Expert Panel

Technical Assessment Synopsis Report

European Green Capital Award 2019

April 2017

www.ec.europa.eu/europeangreencapital

Acknowledgements

The authors of this Technical Assessment Report are the European Green Capital Award Secretariat, RPS Group Limited (hereafter RPS) together with the contribution of the Expert Panel. We would like to thank the Expert Panel and the European Commission Directorate-General for Environment for their assistance in the preparation of this report.

RPS, an environmental and communications consultancy based in Ireland, is currently appointed as the European Green Capital Award Secretariat. The competition application process and the work of the Expert Panel and the Jury are facilitated by the Secretariat.

The Secretariat also assists with PR activities related to the European Green Capital Award through the European Green Capital Award website, Facebook, Twitter and LinkedIn pages, and through various communication channels such as brochures, press releases, newsflashes and film clips etc.

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1 INTRODUCTION

Europe's cities are recognised as the engines of the European economy, providing jobs and services, and serve as hubs that catalyse creativity and innovation. Cities are the living environment for 72% of all Europeans with this percentage expected to rise to 80% by 2050. They possess potential such as economic growth, innovation and employment opportunities[1]. However, they are facing ever increasing challenges, with regards to the environment, transport and social cohesion.

The European Green Capital and European Green Leaf Awards are underpinned by European Policy on sustainable urban planning and design. The Awards support the goals set out most recently in the Urban Agenda for the EU-Pact of Amsterdam, signed in 2016, and prior to this the 7th Environmental Action Programme (EAP), as adopted in 2013.

The Urban Agenda for the EU-Pact of Amsterdam

The European Commission adopted a Communication in July 2014 and launched a public consultation on an EU Urban Agenda[2] . The EU Urban Agenda aims to address the challenges faced by cities and also to fully exploit the potential of cities by integrating the urban dimension into EU policies. The EU Urban Agenda also aims to promote cooperation and partnerships between member states, the European Commission, European institutions, cities and other stakeholders in order to stimulate growth, liveability and innovation in the cities of Europe through:

1. Improving the development, implementation and evaluation of EU legislation ('Better Regulation');
2. Ensuring better access to and utilisation of European funds;
3. Improving the EU urban knowledge base and stimulating the sharing of best practices and cooperation between cities.

The Urban Agenda for the EU outlines 12 priority themes, which are essential for development in urban areas in order to achieve smart, green, inclusive growth. Many of the themes outlined align with the indicators and topic areas assessed in the EGCA and EGL Awards, including; Urban Mobility, Circular Economy, Climate Adaptation, Air Quality, Energy Transition and Sustainable Use of Land and Nature-Based Solutions.

The Urban Agenda for the EU will contribute to the implementation of the UN 2030 Agenda for Sustainable Development, notably Goal 11 'Make cities inclusive, safe, resilient and sustainable' and the global 'New Urban Agenda' as part of the Habitat III process.

7th Environmental Action Programme (EAP)

The Commission commenced the 7th Environmental Action Programme (EAP) in 2013 which sets out a strategic agenda for environmental policy-making with 9 priority objectives to be achieved by 2020. It establishes a common understanding of the main environmental challenges Europe faces

[1] http://urbanagendaforthe.eu/wp-content/uploads/2015/12/EU-Urban-Agenda-factsheet.pdf

[2] http://europa.eu/rapid/press-release_IP-15-5096_en.htm

and what needs to be done to tackle them effectively. This programme underpins the European Green Capital Award (EGCA) in relation to policies for sustainable urban planning and design.

Protecting and enhancing natural capital, encouraging more resource efficiency and accelerating the transition to the low-carbon economy are key features of the programme, which also seeks to tackle new and emerging environmental risks and to help safeguard health and welfare of EU citizens. The results should help stimulate sustainable growth and create new jobs to set the European Union on a path to becoming a better and healthier place to live.

Cities play a crucial role as places of connectivity, creativity and innovation, and as centres of services for their surrounding areas. Due to their density, cities offer a huge potential for energy savings and a move towards a carbon-neutral economy.

Most cities face a common core set of environmental problems and risks, including poor air quality, high levels of noise, greenhouse gas (GHG) emissions, water scarcity, contaminated sites, brownfields and waste. At the same time, EU cities are standard setters in urban sustainability and often pioneer innovative solutions to environmental challenges. An ever-growing number of European cities are putting environmental sustainability at the core of their urban development strategies.

The 7th EAP sets the target of meeting local, regional and global challenges by enhancing the sustainability of cities throughout the European Union and fixes the goals that by 2020 a majority of cities in the EU are implementing policies for sustainable urban planning and design.

European Green Capital Award

The European Green Capital Award is the result of an initiative taken by 15 European cities (Tallinn, Helsinki, Riga, Vilnius, Berlin, Warsaw, Madrid, Ljubljana, Prague, Vienna, Kiel, Kotka, Dartford, Tartu & Glasgow) and the Association of Estonian cities on 15 May 2006 in Tallinn, Estonia. Their green vision was translated into a joint Memorandum of Understanding establishing an award to recognise cities that are leading the way with environmentally friendly urban living. The initiative was launched by the European Commission in 2008.

It is important to reward cities which are making efforts to improve the urban environment and move towards healthier and sustainable living areas. Progress is its own reward, but the satisfaction involved in winning a prestigious European award spurs cities to invest in further efforts and boosts awareness within the city as well as in other cities. The Award enables cities to inspire each other and share examples of good practices in situ. All winning cities are recognised for their consistent record of achieving high environmental standards and commitment to ambitious goals.

The objectives of the European Green Capital Award are to:

a) Reward cities that have a consistent record of achieving high environmental standards;
b) Encourage cities to commit to on-going and ambitious goals for further environmental improvement and sustainable development;
c) Provide a role model to inspire other cities and promote best practice and experiences in all other European cities.

The overarching message that the award scheme aims to communicate to the local level is that Europeans have a right to live in healthy urban areas. Cities should therefore strive to improve the quality of life for their citizens and reduce their impact on the global environment. This message is brought together in the Award's slogan 'Green cities-fit for life'.

1.1 ANNUAL AWARD PROCESS

The first cycle of the European Green Capital Award, a biennial process at that time, led to the inaugural award for 2010 going to Stockholm and Hamburg as the 2011 European Green Capital. The second cycle, completed in 2010, resulted in the Spanish City of Vitoria-Gasteiz becoming the 2012 European Green Capital and Nantes in France becoming European Green Capital in 2013. In 2011, the approach was modified to become an annual call. Since then the 2014 European Green Capital, Copenhagen, 2015 European Green Capital, Bristol, 2016 European Green Capital, Ljubljana, 2017 European Green Capital, Essen and 2018 European Green Capital, Nijmegen, have all been annually awarded. This annual cycle continues on to find the 2019 European Green Capital. The evaluation format was also modified in 2011 in order to streamline the entire process whilst giving the Jury a more significant role in the process.

During the 2016 EGCA cycle the competition was opened for the first time to applications from cities with a population of over 100,000 inhabitants, as the limit for previous cycles was over 200,000 inhabitants. In addition to this, the competition was opened for the first time to eligible cities from Switzerland. This remained the case for the 2017, 2018 and 2019 EGCA Competition cycle. In June 2014, the 2017 EGCA call opened to over 500 cities from EU Member States and Candidate Countries (Albania, FYROM, Montenegro, Serbia, Turkey); Iceland, Liechtenstein, Norway and Switzerland.

As in previous years, the Expert Panel has carried out a technical assessment of each of the 12 environmental indicator areas (detailed in Section 2.2) and provided a ranking of applicant cities together with qualitative comments on each application. This ranking is derived as a result of primary expert assessment, clarification from the cities and peer review from another expert (more details on this procedure in Section 2). This information is presented to the Jury in the form of this report to form part of their deliberation at the Jury Day.

The shortlisted cities are invited to present a communication strategy substantiated by action plans on how they intend to fulfil their green capital year, should they win.

The Jury will assess the shortlisted cities based on the following evaluation criteria:

1. The city's overall commitment, vision and enthusiasm as conveyed through the presentation.
2. The city's capacity to act as a role model, inspiring other cities, promoting best practices and raising the awareness of the EGC model further, bearing in mind city size and location.
3. The city's communication strategy and actions, which should address:
   - Citizen communication and involvement to date in relation to the 12 environmental indicators, effectiveness via changes in citizen behaviour, lessons learned and proposed modifications for the future.
   - The extent of the city's (local, regional and national) partnering to gain maximum social and economic leverage.

- How they intend to fulfil their role of EU Ambassador, inspiring other cities.

Based on the proposals from the Expert Panel and information presented to the Jury, the Jury will make the final decision and select the city to be awarded the title of European Green Capital 2019. The winner will be announced at the EGCA Awards Ceremony in Essen (Germany), European Green Capital 2017, on the 2nd June 2017.

1.2 AIM OF THIS REPORT

This Technical Assessment Report provides an overview of the approach to this Award. It presents the technical assessment of the Expert Panel for each of the 14 applicant cities, which forms the basis for shortlisting the cities. This is presented per indicator per city for transparency of the overall process.

Both of these reports are compiled and edited by RPS Group, Ireland, acting as Secretariat for the European Green Capital Award.

2 TECHNICAL ASSESSMENT PROCEDURE

2.1 APPLICANT CITIES FOR 2019 EGC AWARD

A total of 14 cities applied for the 2019 EGC Award. Details of the 2019 applicants are included in Table 2.1 and Figure 2.1.

Of the 14 cities to be evaluated 12 are signatories of the Covenant of Mayors Office (CoMO) and 12 of the eligible countries from across Europe are represented. The smallest city by population is Funchal in Portugal with a population of 106,721, whereas Seville in Spain has the largest population of 698,944.

Table 2.1 - Details of Applicant Cities (presented in alphabetical order)

	City	Country	Inhabitants	Signatory of the CoMO
1	Arad	Romania	179,202	Yes
2	Bologna	Italy	386,633	Yes
3	Florence	Italy	377,587	Yes
4	Funchal	Portugal	106,721	No
5	Ghent	Belgium	256,235	Yes
6	Kamza	Albania	140,000	No
7	Lahti	Finland	119,263	Yes
8	Lisbon	Portugal	547,733	Yes
9	Oslo	Norway	658,390	Yes
10	Pécs	Hungary	156,049	Yes
11	Seville	Spain	698,944	Yes
12	Strasbourg	France	275,718	Yes
13	Tallinn	Estonia	443,268	Yes
14	Wroclaw	Poland	609,857	Yes

Figure 2.1 - Map of European Green Capital 2019 Applicant Cities

2.2 TWELVE INDICATOR AREAS

The selection of the European Green Capital 2019 is based on the following 12 environmental indicator areas:

1. Climate Change: Mitigation and Adaptation
2. Local Transport
3. Green Urban Areas incorporating Sustainable Land Use
4. Nature and Biodiversity
5. Ambient Air Quality
6. Quality of the Acoustic Environment
7. Waste Production and Management
8. Water Management
9. Waste Water Management
10. Eco-innovation and Sustainable Employment
11. Energy Performance
12. Integrated Environmental Management

For the 2019 cycle, the 12 indicators areas remain as they were for the previous cycle but have incorporated some changes to the text content.

2.3 APPLICATION FORM

The format of the Application Form was modified for the 2015 award cycle to ask cities to provide information for each of the 12 indicator areas in the format of 'Present Situation, Past Performance and Future Plans' underpinned by the EMS principles of 'Plan, Do & Check and Act'. This was found to be successful and was retained for the 2016, 2017, 2018 and 2019 award cycles. The format of the Application Form was modified for the 2018 cycle to ask cities to provide environmental data in table format for each indicator. This facilitated the extraction of data to be used for benchmarking of the cities and was retained for the 2019 cycle. Also, Section E of each indicator, Good Practices, was removed from the Indicator sections and a new section called the Good Practices section was added to the end of the Application Form asking cities to provide 6 examples of Good Practices in their city. This was also retained for the 2019 cycle. A copy of the 2019 EGCA Application Form is attached in Appendix A.

For this award cycle some modifications have been made to the indicator structure, allowing for a more consistent document across the 12 indicators. The Guidance Note was also revised for the 2018 award cycle to provide a policy background and further relevant information to shape applicant cities responses. These revisions were retained for the 2019 cycle. The 2019 Award Application Form has 4 sections per indicator as follows:

a) Describe the present situation.
b) Describe the measures implemented over the last five to ten years.
c) Describe the short and long term objectives for the future and proposed approach to achieve these.

d) List how the above information can be documented, add links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

For all indicator areas, information should be provided on short and long term commitments in the form of adopted measures and approved budgets. These measures must be proven by references and links where possible to published reports, plans or strategies. Further information on these references and links may be requested by the Expert Panel during the clarification phase. The 'budgets' refer to approved budgets to be used for the implementation of these reports, plans or strategies.

The 2016 EGCA Application Form introduced a new section at the start of the application form 'City Introduction & Context'. This section was retained for the 2017, 2018 and 2019 EGCA Cycles as it is considered to provide valuable insight and context to the Expert Panel. A legislative non-compliance background check of shortlisted cities was also conducted as part of the 2019 award technical assessment.

2.4 EXPERT TECHNICAL ASSESSMENT PANEL

The Technical Assessment Panel consists of 12 experts who bring internationally recognised expertise within each of the areas covered by the indicators to the process. Profiles for each of the experts can be found in Appendix B.

Table 2.2 - Expert Technical Assessment Panel

	Indicator	Expert	Title
1	Climate Change: Mitigation and Adaptation	Mr. F. Javier González Vidal	Atmospheric pollution technical advisor. Regional Government of Valencia, D.G. Environmental Quality, Spain
2	Local Transport	Dr. Ian Skinner	Director, Transport and Environmental Policy Research, Crowborough, UK
3	Green Urban Areas incorporating Sustainable Land Use	Dr. Annemieke Smit	Senior researcher on Nature Based Solutions for Society, Alterra-Wageningen UR
4	Nature and Biodiversity	Mr. David Jamieson	Head of Parks, Greenspace & Cemeteries, City of Edinburgh Council
5	Ambient Air Quality	Prof. Christer Johansson	Professor at the Department of Environmental Science and Analytical Chemistry of Stockholm University & Environmental Officer at the Environment and Health Administration (EHA) of the City of Stockholm
6	Quality of the Acoustic Environment	Prof. Diogo Alarcão	Principal Researcher and Professor in the scientific area of Acoustics at Instituto Superior Técnico University of Lisbon and at the Polytechnic Institute of Lisbon, Portugal

7	Waste Production and Management	Mr. Warren Phelan	Technical Director, Waste, Energy & Environment Division, RPS Group, Dublin, Ireland
8	Water Management	Mr. Giulio Conte	Project Manager, Ambiente Italia, Rome
9	Waste Water Management	Dr. Ana Lončarić Božić	Associate Professor Faculty of Chemical Engineering and Technology, University of Zagreb, Croatia
10	Eco-innovation and Sustainable Employment	Dr. Stefan Ulrich Speck	Project Manager environmental economics and policies, European Environment Agency (EEA), Denmark
11	Energy Performance	Prof. Dr. Manfred Fischedick	Vice President of the Wuppertal Institute and Professor at the Schumpeter School of Business and Economics, Wuppertal, Germany
12	Integrated Environmental Management	Mr. Jan Dictus	Founder, GOJA Consulting for Environment and Sustainable Development, Austria

2.5 TECHNICAL ASSESSMENT PROCEDURE

2.5.1 Primary Technical Review

The Experts were asked to assess each application based on its own merit and then benchmark all applications against each other within each indicator area. Each indicator area has three component parts: present, past and future. **Each part carries equal consideration by the expert**.

2.5.2 Clarifications & Benchmarking

The Expert Panel members were given the opportunity to ask for clarifications from the applicant cities. In addition to this, a benchmarking exercise was also carried out by the EGCA Secretariat where key performance data provided by the cities was extracted from their application forms. Cities were given the opportunity to validate that all data collected in this way was correct. Clarifications and benchmarked data were provided to the experts during the technical assessment phase.

2.5.3 Ranking Criteria

Experts use a defined ranking system. Under this ranking system a position of 1st, 2nd, 3rd etc. is applied to each city per indicator. Since there are 14 applications to be evaluated then each city must be ranked from 1st as the best to 14th as the weakest. Note: these are not quantitative scores but rankings.

2.5.4 Peer Review

It is important to note that a peer review was carried out as part of the technical assessment round. All Expert Panel members assessed their respective primary indicator, and each indicator was also assessed by a second panel member (co-evaluator). This peer review exercise ensures a quality check of the assessment process. Where the two experts differ on a ranking, they must work together to reach a consensus. The final agreed ranking is a combination of both reviewers' assessments.

Table 2.3 - Indicators and corresponding Primary Expert & Peer Reviewers

	Indicator	Primary Expert	Peer Reviewer
1	Climate Change: Mitigation and Adaptation	Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick
2	Local Transport	Dr. Ian Skinner	Mr. Jan Dictus
3	Green Urban Areas incorporating Sustainable Land Use	Dr. Annemieke Smit	Mr. David Jamieson
4	Nature and Biodiversity	Mr. David Jamieson	Dr. Annemieke Smit
5	Ambient Air Quality	Prof. Christer Johansson	Prof. Diogo Alarcão
6	Quality of the Acoustic Environment	Prof. Diogo Alarcão	Prof. Christer Johansson
7	Waste Production and Management	Mr. Warren Phelan	Dr. Stefan Ulrich Speck
8	Water Management	Mr. Giulio Conte	Dr. Ana Lončarić Božić
9	Waste Water Management	Dr. Ana Lončarić Božić	Mr. Giulio Conte
10	Eco-innovation and Sustainable Employment	Dr. Stefan Ulrich Speck	Mr. Warren Phelan
11	Energy Performance	Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal
12	Integrated Environmental Management	Mr. Jan Dictus	Dr. Ian Skinner

2.5.5 Conflicted Application

In the event of a conflicted application, where an expert cannot complete an unbiased assessment of an application for personal or professional reasons, a suitable external expert is identified by the EGCA Secretariat to complete both the primary technical review and the peer review of the conflicted application. The review carried out by the external expert is discussed with the main evaluator for the indicator and the peer reviewer and the overall rank is agreed amongst the 3 experts involved. There was no conflict of interest raised in the 2019 EGCA cycle.

2.5.6 Background Check

As part of the EGCA process a high level background check is carried out by the European Commission on all shortlisted cities to identify if any of those shortlisted are in breach of environmental legislation or do not meet European reporting requirements. This background check is not presented to the Expert Panel during the technical assessment process. It is provided to the Jury in advance of the Jury Meeting and their deliberations.

3 TECHNICAL ASSESSMENT RESULTS

Based on the technical assessment results, the Expert Panel has proposed to shortlist the following 5 cities (in alphabetical order) for the title of European Green Capital 2019:

Ghent-Lahti-Lisbon-Oslo-Tallinn

The Jury will invite these five cities to the next stage of the evaluation process.

The Expert Panel's detailed ranking for the shortlisted cities in all indicator areas is detailed in Table 3.1.

Table 3.1 - Technical Ranking of Shortlisted Cities for European Green Capital Award 2019

Indicator / Applicant City	Climate Change: Mitigation & Adaptation	Local Transport	Green Urban Areas incorporating Sustainable Land Use	Nature & Biodiversity	Ambient Air Quality	Quality of the Acoustic Environment	Waste Production & Management	Water Management	Waste Water Management	Eco-innovation & Sustainable Employment	Energy Performance	Integrated Environmental Management
Ghent	2	2	5	5	2	7	2	4	6	3	2	1
Lahti	3	4	1	3	9	2	3	1	1	2	9	3
Lisbon	4	3	4	2	5	5	4	5	2	4	6	7
Oslo	1	1	2	1	1	1	1	6	7	1	1	2
Tallinn	9	7	3	4	7	3	5	2	3	5	5	5

4 TECHNICAL ASSESSMENT OF SHORTLISTED CITIES

4.1 SHORTLISTED CITY SUMMARIES

4.1.1 Ghent

Ghent is a port and university city with 256,235 inhabitants in the Flemish Region of Belgium and is the capital and largest city of the East Flanders province. Ghent was established on the confluence of the Rivers Scheldt and Leie and has become a prosperous city in the industrial heart of Europe.

Ghent aims to become a climate-neutral and climate-robust city and was presented with a Eurocities award in 2012 for the city's Climate Policy. Citizen participation, co-creation and alternative forms of cooperation such as citizen budgets allow the people of Ghent to be directly involved in policymaking. This is demonstrated in sustainable neighbourhood initiatives, communal gardening projects, collective renovations, group purchases, sustainable start-ups; and cooperative or public-private projects to extend solar parks and district heating systems.

Some key statistics for Ghent are outlined in Table 4.1 below.

Table 4.1 - Ghent Key Performance Indicators EGCA 2019

CO_2 emissions (tCO_2/capita)	5.64t CO_2/capita
Proportion of population living within 300 m of an hourly (or more frequent) public transport service	76.1%
Percentage of people living within 300 m of green urban areas >= 5,000m^2 in overall city area (%)	81.9%
Household waste recycling rate (%)	57.6%
Domestic water usage (Litres per capita per day)	93 l/capita/day
Wastewater load (population equivalent)	221,806 p.e.
Energy usage/capita (kWh/capita)	24,492 kWh/capita

Ghent demonstrates a consistently strong performance across many of the indicator areas including climate change, local transport, air quality, waste management, energy performance and integrated environmental management. An integrated initiative of particular note is Ghent's citizen budget and crowd funding initiative which provides an innovative financing mechanism to the city.

Ghent's shows great ambition with regard to climate change and has committed to become climate-neutral by 2050. The city has taken the first steps to achieve this by undertaking initial analyses and a feasibility study. It is implementing actions to promote the behaviour and structural changes required to achieve the goals set out in their Climate Plan.

Ghent is leading by example with regard to sustainable transport through its adoption of alternatively-fuelled cars and the introduction of measures to enable and encourage the use of these vehicles. The municipality of Ghent shows further leadership in this regard by encouraging its staff to

use alternative modes of transport and continues to implement positive measures in favour of public transport, walking and cycling.

4.1.2 Lahti

Lahti is the capital of the Päijänne Tavastia region in Finland and has 119,263 inhabitants. It is situated approximately 100 kilometres to the northeast of Helsinki, the capital city of Finland on the southern bay of Lake Vesijärvi.

After the Second World War, Lahti experienced rapid industrialization and growth of the population and economy. This also led to significant environmental challenges such as the eutrophication of Lake Vesijärvi and a higher dependency on cars in the city centre. The City of Lahti has addressed these challenges by setting up and funding the Lake Vesijärvi project, where university research groups, residents, local companies and the city work together to improve the condition of the lake. The City of Lahti also set up Lahti City consortium which has invested €100 million to the development of the city centre transport system e.g. underground parking spaces, new bicycle lanes and wider pedestrian areas. The city has also upgraded the public transportation service by 40% within recent years (2014-2016).

Some key statistics for Lahti are outlined in **Error! Reference source not found.** below.

Table 4.2 - Lahti Key Performance Indicators EGCA 2019

CO_2 emissions (tCO_2/capita)	6.96 tCO_2/capita
Proportion of population living within 300 m of an hourly (or more frequent) public transport service	82.8%
Percentage of people living within 300 m of green urban areas >= 5,000m^2 in overall city area (%)	99%
Household waste recycling rate (%)	38%
Domestic water usage (Litres per capita per day)	121 l/capita/day
Wastewater load (population equivalent)	111,916 p.e.
Energy usage/capita (kWh/capita)	41,072 kWh/capita

The city of Lahti shows strong performance across a majority of the indicator areas and demonstrates great proficiency in green urban areas, eco-innovation and sustainable employment and quality of the acoustic environment.

Lahti excels with regard to its management of water and treatment of wastewater. Lahti's Lake Vesijärvi restoration project which aims to restore the water ecosystem as a resource for the local community is an excellent example of the municipality's ability to collaborate with other actors, including scientists and other municipalities, to reach a common objective. The project is exemplary in its approach which uses a two-fold strategy; removing the impact factors on one side (including wastewater and urban run-off) and actively accelerating the natural recovery process (through aeration and bio-manipulation) on the other side.

Lahti demonstrates innovation in its approach to managing green urban areas through the use of the KEKO eco-efficiency tool, ecosystem services mapping and the continuous master planning process

which is evaluated against the Setukeke sustainability measures. These methods ensure that Lahti is resilient and responsive with regard to the impacts from climate change and social and economic pressures.

4.1.3 Lisbon

Lisbon is the capital and largest city of Portugal with a population of 547,733. Lisbon was the first capital in Europe to sign the New Covenant of Mayors for Climate and Energy after achieving reductions of 50% in CO_2 emissions (2002-14), 23% in energy consumption and 17% in water consumption in the municipality (2007-13).

Lisbon now has one of the world's largest electric vehicle charging point networks with 516 plugs citywide and one third of the municipal car fleet is electric. Lisbon's local transport system has also been enhanced by the addition of 60 km of cycle paths and 5 bicycle and pedestrian bridges have over the last 8 years.

Lisbon was awarded the prize for European Entrepreneurship Region (EER 2015), hosted the Web Summit 2016 and is a leader in the Sharing Cities Horizon 2020 Smart Cities & Communities project.

Some key statistics for Lisbon are outlined in Table 4.3 below.

Table 4.3 - Lisbon Key Performance Indicators EGCA 2019

CO_2 emissions (tCO_2/capita)	3.8 tCO_2/capita
Proportion of population living within 300 m of an hourly (or more frequent) public transport service	93.3%
Percentage of people living within 300 m of green urban areas >= 5,000m^2 in overall city area (%)	80%
Household waste recycling rate (%)	21.5%
Domestic water usage (Litres per capita per day)	148 l/capita/day
Wastewater load (population equivalent)	909,600 p.e.
Energy usage/capita (kWh/capita)	13,849 kWh/capita

Lisbon presented itself as a strong applicant, particularly through its approach to nature and biodiversity and wastewater treatment.

Lisbon's approach to water recycling is a good example of harmonising the approach to both wastewater management and water use. Since 2009, Lisbon has recycled over 1.5 million m^3 of its wastewater per annum and used this for the irrigation of green areas and street cleaning. Despite the deficit in Portuguese legislation for wastewater reuse, Lisbon wants to increase the reuse of wastewater by launching an irrigation plan in 2017 of green public spaces with large water consumption. This initiative represents a significant step in the commitment of Lisbon towards the Urban Water Agenda 2030 targets.

Conservation and rehabilitation are at the forefront of Lisbon's approach to nature and biodiversity. This is evidenced by the management of Lisbon Forest Park as a biological reserve and the continued operation of the Wildlife Rehabilitation Centre as a unique service for rehabilitating and rewilding

injured or displaced animals. The city continues to focus and reinforce the municipal ecological structure which will in turn provide myriad ecosystem services as it strengthens and grows.

Lisbon's performance with regard to local transport is also noteworthy. Particular strengths are highlighted through its creation of shared zones, car restricted areas and 30 km/h zones. The city's vision is beneficial for public transport, cycling and walking and demonstrates a proactive approach to local transport by encouraging the use of alternatively-fuelled vehicles, continued measures to improve the environmental performance of its fleet of vehicles and the future plans to establish a network of electric charging points.

4.1.4 Oslo

Oslo is the capital of Norway with a population of 658,390. It is surrounded by the nationally protected Marka Forest and the Oslo Fjord, which are interconnected via ten main waterways.

Oslo has become the 'Electric Vehicle Capital of the World' with 30% of all new cars sold in Oslo being electric vehicles as local and national authorities have boosted the private market for zero emission vehicles. Oslo also wishes to promote innovation and new jobs in the circular economy and is at the forefront of circular use of available resources, like using biowaste and city sewage for biogas production, fuelling city buses and waste trucks.

In June 2016, the municipality passed the Climate and Energy Strategy for Oslo which sets targets to cut emissions by 50% by 2020 and 95% by 2030. As part of the City budget, Oslo has also introduced binding climate budgets including 42 measures quantifying the needed emission reductions before 2020. To ensure that these targets will be met, the Business for Climate Network was established to foster dialogue between business communities, NGOs and citizens to address areas where business operations may prevent the city from meeting the emission targets.

Some key statistics for Oslo are outlined in Table 4.4 below.

Table 4.4 - Oslo Key Performance Indicators EGCA 2019

CO_2 emissions (tCO_2/capita)	2.3 tCO_2/capita
Proportion of population living within 300 m of an hourly (or more frequent) public transport service	90%
Percentage of people living within 300 m of green urban areas >= 5,000m^2 in overall city area (%)	98.4%
Household waste recycling rate (%)	38%
Domestic water usage (Litres per capita per day)	160 l/capita/day
Wastewater load (population equivalent)	792,000 p.e.
Energy usage/capita (kWh/capita)	23,872 kWh/capita

Oslo proves itself an excellent performer with consistent strength demonstrated across the majority of the indicators including climate change, local transport, nature and biodiversity, air quality, quality of the acoustic environment, waste management, eco-innovation and sustainable employment and energy performance.

Oslo's integrated approach to improve the quality of its city and its inhabitants is demonstrated in a number of its initiatives including its climate financing scheme and the reopening of Oslo's waterways. They have revolutionised their previous strategy, which was to enclose waterways, and are now actively reopening these in order to make them accessible for people, to facilitate habitat development and to manage stormwater more efficiently.

Oslo's integrated climate financing strategy, the 'Climate Budget', aims to cut greenhouse gases in half by 2020. The initiative consists of 42 separate measures across three different sectors; energy and the built environment, resources and transport. This will have significant positive implications for climate change, local transport, eco-innovation and sustainable employment and energy performance. It will have further positive impacts for the city's biodiversity and air quality through the reduction in harmful emissions. Reaching the ambitious targets implies that the city will achieve an 836,000 tonne reduction of greenhouse gas emissions by 2020.

4.1.5 Tallinn

Tallinn is the capital and largest city of Estonia with a population of 443,268. In 1997, the Old Town of Tallinn earned the recognition as a UNESCO World Heritage site due to its medieval architecture. The park network of Tallinn is uniquely established on the bastion belt around the Old Town with 90 m^2 of public green areas and 207 m^2 of areas with vegetation per capita. Protected areas at the local or state level make up 19.5% of Tallinn's area and the Natura 2000 network of protected areas covers 8.2% of the territory.

Tallinn has shown significant progress in waste management. Waste segregation began as a pilot programme in 1999 and by 2015, the volume of segregated waste surpassed the volume of mixed waste with 66% of the waste being recycled and only 2% landfilled.

In 2011, Tallinn was named the European Capital of Culture which it shared with the Finnish city of Turku. Also, in 2006, the then Mayor of Tallinn, Jüri Ratas, suggested the idea of the European Green Capital Award.

Some key statistics for Tallinn are outlined in Table 4.5 below.

Table 4.5 - Tallinn Key Performance Indicators EGCA 2019

CO_2 emissions (tCO_2/capita)	8.5 tCO_2/capita
Proportion of population living within 300 m of an hourly (or more frequent) public transport service	88%
Percentage of people living within 300 m of green urban areas >= 5,000m^2 in overall city area (%)	87.3%
Household waste recycling rate (%)	44%*
Domestic water usage (Litres per capita per day)	91.1 l/capita/day
Wastewater load (population equivalent)	379,715 p.e.
Energy usage/capita (kWh/capita)	21.3 kWh/capita

*recycling rate of municipal waste, recycling rate for household waste was not available

Tallinn put forward a strong performance, specifically with regard to water management and also demonstrated a commendable approach to green urban areas, quality of the acoustic environment and wastewater treatment.

Tallinn has developed a robust strategic and development plan for its green urban areas. Despite the pressures of industrial collapse and subsequent population increase, Tallinn has managed to preserve its central green areas which provide important social and biological benefits to the city. They demonstrate an innovative approach to gathering data about the city and its citizens by regularly undertaking satisfaction surveys with the residents. This is a novel mechanism to meet and understand the environmental and recreational needs of the city's inhabitants.

4.2 GHENT TECHNICAL ASSESSMENT

4.2.1 Climate Change: Mitigation & Adaptation

Main Evaluator	Co-evaluator	Ranking
Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick	2

Ghent has provided a complete estimate of the anthropogenic annual emissions (inventory) for a number of years showing a decreasing trend. They have provided a good description of the methodology used to gather information and how these complete estimates were informed. Ghent also takes cognisance of how the economy and weather have influenced the total emissions of the most relevant sectors.

The city has committed to become climate-neutral by 2050 and the short term targets seem within reach. The city has taken the leading role through the implementation of policies for its own building and public lighting since 1998, and has led some interesting initiatives such as the so called 'Thursday Veggie Day' that involves schools and municipal staff.

Some budget information has been provided for the policies and measures for the period 2014-2019, together with an estimation of their impact on the CO_2 emissions of the city. Ghent is aware that engagement with both industries and citizens is key for success and takes action for both. Examples of these initiatives include energy coaching, sustainable business sites, addressing energy poverty, and Ghent's 'people inspire Ghent's people' programme.

The ambition of the city to become climate neutral is commendable, and a brief analysis has been done on its feasibility. Actions are being taken to promote the required behavioural and structural changes, but the Climate Plan focuses solely on the low hanging fruit.

Adaptation is a key issue for Ghent, with the objective of becoming climate robust by 2030. Its plan focuses on political support, building knowledge, policy integration, pilot projects, awareness raising and monitoring/evaluation. The main measures implemented so far consist of the promotion of green roofs and rain water management, while more knowledge is being built on heat stress and flooding risks.

4.2.2 Local Transport

Main Evaluator	Co-evaluator	Ranking
Dr. Ian Skinner	Mr. Jan Dictus	2

Ghent is in the process of implementing a SUMP, which has some ambitious targets for modal shift and sets the framework for the development of a sustainable transport system. The city has involved the public at various stages in the development and implementation of the plan, which is very positive.

The city has implemented, and plans to implement, many good measures in favour of public transport, walking and cycling. It is leading by example, as it encourages its staff to use alternative modes. Measures in favour of pedestrianisation are good, however, it would have been good to have more detail on other measures the city is taking to support pedestrians.

The city's new circulation plan is important in reducing car use in the city centre, and in facilitating the introduction of measures in favour of other modes.

The city is leading by example in its adoption of alternatively-fuelled vehicles, as well as introducing measures to enable and encourage others to use such vehicles. It would have been good to know more about the city's plans to encourage car sharing.

Ghent is implementing a lot of good actions to reduce the environmental performance of freight, including acting as a pilot for bicycle courier services, encouraging green deliveries through public procurement and the setting up of a sustainable goods distribution platform that aims to bundle goods and use clean vehicles for the last mile of deliveries.

4.2.3 Green Urban Areas incorporating Sustainable Land Use

Main Evaluator	Co-evaluator	Ranking
Dr. Annemieke Smit	Mr. David Jamieson	5

Ghent presents some very interesting approaches of urban renewal areas, where old industrial areas are transformed into diverse, green and very liveable compact areas, ARBED is one such example.

The ‘temporary use’ option shows potential benefits for the green urban areas and biodiversity sectors. These temporary areas can be local hotspots for urban agriculture, specific pioneer species or adventure playgrounds. It would have been helpful to understand what vision Ghent has for these temporary areas.

In the application, Ghent notes that the number of requests for activities in parks is rising and the need for additional green space remains high. In section 3C the upcoming activities for neighbourhood parks and urban greenery are presented. It would have been beneficial for Ghent to describe how they match the needs of the different demographic groups within the city to the green

spaces that are created or renovated. Similarly, it would have been interesting to know, how Ghent ensures that the green areas create benefits to citizens quality of life.

In section 3A, the quality of blue and green areas is explicitly limited to ecological quality. This is a good approach, but unfortunately the city did not address how the green spaces add to the liveability of the city nor did they give information on the role that green infrastructure plays in combatting future challenges (e.g. climate change, extreme weather, increasing population). The city would have benefitted from discussing how much regulating ecosystem services are provided or the extent to which the green spaces meet the needs of the citizens.

The application is very much improved compared to the previous one, although the discussion on the present situation could have done more to demonstrate the strengths of the city. The form asked for a vision on a set of topics, the application provided an enormous amount of maps and facts, but no 'why'. This was much better in the other sections. Overall Ghent provided a good application with interesting examples.

4.2.4 Nature and Biodiversity

Main Evaluator	Co-evaluator	Ranking
Mr. David Jamieson	Dr. Annemieke Smit	5

Given that 40% of Ghent's natural assets are within the city, it is surprising that there are no designated sites of local biodiversity importance. The formal designation of the ‘small core nature areas’ referred to could provide an excellent means of bringing protected nature right into the heart of urban communities and neighbourhoods.

The city is to be congratulated for initiating extensive habitat mapping and using this to establish biological score-cards. Sustained use of this score-card methodology will be an excellent means of monitoring biological impact and improvement.

A ban on the use of chemical pesticides in the maintenance of green areas is welcomed. It would be interesting to learn how the city now controls invasive species and unwanted weeds by alternative means.

Enabling communities to actively participate in site management and maintenance is an encouraging step towards comprehensive stakeholder engagement in nature conservation. The use of citizen agreements is particularly innovative.

It is pleasing that a species plan is being drafted. No-doubt, this will steer actions for the conservation and enrichment of Ghent's priority fauna and flora.

4.2.5 Ambient Air Quality

Main Evaluator	Co-evaluator	Ranking
Prof. Christer Johansson	Prof. Diogo Alarcão	2

The city has good knowledge of the air quality situation based on several air pollution monitoring stations in the city. Both PM_{10} and NO_2 concentrations are below limit values and they show strong and steady decreasing trends. It is noted that air quality is negatively affected by two heavily trafficked highways (E40 and E17) and concentrations in areas close to the highways seem to be exceeding the limit values. The city government has limited possibilities to control traffic on these national motorways.

PM_{10} concentrations are mainly from local wood burning, as much as 63% in the city conurbation, and road traffic at 22%. For NO_2, diesel vehicles make the most significant contribution to the concentrations.

Action plans that have contributed to improve air quality include measures that have reduced industrial and traffic emissions. The city's first local air quality action plan from 2010 to 2015 included 50 actions focusing on mobility, alternative fuels and communication and knowledge building.

The city has many important ongoing and planned actions involving pedestrianisation (the city has one of the largest pedestrian zones in Europe), restricted parking in the city centre, sustainable mobility (increasing cycling, walking, public transport), electrification, increased use of alternative fuels, reduced emissions from goods transport and cleaner city fleet. The city fleet includes 35 electric vehicles, 55 electric bicycles, 14 CNG vehicles and one hybrid truck. Other actions like subsidisation of electric bicycles, grants for car sharing, tax relief for CNG pumps and park & ride schemes are also important steps to improve air quality.

The current action plan (2016-2020) aims to achieve limit values everywhere. An important future plan is the introduction of a Low Emission Zone from January 2020. The bus fleet will only run on alternative fuels, which means, lower PM emissions, but not necessarily lower NO_x emissions (depends on type of biodiesel). The future plan is also to increase number of charging points.

An interesting and innovative way of engaging people and raising awareness is the involvement of the public to monitor NO_2 on their balconies. The planned use of modelling and measuring black carbon is a very good way to improve the knowledge regarding the importance for air quality of wood burning and other combustion processes.

4.2.6 Quality of the Acoustic Environment

Main Evaluator	Co-evaluator	Ranking
Prof. Diogo Alarcão	Prof. Christer Johansson	7

Data from the 2014 strategic noise maps show that 77.3% and 32.8% of the population is exposed respectively to total noise levels L_{den} over 55 dB(A) and over 65 dB(A). In relation to the night

indicator, L_n, 82.4% of the population is exposed to total noise levels over 45 dB(A) and 38.3% is exposed to total noise levels over 55 dB(A). These are extremely high share values, stemming mainly from the existence of a large network of major transport routes crossing the territory, and thus the present situation portrays a very noisy acoustic environment in the city. It is additionally said that almost 15% of the population is exposed to L_{den} levels over 70 dB(A) of road traffic noise, which is certainly a very high figure. No trends are reported.

Quiet areas are not formally defined or classified, but the city reports that 71% of the population lives within 300 m of 'quiet' green spaces. In this respect, an exploratory study on the acoustic environment of six of these green spaces (done in September 2016) revealed that values for the statistical indicator L50 lay between 35.1 and 47.1 dB(A), and those for the statistical indicator L95 lay between 35.7 and 44.4 dB(A), which are very low levels (and without relevant time variations). These results will be the starting point for a fully-fledged inventory of the quiet areas of the city, which is a very positive approach.

Measures considered in the Noise Action Plan 2011-2014 were implemented in order to reduce noise; these measures comprise mainly road traffic and mobility management schemes such as 30 km/h zones, pedestrianisation of city centre areas, encouraging the use of bicycles (400 km of tracks and 10,000 parking places) and improving public transport infrastructures (new trams and hybrid traction buses, that constitute 1/3 of the fleet), but also the implementation of acoustic barriers, low noise asphalt and heavy vehicles restrictions along some major roads. When streets with bus and tram lines are renovated, low noise materials are used as standard, particularly concerning the tramway superstructure that uses resilient materials for decoupling the rails from the rest of the structure. It is, however, not clear if the road surfacing is done employing low noise asphalts as a standard procedure. Of the city's fleet, 5% (35 vehicles) is electric, and another 13 e-vehicles were added in late 2016; street sweepers are also electric.

The city has a comprehensive approach regarding noise from catering and events whereby activities subject to permitting such as cafés, bars, event structures, garages and car repair shops are required to comply with noise standards. The measure of raising noise awareness among event organisers by the use of noise measurements is worth mentioning, as is the noise monitoring campaign during the 'Gentse Feesten' carried out using good communication to citizens and to the event organisers.

The city's Noise Action Plan 2014-2019, integrated with actions by the Flemish and Federal governments, has several measures for the management and reduction of ambient noise. The reported measures comprise mobility issues like extending the pedestrian area in the city centre from 35ha to 50ha, the extension of 50 km of cycle tracks, traffic rerouting, speed limitation for motorways and extending the 30 km/h zones, the substitution of two main bus lines by a tram line, and resurfacing of city roads, for which a budget of €13 million per year is allocated. It is not clear whether or not, and in what cases, low noise asphalts are to be employed as standard for reducing road traffic noise, nor is it clear how the so-called quieter street design can in fact reduce noise levels in the proximity of the roads. The municipality envisages the implementation of a city distribution centre on the urban outskirts and the use of quieter (electric, hybrid) vehicles for the distribution of goods, which is noteworthy.

The foreseen formal definition and inventory of quiet areas, and the good practice guide on urban planning for supporting noise management designs are good measures and the city should assure that these actions are implemented. In addition, the envisaged adoption of C-weighted noise levels, and associated regulation, for reducing bass noise in large scale recreational events can be considered as an interesting good practice. However, short and long term objectives concerning the

quality of the acoustic environment could be better defined, and a quantification of the foreseen reduction in terms of noise exposed population should be determined.

4.2.7 Waste Production and Management

Main Evaluator	Co-evaluator	Ranking
Mr. Warren Phelan	Dr. Stefan Ulrich Speck	2

Ghent has the highest rate of recycling of the applicant cities which has been built on an impressive multi bin collection system covering the city. The city's collection is incentivised and encourages its citizens to recycle. This is also the case at recycling centres.

The city has good information on waste prevention and reuse measures and these are clearly integrated into the system for managing wastes. Measures include partnerships with restaurants to reduce food wastes and supporting organisations and repair cafes to drive the reuse agenda.

The city has an incinerator in place and investment has been made to increase the plant's efficiency. The plant generates electricity and provides heat to a local hospital. The city landfills < 1% of waste which is evident of its high performing system.

The future plans to progress the waste system further could have been better described with a greater focus on future actions and how the city is planning to embed the circular economy into its policies.

The city provided a strong application and is one of the top performing cities for the waste indicator demonstrating a sophisticated and progressive system for managing its wastes.

4.2.8 Water Management

Main Evaluator	Co-evaluator	Ranking
Mr. Giulio Conte	Dr. Ana Lončarić Božić	4

The city is performing relatively well with regard to water management as demonstrated through the low urban and domestic water consumption rate. The low water consumption is also attributed to the municipality's emphasis on using rain water as a non-potable source which is encouraged through the provision of a grant worth €500 for rainwater collection projects. This grant scheme ran from 2003 to 2013. Furthermore, the building regulations require developers to manage rainwater to minimize run-off by obliging them to undertake a water test in order to receive their building permit.

The city is showing continuous improvement with regard to water losses through the implementation of a leakage monitoring programme. The municipality aims to introduce a grant for green roofs worth €32 million to further support rainwater harvesting.

The relationship between Ghent water bodies and its citizens has been reinvigorated through an impressive effort of the administration to bring people towards Ghent waters (cycling tracks, greenery, etc.). Even though the city water bodies are far from being a 'natural ecosystem' (all water bodies in Ghent are artificial or heavily modified), the effort of the municipality to bring people towards Ghent waters is clear.

Strategies for the future include a continuous effort to reduce water distribution losses and a set of measures identified by the climate change adaptation plan. This plan includes interesting measures, for example the increase of permeable surfaces, the reopening of underground ditches, the creation of natural infiltration and storage areas however its objectives are not clearly identified (the extension of impermeable surface is to be removed, the storage capacity expected by NWRM, etc.).

4.2.9 Waste Water Management

Main Evaluator	Co-evaluator	Ranking
Dr. Ana Lončarić Božić	Mr. Giulio Conte	6

The city is served by 11 WWTPs which are all compliant with the Flemish environmental permit and UWWTD standard. In 2016, 89.74% of total generated wastewater load was treated representing a significant improvement in comparison to 74% treated in 2006.

The current wastewater management practice for the remaining portion of unconnected population is not described.

The city has compiled a full inventory of sewerage and canals systems which provides an effective tool for monitoring and planning wastewater projects.

The future plans include budgeted activities on a yearly basis for improvement, maintenance and management of the wastewater collection system in order to ensure effective operation of the system. It is foreseen that the connection rate would reach 99% upon completion of the established municipal programme, supra-municipal programme and area-wide plans.

The improvements are foreseen in connection to the sewerage system. The pilot project, Old Docks, includes innovative use of concentrated black wastewater together with the fermentable green and kitchen waste to produce biogas as a renewable energy source, while the heat of the grey wastewater will be recovered and delivered to the heating network.

4.2.10 Eco-innovation and Sustainable Employment

Main Evaluator	Co-evaluator	Ranking
Dr. Stefan Ulrich Speck	Mr. Warren Phelan	3

The application is of high quality illustrating that Ghent is at the forefront with regard to the Indicator Eco-innovation and Sustainable Employment among the applicant cities.

Ghent shows impressive development in eco-innovation and sustainable employment by working with businesses and educational institutions to establish a 'clean-tech cluster'.

The two flagships of eco-innovation; the existing Ghent Bio-economy valley and the future project of the Ghent Syngas cluster are high-quality examples of industrial symbiosis and of the circular economy.

It is noted that detailed information on budget allocation is not given and the application does not address the publication of environmental reporting by the municipality as a source of informing the public of progress in implementing activities. The discussion of implementing awareness raising campaigns is not validated with sufficient evidence.

Ghent highlights future targets in different areas such as its sustainable vehicle fleet and provides some information on future developments. However, the application does not stress that an overall policy or strategies in the field of eco-innovation and sustainable employment exist.

4.2.11 Energy Performance

Main Evaluator	Co-evaluator	Ranking
Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal	2

Ghent provides a detailed description for energy performance from 2007-2014 and for energy use by the city, public buildings and street lighting, 2003-2014. Between 2007 and 2014, energy consumption per capita fell by 14.2%. Factors influencing this trend are clearly described (e.g. weaker economy in 2009 and 2011, heavy winters of 2012 and 2013). Renewable energies are increasing (doubling from 2007-2014), however in 2014, locally produced renewable energies account for only 2.4% of total energy consumption. Additional information on the relative energy performance of municipal buildings (kWh/m^2) would be appreciated.

Since mid-2008, the City of Ghent buys 100% green energy. Between 2003 and 2015, total energy consumption fell by almost 20%. A city district heating system was installed at the end of the 1950's and is a 2nd generation district heating system. In January 2009, Ghent became the first city in Flanders to sign the Covenant of Mayors. In November 2015, the new integrated Covenant of Mayors was signed. As such, the city has been an important frontrunner role model for the country.

Ghent has implemented some very convincing measures. A target to save 3% energy per year (2014-2018) shall be reached by renovations (-8%), efficiency (ESCOS, -4%), technical interventions and maintenance (-1.5%) and raising awareness (-1.5%). In June 2007, the city council approved a policy on passive and low energy buildings. In general, all of its own new-build projects and in PPS-projects, in which the city is the major financer, will be passive buildings. For renovation projects, the optimal energy performance level as well as how renewable energy can be used are ascertained through a technical and financial feasibility study.

Furthermore, there are very convincing support schemes for citizens and companies (e.g. free sustainable building advice, energy grants, free energy scans with priority to vulnerable families, financial support for social housing, e-coaching for companies).'

The city states that it has the vision to become a climate neutral city by 2050. Short-term targets include a 20% reduction in overall energy consumption by 2019 (compared to 2007) and a 15% reduction in energy consumption in city buildings and street lighting by 2018 (compared to 2013).

Mid-term targets that would pave the way for the 2050 target of climate neutrality are not evident in the application. These should form part of a roadmap outlining how climate neutrality shall be reached by 2050 (including concrete measures and instruments).

4.2.12 Integrated Environmental Management

Main Evaluator	Co-evaluator	Ranking
Mr. Jan Dictus	Dr. Ian Skinner	1

It is regarded positively that Ghent explicitly puts people first in all its policies and actions, as is clearly demonstrated in the smart city concept. The citizen budget and crowdfunding initiative demonstrate that Ghent is constantly seeking innovative financing means, which is regarded as a good policy.

Internationally Ghent is well connected. As president of EUROCITIES, Ghent is well placed to act as an ambassador for urban policy.

At the moment, the city of Ghent is working on a new structure plan, which sets out the strategies up to 2030: Space for Ghent - structural vision 2030. Space for Ghent is being worked on with maximum involvement of the people of Ghent. These bottom-up ideas offer inspiration for the structural vision to 2030.

Ghent is very active in policy and strategy development and is making strides in the implementation of these ideas, be it in big projects like the Old Docks and the Winter Circus, or in smaller projects that directly affect the personal living area of the citizens; Living Street and check out your house.

4.3 LAHTI TECHNICAL ASSESSMENT

4.3.1 Climate Change: Mitigation & Adaptation

Main Evaluator	Co-evaluator	Ranking
Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick	3

Lahti demonstrated a robust and detailed inventory system with a time series starting back in 1990. It provided a detailed analysis of the trends to 2015 and has made clear that this information is used in the political decision making process as evidenced by their 4 year cycle strategic masterplans.

The targets established by Lahti are ambitious, but without further detail on the path to become carbon neutral and waste free, they seem difficult to achieve. However, the city has proved to be

able to achieve some important reductions in the past that have been justified, such as the district heating system operated by a council owned energy company switching to cleaner fuels.

The city is making focused efforts to influence and change consumer behaviour as a key factor to improve the use of energy and reduce its emissions both leading by example and through several initiatives, such as the Lahti Region Environmental Services assistance to residents. In addition, some interesting partnerships and initiatives with the private business sector and academia are in place to engage them in reducing its emissions.

There are clear plans for the future to decarbonize the energy use in the city with a special focus on some key sectors identified in the inventory (electricity and district heat co-generation) and with a foreseen significant investment for flagship projects with a huge potential to reduce emissions. However, more detailed information on other relevant sources, such as transport, would have been welcome. Lahti provided different specific scenarios for the future development of the energy system. Using this approach is absolutely commendable. However, the application lacks clarity regarding which of the different future pathways Lahti is trying to follow.

The city takes adaptation into consideration (has established a working group) and has taken advantage of international projects to build knowledge and identify the main risks. However, more detail on the conclusions and specific actions would have been welcome.

4.3.2 Local Transport

Main Evaluator	Co-evaluator	Ranking
Dr. Ian Skinner	Mr. Jan Dictus	4

Lahti has some very good plans in place to help it create a city that reduces the need for transport and which encourages walking and cycling. Its objectives for changing modal share are good, which is important given the city's comparatively high car modal share. It would have been good for the application to have contained more information about the way in which the city has and plans to engage citizens and stakeholders in the implementation of these plans.

The measures that the city is planning and has put in place to enable and encourage the use of public transport, cycling and walking are very extensive, including changing attitudes and the urban structure, as well as providing the infrastructure, to increase the amount of cycling and walking. The city's commitment to running public transport at least every 30 minutes is good, particularly given the rural nature of much of the municipality.

An objective of reducing the number of cars accessing the city centre by 40% a day is ambitious, and the reduced traffic will enable the development of infrastructure for other modes.

The city has taken some initial steps with respect to electro-mobility, and its intention to further develop electro-mobility, including the aim of changing its buses to electric buses, is positive.

While diverting trucks away from the city centre is good, it would have been interesting to know more about what action is being taken to improve the environmental performance of goods deliveries within the city.

4.3.3 Green Urban Areas incorporating Sustainable Land Use

Main Evaluator	Co-evaluator	Ranking
Dr. Annemieke Smit	Mr. David Jamieson	1

Lahti presents an impressive example of co-creation with its citizens. Monitoring residents' satisfaction with green spaces, combined with a GIS system that contains knowledge built with input from residents, ensures that future developments will actually be used, because they fit the residents needs and wishes including the needs of children.

The KEKO eco-efficiency tool and continuous master planning process combine to help the city respond relatively quickly to the impacts of climate change, and demographic and economic pressures. The Seutukeke sustainability measures that are used to evaluate the master plan are particularly innovative, and it will be interesting to see how effective they are in influencing decision making in Lahti.

Consideration of ecosystem services seems to be incorporated in the thinking of Lahti to such an extent that this aspect of city planning and management is barely explained. An ecosystems services approach is actually not very common amongst EGCA cities, so it would be valuable to make its purpose, operation and benefits more explicit. In that way, other cities can learn from it as well.

The application is strong on showing how Lahti has experimented with different tools (e.g. KEKO) and principles (e.g. ecosystem services mapping, participative approaches), and how it has learned from the past to continue improving the city for the future. It would therefore be helpful if relevant budget allocations were presented.

Lahti obviously read and used the guidance notes, resulting in a well-structured application which addresses all topics asked. The present, past and future plans sections are well connected and tell a singular 'story' of improvement over time. Besides the structure of the application, the city has been working with sound strategic urban master plan processes, which are not only used to look forward, but are also linked to impact assessment and the ongoing participation of residents. The application shows that Lahti has a well organised system of master plans, sustainability assessments and an ecosystem services approach that comes together in sound plans for future developments.

4.3.4 Nature and Biodiversity

Main Evaluator	Co-evaluator	Ranking
Mr. David Jamieson	Dr. Annemieke Smit	3

Lahti has a large number of locally designated nature sites as a result of its LUMO programme. This is an excellent way of widening site protection and bringing nature to neighbourhoods and people's everyday lives.

Even though biodiversity is incorporated into many other plans, Lahti would benefit from the creation and implementation of a Biodiversity Action Plan. The EU Strategy on Biodiversity would be a good starting place for this plan.

The fact that all protected sites have active management plans is to be applauded. This indicates continued commitment to positive habitat maintenance and regular opportunity to review and refresh policy and priorities.

With continued population growth, it is right that the city is focusing on improving and widening its ecological network. Functioning ecosystem services will be vital in ensuring resilience to climate change and local population pressures.

Continuous habitat and species mapping is a valuable way to monitor environmental impact and improvement. It is encouraging that children and other citizens will be increasingly engaged in this exercise, as education and awareness will give life to the knowledge accrued.

4.3.5 Ambient Air Quality

Main Evaluator	Co-evaluator	Ranking
Prof. Christer Johansson	Prof. Diogo Alarcão	9

The city has several monitoring stations for air quality that show no exceedances of the EU air quality limit values. NO_2 concentrations are decreasing, but for PM_{10} there is no consistent trend. It is likely that PM_{10} exceedances are mainly due to non-local sources and local road dust. The latter is largely influenced by the use of studded winter tires and meteorological conditions during winter time.

The city's Air Quality Action plan from 1997 is still the basis for today's actions, which focus on road traffic. In particular this plan focuses on street cleaning to reduce road dust emissions, but also considers actions that improve overall air quality like pedestrianisation, cycling, public transport, electrification of the city fleet, and extended use of district heating.

Future action plans include a bicycle borrowing system and investments in cycling paths, electric buses, electric cars, more charging stations and a bypass road reducing lorry traffic in the centre.

4.3.6 Quality of the Acoustic Environment

Main Evaluator	Co-evaluator	Ranking
Prof. Diogo Alarcão	Prof. Christer Johansson	2

Lahti finished the strategic noise maps for road, railway and industrial noise sources in 2012, concluding that the major source of noise is derived from road traffic. Railway traffic noise and industrial noise are of limited concern.

Values for the share of population exposed to total $L_{den} \geq 55$ dB(A) and $L_{den} \geq 65$ dB(A) are 33% and 9.8% respectively, while the share for exposure to total $L_n \geq 45$ dB(A) is 38.8% and to $L_n \geq 55$ dB(A) is 10.8%. These are rather low share values and thus the actual situation seems to portray a good overall quality of the acoustical environment. Unfortunately, no trends are provided.

Explicit information on the formal definition and management of quiet areas is made available and it is reported that 41.4% of the population is living within 300 m from them. The definition establishes that noise levels are to be under 50 dB(A) during the day period and under 45 dB(A) during the night period. The minimum area of each quiet area must be greater than 2 ha. On this basis, the city divided the quiet areas into 3 classes, depending on the intrinsic recreational and ecological value, which is an interesting approach.

No acoustic zoning has been formally done. Noise reduction measures such as acoustic barriers (9.9 km), traffic reduction in the city centre with pedestrian areas, speed reduction near sensitive areas, the development of a better public transport (new transport lines added and a new travel centre, integrating bus and railway stations costing €18 million) and the more intensive use of cycling (with new cycle tracks) are underlined as contributing to a better acoustic environment. It is reported that there will be 532 km of combined pedestrian and cycle tracks in place by the end of 2016.

The Municipality owns a few electric bicycles and 7 e-vehicles, and a test ride of these electric bicycles was put in place by the city in 2016 for local companies workers and residents. This is noteworthy as it demonstrates the city's efforts to engage and communicate with its citizens. Overall, stakeholder interaction and involvement by the city are considered good. The Noise Action Plan and report, noise maps and the location of quiet areas are accessible to the public online.

The city's Noise Action Plan for 2013-2018 identifies some objectives like the protection of residents exposed to noise levels above 65 dB(A), of highly populated areas, of schools and kindergartens and quiet areas. The related future actions comprise the construction of several acoustic barriers (budgets are given), traffic management, speed limitations, the construction of a bypass road (using tunnels or below level excavation), promotion of soft modes of transport and the extension of pedestrian areas. It would be beneficial for the city to define the predicted reduction in the share of people exposed on the basis of these future actions.

4.3.7 Waste Production and Management

Main Evaluator	Co-evaluator	Ranking
Mr. Warren Phelan	Dr. Stefan Ulrich Speck	3

The city has a good source separated collection system and a very impressive system for managing the different waste fractions with the management of waste flows well demonstrated.

In its application, the city demonstrates impressive waste infrastructure. The facilities include a sorting facility, a gasification plant, a waste-to-energy facility, and a biogas plant, which are all used to treat different fractions of waste collected in the city. The gasification and waste-to-energy facilities are highly efficient with impressive recovery and usage of electricity and heat.

The city recognised the need to improve the rate of recycling and, in response, a new target has been set. The city also proposes to address the market structure for the collection of waste which will support improvements to the collection and recycling systems. The city has set the target of becoming carbon neutral, tackling consumption patterns and reducing the level of waste generated. The city is part of the Sustainable Communities Network.

The city provided a good level of data to support the application which showed waste per capita has increased while residual waste per capita decreased. Prevention and reuse measures were well described and these form part of the city's approach to tackling waste. The city has implemented campaigns and measures on food waste and an online service to facilitate the reuse of items is supported by the city.

The city provided a strong application and is one of the top performing cities for the waste indicator demonstrating a sophisticated and progressive management system.

4.3.8 Water Management

Main Evaluator	Co-evaluator	Ranking
Mr. Giulio Conte	Dr. Ana Lončarić Božić	1

The data for Lahti shows that urban consumption is significant (even though not too high for a water-rich area) while domestic consumption is good and the efficiency of the distribution system is very good.

Quality of water bodies in Lahti suffers pollution mainly emanating from industry, agriculture and urban run-off. Some of the causes have been removed in the last few years but the effects on water bodies are not yet fully seen; most of the lakes are in moderate status while groundwater chemical status is still poor.

In the past, besides the improvement of the supply and distribution system, a great effort has been made to reduce the impacts of stormwater on the water quality of lakes, to protect groundwater and

to improve the quality of drinking water. The actions taken have achieved important results however more work will be required for the city to achieve satisfactory water quality status.

Lahti's water policy appears very well oriented and comprehensive in all different aspects: drinking water protection, improvement of unsatisfactory conditions of water bodies and innovative stormwater management. The application demonstrates that there is strong awareness in the role the city has to play in preserving and improving groundwater quality for the benefits of other communities.

Plans for the future are inspired by a very good and innovative approach concerning the management of stormwater including SUDS, constructed wetlands and blue/green infrastructure to manage urban rainwater. Objectives are ambitious and well set, however they are not always clearly quantified.

4.3.9 Waste Water Management

Main Evaluator	Co-evaluator	Ranking
Dr. Ana Lončarić Božić	Mr. Giulio Conte	1

The city of Lahti is served by 3 WWTPs with the total design capacity well above the total received load in 2015. The recorded decrease in water consumption and wastewater generation over a past decade is acknowledged as a positive improvement to wastewater management.

The collection network of Lahti is mainly separated. Since 2012, Lahti has in place a Storm Water Management Plan promoting the construction of retention ponds and wetlands. Lahti also has a Water Management plan in place since 2010. A new update to this will address the problem of microplastics in wastewater. Planned investments are covered by the sewage charge.

An investment has been recently made into the disinfection facility. Lahti aims to improve quality of treated water beyond the permit requirements and to reach the national bathing water regulation and it is considered to be the example of a good practice.

Lahti has responded well to the one of the key identified environmental challenges, the eutrophication of the Lake Vesijarvi. The status of the Lake is improved and the city aims to find a new solution for the storm waters from the city centre in cooperation with the University of the Helsinki and the Lake Vesijarvi Foundation.

4.3.10 Eco-innovation and Sustainable Employment

Main Evaluator	Co-evaluator	Ranking
Dr. Stefan Ulrich Speck	Mr. Warren Phelan	2

Lahti prepared a high quality application demonstrating that policies addressing eco-innovation are in place at many levels involving different stakeholders (city level, business, research/university/schools).

The application stresses the significance of EU policies in developing national and local policies. It is worthwhile to highlight that Lahti established a range of short, medium and long-term policies in this field, such as the roadmap for sustainable, circular economy city of Lahti 2050. Emphasis is also given to the policy of having a strategic master plan with four year cycles so that adjustments can be made.

Clean-tech policies are already in place since early 2000 and stated as one of the three key strategic priority areas, i.e. a forerunner among the applicant cities. Linking the municipality, industries, and higher education is an important asset in this field as well as the development of industrial symbiosis.

Some topics of the application could have been addressed more comprehensively. More detailed information on budget allocation by the municipality to the different policies and strategies and the involvement of the civil society would have been useful.

Overall, the application is clear and comprehensive. However, some of the figures are difficult to read/understand as they are not discussed in the text.

4.3.11 Energy Performance

Main Evaluator	Co-evaluator	Ranking
Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal	9

Lahti is a growing city (+11.5% from 1990 to 2015). While energy consumption per capita and in total increased during that time (+4.4% per capita and +16.5%), CO_2e emissions could be significantly reduced by 37.2% per capita (10.99 tonnes in 1990; 6.9 tonnes in 2015) and by 30% in total (1023.9 kilotonnes of CO_2e in 1990 to 717.1 kilotonnes of CO_2e in 2015).

District heating and CHP plants are an important part of the energy strategy of Lahti. In 2015, about 66% of buildings and 90% of inhabitants in Lahti were connected to district heating. Of the municipal buildings 99% use district heating. In 2015, 42.7% of the district heating was generated by renewable sources. However, there is no data on the development of renewable energies for district heating/CHP plants and on renewable energy production in general. Furthermore, additional information on factors influencing energy consumption would be helpful, e.g. meteorological conditions.

The National Energy Efficiency Agreement (2008-2011; next agreement for 2017-2021) forms the basis for the strategic development of energy performance in Lahti. The agreement includes Lahti premises (municipal buildings), street lighting, Lahti Housing Ltd. (residential, rental buildings), Lahti Aqua Ltd. (water and wastewater management). The aim is to save energy by 9% during the period 2008-2016. Additional information regarding the progress of energy savings and if they are on track to reach the target by 2016 would have been helpful. In 2012, Lahti joined the Covenant of Mayors. The Sustainable Energy Action Plan (SEAP) was established in 2013.

In the last couple of years, Lahti implemented several measures to improve energy performance, both for residents and by considerable infrastructural investments. The Consumers' energy advising in Päijät-Häme project (2010-2016) offers energy counselling targeted at residents in Lahti region. The 'Eco-efficient Energy Solutions' project (2015-2016) included the development of an e-service that uses different open data sources and maps to compare several different sustainable energy solutions suitable for the particular building. There is also a contact channel to local businesses. Infrastructural measures include investments into Swedish hydro power: the Labio biogas production plant as Finland's largest biowaste treatment plant and the Kymijärvi 2 waste gasification plant including combined heat and power (CHP).

There are several plans for the future, including further investments in renewable energy (wind power) and citizens' engagement (climate partnerships with companies and organisations). For the biofuel power plant Kymijärvi 3 (that shall be operational by 2020 and that shall increase renewable sources to 80%) the discussion of sustainability criteria would be desirable. By joining the Finnish Sustainable Communities (FISU) network in 2016, Lahti committed to working towards becoming carbon neutral and waste-free, and curbing overconsumption by 2050. Communities of the network will share experience and develop a roadmap for how to achieve the long-term targets. For 2017-2020, energy consumption shall decrease by 9% and greenhouse gas emissions shall decrease by 35% from 1990 to 2020. Lahti is in the process of developing a Master Plan development (2017-2021). Residents, decision-makers, organisations and experts shall be included in this plan. It will be interesting to learn about the results of this participatory approach.

4.3.12 Integrated Environmental Management

Main Evaluator	Co-evaluator	Ranking
Mr. Jan Dictus	Dr. Ian Skinner	3

Lahti has a very well structured and transparent vision with five transformation programs.

The sectoral plans are clearly related to the overall vision which is therefore the binding factor of the integrative policy and stimulates cooperation with different stakeholders.

The merging of the two municipalities probably helped the process of participation, because citizens were strongly involved in that process. It is to be recommended that this way of involvement will continue in the future, now that a new organisation is in place.

The development of the Lahti 2025 roadmap is an example of a good integrative policy. In drafting the roadmap, the city involved residents, organisations of the city of Lahti, companies and other partners. The action plan assures accountability by setting out that responsible parties will be

identified for all actions. It is planned that the roadmap will be continually updated and its implementation monitored.

The exemplary performance of the city is demonstrated in the Green Public Procurement programme however more could be done to lead by example.

4.4 LISBON TECHNICAL ASSESSMENT

4.4.1 Climate Change: Mitigation & Adaptation

Main Evaluator	Co-evaluator	Ranking
Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick	4

Lisbon has provided emissions data since 2002 with a clear methodological approach and some basic breakdowns that should be further separated by sector to improve the knowledge about the key sources.

The significant 48% reduction since the base year is due to, besides population decline and the economic downturn, the local mobility policies of the city and the national rise of renewables. However, apart from the given reasons it remains unclear how this huge decrease in energy consumption (e.g. gasoline 69% from 2002 to 2014) and emissions could be achieved.

The framework to fight against climate change includes the Energy-Environment Strategy, the Sustainable Energy Action Plan (and new Covenant of Mayors) and the Master Plan of the city. The local administration has binding targets in the short and long term to show commitment and lead by example. Partnership schemes are in place to engage business and consumers, but more detail on the mechanisms used, commitments and results would have been welcome.

The city has put in place a good series of measures in different key sectors, including some that take into account social vulnerability and the importance of the legal framework, for example local regulations and public procurement.

The future plans for the city are very ambitious, with a 70% reduction target by 2030 and 100% by 2050. The achievements so far and the planned actions focused on the improvement of the energy performance of buildings, transport and behaviour change are promising, but would have benefited from some financial commitments.

The municipality is concluding the Strategy for Adaptation, which defines the guidelines and adaptation options organised in urban planning, urban management and governance. Lisbon has been working since 2008 on its Green Infrastructure Program with a view to promote diversity, functionality and integration of green areas through its Master Plan. This includes several base studies on the effects of climate change and risk evaluation, and has adopted global benchmarks, including urban allotments, green structure areas and water cycle improvements. As a result, this shall allow for better water management and infiltration into the subsoil, air ventilation corridors, and urban heat island mitigation.

4.4.2 Local Transport

Main Evaluator	Co-evaluator	Ranking
Dr. Ian Skinner	Mr. Jan Dictus	3

Lisbon's vision of a city of multi-functionality, walking neighbourhoods and a square in each neighbourhood is excellent, as is its aim to guarantee access for everyone to two alternatives to the car within 500 metres. The city has many appropriate plans in place however it would have been good to know more about any relevant quantitative targets that these contain.

The city's vision is clearly beneficial for public transport, cycling and walking and many measures have been implemented, and are planned, to facilitate and encourage the use of these modes. The ambition to increase the length of cycling paths is impressive, as is the fact that there is a dedicated budget for the city's Pedestrian Access Plan.

The creation of car restricted areas and 30 km/h and shared zones are all positive. The regulation and taxing of parking were mentioned, although it was not clear what these mean in practice, so more information on this would have been useful.

A bicycle sharing scheme is being implemented, which is positive, however it would have been good to know more about what the city is doing to encourage car sharing. The application made a reference to lower the impact of the logistics system - more information on this would have been useful.

The city is clearly being proactive, as well as leading by example, in encouraging and enabling the use of alternatively-fuelled vehicles. Its plans to develop the network of electric charging points and to continue to improve the environmental performance of its own vehicle fleet are very positive.

4.4.3 Green Urban Areas incorporating Sustainable Land Use

Main Evaluator	Co-evaluator	Ranking
Dr. Annemieke Smit	Mr. David Jamieson	4

The vision of expanding green areas by 20% via the Green Infrastructure Program is admirable, particularly given that much of this will be achieved by establishing 380 neighbourhood and urban squares. This approach; 'square in each neighbourhood' should significantly raise the percentage of people living within proximity to urban green space and make Lisbon an even more liveable city than it already is.

It is interesting to see that Lisbon managed to implement rehabilitation of derelict zones in the harbour area for both public (leisure) and economic sectors. Similarly, it is pleasing that Lisbon has focused its recent new developments on post-industrial sites rather than established green areas. In order for this approach to be sustained it is important that as the city grows and expands it maintains stringent protection measures in its Master Plan and associated civic strategies.

Lisbon shows some impressive examples of participative projects on design and creating green spaces. The participative budget seems an example worth showing to other cities as a model, however, further information about the system would be beneficial. The city acknowledges that that green spaces not only have to be designed and created, but also maintained. This is a positive sentiment, however, it could be strengthened by engaging the citizens to help with this maintenance.

Lisbon has implemented a nice plan on green infrastructure with the 9 green corridors. This could be used as an example of how to get green into the city.

4.4.4 Nature and Biodiversity

Main Evaluator	Co-evaluator	Ranking
Mr. David Jamieson	Dr. Annemieke Smit	2

Lisbon has a good number of locally designated sites amongst its protected status hierarchy. However, the city habitat plans suggest that there is scope for more neighbourhood nature areas.

Management of the Lisbon Forest Park as a biological reserve for nature is a wonderful asset for the city's residents and many visitors.

The Wildlife Rehabilitation Centre provides something of a unique service in rehabilitating and rewilding injured or displaced animals.

The city is to be congratulated for the ongoing focus on reinforcing the municipal ecological structure, as it will provide a myriad of ecosystem services as it grows and strengthens.

The scale of civic investment in green infrastructure is welcomed, and will help propel Lisbon towards its goal of increasing biodiversity by 20% by 2020.

4.4.5 Ambient Air Quality

Main Evaluator	Co-evaluator	Ranking
Prof. Christer Johansson	Prof. Diogo Alarcão	5

The city has very good knowledge about the air quality situation and identifies the most significant sources. There are several monitoring stations for air quality and concentrations of PM_{10} and NO_2 are decreasing. It is noted however that NO_2 is exceeding the limit value.

The main local source of both NO_2 and PM_{10} is road traffic. For PM_{10} the non-local contribution is around 50%, whereas NO_2 is mainly due to local sources.

The city has taken several actions as part of an agreement with the Ministry of environment. A low emission zone has been implemented, a 30 km/h zone has been established and improvements

made to the municipal fleet, altogether resulting in reduced vehicle exhaust emissions. Reduced car use is promoted through development of the cycling network and cycling infrastructure, parking measures and awareness raising campaigns.

Future objectives are to achieve air quality targets as well as the stricter WHO guidelines. This is being realised through the integration of plans at regional and national levels. If implemented, many of the measures outlined in their strategic plan for future mobility will help achieve the goals in the future.

4.4.6 Quality of the Acoustic Environment

Main Evaluator	Co-evaluator	Ranking
Prof. Diogo Alarcão	Prof. Christer Johansson	5

Results from Lisbon's strategic noise map (2008) show that noise exposure is mainly due to road traffic sources, although there is also some exposure due to air traffic and locally, due to railway traffic noise, with industrial noise pollution being negligible. Data from the noise maps show that the share of population exposed to total L_{den} values ≥ 55 dB(A) and ≥ 65 dB(A) are respectively equal to 55% and to 18%, while 60% and 22% of the population is exposed respectively to total L_n values ≥ 45 dB(A) and ≥ 55 dB(A). These are considerably high exposure percentage values. Notwithstanding this, it is reported that exposure percentage values were substantially reduced since the year 2000, when almost 50% of the municipal area was exposed to LA_{eq} daytime levels in excess of 65 dB(A). This may indicate a noteworthy decrease in the overall environmental noise levels, although indicators are not directly comparable and different assessment procedures might have been used, so these figures should be used with care.

Twelve quiet areas were formally defined, delimitated and mapped and it is reported that approximately 13% of the population lives within 300 m of them, these quiet areas are also located within 30 km/h zones.

Acoustic zoning was established, but the entire municipal territory was singly classified as a 'mixed zone', this is not a very good starting point and a more ambitious positioning could have been made concerning the inclusion of more sensitive land uses, such as homes, schools, hospitals and recreational areas, as 'sensitive zones'.

Relevant noise reduction measures that were adopted and implemented include 30 km/h speed zones, speed control with signs, noise barriers along main roads, resurfacing of streets with low noise asphalts, restricted access to residents in historic districts, extending bicycle tracks, differentiated parking charges in the city centre and eliminating rail joints.

Various communication actions with citizens have and continue to be carried out, including yearly participatory budgets and several winning projects over the last 6 years which were related to noise issues, however, no examples were given. Overall, stakeholder interaction and involvement by the city is considered good.

Lisbon's Noise Action Plan highlights priority measures that include, above all, the protection of areas with population exposed to total noise levels L_n ≥ 60 dB(A), and actions for protecting and extending

quiet areas. An overall budget of €9 million is mentioned for three five year long phases, and it is argued that measures amounting to €8 million were implemented in the last five years.

Detailed actions from the city are defined in order to handle mainly road traffic noise hot spots within 29 urban zones, whereby noise reduction measures like traffic restrictions, speed limitations, low noise asphalts usage, and the promotion of soft modes of transport, such as extending the bicycle tracks by 90 km, are considered. In addition, the city wants to increase the green areas by 20% by 2020, these green areas should be classified as quiet areas, where possible, and it intends to extend the 30 km/h zones for more residential areas and for school areas. A foreseen reduction in the share of population exposed to the different noise indicator classes is provided; a reduction of around 46% in the population exposed to $L_n \geq 60$ dB(A) is noteworthy.

4.4.7 Waste Production and Management

Main Evaluator	Co-evaluator	Ranking
Mr. Warren Phelan	Dr. Stefan Ulrich Speck	4

The city provided a good quality application with a consistent approach to all parts of the question. The data provided can be improved as it lacked clarity and was inconsistent in parts of the response.

The city demonstrated a strong commitment to waste prevention and is implementing a series of interconnected measures to collect and reduce food waste. The city has approved a food waste reduction plan and is working with stakeholders in the city to implement specific actions.

The city's waste management system is established and progressing well. Source separate systems for the collection of different waste fractions have developed and further expansion is planned. The existing recycling rate at 21% needs to improve and an extended selective collection system will help this to grow.

The waste collection system and the treatment infrastructure used to process and treat waste are well described. A good mix of facilities is in place which continues to support the developing collection system.

The city has a clear plan to improve the existing waste management system and has set out quantitative targets to advance the existing waste management system. The city also has strong measures supporting the transition to a circular economy such as green public procurement, waste as a resource, waste prevention and behavioural research studies.

4.4.8 Water Management

Main Evaluator	Co-evaluator	Ranking
Mr. Giulio Conte	Dr. Ana Lončarić Božić	5

The city is performing reasonably well with regard to domestic consumption but is not exceling. The information presented on urban consumption is not clear. Water losses show an excellent performance, which is attributed to the great effort carried out in recent years.

The water management strategy appears to be clear and complete and well established. This allows the city to achieve important targets concerning water loss reduction and energy efficiency of the distribution system.

The problem of stormwater management and climate change adaptation is clearly defined and a specific strategy is envisaged in the Municipality plans. Similarly the water-energy nexus is considered and significant results have already been achieved.

Plans for the future are very ambitious, and most of the key issues, such as rainwater management, adaptation and water reuse, are considered.

More attention could be given to domestic and non-domestic water consumption. Improvements could be made through specific policies of tariffing and incentives to the use of unconventional water resources, such as greywater, if rainwater is not considered a feasible option due to the Mediterranean climate.

4.4.9 Waste Water Management

Main Evaluator	Co-evaluator	Ranking
Dr. Ana Lončarić Božić	Mr. Giulio Conte	2

The city is served by 3 wastewater treatment plants, 2 exclusively operated for the city and 1 is operated in conjunction with neighbouring municipalities. The city reports compliance with the UWWTD and an impressive 100% of total generated wastewater is connected to the collection system and WWTPs. The collection system is mainly combined.

A small part of the treated water is reused within WWTP for non-potable purposes but the plan for 2017 includes irrigation of the public green spaces.

A considerable variety of measures have been implemented in recent years which has improved the collection and connection system, design capacity and level of treatment as well as the management of the collecting system of Lisbon.

Future plans include improvements of the collection system and upgrade of the WWTP. Driven by the past events, Lisbon has developed a Drainage Master plan for 2016-2020.

4.4.10 Eco-innovation and Sustainable Employment

Main Evaluator	Co-evaluator	Ranking
Dr. Stefan Ulrich Speck	Mr. Warren Phelan	4

Lisbon made a strong application in the eco-innovation and sustainable employment indicator. It provided a range of useful information on what the city is doing in the different policy areas related to the green and circular economy as well as details on the involvement of different stakeholders.

The application discusses interesting structural projects for the future including information on costs. It would have been beneficial to receive information about long-term policy plans and strategies and quantifiable future targets established by the municipality.

The city covers projects and initiatives in a very broad sense covering schools, agriculture, water, waste, transport and energy efficiency for example. Policies are in place to promote sustainable employment.

It would have been beneficial for the assessment of the application to have received more detailed information on the different aspects reported by the municipality. For example, regarding the content of water, the energy and materials matrix reports could have discussed the topic of employment as a strategic focus of Lisbon's entrepreneurial strategy.

The city achieved high rankings in different global, EU wide and regional investigations. Due to the nature of the application criteria it is very difficult to assess and include these ranking results in the European Green Capital Award scheme because it is not possible to consider them in detail.

4.4.11 Energy Performance

Main Evaluator	Co-evaluator	Ranking
Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal	6

Lisbon presents several facts and figures for the current situation and past development of energy performance which demonstrate decreasing electrical consumption. Examples include street and traffic lighting, buildings, and small urban structures, increasing PV and wind power installed in Lisbon. Power supplied by the district heating and cooling network has slightly increased from 2004 to 2015, however it has remained stable since 2010. Sometimes, the numbers and developments presented could have been explained in a bit more detail, such as the underlying reasons for the developments.

Lisbon focuses on renewable energies, for example in the Lisbon Solar City structural project and regarding energy efficiency, intelligent networks and sustainable mobility. Lisbon has replaced 100% of traffic lights with LED and is in the process of replacing street lights through energy performance contracting. Lisbon Municipality and its direct agencies and organisations are involved in a wide variety of different EU projects that bring together different stakeholders, such as public building

managers, citizens, energy service companies and policy makers. Sometimes the measures presented are a bit unclear regarding duration, content and their relevance for Lisbon's overall strategy.

Lisbon is participating in the Committee of the Regions and in networks such as EUROCITIES, Energy Cities and ICLEI. An interesting approach is Lisbon's smart city approach, as stated in their application where all smart city intelligence will be gathered for municipal management, to be shared and made available for citizens, entrepreneurs, universities and research centres. However, the concrete relevance of the project remains unclear.

As Lisbon was the first capital city to join the Covenant of Mayors for Climate & Energy. The city has short and mid-term targets for 2020 and for 2030. There are several sub targets for 2020. By 2050, Lisbon aims to reduce greenhouse gas emissions by 80-95%. Some of the targets seem mainly to be motivated by national directives and not by specific city related target setting.

A concrete strategy or roadmap about how the mid and long-term targets shall be reached is missing. Although the importance of involving citizens and stakeholders is mentioned, it remains unclear how they shall be included in future plans and strategy development. A detailed strategy on how to make use of the renewable energy potential from sunlight would be desirable.

4.4.12 Integrated Environmental Management

Main Evaluator	Co-evaluator	Ranking
Mr. Jan Dictus	Dr. Ian Skinner	7

Lisbon's Project Funding Team seems like a responsible and measured way of securing funding and realisation of policy and projects. Together with the use of participatory budgeting and the BIP/ZIP program, it shows that Lisbon has a responsible and creative way of using financing as a practical tool.

The Mayor´s statement decision of moving his cabinet temporarily into a socially depressed area before the expected renovation can be seen as a strong commitment to the city's own policy.

Although it has been made clear that Lisbon is internationally well connected, the role at regional and national level has not been explained in the application.

Unfortunately, many questions from the application form have been answered insufficiently or not at all. As a result, a complete assessment of the city's performance could not be made.

4.5 OSLO TECHNICAL ASSESSMENT

4.5.1 Climate Change: Mitigation & Adaptation

Main Evaluator	Co-evaluator	Ranking
Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick	1

Oslo has proved to have recorded emissions, including a breakdown of sources by sector, for a long time period. The time series and emissions presented by the city date back to 1990. This proves that they have a solid monitoring system that is key for policy decision making and that leads to a clear focus on the transport sector. Emissions trends seem to be fully justified as a result of the implemented measures and are analysed with certain detail.

Oslo's targets are among the most ambitious, up to 50% reduction by 2020 compared to 1990 and neutral by 2050, this seems achievable taking into consideration the present situation and the integrated strategies designed. Particular national conditions, such as the availability of CO_2-free electricity, will very much help to achieve these targets. The specific measures are based on simple concepts, such as zero emissions mobility, blue-green infrastructure and closed loops, being used to engage citizens and businesses. The measures demonstrate a high level of commitment from the city administration to lead by example and make use of green governance. This context could serve as an inspiration to other cities.

The city has implemented a relevant number of measures in different sectors and has provided descriptions, investments and effects. The measures focus on developing the sectors which contribute the most to the energy profile and promote the use of local renewable electricity in different sectors. Particular attention is given to these sectors and how they can take advantage of the local potential for renewable electricity. Especially commendable are some innovative actions such as divesting the pension portfolio from coal companies, financing of public transport from the toll ring, the climate budgets in the municipal budget process and the pilot for zero emission construction vehicles and machinery through public procurement.

The measures presented for the future appear to align with the planned strategy and, in most cases the budget allocation seems secure, giving continuity to the city transformation.

Oslo's approach to adaptation, their 2015 Adaptation Strategy, has integrated risk, vulnerability and impact assessment in to the Municipal Master Plan and, in cooperation with the Emergency Agency, is based on a cross-sectorial network and on a robust knowledge base. The city considers the Blue-Green factor a key tool, with stormwater being the main challenge (some interesting projects have been implemented on green roofs and impervious surfaces). In addition, the city is trying to assess the value of ecosystem services and its effects on the resilience of the city. It is reopening its waterways to make them accessible for people, to facilitate increased habitat for biodiversity and to handle storm water more efficiently. The future action plan on adaptation also seems very promising.

4.5.2 Local Transport

Main Evaluator	Co-evaluator	Ranking
Dr. Ian Skinner	Mr. Jan Dictus	1

Oslo has the necessary plans in place to deliver a sustainable transport system, which include ambitious objectives for reducing car use, as well as a clear revenue source from the toll ring that is used to finance improvements in public transport.

The city has implemented extensive measures in support of public transport and cycling, including extending and improving the quality of infrastructure for public transport, introducing real time information and digital ticketing, as well as an 'enhanced travel guarantee', which covers 10 service-related issues. It would have been interesting to have more information on the city's future plans in this area, including data with respect to cycling and walking.

In addition to the toll ring, a restrictive parking policy has been implemented, including removing spaces and increasing fees, in order to discourage car use in the city. Congestion based pricing on the toll ring, along with more of the same type of measures will further restrict car use, as will the initiation of a car-free city centre.

Oslo has good car and bicycle sharing schemes and is piloting fossil free construction, which is good. The city has stated that it will analyse its logistics system; it would have been useful to have more information on what this means in practice from the perspective of improving the environmental performance of logistics.

The city is implementing a wide range of measures to promote electro-mobility, including free parking, access to bus lanes, grants for EV charging points and a fossil free objective for its bus company. The city is also leading by example, as it is replacing its car fleet with electric vehicles.

4.5.3 Green Urban Areas incorporating Sustainable Land Use

Main Evaluator	Co-evaluator	Ranking
Dr. Annemieke Smit	Mr. David Jamieson	2

In general, Oslo connects sustainable land use to a vision of a compact city and realises that such a city can only be formed by integration of several aspects, such as mobility, stormwater management and recreation. Oslo expects to grow rather fast during the coming years. Oslo’s clear strategy on urban development with emphasis on high residential density, high frequency transit services and part improvement to encourage walking and cycling is a good illustration of their integrated approach to green urban areas incorporating sustainable land use.

Connected to the vision of a compact city, there is a need to get the infrastructure right. Two very specific projects stand out: 1) sub surface project, because this part is the basis of the city; 2) the assessment of potential for green roofs, as a very proactive action to increase the green roof surface.

Oslo is an excellent example of a city that anticipates future changes in both climate and demography. Many interesting, innovative and participative projects are presented. The application does not indicate if the effectiveness of the measures is being monitored. This makes it hard to know what projects are worth repeating, improving or showing to other cities with comparable situations.

By monitoring of the actual use, quality and maintenance of green areas, the green areas are partly tailor made to the demographic situation in different parts of the city. It would be beneficial to know the extent to which the system enables monitoring of actual use. Similarly, it would have been helpful if the city provided further information on the future plans for the green spaces as the demographics change.

Oslo presents a very clear and complete application. All information is well structured and is related to the application form. Many new developments, plans and demonstration projects are already underway or will start soon. However, it remains unclear how long term progress and maintenance is ensured, both in budgets and in commitments of municipality and residents, and how the impact of the many interventions will be evaluated. Giving information about evaluation and monitoring is fundamental to understanding the overall approach to this topic.

4.5.4 Nature and Biodiversity

Main Evaluator	Co-evaluator	Ranking
Mr. David Jamieson	Dr. Annemieke Smit	1

The city has a significant number of nationally and locally protected sites. Continued conservation of these sites will ensure that nature continues to play an important role in urban life.

Oslo's decision to manage its forest estate for nature and recreation rather than income is realising significant gains for both wildlife and people.

Extensive and continuous biological surveying means that Oslo is very aware of its natural heritage and has the information on which to develop reasoned and sound nature policy and projects.

A high level of support for citizen engagement through NGOs and activities is reaping positive results on the ground and strengthening knowledge of, and love for, local nature.

The continued ecological restoration of Oslo's extensive waterway network is to be applauded given the significance of aquatic and riparian habitat across the city and its hinterland.

4.5.5 Ambient Air Quality

Main Evaluator	Co-evaluator	Ranking
Prof. Christer Johansson	Prof. Diogo Alarcão	1

The city has a long tradition of measuring air pollutant concentrations and has a very good knowledge about the air quality situation in the past and today. In the past, both PM_{10} and NO_2 concentrations exceeded the limit values. Today the main focus is on NO_2 as the limit value for PM_{10} has been achieved.

The main source of NO_2 is diesel traffic. The primary sources of PM_{10} are emissions from road dust and wood burning, as well as non-local sources. The location of Oslo in a valley and the meteorological conditions during the winter reduces ventilation and makes air pollutants accumulate during winter.

In the past, actions that led to a reduction in PM_{10} concentrations primarily included fees on the use of studded winter tires, lower speed limits, more frequent street cleaning, binding of road dust and replacement of high-emitting wood stoves. Important actions to reduce emissions from transport include the toll ring, developments of public transport, electrification of vehicles and information and awareness raising campaigns. The rapid electrification of the vehicle fleet is very impressive.

The city's current goal is to comply with the air quality limit values and this is to be achieved by reducing traffic by 20% from 2015 to 2019. The air quality action plan is currently being revised and in addition to the EU limit value for NO_2, Norway has set stricter limit values for PM_{10} and $PM_{2.5}$ compare to the EU limit values.

Future plans are very ambitious and include introduction of a low emission zone, making the inner city a car free zone and banning diesel vehicles if NO_2 levels are high. When the ban on diesel vehicles is implemented it is estimated that NO_x emissions will be reduced by somewhat more than 20%. There are also plans to quintuple toll ring charges on the days with poor air quality. Interventions on road traffic are partly financed by the toll ring charges which will be based on congestion and vehicle emissions.

A goal linking climate and air quality is to make the public transport fleet fossil free by 2020. Even though the city has very ambitious action plans to reduce road traffic emissions, the contribution from residential wood burning to PM_{10} may still need further measures in the future.

4.5.6 Quality of the Acoustic Environment

Main Evaluator	Co-evaluator	Ranking
Prof. Diogo Alarcão	Prof. Christer Johansson	1

Noise exposure in Oslo is due mainly from road and railway traffic sources. Data from the 2011 strategic noise maps show that 62% and 19% of the population is exposed respectively to total L_{den} levels over 55 dB(A) and over 65 dB(A), and that 73% and 26% of the population is exposed

respectively to total L_n levels over 45 dB(A) and over 55 dB(A). These are considerably moderate exposure shares if one considers the higher L_{den} and L_n limits, but rather high exposure shares if one considers the lower L_{den} and L_n limits. The reason is attributed to an overestimation of the population's exposure to the lower noise levels because the mapping considered all urban roads as noise sources and default traffic flow volumes were attributed to them.

It is reported that the population share living within 300 m of quiet areas is 35%. This consists of 14 quiet areas, totalling 13 km^2, which are formally defined, delimitated, managed and protected (Oslo was one of the first European cities to do so).

Due to a substantial increase of about 10% in the number of inhabitants from 2006 to 2011, the numbers of the population exposed respectively to L_{den} values higher than 55 dB(A) and to L_n values higher than 45 dB(A) increased respectively by 5% and 7%, since 2006. On the other hand, permissible indoor noise levels as well as permissible environmental noise levels in protected outdoor environments, L_{den} limit value 55 dB(A), have become stricter. The city reports very detailed exposure data including figures for sensitive buildings such as schools, kindergartens and hospitals, for which the share of hospital buildings exposed to noise decreased significantly in the last years. Oslo has developed noise maps for the actual situation and also for the prospective situation linked with area planning, which is a very positive approach.

Many significant noise management and reduction measures were implemented, together with several communication actions, urban planning and building development guidelines, stake-holder involvement and the selection and preservation of quiet areas. Many measures for reducing road traffic noise were implemented, including acoustic barriers, façade insulation improvement, tunnels construction, enhanced modal split, 30 km/h zone for the whole city centre, 60 km/h speed limit in the winter, construction of charge points for e-vehicles and the adoption of electric vehicles by municipal agencies, a better co-ordinated and sustainable transportation of goods in the city, bicycle tracks and pedestrianised areas. Measures regarding the reduction of railway traffic noise such as less noisy trains and trams, railhead grinding and curve squeal noise mitigation were adopted and implemented.

There is a great effort being made concerning the definition and preservation of quiet areas, which include acoustic analysis, surveys, information and pilot projects such as the Parkcheck tool, low noise asphalts in nearby streets and the development of an innovative method for soundscape mapping. The city developed very interesting and valuable fact sheets and brochures on quiet areas in general, as well as on each individual area, being one of the several communication actions with the citizens undertaken by the municipality. Other communication actions include online noise maps and online quiet areas maps, dedicated e-mail account for requests about quiet areas, website for communicating about noise and quiet areas and for submitting noise complaints directly.

The city reports on very interesting, state of the art initiatives and soundscape approaches for improving the acoustic qualities in urban spaces that include careful placement, planning and design of infrastructures in squares and meeting places, surveys describing the positive contribution of natural sounds like rustling leaves and bird calls and a new method for soundscape mapping for quiet areas and parks (integrated in the Quadmap EU project).

The Noise Action Plan 2013 - 2018 establishes short and long term objectives, such as achieving 10% reduction in noise annoyance by 2020, compared to 1999 levels, reducing the number of people exposed to indoor noise levels exceeding LpAeq24h 38 dB by 30% by 2020, compared to 2005 levels,

and maintaining and improving acoustic conditions in quiet areas. The Plan focuses on five main areas: communication with the citizens, prioritised reduction of noise at the sources derived from transport, urban area and transport planning, implementing measures inside and outside buildings using acoustic barriers and façade insulation, and maintaining and improving the acoustic conditions in quiet areas.

Future specific actions to manage sound and to reduce the impact of noise are detailed together with budgetary information. Such actions comprise sustainable urban planning and regulatory provisions regarding quiet areas, enhanced public transportation and soft modes of transport, new tunnels, new trams and new electric vehicle charge points, with 400 new EV charge points being established in 2016 and 2017.

Due to the city's steady population growth, Oslo emphasises condensed urban development in central areas and around public transportation hubs. A short term negative impact of this is that it will result in a higher number of people being exposed to high noise levels. However, this situation is hoped to be changed in the long term because of more sustainable travel by public transport and cycling as an alternative to the car due to the shorter travel distances involved in the future. Comprehensive monitoring programmes should be designed in order to see the evolution of the urban acoustic environment.

4.5.7 Waste Production and Management

Main Evaluator	Co-evaluator	Ranking
Mr. Warren Phelan	Dr. Stefan Ulrich Speck	1

Oslo submitted the strongest application for the waste production and management indicator. The application demonstrated a high performing complete system which continues to evolve.

In its application, the city demonstrated that its waste system has undergone a history of progress. Recently the city has diverted materials from energy recovery treatment to recycling recognising an area for improvement and taking the action to address it. The city has set a target to grow its recycling rate to 50% by 2020.

The city has clear plans to evolve the waste management system putting in place a series of related strategies to transition to a circular economy approach. A food waste reduction strategy is planned as well as a consumption and green public procurement strategy. There is cross pollination between strategies to deliver future measures.

The city has shown a clear commitment to material reuse and prevention with many measures being implemented by the city, for example, an economic incentive is offered to citizens to use cloth diapers. In real terms, household waste per capita has declined over a 10 year period. The city supports and values behavioural change which is part of the city's delivery strategy to improve source separated collection.

The city has a highly developed and integrated waste treatment system with impressive infrastructure serving the city including high performing waste to energy facilities, biogas plant, composting facility, sorting plant and hazardous waste facility.

4.5.8 Water Management

Main Evaluator	Co-evaluator	Ranking
Mr. Giulio Conte	Dr. Ana Lončarić Božić	6

Due to the availability of large quantities of high quality surface water, urban consumption and distribution losses are quite high. It is noted, however, that the percentage of leakage is continuously decreasing (halved in 20 years) as a result of the implementation of specific measures of detection. Domestic consumption is reasonable but further improvements could be made.

Oslo is also working systematically to reopen waterways and reduce vulnerability to urban flooding; up to now, less than 3,000 m of waterways have been reopened but much more is expected in the future.

The Stormwater Management Strategy for Oslo is a very well-set, clear and complete climate adaptation plan, aimed at reducing flood risk through a multi-objective approach that tries to add value to ecosystem services. The water-energy nexus is carefully considered and the present performance is already good

Bathing water quality of local water bodies is good. It has been concluded that the ecological status of streams and rivers is also good. However, this was not clear in the application as no qualitative data was provided to substantiate the finding of the analyses discussed within it.

4.5.9 Waste Water Management

Main Evaluator	Co-evaluator	Ranking
Dr. Ana Lončarić Božić	Mr. Giulio Conte	7

Almost the entire population of Oslo is connected to the collecting system and two WWTPs. The total load received by the WWTPs of 79,000 PE as recorded in 2015 is lower than the total generated wastewater of the city amount 792,000 PE. One of the WWTPs is co-owned by three municipalities. It is assumed that those municipalities contribute to the total load received. The application would have benefited from providing the information on total design capacity of the WWTPs discussing separately how they manage the fraction of total generated wastewater load of the city not received by the WWTPs.

The plants were optimised to accommodate higher load than originally designed. Compliance with the national regulation and the UWWTD is reported.

Both WWTPs extract biogas and 89% of sludge produced is used in agriculture. The management of the remaining 11% is not discussed in the application.

Within the recent period, local purification of stormwater and eco design with rapids, deep pools, recreational areas and purification systems managing run-off from the roads have been established. This has positively influenced the water quality in the inner parts of the Oslo Fjord.

The Master Plan for Sewage and Water Environment 2014-2030 has been adopted in Oslo and the budget for future activities is ensured by water and sewage charges. The need for safe wastewater management and climate change adaptation is outlined in the application and the concern regarding increased pressure on the sewage system due to the expected increase in population is indicated. The application would have benefited from defining the measures and plans to cope with the identified problems.

4.5.10 Eco-innovation and Sustainable Employment

Main Evaluator	Co-evaluator	Ranking
Dr. Stefan Ulrich Speck	Mr. Warren Phelan	1

Oslo prepared a very strong application for the eco-innovation and sustainable employment indicator covering all topics and criteria asked in the application.

All stakeholders are involved and social awareness programmes and training is provided by the city, for example, the business for climate network and social innovation programmes.

The city has adopted several future policies and strategies with clearly defined and quantifiable targets including the goal of having a 100% electric vehicle car fleet and reducing GHG emission by 95% in 2030.

The city is strong with regard to cooperating with business. It would have been interesting to get more information on the potential cooperation between academic institutions and the municipality.

This application is very clear and the structure addresses the criteria asked for in a comprehensive manner.

4.5.11 Energy Performance

Main Evaluator	Co-evaluator	Ranking
Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal	1

Oslo has the opportunity to build its energy system upon the specific renewable energy potential in Norway. Norway produces more electricity from hydro power than it consumes. Furthermore, there are strict national building regulations that trigger energy performance in Norway. Oslo focuses on phasing out fossil fuels for heating and replacing it with renewable energy. In the district heating system, 1.3% was oil and gas in 2015 which will be fossil-free by 2016. Oslo started very early with the formulation of quite ambitious targets, for example, in 2008 it was decided to have fossil free heating in all municipal buildings. Overall, 180 buildings have already phased out fossil fuels and the

remaining 25 have phase out plans in place. By 2020, there will be a national ban on fossil heating oil in all buildings.

Oslo has ambitious building regulations and as of 2014 all new municipal buildings comply with passive house or equivalent standards. The City has 14 passive house buildings in use. Prospectively, new public buildings shall generally be energy positive and refurbished municipal buildings shall comply with passive, zero energy or plus house standard. All municipal buildings rented, shall as a general rule, comply with very low energy standards by 2015 and with passive house standards or equivalent by 2020. A further discussion of the specific potentials of wind and solar energy is very limited, further information would be desirable.

Oslo has some exemplary support schemes and sees itself as a catalyst for national building codes and as a front runner for funding schemes. Since the early 1980s, Oslo has a Climate and Energy Fund that is a support scheme for households and businesses. It is financed through an extra tax on the energy bill. Actions for citizens focus on replacing oil boilers in private homes and buildings with renewable solutions. Since June 2016, 'The oil free help' offers home visits by energy advisers for households with an oil boiler. Experts advise on the alternatives and inform citizens about the support schemes and the impending national ban. However, the involvement of citizens, companies, industries and other relevant stakeholders could be broadened, such as a participatory approach for city activities or strategy development processes.

Oslo has set ambitious targets to reduce greenhouse gas emissions by 50% by 2020 and by 95% by 2030 compared to 1990. Norway agreed to cut the country's net greenhouse gas emissions to zero by 2030 in June 2016. Oslo's projections towards 2030 appear feasible against the background of available hydro power, a national ban on fossil heating oil in all buildings by 2020 and the ongoing intensive electrification of transportation. Oslo has experienced a massive electrification of the transport sector in past years. In 2015 and 2016, over 30% of new cars sold are electric or plug-in hybrids. There are monitoring and performance evaluation schemes for all targets and sub targets as part of the financial budget.

Carbon Capture and Storage (CSS) is mentioned as an option in relation to the waste plant, but its application (the aspect of CSS which normally faces problems with respect to public acceptance) and how to implement it are not further discussed.

4.5.12 Integrated Environmental Management

Main Evaluator	Co-evaluator	Ranking
Mr. Jan Dictus	Dr. Ian Skinner	2

The City of Oslo's experiments with new methods of participation and its use of innovative tools and instruments is commendable.

In addition to basic monitoring, Oslo has a systematic evaluation programme for most strategies and action plans in place. The evaluations are conducted by the City's experts, research institutes, consultants, and through user surveys, which include in-depth evaluations of the implementation and follow-up of cross-sectoral environmental targets, management of hazardous waste and the

Environmental Information Act. Such evaluations can indeed improve the quality and effectiveness of municipal policies and should be a basic activity for more cities.

The Climate Budget is a recommendable tool to share the responsibility for climate activities within the city administration and among partner organisations. But one should be aware that there are more aspects to integrated environmental policy than climate targets alone.

Oslo is internationally well connected and has taken the lead in innovative projects.

Oslo is leading by example, not only by introducing Environmental Management Systems in their own organisation, but through its additional programs. The cited Green Procurement and EcoLighthouse programme may not be new, but they are still important instruments to support (small) companies in environmental performance.

4.6 TALLINN TECHNICAL ASSESSMENT

4.6.1 Climate Change: Mitigation & Adaptation

Main Evaluator	Co-evaluator	Ranking
Mr. F. Javier González Vidal	Prof. Dr. Manfred Fischedick	9

With reference to the methodology used, Tallinn has provided information on emissions for 2007, 2011 and 2013; this data shows a reduction in emissions as a direct result of specific past actions, including the use of renewables in the district heating CHP plant and energy efficiency in buildings. A complete time series with a more comprehensive sectoral breakdown for analysis would be welcome.

In the mid-term, the city has committed to reduce its emissions 40% by 2030 in its Environmental Strategy. This is complemented with the SEAP 2011-2021, but no further long term objectives are mentioned. The municipality could have taken a more proactive approach to leading by example, however, given the significant commitments regarding city owned buildings, it appears that the city does intend to take on a bigger role in the future.

The city has dedicated a significant part of its budget to launch some interesting initiatives, such as the Energy Agency, to raise awareness, and has also invested in and runs some successful projects in key sectors such as the Fix the Facades scheme and free public transport. However, the approach to engage the private sector and promote business opportunities could have been discussed in more detail.

The plans for the future detailed in the Environmental Protection Action Plan 2013-2018, include a good set of standard measures in several key sectors mainly in renewable energies, energy efficiency and transport, but also taking into consideration spatial planning and green public procurement. Unfortunately, the role of innovation and the participation of citizens (behavioural change) in shaping the future of the city are not detailed.

Tallinn plans to start preparing its adaptation action plan once the national strategy is completed in 2017. The city will also take into consideration the national Flood Risk Management Plan in the general plans of city districts, and plans to use research and scenarios which model impacts under different future projections to identify the impact and cost of climate change before designing actions.

4.6.2 Local Transport

Main Evaluator	Co-evaluator	Ranking
Dr. Ian Skinner	Mr. Jan Dictus	7

Tallinn's application mentions various plans including the aim to develop a sustainable urban mobility plan, which is good. It would have been beneficial to have more information on the objectives of the city's plans with respect to sustainable transport and the involvement of citizens and stakeholders in the development of these plans.

Tallinn has implemented a lot of measures in support of public transport, cycling and walking and has plans to implement many more, which is very good. The application recognises the need to develop the city centre in a way that facilitates sustainable means of transport.

There are measures in place to improve traffic flows and to give priority to public transport at junctions. The plans to expand the car-free zone and to develop its progressive parking policy are good measures to restrict car use.

The city has plans to extend its public bicycle rental scheme, which is good; however, it would have been useful to have more information about how the city plans to encourage car sharing. It would be good to have more information on what the city's plans are with respect to improving the environmental performance of goods deliveries in the city.

The city is taking action to introduce alternatively-fuelled vehicles into its public transport and other municipal fleets. It would have been good to have more information on how the city is encouraging the uptake of alternatively-fuelled vehicles more generally.

4.6.3 Green Urban Areas incorporating Sustainable Land Use

Main Evaluator	Co-evaluator	Ranking
Dr. Annemieke Smit	Mr. David Jamieson	3

Tallinn has sound strategic development plans that, when combined with good monitoring of their implementation, should help the city develop sustainable land use patterns as it moves into another period of growth.

It is encouraging that Tallinn, even with all the pressures that have arisen as a result of industrial collapse and subsequent population increase, has been able to preserve its central green areas.

These are important biological and social spaces and provide good examples of what can be achieved elsewhere in the city.

Undertaking regular satisfaction surveys with residents is a good way of ensuring that the city is meeting the environmental and recreational needs of its citizens. These surveys could also be used to identify if people would be willing to participate in green space projects or even help with site management.

The Green Area Development Plan is undoubtedly helping make green spaces and green corridors more functional and attractive. However, this approach could be improved further by viewing green areas and connections not simply in terms of their recreational functions, but also as important places for urban regulating functions, such as temperature, humidity, water regulation and noise.

The short-term goals of Tallinn's development plans and documents present a rich mix of environmental and social improvement opportunities which, when implemented, should help city residents have better integration with and access to their outdoor places. The concept of a green space factor to assure biodiversity and greenery in new developments is particularly intriguing. It would have been beneficial for the city to include more information on the success of this approach.

4.6.4 Nature and Biodiversity

Main Evaluator	Co-evaluator	Ranking
Mr. David Jamieson	Dr. Annemieke Smit	4

Given that Tallinn has a very rich landscape and nature it is surprising that it only has nine designated sites of local biodiversity importance. There is certainly scope to identify, protect and actively manage more. This could become a key feature of the city's new Biodiversity Action Plan.

The newly produced urban biotopes map is an excellent advance for the city. If kept up to date, it will prove invaluable in ecosystem service analysis and sustainable urban planning.

Joining the Eco-School network will help the city's children become more involved with nature and increasingly aware of their impact on natural systems.

The intention to use eco-accounting and green points as an aid to creating sustainable developments looks very promising. It will be interesting to see how this is applied in forthcoming years.

The Tondiraba eco-golf course seems to be an excellent example of ensuring that nature can thrive in an urban environment. The classification and protection of the completed site as a site of local biodiversity importance would be a significant achievement for the city.

4.6.5 Ambient Air Quality

Main Evaluator	Co-evaluator	Ranking
Prof. Christer Johansson	Prof. Diogo Alarcão	7

The city has very good knowledge about the air pollution situation, both from monitoring and modelling, providing information on the spatial distribution of NO_2, PM_{10}, CO and SO_2. In addition, companies monitor air pollutants.

The city has low levels of air pollutants partly due to the location along the coast and prevailing westerly winds from the Baltic Sea and the Gulf of Finland. Levels of all primary pollutants have decreased substantially during the past 10 years.

Traffic, mainly non-exhaust, and wood burning are the main sources of PM_{10}, whereas vehicle exhaust emissions is the main source of NO_2. PM_{10}. Levels are also likely affected by transport of air from outside of the city.

Important past actions that have contributed to improved air quality include extended public transport, free transport for residents of Tallinn, cleaner bus fleet, development of cycling infrastructure, actions promoting electrification, road cleaning and awareness raising activities. Future plans include the extension of public transport, a bicycle rental system, park and ride, promotion of non-studded tires and dissemination of information to residents to reduce emissions from wood burning.

Considering the low air pollution levels, the long term goal could be more ambitious, for example, the city could set goals to achieve the standards set out in the WHO guidelines rather than just keep levels below EU current limits.

4.6.6 Quality of the Acoustic Environment

Main Evaluator	Co-evaluator	Ranking
Prof. Diogo Alarcão	Prof. Christer Johansson	3

Data from the strategic noise maps produced in 2012 show that 68% and 22% of the population is exposed to total noise levels $L_{den} \geq 55$ dB(A) and ≥ 65 dB(A), respectively. Regarding night period exposure, 75.5% and 25.3% of the population is exposed to total noise levels $L_n \geq 45$ dB and $L_n \geq 55$ dB respectively. These are considerably high share values and thus the present situation data suggests a noisy acoustic environment in the city.

Quiet areas were formally defined and delimitated in the 2013 Action Plan and an interesting two-type definition approach was chosen based on existing day noise pressure levels being lower, or higher than 55 dB(A) (critical quiet area). It is reported that 66% of the citizens live within 300 m of these quiet areas, which is a very good percentage.

Acoustic zoning was done for 4 types of land use areas, following Estonian national legislation that considers the day and night period noise levels. These 4 areas have differentiated noise limits, as well as guideline values for existing and planned areas, which may be lower than the associated limit values, and also so-called critical values, which are always higher than the associated limit values. This zoning approach is both detailed and interesting but could be difficult to manage in practice.

Overall, stakeholder interaction and involvement by the city as well as communication with the citizens are considered good. Noise monitoring is being undertaken and reported. Interesting reporting means are, for example, the online noise map and action plan, the noise information panel close to bus stations on some major streets that display real time noise pressure levels and an interactive environmental information screen located in the city centre.

Noise reduction measures that have been implemented comprise speed reductions along main roads and in residential districts, restriction of heavy traffic, paid parking together with pedestrianisation of areas in the city centre, renovation of tram and railway rolling stock together with renovation of the rail infrastructure using resilient fastenings, noise barriers along reconstructed motorways, night time air traffic restrictions, urban planning considering prospective noise situations and the reinforcement of façade insulation for apartments buildings.

Noise Action Plans were prepared in 2009 and in 2013, and during 2017 a mobility plan will be further developed in conjunction with the roads administration and neighbouring municipalities. Future actions consider the renovated tram infrastructure of two lines together with a new tram line connecting the airport, the continuous encouraging of soft modes of transportation together with the establishment of 40 km of new pedestrian and cycle tracks by 2020, expansion of the pedestrian areas in the old town, extending the speed limits of 30 km/h to further residential areas, continuing the façade insulation improvement program, awareness raising campaigns regarding noise and the protection of quiet areas through adequate legislation. Budgets are only provided for the renovation of Tallinn's Main Street, with €30 million towards enhanced mobility, cycle tracks and pedestrian areas, and €79,050 for the noise reduction measures to be applied in areas with current noise limit values exceedances.

Short and long term objectives concerning the quality of the acoustic environment should be given, and a quantification of the foreseen reduction in terms of noise exposed people should be envisaged.

4.6.7 Waste Production and Management

Main Evaluator	Co-evaluator	Ranking
Mr. Warren Phelan	Dr. Stefan Ulrich Speck	5

The city provided a good quality application with a consistent approach to all parts of the questions. The data submitted can be improved as it was found to be confusing and inconsistent in parts of the response.

Tallinn has a particularly strong collection system which continues to develop. Food waste, packaging waste and residual waste fractions are all collected separately. There is good coverage across the city and this has helped to grow the recycling rate which is reported at 44% which compares well to the other applicants.

The city has advanced its treatment of waste and is integrating more solutions with waste infrastructure including a city incinerator and composting plant. The use of landfill has decreased with only 2% of waste sent for disposal. This shows the city's commitment to moving waste up the hierarchy.

The city tackled the organisation of the collection market transforming it from an open market serviced by private collectors to a structured arrangement with the public authorities overseeing competitive tendering for collection services. This is helping to bring greater consistency and quality into the collection services.

The progress the city has made is set to continue with a concrete set of measures. A new city waste plan is being developed and the city intends to increase the separate collection of biodegradable waste and in particular dry packaging waste such as paper and card. The application would have benefited from better descriptions on the transformation to a circular economy.

4.6.8 Water Management

Main Evaluator	Co-evaluator	Ranking
Mr. Giulio Conte	Dr. Ana Lončarić Božić	2

The performance of the city in terms of rational water use is very good; both domestic and urban per capita water consumption is quite low. Similarly, performance in terms of water distribution losses is good compared to the average European value, and shows a very good trend in the last 15 years. The energy consumption for water distribution (Kwh/m^3) is average.

Most of the potable water comes from a shallow lake which suffers from eutrophication. However, measures have been taken to improve the lake water quality and in 2015 the quality of the raw water taken from Lake Ülemiste water intake system met the requirements of Directive 75/440/EC Class A2.

The improvement of potable water sources is confirmed by the water samples taken at consumer's taps, which in 2015 conformed to 99.9% of the current quality requirements. In only 4 tests out of 2,945 the quality did not meet the requirements and this was due to an over-the-limit iron content and/or turbidity. The water pipes underwent immediate maintenance, after which the repeat tests conformed to the quality requirements.

The issue of rainwater management is clearly presented in the application and a strategy to mitigate both flood risk and pollution due to storm water is part of Tallinn's environmental strategy until 2030. The water-energy nexus is carefully considered and the present performance is good.

4.6.9 Waste Water Management

Main Evaluator	Co-evaluator	Ranking
Dr. Ana Lončarić Božić	Mr. Giulio Conte	3

The application reports a respectable performance in wastewater collection and treatment. In Tallinn, 100 % of generated wastewater load is treated in a WWTP, where 99.9% is connected through the sewage network and remaining 0.1% is equipped with the liquid-tight containers discharged into sewers. Tallinn's WWTP fully complies with the UWWTD requirements.

The WWTP generates 27-30 tonnes of sludge annually which is mixed with peat and composted, and subsequently used as a fertiliser in landscaping and as ground filler. The agronomic compliance is confirmed through the performed field studies.

The measures implemented in past years improved the wastewater performance of the city. Examples of this include the extension and reconstruction of the sewerage network and reconstruction of pump stations and wastewater treatment plant. The area of combined sewerage was reduced by the establishment of new stormwater drainage pipes thus reducing the storm water flow into the WWTP and improving the efficiency of the plant.

For the past six years, Tallinn has organised an information campaign explaining what should and shouldn't be flushed down toilets. This is a positive initiative, however, the involvement and active participation of the citizens and the outcomes in response to the campaign were not detailed in the application form.

Tallinn has a public water supply and sewerage development plan for 2010-2021 in place. The budget has been allocated for the renewal of wastewater and sewage systems. Planned activities include the replacement of old pipelines, further reconstruction of the sewerage network, the pump stations, and the treatment plant, as well as the conversion of the combined into separate collection systems. A snow handling concept includes separate collection sites for 'clean snow' and the snow contaminated with the snow control agents.

4.6.10 Eco-innovation and Sustainable Employment

Main Evaluator	Co-evaluator	Ranking
Dr. Stefan Ulrich Speck	Mr. Warren Phelan	5

Tallinn prepared a solid application focusing on ICT and e-services as the flagship of eco-innovation.

The city has several policies and strategies in place addressing eco-innovation, however, these policies have a rather short-term timeframe, finishing in 2018, and no policies with a longer timeframe seem to have been adopted by the city.

The application demonstrates a strong link between the municipality and the business sector, in particular with the ICT sector, as well as with universities.

The municipality focuses on ICT as the flagship of eco-innovation, including the implementation of ICT in the transport sector. The application would have been stronger if more detailed information would have been given in other areas, such as material and resource use, as they are also key in the transition towards a circular and green economy. The area of sustainable employment is not covered in detail.

The application does not provide sufficient information related to social innovation and establishing awareness programmes for citizens. Furthermore, criteria listed in the application, such as green reports, are not addressed.

4.6.11 Energy Performance

Main Evaluator	Co-evaluator	Ranking
Prof. Dr. Manfred Fischedick	Mr. F. Javier González Vidal	5

Tallinn joined the Covenant of Mayors in 2009 which formed the basis for its Sustainable Energy Action Plan for 2011-2021 and its 20-20-20 goals for 2020. The Tallinn Energy Agency, established in 2012, is responsible to plan, develop and monitor the city's sustainable energy sector and to fulfil the commitments agreed with the Covenant of Mayors. According to the Tallinn Environmental Strategy 2030, Tallinn aims to reduce the amount of CO_2 emissions into the atmosphere by 40% and increase the share of energy efficiency and renewable energy consumed by 40%.

For improving energy performance, Tallinn could decrease the use of fossil fuels for heating and in transport by renewable energies of firewood, woodchip and peat. However, a discussion of sustainability criteria for using biomass is missing. Furthermore, the discussion of renewable energy production, such as wind or solar, is missing. This information would have been desirable, especially considering its location on the Baltic Sea with favourable conditions for wind energy.

A focus of Tallinn is the insulation and retrofitting of existing buildings. The ‘Fix the Facades’ is a commendable support scheme. It was set up in 2010 and assists apartment associations in improving energy efficiency of apartment buildings. Through the scheme, apartment associations can receive funding to cover the self-financing costs of their retrofitting loan, up to 10% of a loan. Funding is available for complete retrofitting projects, including insulating façades and roofs, replacing windows and doors, and changing or reconstructing heating and ventilation systems. These actions help raise the energy rating of the building to a 'C' energy label. Such retrofitting should by estimation bring about 40% energy savings. The funding is intended for apartment buildings built prior to 1993.

To achieve its targets, Tallinn focuses primarily on the reduction of energy use in buildings, and the combination of heat and power production. However, a clear strategic roadmap is missing. The results of the ongoing project ‘R4E - Roadmap for Energy 2050’ will be interesting to see. The POWER Programme ‘Strategy for Energy Efficiency Through Climate Agreements (SEECA)’ seems to be interesting as it provides a roadmap for a low carbon economy. It would have been worth discussing how this roadmap is used in practice and its main pillars of implementation.

There is no clear approach for involving stakeholders, such as residents, companies or industries, in city activities. Also the discussion of consumer behaviour as an important option to limit energy demand would have been desirable.

4.6.12 Integrated Environmental Management

Main Evaluator	Co-evaluator	Ranking
Mr. Jan Dictus	Dr. Ian Skinner	5

Both the Tallinn Environmental Strategy 2030 and the Tallinn Development Plan 2014-2020 have emphasised environmental sustainability and consequently translated that into many sectoral plans and policies.

Leading by example is mainly achieved through the environmental management systems within the city's own administration. No leading activities in building and construction, fleet management, or other areas have been mentioned, which would have helped to inform Tallinn's status with regard to integrated environmental management in these sectors.

Tallinn is internationally well connected, and has the potential and the experience, of demonstrating good examples.

Participation and co-decisions seem to be well structured and organised. Cooperation between the city government and the sub-district associations is governed by Best Practice in Cooperation where their mutual rights and obligations are laid down.

The Tallinn Youth Council represents the interest of young Tallinn residents at the Tallinn City Council as an advisory council.

Evaluation of projects and policies help to inform questions of their effectiveness and efficiency. It is not clear from the application how evaluation of projects and policies is organised, at what frequency they are undertaken or if they take place at all.

APPENDIX A

APPLICATION FORM FOR THE 2019 EGCA TITLE

Application Form for the European Green Capital Award 2019

City Introduction and Context

Give an overview of the city and a general background to the application, including examples of social and economic sustainability in the city.

Discuss positive and negative factors that have influenced the quality of the environment within the city and its surrounding area.

Provide a description of the key environmental challenges which the city faces including historical, geographical and/or socio-economic factors which have influenced the city's development.

The city's infrastructure plan should be briefly explained.

Applicants are advised to include any former or outstanding environmental legal proceedings in this section.

Please also complete the following table:

Indicator		**Units**	**Year of data**
Population		Inhabitants	
Area		km^2	
Population Density		Inh/km^2	
GDP		€/Capita	
Köppen climate classification			

(max. 1000 words and five graphics, images or tables)

1. Climate change: Mitigation and Adaptation

Refer to Section 2.1 of the Guidance Note

1A. Present Situation

Please complete the following table:

City Reduction Targets (add rows if needed for further commitments)	**Base Year**	**Target Year**	**% Reduction**
CO_2 Emissions / capita	**t CO_2/inh - Total**	**Transport t CO_2/inh**	**Total (less transport) t CO_2/inh**
Total CO_2 emissions (tonnes) per year		Tonnes	Please insert year of data here
Total CO_2 emissions per MWh electricity consumed		Tonnes	Please insert year of data here

Describe the present situation in relation to CO_2 emissions, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area.

Give details of any Baseline Emission Inventory prepared by the city, mentioning the baseline year and the applied methodology (direct/indirect emissions, data collection process, monitoring system), as well as the competent department. Provide a breakdown of the main sources of emissions.

Where available, information/data on the inventory and on the following indicators should be provided from previous (5-10) years to show trends, together with an explanation of the evolution.

Scientific grounds should be provided for any claimed reduction in CO_2 emissions. Describe how the inventory system and information is integrated in the design of policies and measures.

Provide figures (in the table above), and comment on, the following specific indicators for the city:

1. Total CO_2 emissions (tonnes) per year;
2. CO_2 emissions per capita (tonnes) per year;
3. CO_2 emissions per capita (tonnes) resulting from fuel use in transport;
4. CO_2 emissions (tonnes) per MWh electricity consumed;
5. CO_2 emissions reduction target(s) (e.g. 20% by 2020 compared to 1990).

Please also state clearly what year the data provided relates to.

Mention any target(s) adopted specifically for the municipal administration (e.g. carbon neutral municipality by 2020, adaptation measures set on municipal level).

Regarding adaptation to climate change, please mention if your city has developed a comprehensive local adaptation strategy and/or integrated adaptation to climate change into existing relevant plans. (eg if your city has joined or is planning to join the Mayors Adapt initiative)

(max. 600 words and five graphics, images or tables)

1B. Past Performance

Describe the measures implemented over the last five to ten years to reduce greenhouse gas emissions, including resources allocated to implement these measures. Comment on which measures have been most effective and how the implementation and impacts have been monitored.

Make reference to:

1. An overall strategy for climate change or any other strategy or action plan to reduce emissions, and allow adaptation for this period;
2. Mainstreaming of climate protection measures across municipal services and in key areas of action such as energy efficiency in residential and commercial buildings, public transport and waste management. Highlight any innovative schemes for the built environment such as low carbon zones;
3. Mechanisms used (e.g. local regulations, financing schemes, partnerships). Explain how the city works on emissions reduction with other governmental bodies, private sector service providers, enterprises and citizens. Mention relevant national legislation or programmes and participation in EU-funded projects or networks.

Describe the city's approach to adaptation to the impacts of climate change (e.g. heat island effect in urban areas based on nature-based solutions/Green Infrastructure), including the works performed to identify and improve the adaptive capacity of the city and its vulnerability and on adaptation plans.

Provide details on the monitoring system (frequency, responsibility, outcomes) and how lessons learned have been used.

(max. 1200 words and five graphics, images or tables)

1C. Future Plans

Describe the future short and long term objectives and proposed approach for further emissions reduction, 'climate proofing' and adaptation to the impacts of climate change. Describe planned measures, including timescales and emphasise to what extent plans are supported by commitments, budget and staff allocations and monitoring and performance evaluation schemes.

Make reference to any long-term strategy employed and how it is integrated with other environmental areas.

Briefly explain the rationale for choosing these future measures and highlight any innovative financing arrangements.

(max. 800 words and five graphics, images or tables)

1D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

2. Local transport

Refer to Section 2.2 of the Guidance Note

2A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator	Data		Units	Year of data provided
Proportion of population living within 300 metres of an hourly (or more frequent) public transport service			%	
For all journeys under 5km, proportion of these journeys undertaken by: i) car, ii) public transport, iii) bicycle, iv) by foot and v) other	Car		%	
	Public Transport			
	Cycling			
	Foot			
	Other			
Proportion of buses operating in the city that are low emission (at least Euro V)			%	

In relation to the above, please state:

- For the 'Proportion of population living within 300 metres of an hourly (or more frequent) public transport service': the data and calculation method of the figure.
- For public transport, please include journeys by any type of public transport present in the city (e.g. buses, trams, trolleybuses, light rail, and other rail services) even if these are privately-operated.
- For 'other' in the table above please state what is included by any figure presented for as 'other'.

The remainder of the text in this section should describe the present situation for both local passenger transport and urban freight transport. This should include qualitative and quantitative information on:

- **Transport infrastructure**
- **Vehicle numbers**
- **Mobility flows**
- **Infrastructure management tools**
- **Existing model shares**
- **Alternative mobility scheme**
- **Use of alternative-fuel vehicles**
- **Any disadvantages or constraints of relevance to transport**
- **Governance arrangements and responsibilities**
- **Improved spatial planning**
- **Sustainable Urban Mobility Plans (SUMP)**

Provide references where possible and relevant details.

(max. 600 words and five graphics, images or tables)

2B. Past Performance

The aim of this section is to make clear how the situation described in Section 2A has been achieved. Where available, quantitative information and data should be provided for the previous five to ten years in order to show recent trends.

The section should describe the **strategies and plans** that have been implemented over the last five to ten years (including any SUMP or equivalent) to ensure that the development of transport in the city was undertaken in an integrated manner. This should include both integration between the different modes of transport and also the integration of transport and land use planning in order to avoid unnecessary travel, to limit urban sprawl and to stimulate the use of public transport, cycling and walking. Refer to the way in which the city authorities involved stakeholders in the development of these plans.

Describe the **measures** implemented over the last five to ten years. Particular reference should be given to measures that have helped to deliver:

- Increased use of public transport, cycling and walking;
- Decreased, and more efficient, car use, including measures to reduce congestion;
- Modal shift, i.e. from transport by private car to public transport, cycling and walking;
- Improvements in the environmental performance of urban freight, including cleaner vehicles, freight consolidation and bicycle deliveries;
- Increased use of alternatively-fuelled vehicles, using renewable and sustainable fuels; and
- Spatial planning approaches which have led to more environmentally-friendly transport models.

Comment on which measures have been most effective and lessons learned. Emphasise involvement in and possible benefits from the city's participation in national or European networks and programmes.

(max. 1200 words and five graphics, images or tables)

2C. Future Plans

Describe the short and long term **objectives** for local transport (both passenger and freight) and how you plan to achieve these. Outline the **plans and strategies** in which these objectives are found, and the extent to which these are supported by political commitments, budget allocations, and monitoring and performance evaluation schemes. Refer to integrated transport, land use planning, stakeholder involvement and the use of a SUMP or equivalent. Set out the **measures**, including those adopted but not yet implemented, that contribute to the delivery of the objectives, including:

- Increased use of public transport, cycling and walking;
- Decreased, and more efficient, car use;
- Modal shift;
- Improvements in the environmental performance of urban freight; and
- Increased use of alternative-fuel vehicles.

(max. 800 words and five graphics, images or tables)

2D. References

List supporting documentation (e.g. survey about user satisfaction with the urban transport system), and add links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

3. Green urban areas incorporating Sustainable Land Use

Refer to Section 2.3 of the Guidance Note

3A. Present Situation

Please complete the following table providing the most recent data that is available:

Land use within the city (this will provide important background information on the character of the city and is not an evaluation criterion itself)				
	Inner City	**Overall City**	**Unit**	**Year of data provided**
Public Green Area			%	
Private Green Area				
Blue				
Residential				
Industrial/economic				
Mixed				
Brownfield				
Other				
Total	**100**	**100**		
	Inner city	**Overall city**	**Unit**	**Year of data provided**
Population density in built-up areas (city area minus green and blue			Inhabitants per ha	
Percentage of people living within 300 m of green urban areas of any size in inner city Population density (inhabitants per hectare) for new developments			% Inhabitants per ha	

Describe the vision for urban planning, sustainable land use and Green Infrastructure. Also provide the status of any plans.

Include information on the indicators mentioned below for both the inner city area and the overall city area (see guidance note for clarification):

1. Evaluation of the densification in the inner-city or urban cores;
2. Location and previous land use (brown field or green field) of new developments;
3. Population density (inhabitants per hectare) in built-up areas (city area minus green and blue areas);
4. Population density (inhabitants per hectare) for new developments;
5. Quality of green and blue areas;

6. Investments in green infrastructures (e.g. sustainable urban drainage, green rooftops, vertical gardens, high-quality business parks and public spaces, biodiversity-rich communal gardens, green belts and metropolitan park systems) ;
7. Use of permeable or semi-permeable materials and surface areas covered by them.

Maps:

Provide a land use map that indicates
1. The municipality boundaries delineating the overall city area; and
2. The inner city area.

Provide additional maps showing city parks, the scale of green and blue areas in the city and their connectivity and coherence.

Provide maps of the location of brownfield sites that have been regenerated in the past ten years.

(max. 1100 words and five graphics, images or tables plus requested maps)

3B. Past Performance

Describe the measures implemented over the last five to ten years. Comment on which measures have been most effective.

Make reference to measures for::
1. Minimising the total area of fallow, derelict and contaminated land;
2. Regenerating formerly developed sites (e.g brownfields used for new housing or business etc;
3. Limiting urban sprawl, (e.g. by cooperating with the neighbouring municipalities);
4. Renovating urban land, renewing urban design or rehabilitation of derelict zones or housing areas which were in poor state to make city living attractive and enable a more sustainable lifestyle (e.g. short distances to services and facilities reduce the transport demand and promote walking and cycling; multi-apartment houses save energy for heating, cooling, reduce infrastructural needs);
5. Increasing or sustaining population density in built-up areas while protecting green areas and providing a high quality of life within densely populated areas;
6. Limiting urban sprawl including cooperating with the neighbouring municipalities;
7. Limiting, mitigating or compensation environmental impacts of soil sealing;
8. Improving the quality of green and blue areas
9. Promoting the use of green infrastructure (tax reductions for green roofs, building permits, funding schemes for green roofs or biodiversity-rich communal gardens);
10. How are current and future changes such as economic growth, demographic or climate change integrated in sustainable land use planning?
11. Were developments co-created with the citizens who are/were meant to use the green spaces?
12. How was the effectiveness of management measures monitored?

(max. 1200 words and five graphics, images or tables)

3C. Future Plans

Describe the short and long term objectives and strategic approaches to the establishment and management of green urban areas (public and privately owned) with particular reference on taking into consideration :

1. The benefits of green areas for people's quality of life, public health and recreation;
2. Additional benefits of green areas for regulating water balance, adaptation to weather extremes, filtering air pollution, pesticide risk and use reduction etc.;
3. Rehabilitation of brown field sites, derelict and/or contaminated land; both for new development and/or desealing measures for environmental purposes.

Emphasise to what extent plans are supported by:

- commitments,
- budget allocations,
- monitoring and performance evaluation schemes,
- criteria that will be used to measure progress and impact,
- Measures to ensure long term maintenance of (public) green areas.

(max. 800 words and five graphics, images or tables)

With particular reference to strategic approaches to the establishment and management of green urban areas (public and privately owned) taking into consideration their functional value:

1. People's quality of life, public health and recreation;
2. Additional ecosystem functions and services such as regulating water balance, balancing climate extremes, filtering air pollution, education, pesticide risk and use reduction etc.;
3. Rehabilitation of brown field sites, derelict and/or contaminated land; both for new development and/or desealing measures for environmental purposes.

Please make reference to the criteria that will be used to measure progress and impact.

(max. 800 words and five graphics, images or tables)

3D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

4. Nature and biodiversity

Refer to Section 2.4 of the Guidance Note

4A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator	Number	Total area (ha)	Year of data provided
Number and total area of Natura 2000 sites that are located in the city or nearby (i.e. within 10 km)			
Number and total area of designated sites of **national** biodiversity importance within the city (habitat/species management areas)			
Number and total area of designated sites of **local (city)** biodiversity importance within the city (habitat/species management areas)			
Date and time horizon of your city's Biodiversity Action Plan			

Describe the present situation of nature and biodiversity in your city, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area.
Please provide details of the following:

1. Maps showing habitats, ecosystems or biotopes;
2. Date of management plans for the sites indicated in the above table;
3. Confirmation of designated habitats and/or species, and the principal challenges faced;
4. Information on any other wild native species of interest in the city (e.g. species that are rare, endangered or iconic) and how they are managed.

Other topics to be covered are: the management of any invasive species, activities designed to raise public awareness of biodiversity, action on reducing pesticide use (see Guidance Note), and work to promote and manage natural/wildlife parks and gardens as well as green roofs and walls for biodiversity.

(max. 600 words and five graphics, images or tables)

4B. Past Performance

Describe the measures implemented over the last five to ten years. Comment on which measures have been most effective.

1. Indicate trends in management and size of sites protected for nature and biodiversity (Natura 2000 sites, national and local sites) as listed above in table, in and around the city.
2. Indicate any dedicated conservation actions to manage and restore the sites and species numbers;

3. Monitoring work: where possible, show trends in biodiversity data and management over the past 5-10 years. How effective has past management been?
4. Protecting nature in any other open spaces; what has been done (including survey and mapping work.
5. What communication activities are in place to promote awareness of nature and biodiversity generally and in the protected area network among the public, particularly among young people.
6. Monitoring the effectiveness of management measures.
7. Describe any innovative approaches, e.g. shared management of sites, the role of the public.
8. In what ways are the economic, health and job benefits of biodiversity protection integrated into strategic and finance planning and how is this communicate to citizens?

(max. 1200 words and five graphics, images or tables)

4C. Future Plans

Describe the short and long term objectives for nature and biodiversity and how these proposals will be achieved. Indicate strategic and policy commitments, budget allocations, and monitoring and performance evaluation schemes. Demonstrate how this work coincides with the EU 2020 Biodiversity Strategy, Nature Directives and other relevant Directives such as sustainable use of pesticides, and complementary national strategies.

(max. 800 words and five graphics, images or tables)

4D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

5. Ambient air quality

Refer to Section 2.5 of the Guidance Note

5A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator		Unit	Year of data
Max Number of days per year on which EU target value for ozone was exceeded (8h mean)		Days	
Number of ozone monitoring stations		No of monitoring stations	
Max Number of days per year on which EU target value for PM_{10} was exceeded (8h mean)		Days	
Number of PM_{10} monitoring stations		No of monitoring stations	
PM_{10} - Max concentration recorded		ug/m^3	
Number of NO_2 monitoring stations		No of monitoring stations	
NO_2 - Max concentration recorded		ug/m^3	
NO_2 - Annual Average concentration		ug/m^3	
Number of $PM_{2.5}$ monitoring stations		No of monitoring stations	
$PM_{2.5}$ - Max concentration recorded		ug/m^3	
$PM_{2.5}$ - Annual Average concentration		ug/m^3	

Describe the present situation in relation to ambient air quality, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Topographical constraints, the use of green areas to improve air quality and risk reduction for the urban heat island effect should also be mentioned where relevant. Where available, information/data should be provided from previous years (5-10) to show trends.

Make reference, providing data in the table above, to:

1. Number of days per year on which EU target value for ozone was exceeded (8h mean);
2. Number of days per year on which EU limit values were exceeded for PM_{10} (daily mean);
3. Number of hours per year on which EU limit values were exceeded for hourly NO_2 (hourly mean)
4. Annual mean concentration of NO_2, PM_{10} and $Pm_{2.5}$;
5. Assess the contribution from local sources and from long-range transport for annual mean concentration of NO_2, PM_{10} and $Pm_{2.5}$.

(max. 1,000 words and five graphics, images or tables)

5B. Past Performance

Describe the plans and measures implemented over the last five to ten years for the improvement of ambient air quality. Comment on which measures have been most effective.

Particular reference should be given to:

1. Existence and implementation status of an air quality management plan;
2. Local measures taken to improve air quality and quantify their effect on air quality;
3. Information for the public (both inhabitants and tourists) on air quality levels (e.g. web pages, information screens) in order to increase public awareness and behavioural change.

(max. 800 words* and five graphics, images or tables*)

5C. Future Plans

Describe the short and long term objectives for the future, proposed plans and the proposed approach and measures for their achievement. Quantify the effects of proposed measures on air quality.

Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

(max. 800 words and five graphics, images or tables)

5D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

6. Quality of the Acoustic Environment

Refer to Section 2.6 of the Guidance Note

6A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator		Unit	Year of data
Share of population exposed to total noise values of L_{den} above 55 dB(A)		%	
Share of population exposed to total noise values of L_{den} above 65 dB(A);		%	
Share of population exposed to total noise values of L_n (night noise indicator) above 45 dB(A)		%	
Share of population exposed to total noise values of L_n (night noise indicator) above 55 dB(A)		%	
The percentage of citizens living within 300 m of quiet areas.		%	

Describe the present situation in relation to the quality of the acoustic environment, including any disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available, information/data should be provided from previous years (5-10) to show trends.

Additional figures for noise exposure to individual noise sources (road, rail, air, industry, and leisure/entertainment) can also be included.

(max. 800 words and five graphics, images or tables)

6B. Past Performance

Describe the measures implemented over the last five to ten years for improving the urban sound quality and increasing awareness to noise. Comment on which measures have been most effective.

Make reference to:

1. Classification of territory (if applicable) into appropriate noise classes and with appropriate noise limits (e.g.: specially protected, hospitals/schools, residential, commercial, industrial) including details on enforcement mechanisms if in place;
2. Stakeholder involvement;
3. Communication with citizens;
4. Preservation and improvement of good acoustic urban environments such as quiet areas;
5. Noise reduction measures that influenced the current situation;
6. With respect to the adopted action plans, what is the percentage of the plan effectively implemented (e.g. overall amounts already paid for actions versus overall amounts initially committed).

(max. 1000 words and five graphics, images or tables)

6C. Future Plans

Describe the short and long term objectives for quality of the acoustic environment and the proposed approach for their achievement. Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Make reference to:

1. Stakeholder involvement;
2. Consultation with the population including noise perception survey;
3. Actions to reduce the impact of noise from roads, railways, industrial areas and air traffic (Noise Plan);
4. Foreseen reduction in the share of population exposed to noise values of L_{den} (day-evening-night indicator) above 55 dB(A) and above 65 dB(A) and in the share of population exposed to noise values of L_n (night indicator) above 45 dB(A) and 55 dB(A), mention targets;
5. Actions to maintain, extend, or improve urban quiet areas;
6. Holistic/qualitative approaches to the acoustic environment (e.g with soundscapes approaches, using green infrastructure solutions).

(max. 800 words and five graphics, images or tables)

6D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

7. Waste production and management

Refer to Section 2.7 of the Guidance Note

7A. Present Situation

Please complete the following table providing the most recent data that is available for your city. If city data is not available, please provide a short explanation and use regional or national data.

Indicator	Type of Data (City/Regional/ National)	Unit	Year of data
Percentage of household waste sent to landfill		%	
Percentage of household waste sent for thermal treatment or similar recovery		%	
Percentage of organic waste collected separately Please indicate what is included within the organic waste collected ie food waste only or food and garden waste		%	
Percentage of recycled household waste		%	
Percentage of recycled packaging waste		%	
Percentage of recovered packaging waste		%	
Amount of Household Waste generated per capita		kg/capita	
Amount of Municipal Waste generated per capita		kg/capita	

Describe the present situation in relation to waste production and management by responding to each of the questions below.

Include details on:

1. Waste strategies or plans in place;
2. Waste prevention measures, including food waste and packaging waste;
3. Reuse and/or repair initiatives/partnerships currently in the city; include an example of such initiatives describing the types and quantities of materials reused;

4. Describe current waste collection system including the types of waste collected separately and the extent of roll-out (% coverage) of the collection systems;
5. Provide details of the treatment of the separately collected wastes;
6. Proportion of organic waste collected separately. Please provide details of the type of treatment and the capacity of biological treatment facilities
7. If thermal treatment operations are in use, describe the scale of the facility, the type of energy recovered, including the energy performance, and the number of households who are part of the facilities energy network;
8. Proportion of biodegradable waste sent to landfill
9. Application of the 'polluter pays' principle, including 'pay as you throw' (PAYT) initiatives.

(max. 800 words and five graphics, images or tables)

7B. Past Performance

Describe the measures implemented over the last five to ten years for improving waste management and include details on the following;

1. Historical trends in the amount of household waste produced per capita in the city;
2. Trends in waste treatment in the city over the last 5-10 years; for example how have rates of recycling, recovery and disposal changed over this period;
3. Evolution of source segregated collection systems in the city;
4. The collection market in terms of how it has developed and the role of municipal (public) authorities and/or private waste companies;
5. Medium to long-term measures/programmes which have promoted waste prevention or recycling;
6. Use of instruments (economic or regulatory) applied in the city to effect the management of household and or municipal wastes
7. Type and scale of infrastructure put in place to manage waste including the approach to managing residual waste and progress to date;

(max. 1000 words and five graphics, images or tables)

7C. Future Plans

Describe the future plans of the city in terms of progressing the management of waste and the transition to a circular economy which in the context of the waste sector refers to keeping resources within the system through activities such as reuse, repair, refurbishment, and recycling. Your response should include:

1. A description of the short and long term objectives/targets for the management of waste and the approach the city proposes to take to ensure these are achieved;
2. Emphasise to what extent plans are supported by commitments, budget allocations, and subject to monitoring and performance evaluations;
3. How is the city taking account of EU policy on waste management within the framework of the Circular Economy;

(max. 800 words and five graphics, images or tables)

7D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

8. Water management

Refer to Section 2.8 of the Guidance Note

8A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator		Unit	Year of data
Domestic usage - Litres per capita per day		litres/capita/day	
Total Usage - Litres per capita per day		litres/capita/day	
Water loss in pipelines, leakage management and network rehabilitation		%	

Describe the present situation in relation to water management, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area, including the situation of your river basin (e.g. if water bodies are in good status, if you are regularly experiencing droughts, scarcity and/or floods and expected future trends). Where available, information/data should be provided from previous years (5-10) to show trends.

Detail the present situation regarding water demand of different sectors and describe plans currently in place to reduce water consumption and to improve water status.

Make reference to:

1. Total water consumption (in cubic meters/year and litres/capita/year) including a breakdown for different sectors (households, industry, energy, agriculture, small business, tourism, public sector);
2. Proportion of urban water supply subject to water metering, both for domestic and non-domestic metering;
3. Source of water (surface water, groundwater)-make reference to aquifers and river basin management;
4. Quality of drinking water (e.g. how many days of non-compliance with the Drinking Water Directive);
5. Water loss in pipelines, leakage management and network rehabilitation; please provide data on total unaccounted water in percentage and whereas available, in specific losses (m^3/km/day) and info on leakage management and network rehabilitation;
6. Storm water management and use of natural water retention measures (www.nwrm.eu) and/or sustainable urban drainage systems (SUDS);
7. Compliance with the Floods Directive and link to the relevant Flood Risk Management Plans;
8. How the links between water and energy consumption (water-energy nexus) (e.g. through pumping, treatment, heating) is taken into account; if available provide data on yearly energy consumption (kWh/m^3 of distributed water);
9. Use of 'non-conventional resources' and water recycling initiatives (rain water use and grey water or wastewater reuse);
10. Compliance with the EU Water Framework Directive and other EU/national/regional legislation applicable at the city level indicating status of water bodies relevant for the urban area within the city limits and relevance of measures enshrined in the applicable river basin management plans.
11. The scale of river restoration projects planned -e.g. for resurfacing (lost) rivers, naturalising previous channeled rivers;
12. Projects to reconnect citizens with waterbodies-eg creation of wetland parks, cleaning up water quality such that swimming is possible.

(max. 800 words & 5 graphics, images or tables)

8B. Past Performance

Describe the measures implemented over the last five to ten years for improving water management. Comment on which measures have been most effective and what progress has been achieved.

Make reference to:

1. Technical, nature-based, economic and institutional measures adopted and their effectiveness in achieving reduction of total water consumption or improvement of water status;
2. Byelaw implementation in relation to efficiency in water usage, tariff and metering systems and water quality;
3. Awareness raising campaigns.
4. Actual and projected improvements (in %) of water status/potential compared to 2009, when the first river basin management plans were to be in place.

(max. 1000 words and five graphics, images or tables)

8C. Future Plans

Describe the short and long term objectives for water management and the proposed approach for their achievement, including how they are influenced by the expected impacts from climate change and other long-term trends. Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Place particular emphases on water quality goals and on key water saving and reuse targets for the future and the proposed approach to achieve these**,** including technical and nature-based measures incorporating water infrastructure to deal with future impacts of climate change.

(max. 800 words and five graphics, images or tables)

8D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

9. Waste Water Treatment

Refer to Section 2.9 of the Guidance Note

9A. Present Situation (max. 600 words)

Please complete the following table providing the most recent data that is available:

Indicator		Unit	Year of data
Percentage (%) of total annual generated waste water load, connected to waste water collecting system + urban Waste Water Treatment plants (UWWTPs)		%	
No of WWTP			
Total Design Capacity (PE)		PE	
Total Load Received by UWWTP (PE)		PE	
Total annual generated waste water load of the city (in PE)		PE	
Treatment level which is applied in each UWWTP: secondary or more stringent; in this case, type of treatment: nitrogen and/or phosphorus removal, disinfection			

Describe the present situation in relation to Waste Water Treatment, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available, information/data should be provided from previous years (5-10) to show trends.

Describe the current general features of Waste Water Treatment according to national requirements and the requirements of the Urban Waste Water Treatment Directive (UWWTD, 91/271/EEC).

Include data and a short explanation for the following specific indicators. Provide explanation in the case of missing information.

1. Provide an indication of the fraction (%) of the total annual generated waste water load of the city coming from population and from industry (also specifying type of industry, where information is available);
2. Proportion (%) of total annual generated waste water load, not connected to waste water collecting systems, and explanation of the type of Waste Water Treatment applied to this fraction (reference to individual or other appropriate systems, i.e., IAS);
3. If the city is located in an EU Member State include data on Waste Water Treatment obligations according to the UWWTD (based on city's size and nature of the area of discharge);
4. Waste water collecting systems: main type of collecting system (combined/separated) and annual proportion (%) of COD-loads discharged via storm water overflows;
5. UWWTPs: Organic design capacity (PE), most advanced treatment level, annual incoming and discharged loads (t/a) of BOD5, COD, Ntot and Ptot and treated waste water amounts (m^3/a) of all UWWTPs serving the city. If the city is located in an EU Member State, indicate whether the UWWTP complies with the treatment requirements under the UWWTD;
6. Annual amounts of generated sewage sludge (t/a) and description of treatment/disposal pathways (% of total amount);
7. Provide data on annual energy consumption for wastewater treatment in kWh/year/PE, if available.

Further information (e.g. on energy efficiency at UWWTPs, treated waste water re-use, economic sustainability, use of integrated constructed wetlands or other GI/nature-based solutions) is highly appreciated.

(max. 600 words and five graphics, images or tables)

9B. Past Performance

Describe the measures implemented over the past five to ten years to improve Waste Water Treatment. Comment on which measures have been most effective. If the city is located in an EU - Member State special reference should be given to non-expired deadlines for compliance with the UWWTD, when applicable (reference to Accession Treaties or sensitive areas under transitional period).

Particular reference should be given to capacity building, measures for maintenance, management and restoration of waste water collecting systems and UWWTPs.

Make reference to citizen engagement and public awareness initiatives.

(max. 1200 words and five graphics, images or tables)

9C. Future Plans

Describe the future short and long term objectives for Waste Water Treatment and management and the proposed approach for their achievement. Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes. Emphasise to what extent plans are triggered by the demands of EU and national regulations.

Refer to:

1. Improvement / maintenance / management of collecting systems;
2. Improvement of connection to collecting systems (*inter alia*, additional % of PE forecasted to be connected);
3. Improvement of design capacity, treatment level and treatment performance of UWWTPs and indicate if these go beyond the requirements in the Directive;
4. Improvement of connection to UWWTPs (*inter alia*, additional % of PE future connections);
5. Improvements of further environmental and economic aspects of Waste Water Treatment (e.g. removal of micropollutants, pollution prevention, energy efficiency at UWWTPs, sludge treatment and disposal, treated waste water re-use, use of integrated constructed wetlands);
6. Measures to improve public participation;
7. Other improvements.

(max. 800 words and five graphics, images or tables

9D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

10. Eco-innovation and Sustainable Employment

Refer to Section 2.10 of the Guidance Note

10A. Present Situation

Please complete the following table providing the most recent data available:

Indicator		Unit	Year of data
Number of electric vehicles owned by the municipality		number	
Number of electric vehicles owned by the municipality (in % of all cars owned by the municipality)		%	
Number of charging outlets available for cars owned privately.		number	

Describe the present situation in relation to eco-innovation and sustainable employment, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available, information/data should be provided from previous years (5-10) to show trends.

Make reference to:

1. Innovations that address material / resource use, (substitution, minimisation of material use, closing loops, etc) and reduce environmental impacts, i.e. measures to improve resource efficiency; new business models (sharing schemes), including actions inspired by circular economy thinking;
2. Awareness raising and training to encourage the development and take-up of environmentally friendly technologies, particularly through training in industrial and business settings. Make reference to the authority launching the initiative as well as its target audience;
3. Efforts to promote green skills, or green jobs;
4. Efforts to promote Green Public Procurement (GPP);
5. Social innovation/stakeholder participation, including for example community programmes, that shows entrepreneurship and new ways of organisation that promote sustainable development and protect the environment locally and globally;
6. Share of the city budget dedicated to support environmental R&D (with particular reference to eco-innovation) by public and private entities;
7. Number of jobs created in green sectors in total, as a share of total jobs in the city and as total jobs created during a period of one year;
8. Share of hybrid or fully electric cars in total stock of vehicles owned by the city. Number of charging outlets available for the cars owned privately.

(max. 600 words and five graphics, images or tables)

10B. Past Performance

Describe the measures implemented over the last five to ten years concerning eco-innovation and sustainable employment. Comment on which measures have been most effective.

Make reference to:

1. Initiatives aimed at increasing eco-innovation and sustainable employment, e.g. projects under Cohesion Policy funds, LIFE, Eco-Innovation Action Plan (EcoAP), Green Public Procurement (GPP), as well as national policy initiatives;
2. How European and national policies have been transferred into policy action at the city level;

3. The publication of reports, such as green accounts, revealing the timely implementation of planned initiatives.
4. Any action which the city is taking in order to develop the urban tissue/infrastructures in an innovative/sustainable way including actions inspired by circular economy thinking.
5. Name/describe what you consider to be the flagship of eco-innovation in your city.

(max. 1200 words and five graphics, images or tables)

10C. Future Plans

Describe the future short and long term objectives to promote eco-innovation and sustainable employment and the proposed approach for their achievement. Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Make reference to:

1. Plans to establish eco-innovation clusters, strategies and initiatives to attract public-private partnerships for further developing eco-innovation and sustainable employment;
2. Future targets of how eco-innovations can be applied by the city, e.g. make reference to share of hybrid or fully electric cars in total stock of the public fleet, or plans to support the infrastructure development for electric cars in public areas (i.e. increase the number of charging points for electric cars in public car parks), sharing economy schemes (i.e. bike sharing) use of public procurement of innovation;
3. Participation at green business networks or partnerships and covenants and cooperation with knowledge institutions, such as universities;
4. Programmes to reach the population and industries promoting green economy thinking.
5. Identify the key future plan which is considered as the flagship of eco-innovation in your city.

(max. 800 words and five graphics, images or tables)

10D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

11. Energy performance

Refer to Section 2.11 of the Guidance Note

11A. Present Situation

Please complete the following table providing the most recent data that is available:

Indicator		Unit	Year of data
Final Energy Consumption		MWh	
Final Energy use/capita		kWh/capita	
Final Energy usage /sector			
Ag & Fisheries		%	
Industry & Commercial			
Transport			
Domestic			
Services			
Other			
Total	**100**		

Describe the present situation and development (particularly in relation to the building sector), using quantitative data and figures. Where available, information/data should be provided from previous years (5-10) to show trends. Highlight the most relevant driving forces for the observed trends. List any disadvantages resulting from historical, geographical and/or socio- economic factors which may have influenced this indicator area.

1. Present total final energy consumption by sectors (structure of energy consumption);
2. Past development of energy consumption and current plan (activities) for energy efficiency improvements and decreasing the use of energy, particularly for
   - energy performance of municipal buildings (in kWh/m^2) with specific reference to city owned buildings and
   - important developments related to other end-use sectors besides the building sector (e.g. transport, industry production, services, public, lighting, electrical appliances food);
3. Present situation, development and current plan for the energy supply mix, particularly regarding the renewable versus non-renewable mix of energy sources during the past ten years (for both heat, electricity and transport; expressed in kWh, MWh or GWh);
4. The current plan for integration and performance of renewable energy technology in municipal buildings and homes compared to the total energy use;
5. The development so far and the current plan of compatible and integrated district heating energy and of combined heat and power energy consumption compared to the total energy use, (expressed in kWh, MWh or GWh);
6. Application of innovative technologies (e.g. current plan for increasing the use of LED lamps in public lighting and use of green roofs/walls for energy saving).

(max. 600 words and five graphics, images or tables)

11B. Past Performance

Describe the measures implemented over the last five to ten years concerning energy, as a qualitative narrative. Comment on which measures have been most effective.

Make reference to:

1. Attempts to improve the energy performance (i.e. i.e. energy efficiency standards particularly of municipal buildings) above national requirements;
2. Maximising and prioritising the use of renewable energy technology (particularly in municipal buildings);
3. Measures to facilitate integrated district system solutions (e.g. cogeneration) and a more sophisticated city-wide control.
4. Measures to trigger stakeholder engagement in the city to improve overall energy demand performance preferably including local government institutions, local market actors and citizens; mention existing co-operations.

(max. 800 words and five graphics, images or tables)

11C. Future Plans

Describe the future short and long term objectives for shaping a sustainable energy system and the proposed approach for achievement. Include measures adopted, but not yet implemented, and details for future measures already adopted.

Emphasise to what extent plans are consolidated by commitments, budget allocations, and monitoring and performance evaluation schemes, what potential there is and what kind of barriers you might expect in the implementation phase. Express and explain if and how far the strategies and targets go beyond national ambitions.

Make reference to the city's strategy to achieve goals by 2030 and 2050 and highlight:

1. The role of energy efficiency improvements;
2. The role of an increasing share of renewable energy in the total energy supply;
3. The city's strategy regarding renewable versus non-renewable energy mix, as well as of the renewable energy mix per se (the percentage of different renewable energy sources). Describe the planned energy mixes for at least the coming two decades, preferably add diagrams to describe this evolution;
4. Other measures affecting the total energy use in the city, e.g. changes in transport systems, industrial practices, food and commodities production and consumption, urban morphology and use of Green Infrastructure, consumer behaviour and import and export chains.

(max. 800 words and five graphics, images or tables)

11D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

12. Integrated Environmental Management

Refer to Section 2.12 of the Guidance Note

12A. Present Situation

Please complete the following table providing the most recent data available:

Indicator	Yes/No	Date from:
Signatory of CoM		
Aalborg Signatory		

Vision, Strategy:
Describe if the city has a clearly defined, widely understood and supported environmental vision for the municipality, for example as part of a broader commitment to urban sustainability.

Is this vision reflected in different strategies and action plans, which include objectives and targets for individual sectors? Please list the most important strategies and plans and indicate their relationship to the overall vision.

Have your vision and the corresponding strategies been endorsed and implemented by the city council? Is there a dedicated budget for implementing the environmental vision?

Management, monitoring and evaluation:
Which stakeholders have participated in the development of the city's environmental vision and associated strategies and action plans? (e.g. contribution of civil society and citizens) How was the participation organised?

How are the management structures of your city organised, and what management tools are used, to achieve your environmental objectives and targets? For example management circles, obligatory sustainability impact assessments of policy proposals, project structures, management groups of different departments, skills promotion, periodic evaluations, etc.

Describe the system of monitoring, reporting and evaluation. What is generally reported to whom at what frequency?

Leadership:
Is the city (administration) leading by example in environmental behaviour? Describe your activities regarding environmental management systems, green public procurement, skills development, etc.

Does your city cooperate with other authorities at different levels or other organisations (regional, national, EU, international) on environmental and sustainability issues? Which of these cooperation activities or projects has your city initiated or acted as leading partner? Please also refer to your participation in European funded projects and to your commitment to international initiatives, charters, etc. Agenda 21, Aalborg Commitments, Covenant of Mayors, C40, Climate Alliance, ICLEI, EUROCITIES, etc.)

List any disadvantages resulting from historical, geographical and/or socio-economic factors, which may have influenced this indicator area.

Involvement of citizens

Describe your activities and engagement with the different communities within your city with particular attention to youth participation.

Describe the goals of these activities, be it awareness raising, shared responsibility, policy development, etc.

Please reference any structures/projects/programmes that you have in place i.e. youth council, elderly citizens, disabled, socially deprived citizens; number of activities that were completed with different groups, the reach and objectives/impacts of these activities.

(max. 1000 words and five graphics, images or tables)

12B. Implementation

Describe the organisational structure of the city administration and show how the environmental strategies are embedded in the organisation. Please include an organogram and indicate which department or political body is the driving force behind the environmental vision?

Innovative instruments
Does the city use, in its environmental policy, innovative instruments like 'nudges', citizen participation in environmental enforcement, awareness-raising through social media, innovative financing, etc.?

Above the level of basic monitoring, do you periodically evaluate the progress of your policies / strategies / projects and do you adopt them according to findings?

(Max. 400 words and five graphics, images or tables)

12C. Future Plans

Describe the short and long term objectives for the integrated management of environmental policy and the proposed approach for their achievement.

Describe present and future projects that demonstrate your commitment to an integrated management of the urban environment.

Demonstrate public awareness of this bid i.e. public consultation, availability to read etc.

(max. 800 words and five graphics, images or tables)

12D. References

List supporting documentation, adding links where possible. Further detail may be requested during the clarification phase. Documentation should not be forwarded at this stage.

(max. 400 words)

Good Practices

Please provide details of at least one present or future flagship project that demonstrates your commitment to an integrated management of the urban environment; Indicator 12. This should be supported by a maximum of two graphics or images.

Please summarise up to six good practices, in any six different indicators, that demonstrate how your city is improving its environment record.

Please identify to which categories your good practice is relevant
Good practices should be taken from information already provided within the application form

Each good practice should be supported by a maximum of three graphics or images. (max 300 words per good practice)

Good Practice 1

***(max. 300 words and three* graphics, images or tables)**

Indicator:

Good Practice 2

***(max. 300 words and three* graphics, images or tables)**

Indicator:

Good Practice 3

***(max. 300 words and three* graphics, images or tables)**

Indicator:

Good Practice 4

***(max. 300 words and three* graphics, images or tables)**

Indicator:

Good Practice 5

***(max. 300 words and three* graphics, images or tables)**

Indicator:

Good Practice 6

***(max. 300 words and three* graphics, images or tables)**

Indicator:

APPENDIX B

EXPERT PANEL PROFILES

Indicator No. 1 - Climate Change: Mitigation and Adaptation

Expert: Mr. F. Javier González Vidal, Atmospheric pollution technical advisor, Regional Government of Valencia-D.G. Environmental Quality, Spain

F. Javier González Vidal is an Industrial Engineering graduate from the Polytechnic University of Valencia. Throughout his professional career he has focused on the promotion of environmental respect, both at the regional and international level.

For the last 17 years he has been working for the Regional Government of Valencia in the D.G. Environmental Quality, where he has gained a wide view of the situation related to the intensive use of energy, climate change, polluting emissions and air quality.

The development and implementation of policies to fight air pollution and climate change have been one of his priorities, using emissions inventories as a key tool to assess effectiveness. Some of the main tasks he has been involved in have been the development, implementation and monitoring of the policies included in the regional Climate Change Strategy and the implementation of the EU ETS, management of the PRTR register, and the air quality network analysis and subsequent development of air quality actions plans.

He was a member of the European Commission Climate Change Committee as a representative of the regional governments of Spain during the negotiations of the European policies.

Since 2005, as a member of the Roster of Experts of the United Nations Framework Convention on Climate Change, Javier contributes to the review of national communications and inventories, focusing on the energy chapter, according to the Kyoto Protocol commitments. He has cooperated actively with D.G. Enlargement providing technical support to EU partner countries with regard to the approximation, application and enforcement of EU environmental legislation through the Technical Assistance and Information Exchange instrument.

During 2013 he worked with the Ministry of Environment of Brazil, in the context of the sectorial dialogues between the EU and Brazil, on the Climate Change and Energy Efficiency Chapter.

Indicator No. 2 - Local Transport

Expert: Dr. Ian Skinner, Director of Transport and Environmental Policy Research, Crowborough, London, UK.

Ian Skinner is an independent researcher and consultant with over 20 years of experience in undertaking research and consultancy projects focusing on the environmental impacts of transport.

His PhD from University College London was on the implementation of sustainable transport policies in South East England and he has also undertaken research at the University of Kent on the marginal cost pricing of transport.

Since his PhD, Ian has worked at the Institute for European Environmental Policy (IEEP) and AEA (now Ricardo-AEA) before co-founding TEPR in 2009. Ian's work focuses on the implementation and evaluation of sustainable transport policies for national and international organisations. Much of

Ian's work has been undertaken at the European level for the European Commission, which has involved impact assessments and evaluations of various EU transport and environmental policies.

He has also worked for UNEP, including in support of their EST goes EAST project, and been an independent evaluator for the European Commission. In 2013, Ian was invited to draft the chapter on European transport policy for a forthcoming Edgar Elgar book Research Handbook on Climate Change Mitigation Law (Van Calster and Vandenberghe (eds)), which was published in early 2015.

Indicator No. 3 - Green Urban Areas incorporating Sustainable Land Use

Expert: Dr. Annemieke Smit, Senior researcher on Nature Based Solution for Society at Alterra (part of Wageningen University and Research)

Annemieke Smit is a Physical Geographer with a PhD in Ecology. In 2001 she started working at Alterra with a focus on Sustainable Soil and Land Use. She is an expert on sustainable land use management, both in urban, peri-urban and rural areas. She was one of the core team member of the Dutch Community of Practice CoP Sustainable land use management in spatial planning.

For the past two years she has been involved in the Alterra Green Cities programme, combining ecological, social and economic knowledge about multiple benefits of Green Infrastructure to the urban public and private stakeholders. She specialised in multi-stakeholder projects and is often involved in national of EU assessments on sustainable development. She is part of the Dutch advisory board for the development of BREEAM-Community.

With a focus on good and clear communication, Annemieke always keeps in mind that experts tend to go deep into the subject, while policy makers or non-scientific partners want to know about the impact of the research on their world, work and options.

Indicator No. 4 - Nature and Biodiversity

Expert: Mr. David Jamieson, Head of Parks, Greenspace & Cemeteries, City of Edinburgh Council and Director of Greenspace Scotland, United Kingdom

Based in Scotland, David is responsible for managing Edinburgh's public parks and greenspace network, including the city's nature reserves, woodlands, allotments, cemeteries and urban forest. As head of Edinburgh's Parks Service he has secured a number of green accolades for the city, including winner of Britain in Bloom, Entente Florale Gold Medal, Eurocities, COSLA Gold Medal for Service Innovation & Improvement, the UK's Best Parks, Grounds and Horticultural Service Team award, and Fields in Trusts' Best UK Landowner.

Having led the development and implementation of Edinburgh's Nature Conservation Strategy, Urban Forestry Strategy, and Biodiversity Action Plan, he is presently directing the Edinburgh Living Landscape initiative in partnership with local universities, wildlife trust, botanic garden and green space trust. This is an innovative ecosystems approach to urban open space management, bringing nature closer to people's homes and work-places.

David is also Director and chair of the national charity, greenspace scotland, championing the value of green space to government and other decision-makers. As a chartered ecologist and environmental manager, with degrees from Stirling, Heriot-Watt and Huddersfield universities, his career has ranged across the public, academic and voluntary sectors. In recent years he has also been a director of Volunteer Development Scotland, BTCV Scotland, Oatridge Agricultural College and the Falkirk Environment Trust - promoting volunteering as a means for positive social and environmental change.

As well as being the Expert Panel member for Nature and Biodiversity, David is also a UK-level judge for Britain in Bloom and assessor for Green Flag Award, the two largest green award programmes in Great Britain. This gives him insight into current best practice in green space management, urban ecology, community-driven environmental initiatives, and sustainable development.

Indicator No. 5 - Ambient Air Quality

Expert: Christer Johansson, Professor at the Atmospheric Science unit of the Department of Environmental Science and Analytical Chemistry, Stockholm University, and Air quality expert at the Environment and Health Administration (EHA) of the city of Stockholm.

Christer's focus area during the past 25 years has been on urban air pollution. This includes anthropogenic emissions, air pollution monitoring, atmospheric dispersion modelling, chemical reactions, population exposure and air quality and health impacts.

He has been working closely with epidemiologists, atmospheric scientists as well as urban planners in many national and international research projects. At Stockholm University he is also supervising PhD and Master students and responsible for a Master course on 'Air Quality Outdoors and Indoors', which deals with emissions, air quality management and health risk assessments as well as cost-benefit analyses of air pollution.

At the Swedish National Air Quality Reference Laboratory, he has been advisor to the Swedish Environmental Protection Agency and collaborating with other reference laboratories mainly in Nordic countries.

In the City he works closely with local and national authorities on air quality issues. His unit at the Environment and Health Administration in Stockholm is responsible for operating an air quality management system not only for the city, but for an association, that includes 50 municipalities, energy production companies and regional governmental agencies. The system includes monitoring stations, emission inventories and dispersion models and is also used in urban planning to analyse e g impacts on air quality and health of future planning scenarios.

Indicator No. 6 - Quality of the Acoustic Environment

Expert: Prof. Diogo Alarcão, Specialist in Acoustic Engineering. Principal Researcher and Professor at Instituto Superior Técnico University of Lisbon, Portugal & the Polytechnic Institute of Lisbon, Portugal.

Diogo studied Physics Engineering and holds a PhD in Acoustics from the University of Lisbon. He is a Chartered Acoustical Engineer, member of the board of the Portuguese Acoustical Society and member of the executive commission for the Specialization in Acoustic Engineering of Ordem dos Engenheiros.

He has been responsible for major projects in Environmental Acoustics and Noise Control, including Noise Mapping and Action Plans for large urban areas in various Portuguese cities and for many large transport infrastructures. He has also been responsible for various projects in the area of Room Acoustics and Virtual Acoustics including real time simulation and auralization of sound fields in enclosures.

Indicator No. 7 - Waste Production and Management

Expert: Mr. Warren Phelan, Technical Director, Waste, Energy & Environment, RPS Group Ltd., Dublin, Ireland.

Warren Phelan is a Technical Director with the Waste, Energy and Environment Section of RPS. Warren is a Chartered Waste Manager and a Chartered Civil Engineer with a Master's degree in Engineering Science from University College Dublin.

Since joining RPS in early 2001, Warren has worked in the resource and waste management sector developing specialised skills in policy and legislation, strategy and planning, stakeholder consultations, data analysis and collation methodologies, waste prevention and online resource applications.

Warren has extensive knowledge and experience in the strategic approach to managing wastes at a city, regional and national level. Warren acted as project manager and lead author for the regional waste management plans covering the Irish State. This included preparing the underlying strategy, headline targets, policies for the development of new infrastructure and an implementation roadmap for the duration of the plan period.

The ability to source, compile, analyse and present data is essential for the development of robust waste management systems and plans. In recent years Warren has led a team appointed by the Irish Environmental Protection Agency required to collate and analyse data gathered from all of the major waste treatment facilities in Ireland. Warren has also prepared data for the Irish government benchmarking Ireland's performance in the sector against comparable international countries.

Warren has applied his waste management skills and developed waste management plan for large infrastructure projects, international airports, industrial operations and university campuses. Clients have included INTEL and Aeroport de Paris.

Warren has worked on waste projects in the UK, across Europe and in the Middle East. Warren's clients include the European Commission and the World Bank among others. Warren is currently acting as the Irish country agent on a European Commission Horizon 2020 funded project on Sustainable Innovation (CASI project).

Warren has also worked on the design of many waste facilities including baling stations, transfer stations, material recovery facilities and recycling centres and is currently he is working for WRAP on the redesign of a waste facility in Wales.

Indicator No. 8 - Water Management

Expert: Mr. Giulio Conte, Project Manager of *natural resources area* at Ambiente Italia and *water policy expert* at IRIDRA.

Giulio Conte is project manager of natural resources at Ambiente Italia and water policy expert at IRIDRA. After completing his degree in biology at University of Rome 'La Sapienza' (1987) Giulio Conte has been a researcher at SVIMEZ (association for the industrial development of southern Italy) until 1990.

From 1990 to 1995 Giulio worked as a scientific consultant for Legambiente (environmental NGO) in the field of environmental reporting and aquatic ecosystem monitoring. From 1995 to 1998 he was project manager at Ecomed (Agency of the Municipality of Rome to promote Sustainable Development in the Mediterranean).

In 1997 and 1998 was a member of the commission charged with drafting the Legislative Decree n.152/1999 that transposed directive 91/271 on urban wastewater into the Italian legislation. From 1999 to 2008 he was president of CIRF, the Italian River Restoration Center (www.cirf.org). Presently he works with Ambiente Italia (www.ambienteitalia.it) and IRIDRA (www.iridra.com) and is involved in several projects pertaining to sustainable water management at urban or river basin scale such as Life+ info Water Against Climate Change www.wataclic.eu; ENPI CBCMED Sustainable Water Management in Mediterranean www.swmed.eu; FP7 Operationalisation of natural capital and ecosystem services www.openness-project.eu.

Giulio Conte has authored several scientific and informative articles and of a book on sustainable water management in the domestic sector (Nuvole e Sciacquoni. Edizioni Ambiente – Milano 2008. ISBN 978-88-89014-76-9).

Indicator No. 9 - Waste Water Management

Expert: Dr. Ana Lončarić Božić, Associate Professor, Faculty of Chemical Engineering and Technology, University of Zagreb, Croatia

Ana Lončarić Božić is an associate professor involved in teaching and research in the field of Chemical and Environmental engineering. Ana holds a PhD in Chemical Engineering. Her research interests include advanced technologies for water and wastewater treatment, advanced oxidation technologies, photocatalysis, degradation of recalcitrant pollutants and contaminants of emerging concern and ecotoxicity.

She participated in 5 national and international research projects with academia and industry in the field of advanced wastewater treatment. She is the author/co-author of more than 30 scientific papers published in peer-reviewed journals (cited over 500 times, *h*-index 12). Ana sits on 3 editorial boards and is a regular reviewer for more than 20 scientific journals. She is also an Environmental Management System Auditor.

With a background in Chemical and Environmental Engineering and the expertise in the wastewater treatment and water management, Ana was involved as an evaluator for FP7-ENV-2012, FP7-ENV-2013 and NCBR-Core 2012 calls.

Indicator No. 10 - Eco-innovation and Sustainable Employment

Expert: Dr. Stefan Speck, Project Manager environmental economics and policies at the Integrated Environmental Assessments Programme at the European Environment Agency.

Stefan Speck is an environmental economist with a PhD in economics. His main area of research is the application of market-based instruments for environmental policy, environmental fiscal reform, and green economy.

Prior to his current position, he was employed as a senior consultant at Kommunalkredit Public Consulting in Austria and as a senior project scientist at the National Environmental Research Institute/University of Aarhus in Denmark within the EU-funded project 'Competitiveness effects of environmental tax reforms' (COMETR). He also contributed to the research project 'Resource Productivity, Environmental Tax Reform and Sustainable Growth in Europe' funded by the Anglo-German Foundation.

He has implemented projects for a range of clients including the Danish Environmental Protection Agency (DEPA), European Commission (EC), Organisation of Economic Co-operation and Development (OECD), United Nations Development Programme (UNDP), United Nations Environmental Programme (UNEP), German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and the UK Department for International Development (DFID).

He published widely on environmental fiscal reform and green economy; he was co-editor of the books *Environmental Fiscal Mechanism and Reform for Low Carbon Development: East Asia and Europe* (2013) and *Environmental Tax Reform: A Policy for Green Growth* (2011) and was responsible for the EEA reports *Towards a green economy in Europe EU environmental policy targets and objectives 2010-2050* (2013), *Resource-efficient green economy and EU policies* (2014) and *Environmental taxation and EU environmental policies* (2016).

Indicator No. 11 - Energy Performance

Expert: Prof. Dr. -Ing. Manfred Fischedick, Vice President of the Wuppertal Institute and Professor at the Schumpeter School of Business and Economics, Wuppertal, Germany

Manfred Fischedick is the Vice President of the Wuppertal Institute, an international well known think tank investigating transformation processes to a sustainable development. With particular reference to the areas of climate, energy, resources and mobility, the institute is looking for technical, infrastructure and social innovations supporting the transition to sustainable structures. Special focus is given on the transition process of the energy system and cities.

Manfred Fischedick is a professor at the Schumpeter School of Business and Economics at the University of Wuppertal. He has been working for more than 20 years in the field of energy system analysis (including sustainable urban infrastructure analysis).

He is adviser to the German government as well as the Bundesland of North Rhine-Westphalia, author of various publications and peer reviewed articles. Manfred Fischedick is coordinating lead author for the IPCC, member of several national and international scientific boards and advisory councils.

Manfred Fischedick has been intensively working in the context of sustainable urban infrastructures and energy efficient cities. His project experience comprises among others the development of long term concepts for the German cities of Munich and Düsseldorf and the Chinese city of Wuxi.

For the Innovation City Ruhr Bottrop, which is kind of a real-term laboratory in the Ruhr Valley aiming for an emission reduction by 50% between 2010 and 2020 he is leading the scientific accompaniment process. In addition he was appointed as member of the Scientific International Advisory Council of the mayor of the city of Seoul.

Indicator No. 12 - Integrated Environmental Management

Expert: Jan Dictus, UNIDO Eco-City Expert , Founder of GOJA Consulting for Environment and Sustainable Development, Vienna, Austria

Jan Dictus (nationality Dutch, living and working in Austria since 2000) is an expert on sustainable development of cities. He has provided services to a wide range of clients at international, European, regional and local levels on environmental and sustainable development issues.

He was involved in several EcoCity projects: For the City of Vienna Jan has led the development of the Environmental Vision of Vienna and is presently supporting the network Cities for a Nuclear Free Europe CNFE. Also for Vienna he was technical chair of the EUROCITIES Environment Forum. As a UNIDO expert Jan has been involved in the organisation and reporting of conferences in Jordan and Bahrain on EcoCities in Middle-East and North Africa (MENA Region).

Also for UNIDO and the Government of Japan he is presently setting up a network of Eco-Cities in South East Asia, introducing the instrument of Peer Review for Cities. Together with Astronaut

Marcos Pontes Foundation and UNIDO he is preparing the development of an Eco-State in Roraima, Brazil.

Jan has started a project in Morocco to develop a reference framework of sustainability for the new-to-build EcoCity Zenata. In the past Jan worked on Green Industry and the promotion of Eco-Business projects in e.g. India and Thailand, and on the development of a Green Award mechanism in Cambodia.

Jan is a member of the Expert Evaluation Panel for the European Green Capital Award since 2012, acted as Lead Expert for URBACT-II and is a member of the expert group for the 'UNEP-JCEP Sustainable Urban Development and Liveable Garden Community-China Programme' in China.