicators and expert judgement. It is observed that, usually low ranked cities do not participate in the ranking system in the following years. This non-participation of low ranked cities can be avoided. In order to do that, the ranking system for the Öresund region will reward the city that has shown immense improvement in the environmental performance in comparison to the preceding ranking. The city shall be recognised as 'The Progressive City' in the region. The award will motivate the bottom ranking municipalities to continue their good work on improving environmental performance and thus be encouraged to perform better in the next round of ranking than avoiding non-participation. The final award shall be given to a city that has made

extraordinary efforts in environmental protection. 'The extraordinary environmental performance' award shall encourage other cities to come up with novel projects and innovative ideas to protect the environment.

As mentioned above, the objective of this ranking system is to help municipalities to improve their environmental performance and promote cooperation between cities to facilitate sharing of knowledge, technology transfer and build networks. Cities that are actively involved in such cooperation and participating in collaborative projects with the other cities shall be acknowledged and points shall be rewarded for the same. Another important feature of the proposed ranking system is the arrangement of possible feedback sessions for the municipalities that need assistance from the other cities or the Öresund Committee. The feedback on their environmental performance will help out municipalities to delineate plans for the coming year.

The ranking shall also take into consideration the city character and make efforts to preserve it. In the background of the proposed ranking system, there is a necessity to address the fact that mere participation in the ranking system will not result in improvement of environmental performance of the municipalities. The ranking system provides a tool to help municipalities to measure and benchmark their environmental performance.

### 4.3 Components of a ranking system for the region

The proposed ranking system shall include the following categories and components covering different facets of the urban environment. The author does not want to propose any measurable indicators as it needs further research. The set of categories are described in Table 4-2.

Table 4-2 Set of categories for the proposed ranking system

<p><b>Category 1: Energy</b></p> <ol style="list-style-type: none"> <li>1. CO<sub>2</sub> emissions from energy production</li> <li>2. Proportion of renewable</li> <li>3. Heating and cooling</li> <li>4. Buildings</li> </ol>	<p><b>Category 2: Transport</b></p> <ol style="list-style-type: none"> <li>1. Public transport/non-car transport</li> <li>2. Bike infrastructure</li> <li>3. Private vehicle use</li> <li>4. Infrastructure for non-conventional cars (electric, biogas)</li> </ol>	<p><b>Category 3: Environmental pollution</b></p> <ol style="list-style-type: none"> <li>1. Air</li> <li>2. Water including wetlands</li> <li>3. Noise</li> <li>4. Waste</li> <li>5. Chemicals</li> <li>6. Biodiversity, green areas and land-use</li> </ol>
<p><b>Category 4: Procurement and consumption</b></p> <ol style="list-style-type: none"> <li>1. Green Public Procurement</li> <li>2. Consumption of local and organic food products</li> <li>3. Purchasing policies of the Municipalities</li> </ol>	<p><b>Category 5: Environmental Governance</b></p> <ol style="list-style-type: none"> <li>1. Public participation in decision making</li> <li>2. Environmental plans, future policies and visions</li> <li>3. Climate adaptation policies</li> <li>4. Use of ICT</li> </ol>	<p><b>Category 6: Contribution to the regional development</b></p> <ol style="list-style-type: none"> <li>1. Involvement in city cooperation and city networks</li> <li>2. Collaboration with other cities</li> <li>3. Extraordinary performance</li> </ol>

Source: Own formulation

The above mentioned categories shall be able to contribute to achieve environmental sustainability in the municipalities. The categories not only cover the climate and energy related criteria but also cover environmental governance, procurement and consumption, and the city's contribution to the regional development. This helps to initiate a communication and dialogue between various sections in the municipality, who otherwise have no reason to work together and share knowledge. Measuring indicators and evaluating cities on the basis of all the above categories shall lead to improving the environmental performance.

## 4.4 Discussion

### 4.4.1 Relevant considerations

When it comes to ranking systems it is imperative to discuss indicators used in the event of measuring and evaluating performance. Most of the available rankings these days are based on performance oriented indicators that evaluate the current status of the environment in the city. This sort of approach is of very little use for the small and medium-sized cities that are in the process of developing new projects and policies. There is a need to design indicators that will assist in measuring the future of cities with the help of a number of policies, future plans and vision. Instead of evaluating the details pertaining to sectors, the ranking system should develop indicators that are measured at city level. This kind of approach will help to view the environmental problems at the city level.

The indicators developed should be measurable in both, Sweden and Denmark, with ease. Interviews revealed that most of the awards and ranking systems request municipalities to provide data in a particular format (may also be with different units) and intricate details making it time consuming and inconvenient for the municipalities to participate. It is possible for the proposed ranking system to identify the data sources, from where the consistent data can be acquired. In this regard, various environmental indicators developed in 2007 and reports like 'Key Energy and Climate 2011 - buildings, transport and emissions in local governments' developed and published by SALAR can be of great help. Involving associations like SALAR into designing indicators for the proposed ranking system can be useful considering its expertise in this field. Additionally, ambiguity between the methods to calculate certain type of data (e.g. CO<sub>2</sub> emissions from city) in both the countries shall be addressed in advance.

### 4.4.2 Key stakeholders

Through the comparative analysis of ranking systems and by studying the environmental politics in the region, this research has identified four key stakeholders in the region. These key stakeholders need to step up and lead the way forward to realise the climate smart and CO<sub>2</sub> neutral region. The main stakeholder groups are identified on the basis of their relevance in the region and ability to influence environmental actions in the Öresund region. The following recommendations are suggested for the key stakeholders so as to materialise the regional vision.

**The Öresund Committee:** The Öresund Committee is the apex political organisation in the region, taking care of interests of the both, Swedish and Danish sides. It has developed the vision and therefore needs to take the leading role to make it happen. The Committee shall:

- Facilitate the process of developing a ranking system for the region by establishing an expert team
- Organise finance options through various European projects for the ranking system



- Create policy background for the Öresund region to start the first ever regional ranking system
- Coordinate Interreg projects in the Öresund region contributing to sustainable urban development, such as Urban Transition Öresund, Sustainable City Hub, Energi Öresund
- Ensure that the national Governments are aware of the ranking system and participating municipalities
- Mobilise academic, media, business and other relevant partners to promote the ranking
- Motivate municipalities in the region to participate in the ranking and develop a strong city network

**Local authorities in the region:** Local authorities are the main components of this ranking system. This group of stakeholders will be the most benefited as the proposed ranking system is developed for municipalities in the region to improve their environmental performance. Municipalities in the region shall:

- Consider this ranking system as an opportunity to improve environmental performance and build cooperation with other municipalities in the region
- Collaborate with other cities to develop new projects
- Initiate public-private partnership projects to work in close cooperation with businesses
- Develop projects to increase public participation
- Cooperate with other sections in the municipality to work on environmental sustainability issue
- Communicate environmental work to citizen and politicians
- Implement innovative ideas in the cities to promote sustainable development
- Danish municipalities should accept the proposed ranking as a tool to improve environmental performance

**City and business networks:** City networks are the organisations of the municipalities in the region that aim at sharing experiences and knowledge between the municipalities. Sustainable Business Hub and Copenhagen Cleantech Cluster are recognised as the business network organisations in the region. There is an opportunity for the city and business networks to:

- Develop cross-border cooperation to share knowledge and experiences
- Consider collaborating with other business and city organisations
- Contribute to the ranking system by involving in data sourcing and evaluation
- Set targets for the network members to achieve regional goals
- Cooperate with local authorities to develop collaborative projects
- Help municipalities to source data required for the ranking system
- In future, develop a data system for the region that can be useful for the ranking system
- Develop innovative ideas and technologies that can contribute to sustainable urban development

**Academic partners:** Öresund region is a knowledge center of the Scandinavia and there are number of Universities in the region conducting research in the field of urban environment. They are one of the most essential stakeholders in the Öresund region as they are the thinking brain behind such rankings. Academic partners in the region shall consider to:

- Cooperate with the Öresund Committee to develop a ranking system
- Test possibilities and sensitivities of ranking system, necessary for its success
- Develop set of indicators and locate sources to procure data for ranking
- Create a panel of experts to evaluate the categories in the ranking system
- Communicate the research developed in the Universities to businesses and cities

The current research work has proposed a skeleton of a ranking system by analysing the existing ranking systems in Europe and taking into consideration the opinion of municipal authorities in the region. There is further scope to develop a full-fledged ranking system using the proposed system. The author has not gone into the details of indicators that need to be measured for the ranking system. So, future research shall concentrate on developing measurable indicators for the proposed ranking system and check the sensitivity of the ranking system.

## 5 Conclusions

This chapter summarises the key findings of the research and responds to the research questions asked in the beginning of the thesis. This study was conducted with the main objective of understanding existing environmental city ranking systems and to further investigate their role in improving environmental performance of the participating cities. Keeping in mind the ambitious vision of the Öresund region to become the first CO<sub>2</sub> neutral and climate smart region in Europe by 2020, the research analysed the contribution of the ranking systems in achieving the regional vision. The research questions which guided this work are as follows:

### **How can ranking systems contribute to improve the environmental performance in the Öresund region to become the first CO<sub>2</sub> neutral region in Europe?**

- **Sub-question 1:** What are the implications of the existing environmental city ranking systems in the Öresund region?
- **Sub-question 2:** How can environmental ranking systems influence environmental performances of local authorities?

The research was carried out in the context of the Öresund region and analysed various city ranking systems in Europe. The proposed ranking system as a structure, is expected to be applicable to other cross-border regions (and the world) with a strong regional Committee. Moreover, the categories and criteria used in the proposed ranking system can be used with due modifications making them suit particular regional environments. Put simply, the results of this research are applicable in other contexts if adapted for regional conditions. Further work into how to adapt the proposed regional ranking systems represents an important step for future research.

### ***Implications of existing environmental city rankings in the Öresund region***

From the undertaken research, the existing ranking systems are *homogeneous* in nature, limiting the participation of cities. These ranking systems intend to rank cities selected on the basis of their population or being a capital city as observed in Smart cities and EGCI respectively. In contrast, EGCA is open to apply for all European cities, however the expertise and resources required to finally win the award are beyond the capabilities of smaller municipalities. An approach used in the SMK ranking system to rank all municipalities in Sweden, irrespective of their size, can be used to rank cities in the Öresund region.

For the participating cities, the ranking systems usually end up with either *fame or shame*. The winner and the top performers in the ranking system use it for marketing the city features and attract investors. On the contrary, cities ranked lower in the rankings often tend to ignore the results and eventually stop participating in the ranking systems. This can be explained by the *poor post ranking mechanisms* in the existing ranking systems. Ideally, the ranking systems are developed to increase the competitiveness and promote cooperation between cities by benchmarking. However, except for EGCA none of the existing ranking systems have considered this as one of the building blocks of a ranking system.

*Inappropriateness of indicators* is another issue, which municipalities in the region have to deal with when applying for the European ranking systems. The ranking systems developed with a larger geographical scope tend to become general in order to increase participation. As a result *non-specific* indicators are produced, which are of little help for the participating cities to

improve their performance. It is evident from the results of various environmental ranking systems that Scandinavian cities perform better compared to other regions in the EU. Taking into consideration the implications of the existing ranking systems an inevitability to develop a *customised regional city ranking system* was established. The regional city ranking system that aims to help local municipalities to improve their environmental performance is proposed at the end of research.

### ***Ranking systems to influence environmental performance***

The research contributed to establish the importance of ranking systems in the urban environmental politics. It was useful to study how popularity of a ranking system can change the course of environmental actions in local context. The ranking systems can also help to mobilise political systems and enhance the dialogue between different sections in a municipality. If a ranking system represents relevant local indicators, involves participants belonging to similar conditions and generates media attention, it is likely that the ranking system becomes popular for both citizens and politicians. Considering the influence of the SMK ranking system on the environmental efforts of Swedish municipalities, it is clear that ranking systems can contribute to motivate municipalities to improve their environmental work.

Additionally, Swedish municipalities in the Skåne region perform well in the national ranking system. These municipalities are also considered environmentally proactive like their Danish counterparts. The absence of ranking systems in Denmark limits the chances of Danish municipalities to benchmark their environmental performance. However, their involvement in city networks and evaluation and communication of environmental work at the municipal level is commendable.

An important aspect that came into view during this research is the importance of indicators and ranking systems for the municipalities to evaluate their work. All the officials interviewed confirmed the importance of indicators and reiterated that rankings have the potential to influence the actions at the municipal level. Nevertheless, the city officials were also sceptical about the feeling of competition that comes along with rankings. This perception about the rankings helped in developing the ranking system in the region that will promote cooperation rather than competition between cities.

City ranking provides an opportunity for the better performing municipalities to showcase their best environmental features as well as identify areas that need attention. On the other hand, municipalities that need to improve their performance can get inspiration and assistance from other municipalities. The cooperation between municipalities helps them to learn from others' experiences and share knowledge. Undoubtedly, the municipal network will lead to synergy and help the region to become the first CO<sub>2</sub> neutral and climate smart region in the Europe.

Finally, the author believes that the proposed ranking system is an important tool in the efforts to contribute to the regional vision. Moreover, it will help to strengthen regional cooperation by developing teamwork and networking between the cities. The proposed ranking systems shall assist the municipalities in the region to become environmentally sustainable and lead the way for a better future.

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### **List of people interviewed**

- Anna Alice Driscoll, Ballerup Municipality, Cycle and Climate Coordinator, 26<sup>th</sup> June 2012
- Bo Larsen, Copenhagen Municipality, Civil Engineer, Email Communication, 13<sup>th</sup> August 2012
- Camilla Alfredsson, Helsingborg Municipality, Environmental Strategist, 29<sup>th</sup> May 2012
- Karen Marie Pagh Nielsen, Helsingør Municipality, Climate Consultant, Telephone communication, 22<sup>nd</sup> August 2012
- Kasper Ullum, Ballerup Municipality, Geologist, 26<sup>th</sup> June 2012
- Katrine Svensson, Kristianstad Municipality, Environmental Information, 27<sup>th</sup> June 2012
- Linda Birkedal, Lund Municipality, Environmental Strategist, 2<sup>nd</sup> July 2012
- Pernille Friis Brødsgaard, Albertslund Municipality, Environment and Development employee, 24<sup>th</sup> August 2012
- Torbjörn Adolfsson, Aneby Municipality, Environment Manager, Personal informal communication, 5<sup>th</sup> August 2012

## Appendix

### Appendix 1. Project partners in Energi Öresund and Urban Transition Öresund projects

#### Energi Öresund

No.	Organisation	Organisation Type	Person Contacted
1.	Albertslund Municipality	Local Authority, Denmark	Pernille Friis Brødsgaard
2.	Aalborg University	Academic Institution, Denmark	-
3.	Amagerforbrænding	Waste management and energy production company, Denmark	-
4.	Albertslund Forsyning	District heating, water and sewage company, Denmark	-
5.	Ballerup Municipality	Local Authority, Denmark	Anna Alice Driscoll & Kasper Ullum
6.	City of Copenhagen	Local Authority, Denmark	Bo Larsen
7.	Energy Office Skåne	Regional energy office, Sweden	-
8.	Gate 21	Sustainable future forum, Denmark	-
9.	IIIEE	Academic Institution, Sweden	Mikael Backman
10.	Local authorities Skåne	Association of Local Authorities in Skåne, Sweden	-
11.	Kristianstad Municipality	Local Authority, Sweden	Katrine Svensson
12.	Lund Municipality	Local Authority, Sweden	Linda Birkedal
13.	Lund University	Academic Institution, Sweden	-
14.	Malmö Municipality	Local Authority, Sweden	Joakim Nordqvist
15.	Roskilde University	Academic Institution, Denmark	-
16.	Sustainable Business Hub	Business development group, Sweden	Håkan Knutsson
17.	VEKS	Heat production company, Denmark	-

## Urban Transition Öresund

No.	Organisation	Organisation Type
1.	Malmö Högskola	Academic Institution
2.	Sveriges Lantbruksuniversitet Alnarp	Academic Institution
3.	Aalborg Universitet CPH	Academic Institution
4.	Københavns Kommune	Local Authority
5.	Malmø Stad	Local Authority
6.	Lunds Kommun	Local Authority
7.	Ballerup Kommune	Local Authority
8.	Roskilde Kommune	Local Authority
9.	Roskilde Universitetscenter	Academic Institution
10.	Copenhagen Business School	Academic Institution
11.	Copenhagen Clean Tech Cluster	Business development group
12.	Kunstakademiets Arkitektskole (København)	Academic Institution
13.	Lund University	Academic Institution

**Appendix 2. List of basic questions used for semi-structured interviews with the city officials**

1. What are the best environmental features of your city and how do you communicate them to the outside world?
2. What different city ranking systems you are aware of? Is your city take part of any of them? If not why? If yes what is the motivation?
3. How do you measure environmental performance of the municipality at local level? Are there specific environmental indicators you have to report at National level?
4. Do you think city rankings can help in sustainable development of cities? How these existing ranking systems can be improved?
5. If a city ranking is to be developed for the Öresund region, which particular criteria you would like to include and exclude? why?

### **Appendix 3. Member organisations of the Öresund Committee**

The Öresund Committee comprises 36 members, 18 Swedish representatives and 18 Danish representatives, all of whom serve for the duration of their political mandate in their respective country.

The 12 member organisations of the Öresund Committee are themselves responsible for nominating and appointing the politicians who will represent them as members or deputies on the Committee. Each Committee member has one vote and decisions are generally reached by a simple majority. The activities and operations of the Öresund Committee are financed through contributions from the members. The size of these contributions varies depending on the number of inhabitants in the municipality or region that the respective member represents.

Following table enlists the 12 member organisations from Swedish and Danish side forming in the Öresund Committee.

<b>Denmark</b>	<b>Sweden</b>
Regional Municipality of Bornholm	Region Skåne
City of Frederiksberg	Malmö city
Capital Region (Hovedstaden) of Denmark	Helsingborg City
Region Zealand	Lund Municipality
Local authority contact Zealand (Kommunekontaktråd Sjælland)	Landslrona Municipality
Local authority contact Capital region (Kommunekontaktråd Hovedstaden)	
City of Copenhagen	

Source: <http://www.oresundskomiteen.org/en/politics/>