



Expert Panel
Technical Assessment Synopsis Report
European Green Capital Award 2026
Finalist cities

October 2024

Colophon



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1.Introduction

1.1 Background

The European Green Capital Award (EGCA) has been awarded by the European Commission since 2010. The objectives of the EGCA are to:

- Recognise and publicly acknowledge cities that have a consistent record of working towards high environmental standards.
- Encourage cities to intensify and speed up current targets and commit to ambitious goals for further environmental improvement and sustainable development.
- Engage citizens in embracing change, inspire others and promote experience and best practice in other European cities.

The EGCA 2026 competition cycle was launched in December 2023. The deadline for applications was 30th April 2024. As in previous years, the Expert Panel carried out a technical assessment of each of the seven environmental indicators (detailed in Section 2.2) for all applicants. The Expert Panel provided grades for the three sections (Present situation, Past performance, and Future plans) of each indicator together with qualitative comments. Guided by the Expert Panels' recommendations, a shortlist of cities was established by the Commission and subsequently submitted to the Jury.

Taking into account the Expert Panel's proposals and information presented to the Jury, the Jury will select one city to be awarded the title of European Green Capital 2026. The winner will be announced at the EGCA Ceremony on 27 November 2024 in Valencia, the 2025 European Green Capital. Details of the competition process were set out in the published Rules of Contest¹ for this competition cycle, see Section 2.1.

1.2 Aim of this Report

This Technical Assessment Report provides the Expert Panel's technical evaluations. The primary aim is to provide the information that was the basis for shortlisting the finalist cities. Although all finalist cities have exemplary performance, there might still be areas where improvements are possible according to the experts. The aim of this report is also to provide suggestions for this, to help all cities to become the best they can be.

¹ [EGCA-EGLA 2026 Rules of Contest \(europa.eu\)](https://european-council.europa.eu/media/1000000/EGCA-EGLA-2026-Rules-of-Contest.pdf)

2. Technical Assessment Procedure

2.1 Applicant Cities for EGCA 2026

A total of nine cities applied for the EGCA 2026 competition. All cities submitted valid applications. Details of the 2026 applicants are included in Table 2.1 and Figure 2.1.

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

No.	City Name	Country	Population	CoM ² signatory	GCA ³ signatory	Part of 100 Cities Mission ⁴
1	Braşov	Romania	237,600	2008	2023	-
2	Córdoba	Spain	328,000	-	-	-
3	Riga	Latvia	609,500	2008	2021	yes
4	Rybnik	Poland	124,800	2015	-	-
5	Guimarães	Portugal	156,900	2013	2021	yes
6	Braga	Portugal	193,300	2013	2020	-
7	Heilbronn	Germany	132,500	-	-	-
8	Klagenfurt on lake Wörthersee	Austria	104,600	2011	2024	yes
9	Linz	Austria	212,600	2024	2023	-

Figure 2.1 - Map of European Green Capital 2026 Applicant Cities



² Covenant of Mayors: <https://www.covenantofmayors.eu/>

³ Green City Accord: <http://www.greencityaccord.eu/>

⁴ EU Missions 100 climate-neutral and smart cities:

https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_h_e-cities-mission-reveal-factsheet.pdf

2.2 Technical Assessment

The selection of the European Green Capital 2026 is based on seven environmental indicators. These indicators are outlined below, and a copy of the 2026 EGCA Application Form is attached in Appendix A:

1. Air Quality
2. Water
3. Biodiversity, Green Areas and Sustainable Land Use
4. Waste and Circular Economy
5. Noise
6. Climate Change Mitigation
7. Climate Change Adaptation

Each environmental indicator is composed of the following sections:

- A. Present Situation
- B. Past Performance
- C. Future Plans

The technical assessment procedure involves a thorough evaluation of the application form submitted by every applicant city. This assessment is complemented by an analysis of relevant data sourced from the European Environmental Agency. All seven environmental indicators carry equal weight in the evaluation process. The weightage assigned to each section of these indicators is as follows: section A accounts for 50% of the total weight, while sections B and C both carry a weight of 25%.

2.3 Technical Assessment Experts Panel

The Technical Assessment is done by the Technical Assessment Panel. The Technical Assessment Panel consists of seven independent Experts. A shortlist of the experts per indicator and their titles are included in Table 2.3. A more elaborate profile for each of the Experts can be found in Appendix B.

It is important to emphasize that a peer review was conducted as an integral component of the technical assessment process. Each member of the Expert Panel evaluated their designated primary indicator, and in addition, each indicator underwent evaluation by a secondary panel member, acting as a peer reviewer.

The recommendations made in the technical assessment per city are on behalf of the expert panel and focus on possibilities for improving the city's performance. The recommendations should not be understood as direct advice or criticism from the European Commission to the applicant city.

Table 2.3 - Expert Technical Assessment Panel

	Indicator	Expert	Title
1	Air Quality	Alena Bartonova	Research director for European research collaboration and Manager, European Topic Centre for Human Health and environment, NILU, Norway
2	Water	Wieslaw Fialkiewicz	Assistant professor, Wroclaw University of Environmental and Life Sciences, Poland and head of Hydrodynamics Modelling Section, Institute of Environmental Engineering
3	Biodiversity, Green Areas and Sustainable Land Use	Daniele La Rosa	Associate professor of Urban and Environmental planning, Department of Civil Engineering and Architecture, University of Catania, Italy
4	Waste and Circular Economy	Katia Lasaridi	Professor in Environmental Management and Technology, School of Environment, Geography and Applied Economics, Harokopio University, Athens, Greece
5	Noise	Sergio Luzzi	President and Technical Director of "Vie en.ro.se. Ingegneria", certified company of acoustic consultancy and design in Italy and Adjunct Professor at the University of Florence
6	Climate Change Mitigation	Anna Ternell	Project manager at the Research Institute of Sweden (RISE) and Ph.D. Research Fellow in Geography, University of Pecs, Hungary
7	Climate Change Adaptation	Daphne Keilmann-Gondhalekar	Doctor and assistant professor at the Technical University of Munich (TUM), Research Group Lead Water-Energy-Food (WEF) Nexus Lab, Chair of Urban Water Systems Engineering, Munich, Germany

Finalists Green Capital – 2026

There are three finalists for this competition for the 2026 titles. These cities have distinguished themselves from the cohort of Green Capital 9 applicants:

- Guimarães (Portugal)
- Heilbronn (Germany)
- Klagenfurt on Lake Wörthersee (Austria)

3. Technical Assessment Guimarães

3.1 Introduction Guimarães

Guimarães, a city with a population of 156,830 inhabitants spread over an area of 240,955 km², holds a significant place in Portugal's history. In the 12th century, Guimarães was the site of key events leading to Portugal gaining independence.

The city's success comes from its abundant natural resources, with roots in industrialization starting in the 18th century. Initially focused on leather and linen production, Guimarães evolved into a hub for the textile and shoe industries. This industrial growth led to the depletion of water resources, causing biodiversity loss and a disconnect between the citizens and their rivers.

Guimarães faces unique challenges due to its scattered population distribution, with approximately 70% of residents living outside the main urban centre. Despite these obstacles, the city has done well in addressing environmental concerns. Efforts have been made to improve travelling by car, public transport, and pedestrian-friendly areas to reduce emissions and noise pollution.

The city's notable accomplishments include being named a UNESCO World Heritage site in 2001, the European Capital of Culture in 2012, and the European City of Sport in 2013. Guimarães has been praised as the most eco-friendly town in Portugal for three years in a row and has won awards across Europe. A key focus for Guimarães is to protect the environment, with initiatives like riverbank rehabilitation using green strategies to connect people with nature.

The city continues to work towards a more sustainable future. There is strong political support from all parties and parish councils in Guimarães, highlighting a shared vision for a greener community and ongoing efforts to enhance environmental conservation and sustainability initiatives.

Table 3.1 – Guimarães Key Performance Indicators EGCA 2026

Indicator	Number	Unit
Air Quality		
Number of days where the daily limit value for PM10 has been exceeded per year for each sampling point	14	No.
Number of hours in which the hourly limit value for NO ₂ has been exceeded per year for each sampling point	0	No.
Water		
Domestic water usage (drinking water)	139	l/capita/day
Proportion of water losses from the distribution network	1.43	ILI index
Proportion of population connected to the wastewater collecting system and treatment plant(s)	84.5	%
Biodiversity, Green Areas, and Sustainable Land Use		
Population density in built-up areas (city area minus green and blue)	26.85	inhabitants/ha
Percentage of people living within 300 m of green urban areas of >5,000 m ²	75.58	%

Waste and Circular Economy		
Amount of municipal waste generated per capita	452	kg/capita/year
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)	48	%
Noise		
Share of the population exposed to total noise values of Lden above 65 dB(A)	4.1	%
Share of the population exposed to total noise values of Ln (night noise indicator) above 55 dB(A)	4.2	%
Climate change mitigation		
Total CO ₂ emissions/capita	3.6	t CO ₂ /capita
Energy usage/capita	16 900	kWh/capita

3.2 Results per Environmental Indicator Guimarães

3.2.1 Air Quality

A. Present Situation

Guimarães benefits from favourable to excellent air quality: approximately 97% of the population is exposed between favourable to excellent air quality conditions. The city demonstrates a comprehensive awareness of emission sources, with particular emphasis on household energy production (PM10), road transport (NOx), and long-range transport (PM10). The city has recently funded four monitoring stations to improve monitoring capabilities, which not only track PM10 but also monitor PM2.5 and ozone. Guimarães' consideration of long-range transport and the use of concentration maps is commendable as it provides a broad view of air quality issues and ways to address them.

To address air pollution, Guimarães has adopted a comprehensive approach, focusing on local roads and recognizing the connection between air pollution and noise for synergistic effects. The city is implementing a range of measures, including traffic management and the integration of air quality data into a digital urban platform for public access. Active citizen engagement through participatory programs and educational initiatives supports the city's efforts to reduce air pollution even further. Guimarães actively participates in several national and international agreements regarding air quality. It has signed the [Green City Accord](#), has been awarded a number of international city awards, and has signed multiple commitments on the European level with indirect relevance for air quality.

The air quality zone of Entre Douro e Minho, in which Guimarães is situated, is covered under a NO₂ infringement case. It is important to note that the exceedances concerned were not reported from the sampling point situated in Guimarães.

B. Past Performance

The city has a thorough understanding of its air quality trends. Over the past decade, there were occasional concentrations that surpassed national target levels, with only a few days of exceedance. Between 2015 and 2017, the city introduced a local monitoring system, replacing the national network. In 2017, the national network underwent an upgrade after which it was used again. There have been no documented cases of non-compliance with Air Quality Guidelines in recent years. Air quality was significantly influenced during two years (2017 and 2022) due to major forest fires, affecting public health.

In 2016, Guimarães established its initial air quality plan in collaboration with external experts and began enhancing the capabilities of the Climate Transition Team. The city has engaged in various initiatives and projects aimed at fostering the development and execution of a comprehensive cross-sectoral approach, among which the development of a governance ecosystem, integration with national and regional plans and strategies, and integration with other sustainability themes. The described yearly actions, which are regularly updated, are well-detailed and appear effective. Identified on the basis of a detailed emission inventory and modelling, most measures target traffic calming and modal shift. Along with extensive collaboration with the public through awareness-raising and educational activities, such specific targeting contributes to the successful and effective implementation of the plans.

In essence, Guimarães has a longstanding commitment to local and international environmental initiatives, particularly in air quality improvement. Through a blend of comprehensive information systems, advanced technologies, and civic engagement, the city ensures environmental quality.

C. Future Plans

Guimarães' goals for 2030 are briefly outlined as the city has become a member of the Green City Accord and formed a Climate Transition Team. The Zero emissions mobility strategy is well-grounded. The combination of digitalisation and the Governance Ecosystem Guimaraes2030 lays a strong foundation for further development and execution of future plans. The city utilises

"liveability monitoring" as a method to strategize and track progress, showcasing a holistic approach that puts air quality within the broader environmental context. Co-benefits are naturally considered in the evaluation, and social impacts are also periodically assessed. Collaboration with the university allows for advanced air quality assessment technologies that will enhance national monitoring through research-based collaborations on air quality monitoring. This way the city is set to meet future assessment requirements.

Between 2024 and 2030, the city has earmarked a budget for initiatives aimed at enhancing air quality. The integration of air quality measures into other plans is both coherent and detailed, incorporating participatory planning and citizen engagement. However, it is recommended to set long-term objectives for 2050 to further strengthen the approach.

3.2.2 Water

A. Present Situation

Guimarães is actively working to improve its water and wastewater management. The city complies fully with the EU Drinking Water Directive, with all 7,885 parameters tested in 2023 meeting the required standards. All water quality information is publicly available.

To promote the use of tap water, the city distributed over 76,000 reusable bottles, installed mobile water fountains at events, and ensured public parks and tourist sites to have free water fountains. Noteworthy is a special program offered to vulnerable citizens who receive financial support for their domestic water consumption.

Wastewater is collected through a separate network and treated in 4 wastewater treatment plants at the tertiary treatment level which fulfils the requirements of the EU Urban Wastewater Treatment Directive (EU UWWTD). A relatively large part of the households in Guimarães (ca. 15%) is not connected to the wastewater treatment network and uses individual septic tanks. It is positive to note that the city has strongly focused on awareness campaigns to lower this percentage. Through the Water Circularity Action Plan, Guimarães uses reused water from swimming pools, for cleaning the streets and in several textile industries.

B. Past Performance

Over the past decade, Guimarães has cut water consumption in municipal-owned buildings by 31% and invested over €6 million in rehabilitating approximately 35 km of its water network. Enhanced strategies for early leak detection and repair have further boosted efficiency.

The city has also invested €42 million since 2002 to extend its wastewater network, with around €9 million spent between 2017 and 2023. For stormwater management, innovative solutions such as retention basins to reduce flooding are used. Continuous improvements in wastewater treatment, including enhanced disinfection procedures and aeration systems, have optimized treatment processes and reduced sludge production.

The city provides its residents with real-time insight into water quality through the monitoring system available within the digital urban platform. Noteworthy is the restoration project of 61 km of river banks, making them more accessible to citizens.

C. Future Plans

Guimarães's future goals include achieving a further 5% reduction in water losses by 2027. Planned investments amount to €11 million for the replacement of water networks and €1.5 million for real-time monitoring systems. The city is also working towards meeting the new requirements of the EU Urban Waste Water Treatment Directive (UWWTD) which is currently [being revised](#) and waiting for final approval, with planned investments in treatment enhancements and sludge management. Initiatives like REACTivar, where 61km of riverbanks are rehabilitated, and the development of the Linear Park will contribute to further enhancing surface water quality and ecological conditions. The city is dedicated to continuous improvement through extensive community involvement, educational initiatives, and the adoption of advanced technologies. Its

strategic commitments are outlined in the city's Sustainable Energy and Climate Action Plan (SECAP) 2030 and are upheld by various EU initiatives and agreements. Robust and comprehensive monitoring schemes are in place to monitor progress effectively. However, it is noted that no concrete measures and goals are set for 2050.

3.2.3 Biodiversity, Green Areas and Sustainable Land Use

A. Present Situation

Guimaraes has around 15,000 ha. of designated sites of national biodiversity importance. This is approximately one-third of the city's area. The city also has approximately 666 ha. of designated sites of local (city) biodiversity importance. Less than 1% of the overall city and 12% of the inner city is classified as public green area. Private green areas consist 28% of the inner city and 12% of the overall city area. The city focuses on harmony between urban areas, forests, and agricultural ecosystems to promote healthy biodiversity. Its dedication is exemplified by its role as co-chair of the EUROCITIES-Green-Areas and Biodiversity-Working-Group. The city ranks top three EU cities with the lowest mortality rates linked to insufficient green spaces, according to [a study](#) published in the journal Lancet Planetary Health. Also, Guimarães pledged to the 3BillionTrees initiative, which involves planting 2,000 trees/year (a native tree for each birth) and involving the private sector.

Tree corridors mitigate urban heat islands (UHI). It links climate change mitigation and adaptation excellently, especially as carbon sequestration has been estimated. The Sponge City concept is also integrated, which is highly commendable for being novel. The Biodiversity-Action-Plan2030 used a bottom-up approach through citizen-science-BiodiversityGo! This is a mobile application that allows citizens to enter data on species in their surroundings. These initiatives have led to the implementation of biodiversity and habitat monitoring programs, supported by extensive citizen participation on a large scale.

The planning of green spaces is part of the local authority's master plan. This includes mandatory green space requirements for new development. However, it is recommended to specify the size of these new green spaces. Overall, the city's actions represent a proactive and forward-thinking stance toward biodiversity management and conservation.

B. Past Performance

Under the National Ecological Reserve legal regime, Guimarães has increased the surface of the protected areas. Between 2010-2021, the city expanded its green infrastructure by 195 ha. (approximately 21%). Notably, emphasis was placed on community gardens that support self-sufficiency and the integration of green and blue infrastructures. The 2015 Masterplan revision introduced the concept of Municipal-Ecological-Structure. This resulted in a significant 26% reduction in the construction area according to the Master Plan. It included the establishment of 96 ha of new green parks, incorporating gardens and nearby parks to enhance recreation, connectivity, and climate resilience. Green roofs are also an integral part of the city's strategy. Over the past decade, €4 million was invested in research and education, facilitating the identification and designation of new areas of interest for biodiversity. This led to the expansion of protected zones and the creation of fresh green spaces. The city conducted a survey of habitats, biotopes, and species and implemented a Biodiversity Route to link protected areas.

The establishment of the Landscape Laboratory in 2014 played a vital role in evidence-based decision-making and the development of research and education projects. This is highly commendable. Since 2015, residents have actively participated in selecting local trees and arboreal clusters for classification. Local bird and pollinator field guides have been produced. Collaboration with other local authorities on biodiversity is ongoing. Noteworthy are the city's urban community gardens, a rural-based incubator, and environmental education programs which are all in place to bolster biodiversity. Brownfield site restoration is underway, with a key milestone being the deactivation and sealing of the municipal landfill in 2008.

C. Future Plans

Future commitments of Guimarães are comprehensive, showing goals for the short, medium, and long term. Additionally, in accordance with the EU 3Billion trees goals, the city is striving to map and monitor primary and old growth forests as part of the action plan to become climate neutral by 2030. The city also aims to engage private companies through the Guimarães-Climate-Pact. The implementation of a GreenBelt aims to capture 24 tons of CO₂ in 2030 and up to 46 tons of CO₂ in 2050 while increasing ecological connectivity within the city. It is highly commended to have conducted this estimate showing the co-benefits of urban green infrastructure implementation in terms of climate change mitigation. Also, the city plans to have rehabilitated all brownfield sites in 2050.

Citizen engagement is well outlined through Rapid-Mass-Engagement strategies, involving inhabitants in urban design and territorial planning. Also, citizens' assemblies and online surveys are planned to engage locals in decision-making establishing a budget-priority model.

3.2.4 Waste & Circular Economy

A. Present Situation

Guimarães' waste management system is robust, with well-established separate collection services for regular waste streams such as packaging waste, biowaste, and mixed waste, as well as collection locations for specific waste streams, such as hazardous household waste, textiles, toys, shoes, and coffee capsules. These efforts have achieved a recycling rate of 48%, covering both source-separated waste streams and recyclables recovered from MBT. Mixed wastes are mainly directed to MBT (R3), with just 3% of untreated waste sent to landfill (D1). From the MBT, 31% rejects are directed to energy recovery (R1) and 53% to landfill (D8). The waste management system serves the entire population through door-to-door collection, on-demand services, and EcoCentres for recycling. Notably, the biowaste collection program, which began in 2022 with 10,000 residents, rapidly expanded to 55,000 residents (35% of the total population of 156,900) by 2024. Within two years, this initiative successfully separated 35% of biowaste, setting a commendable example for other cities.

The "polluter pays" principle is very well applied via the Pay-as-you-throw (PAYT) and Save-as-you-reduce (SAYR) systems, which provide incentives for waste prevention and source separation. Green Public Procurement (GPP criteria) are integrated across multiple sectors, leading, among others, to a plastic-free market and 36% decarbonisation of the municipal fleet. The city's circular economy initiatives, reflected in a 62% circularity index according to ERSAR (Portugal's national authority on water and waste), are recognized as a best practice under the Circular Cities Declaration.

Guimarães is covered by a national infringement on the application of the Landfill Directive, which includes the vast majority of landfills in Portugal. According to the infringement, waste is not treated properly before landfilling. However, as the data shows, Guimarães is doing very well and much better than the Portuguese average.

B. Past Performance

Waste management in Guimarães has significantly improved over the last decade with waste generation decreasing. However, separate collection of packaging waste had increased from 42 kg to 97 kg per capita. Since 2012, the city has reduced direct landfill disposal from 62% to 3% by enhancing waste sorting and recycling, while also expanding the integration of over 4,000 Green Public Procurement (GPP) criteria, incorporating sustainability and social equity into a broad range of procurement processes. The city's commitment to a circular economy started in 2015 with the G4CE (Guimarães for Circular Economy) programme and evolved to cover a variety of initiatives targeting reduction, reuse, repair, and recycling. This included prohibiting single-use materials at city events, expanding second-hand markets, and promoting food waste prevention programmes. These efforts have positioned Guimarães as a leader in waste management and circular economy practices, aligning with European objectives.

C. Future Plans

Guimarães has very well-outlined plans for waste and circular economy. Objectives, measures, and ambitions are already included in approved documents such as the Climate City Contract, Green City Accord, and the Waste Action Plan 2030. Short-, medium- and long-term targets for waste management are well defined with quantitative goals to be achieved. Budget for waste management is allocated up to 2028.

Guimarães aims to achieve climate neutrality by 2030 through its Climate City Contract, focusing on reducing waste generation, increasing recycling rates, and overall promoting the circular economy. Key measures include enhancing separate collection for biowaste and packaging waste and promoting circular business models. The city plans to invest €20 million in waste management and circular economy initiatives by 2028, with food waste prevention and plastics reduction being actively supported through well-designed initiatives. Noteworthy is that the city will further integrate GPP criteria using ISO 20400:2017 guidelines. In this way, sustainable procurement across all municipal departments is ensured. The city will launch a circular business network and replicate successful projects like Urgezes Circular to promote repair, reuse, and sharing economies. Monitoring and evaluation will be conducted through the annual Waste Map and through the reporting of a range of indicators to the different agreements and commitments of the city to ensure the effectiveness of these measures.

3.2.5 Noise

A. Present Situation

Guimarães gives a complete overview of noise data, outlined in the updated noise map (2022). The description of Quiet Zones and Quiet Green Zones in terms of dimension and characteristics is provided clearly. The percentage of citizens living in proximity to quiet areas is high (75%). Several good practices to handle noise pollution have been fruitfully developed. These good practices are well aligned with the EU Green Deal and reporting goals for the Green City Accord. Road traffic is the primary source of noise pollution, and to a lesser extent, some noise-related conflicts concern industrial sources in suburban areas. However, it is noted that the city could benefit from more detailed information on how these conflicts are managed.

The city's plans regarding regulation and measures to enhance awareness are clearly outlined in the application. Guimarães is aiming at progressive zero-emission mobility, including a mobility platform for schools, covering almost 18,000 students. The first Zone30 (an area where 30 km/h is the speed limit) was actualised in 2023 with cycle paths and pedestrian areas, serving 69,000 citizens. The effectiveness of this intervention has been positively tested. A new modulation of noise policy, as well as new mitigation measures for the Municipal Noise Reduction Plan are expected in 2024.

B. Past Performance

In the past decade, Guimarães made significant improvements in noise exposure for its citizens. Progressive noise reduction actions monitored through maps and other instruments like the Guimaraes Mobility Matrix showed how the implemented actions had a positive impact on commuters. This increased the use of soft modes of transport (non-motorised) for short-distance rides. Environmental best practices and cultural heritage are brought together by reducing and/or eliminating noise sources from the city centre and extending the UNESCO-classified areas to adjacent parts of the city.

Acting as Transport Authority since 2021, the municipality has improved the urban public transport system by giving 84% of citizens access to public transport within 300 meters of home. Also, very beneficial in reducing noise pollution is the large-scale investment in electric vehicles, with an important impact on both the reduction of road noise and air quality. These measures are combined with the intelligent management of parking and investments in cycling infrastructure (48 km). The expansion of green areas resulted in a high percentage of perceived quietness. 83% of the citizens consider the green areas near their residence to be quiet or not too noisy.

C. Future Plans

Guimaraes signed the Green City Accord and is committed to following WHO guidelines with both general and local objectives. This shows a strong dedication to achieving significant environmental and noise reduction goals. The measures in place aim to enhance both environmental quality and citizens' quality of life, including positive impacts on noise reduction. Measures are aimed at improving environmental quality and on the quality of life of citizens which also concern positive impacts on noise reduction. Noteworthy are an increase in zero-emission transport, an increase in pedestrian and cycle areas, and Quiet Green Zones with mitigation interventions in place. General awareness actions on noise are envisaged in the context of climate literacy. Also, the city plans to set up integrated noise- and air quality monitoring.

A plan of 13 measures with targets for 2025, 2028, and 2030 is provided defining actions and relative costs, financial needs, and key performance indicators (KPIs). Quiet zones, green zones, and Zones30 are approved by the municipality and will be implemented in the next years. Zero emission strategy considers monitoring indicators related to noise. In the coming years, the municipality will aim to change mobility models and implement the school- and pedestrian mobility plan. However, to further enhance these future plans it is suggested that Guimarães provides projections on how the implementation of specific measures, such as the increase in Zone 30 areas or zero-emission transport, will quantitatively impact noise levels in different parts of the city.

3.2.6 Climate Change: Mitigation

A. Present Situation

Guimarães collects emissions data following the recommended methodologies for their Sustainable Energy and Climate Action Plan (SECAP) as developed by the Covenant of Mayors. Based on this plan, the city has developed a comprehensive governance ecosystem including a long-term commitment to working with citizens and with the knowledge- and education sector.

Guimarães has achieved a high share of renewable energy, with 34% of the final energy demand met by renewables in 2021 and 11% of energy locally produced in 2023. The city is also advancing its carbon-free Sustainable Urban Logistics Plan (SULP) and mandates nearly zero-energy standards for new public buildings, promoting low-carbon development and energy efficiency.

Guimarães' Mobility Matrix monitors the implementation of the sustainable urban mobility plan (SUMP). Transport remains a heavily fossil fuel-reliant sector and is responsible for nearly 36% of energy consumption and 45% of CO₂ equivalent emissions. Guimarães has a relatively low share of public transport usage compared to private motorized transport accounting for 17% of the generated transport flows within the city.

It is supported that Guimarães continues to prioritise public transport infrastructure, including expanding and improving it for residents. Also, it is highly recommended to encourage wider electric and alternative fuel vehicle adoption beyond the municipal operation, through incentives, infrastructure, and awareness campaigns, mainly directed at personal vehicles. Developing cycling and pedestrian initiatives are also suggested to further support climate change mitigation.

B. Past Performance

Guimarães has made significant steps in reducing greenhouse gas emissions. Guimarães has been a signatory of the Covenant of Mayors (CoM) since 2013 and approved its SECAP2030 in 2014. This plan outlines actions to make the city more resilient and climate-neutral by 2030. Over ten years of systematic work has resulted in emission reductions except for the industrial sector. By 2022, the city achieved an overall reduction of 17% in greenhouse gas (GHG) emissions compared to 2019. It is part of the 100 Climate Neutral Cities Mission with a goal to achieve climate neutrality already by 2030. The city is very active in this network and embraces new ideas and support from the scheme.

The reconfiguration of central city pedestrian and bicycle lanes increased from 50% in 2011 to 55% in 2021. However, short-distance journeys made with soft modes outside the central have decreased from 47% (2011) to 30% (2021). It is therefore recommended that the city extends pedestrian and bicycle lanes beyond the central city to create a continuous and interconnected network. In doing so, it is recommended to identify and prioritize key corridors that connect residential areas, schools, workplaces, and recreational areas and implement dedicated bike lanes and pedestrian paths along these routes. After 2014, energy consumption trends increased, indicating a potential lack of long-term sustainable energy practices within the industrial sector.

C. Future Plans

Guimarães has ambitious plans to reduce emissions by 80% by 2030, as outlined in its SECAP2030. Key measures include implementing the European Solar Rooftops Initiative to boost renewable energy use, integrating ICT for efficient energy management, promoting sustainable requalification practices, and enhancing public engagement through initiatives like the Climate City Pact. The city aims to achieve zero-emission mobility by expanding bicycle infrastructure, implementing near-zero emission public transport passes, introducing hydrogen buses, and prioritizing pedestrian-friendly infrastructure. Establishing a robust Monitoring-Reporting-Verification system for the Climate-City-Contract and SECAP2030 ensures that progress is tracked accurately and transparently.

Emissions in the industrial sector still lags behind other areas. To address this, it is advised that Guimarães develops comprehensive energy efficiency programs targeting industry specifically. It is mentioned that incentivizing the transition to renewable energy by, for example, installing on-site solar panels, wind turbines, or biomass systems, could accelerate progress in this sector. To support this, it is advised that Guimarães facilitates partnerships with local parties such as renewable energy providers.

The development of the 2030-Climate-City-Contract under the 100 Climate Neutral Cities Mission and other local strategies has accelerated the transition toward a sustainable future. The 2030-Investment-Plan identifies funding and finance opportunities, including innovative finance schemes for the private sector, ensuring sustained support for climate action initiatives.

By 2050, Guimarães plans to achieve 100% Eco-citizens status, complete climate neutrality, and enhanced resilience. The goal of achieving 100% Eco-Citizens status by 2050 means that Guimarães aims to have all its residents fully engaged in sustainable living practices. This involves a comprehensive adoption of environmentally friendly behaviours and lifestyles across the entire population. Key measures include reducing energy demand, maximizing renewable energy use, transforming public infrastructure to nearly Zero Emission Buildings standards, prioritizing zero-emission mobility, and fostering a circular economy. Guimarães will also focus on strong community engagement and continuous monitoring of their sustainability efforts.

However, a more comprehensive energy efficiency strategy for residential and commercial buildings is needed. The city may increase engagement to make everyone feel responsible for climate action. This could be the promotion of energy conservation and sustainability through campaigns.

3.2.7 Climate Change: Adaptation

A. Present Situation

The Guimarães Adaptation Plan provides a systematic climate risks and vulnerabilities assessment. The city is a member of the EU Cities Mission for Adaptation as well as the Climate Neutral and Smart Cities Mission. Under the latter, Guimarães developed their Climate City Contract for which it was awarded the EU Mission Label. The city co-created climate ambitions and adaptation measures with various stakeholders and citizens, which were integrated into its SECAP. Awareness of citizens is very high on key climate impacts including heat increase, forest fires, and flood events also causing landslides. The SECAP defines 53 adaptation measures, each with several indicators including partnerships, cost-benefit analysis with environmental,

social, and economic direct benefits, and monitoring. The municipal strategy for climate change adaptations was revised and updated in 2022.

To decrease the percentage of areas affected by natural fires, various nature-based solutions are in place. They include tree planting programs, the creation of tree corridors, legal actions protecting trees, and large-scale actions against forest fires. This resulted in 90% less affected area than in 2013. Protection of agricultural areas is incorporated in the Masterplan to increase food security. Urban agriculture covers 16% of the inner-city area. 10 hectares are dedicated to community gardens and half of the schools maintain their own gardens. Guimarães emphasizes urban-rural relations, entrepreneurship, private sector engagement, green jobs, citizen science, and climate justice. Additionally, the city has implemented various water-related measures to address flooding and erosion. A Municipal Integrated Operations Centre focuses on synergies and trade-offs for mitigation and adaptation. This Centre is supported by a Climate Transition Team. They have periodic meetings with the City Council and manage a digital platform for citizen engagement. All of this is highly innovative and to be commended.

B. Past Performance

The city formulated its first adaptation strategy in 2015 using an especially developed methodology to assess adaptation achievements. This comprised of six interrelated steps and used the year 2000 as a baseline. Four new climate stations have been added to monitor meteorological events. Climate scenarios were analysed up to the end of the century. Different scenarios of climate risks and spatial distribution of social vulnerability were identified very well. Between 2010-2021, green infrastructure was expanded by 21%.

To enhance engagement, Guimarães created a Landscape Laboratory. This builds up social innovation, enhances citizen science, and supports scientific evidence-based decision-making. Youth are supported to become change leaders, and citizen Green Brigades undertake actions. The communications and engagement strategy actively targets the private sector. Moreover, a strong connection is made to the UN Sustainable Development Goals in the formulation of climate targets.

However, although most of the described past performance is highly commendable, many actions that have been taken over the last decade are not clearly detailed.

C. Future Plans

Guimarães has transformed its governance structures to accelerate the transition. Consolidated as 2050 "One Planet City", the city aims to leverage its local actions towards global climate solutions and contribute to the EU Green Deal. Demonstrating the city's high ambitions, Guimarães wants to be carbon neutral by 2030, ahead of the national target of 2050. Future measures include a Smart Decision Support System, including disaster alert and monitoring systems, food security actions, sustainable construction regulations, sustainable urban drainage systems, green and blue infrastructure including green belt, and climate literacy. Policy commitment is indicated clearly by the role of the municipality as chair in the Climate Adaptation section of the Association of Portuguese Municipalities and other networks related to climate change adaptation.

The city aims at empowering citizens for joint climate action. The NetZeroCities Pilot Cities DistrictC-Zero-Carbon-Commitment under the 100 Climate Neutral Cities Mission is building capacity and ensuring climate justice through social innovation practices, such as Citizens' Assemblies and Placemaking strategies. The municipal budget and activity plan are evaluated in terms of SDG impacts. Small-scale pilots are made replicable. The city also uses the Ecological Footprint method to gauge the impact of its actions. The implementation of these actions is monitored by a committee with 37 members from local, regional, and national institutions and approved by the city council. These plans are very promising for large-scale impact in the city and beyond.

4. Technical Assessment Heilbronn

4.1 Introduction Heilbronn

Nestled in the vineyard landscapes of Baden-Württemberg and along the banks of the Neckar River in Germany lies the city of Heilbronn. A city that has undergone remarkable transformations since its post-World War II reconstruction. With a population of 132,533 inhabitants spread across 99.88 km², Heilbronn has shifted from an industrial powerhouse to a centre of knowledge and innovation. This evolution is marked by the presence of high-rise buildings, pedestrian zones, and underground parking lots that reflect a metropolitan flair. The city's focuses on education and research, hosting a variety of local and international higher education and research institutions such as Hochschule Heilbronn, TU Munich, and ETH Zurich. Heilbronn is also home to Germany's largest science centre dedicated to promoting environmental consciousness. Furthermore, the city is looking towards the future with the development of the innovation park for artificial intelligence. The artificial intelligence campus strives for comprehensive sustainability through CO₂-optimized construction and the use of recyclable building materials. Despite these advancements, Heilbronn faces challenges like ecological water conditions due to cooling activities from the former nuclear power plant Neckarwestheim and coal power plant, which negatively impact the Neckar River. Additionally, concerns like air pollution and noise persist due to the high volume of commuters. Nevertheless, Heilbronn remains committed to addressing and improving these environmental issues as it continues its journey of urban innovation.

Table 4.1 – Heilbronn Key Performance Indicators EGCA 2026

Indicator	Number	Unit
Air Quality		
Number of days where the daily limit value for PM ₁₀ has been exceeded per year for each sampling point	2	No.
Number of hours in which the hourly limit value for NO ₂ has been exceeded per year for each sampling point	0	No.
Water		
Domestic water usage (drinking water)	138	l/capita/day
Proportion of water losses from the distribution network	1.9	ILI index
Proportion of population connected to the wastewater collecting system and treatment plant(s)	99.9	%
Biodiversity, Green Areas, and Sustainable Land Use		
Population density in built-up areas (city area minus green and blue)	60.3	inhabitants/ha
Percentage of people living within 300 m of green urban areas of >5,000 m ²	-	%
Waste and Circular Economy		
Amount of municipal waste generated per capita	479	kg/capita/year
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)	50	%
Noise		
Share of the population exposed to total noise values of L _{den} above 65 dB(A)	8.53	%
Share of the population exposed to total noise values of L _n (night noise indicator) above 55 dB(A)	8.75	%
Climate change mitigation		
Total CO ₂ emissions/capita	8.7	t CO ₂ /capita
Energy usage/capita	24 450	kWh/capita

4.2 Results per Environmental Indicator Heilbronn

4.2.1 Air Quality

A. Present Situation

Heilbronn presents a comprehensive overview of air quality data. The predominant challenges in the city regarding emissions are related to road transport, industry, and small-to-medium-scale energy production sectors. Despite these challenges, Heilbronn currently boasts a commendable air quality. The monitoring of Heilbronn's air quality is conducted consistently by a reputable institute called Baden-Württemberg State Institute for the Environment (LUBW). The two monitoring stations in the city are managed by the state of Baden-Württemberg. It seems that no monitoring stations are operated by the city itself.

The air quality data, alongside information from the European Environment Agency (EEA), indicate that several parameters exceed standard levels. To address these exceedances, it is crucial to develop a strategic and comprehensive Air Quality Plan. Heilbronn has had one urban background and one urban traffic SPO (Station for Pollution Observation) throughout the entire period 2018-2022.

Heilbronn has taken proactive steps to enhance participation concerning air quality and environmental matters by establishing the Heilbronn Dashboard for environmental data. Through engagement in public consultations, conducting awareness campaigns, and organizing tailored initiatives for new residents, Heilbronn demonstrates a commitment to involve its citizens. Nonetheless, fostering a more sustained partnership with civil society is recommended for mutual development goals. Experts mention that this becomes particularly crucial looking forward, given the impending challenges related to the evolving accessibility of the city centre, necessitating extensive collaboration with the public.

B. Past Performance

Since 2008, Heilbronn has made steady progress in its sustainability and climate protection efforts. The measures introduced in 2020 in particular, have led to a significant decrease in the levels of particulate matter (PM_{2.5} and PM₁₀) and NO₂. Overall, the annual average values for all pollutants show a declining trend from 2013 onwards.

The traffic monitoring station initially failed to meet the NO₂ annual average standards. However, since 2019, there has been a significant improvement, largely due to various road transport measures that have been implemented. These measures include speed limit reductions, restrictions on lorries, and better management of parking facilities. Measures for other sectors were not provided. Given its significant contribution to emissions in the area, it is recommended to develop targeted strategies for the industrial sector.

C. Future Plans

Heilbronn's future strategies include the introduction of a novel mobility scheme. This scheme is aimed at reducing the reliance on individual motorised transportation and the complete transition to decarbonized energy sources. These plans are in alignment with the climate change mitigation blueprint. The three key initiatives unequivocally embed air quality within the framework of environmental-climate dynamics, demonstrating a profound comprehension of the system. These initiatives already harbour advanced technological features, but it is noted that there is potential to enhance them through greater involvement of the public beyond the existing digital tools and Mobility Week. The collaboration with industrial partners to improve air pollution management is mentioned as particularly significant.

Overall, Heilbronn's future plans on air quality lack detailed specifications and fail to outline clear objectives for 2030 and 2050. The monitoring of progress predominantly focuses on technological aspects (air quality and climate change mitigation metrics, mobility tracking), while there's an opportunity to consider the social and socio-economic impacts of these initiatives.

4.2.2 Water

A. Present Situation

In Heilbronn, drinking water consumption is low at 138 litres per capita per day, with minimal water losses of around 2%, reflecting efficient management and infrastructure upkeep. The quality of drinking water largely complies with the EU Drinking Water Directive, though minor deviations occasionally occur. Despite having ample and high-quality water supply, encouraging tap water consumption poses challenges. This is due to potential quality issues arising from household plumbing. Consequently, the city offers complimentary water analyses to its residents. Nonetheless, the city's efforts to support vulnerable or marginalized groups in getting access to drinking water remain unclear.

Heilbronn's wastewater management system is exemplary, with 99.9% of the population connected to the network, fully meeting the standards of the EU Urban Waste Water Treatment Directive (UWWTD). Impressively, the wastewater treatment plant (WWTP) is nearly 60% self-sufficient in electricity. A high number of sewer overflows indicates a pressing necessity for enhanced stormwater management practices. Rainwater collected through a separate sewer system is directly released into surface water bodies. However, the variable ecological and chemical conditions of surface water bodies indicate that improvements are needed. Most groundwater bodies show a good status.

B. Past Performance

Heilbronn has achieved a high wastewater system connection rate of 99.9% for its population, with most connections dating back over a decade. To oversee and enhance operations, the city has consistently outfitted combined sewer overflow (CSO) treatment facilities with monitoring devices, leading to a reduction in overflow incidents. The introduction of separate sewer systems in new urban areas has bolstered stormwater management. Rainwater is channelled through retention soil filters before being released into man-made lakes. Although the UWWTD has been fully implemented for over a decade, efforts have primarily focused on enhancing phosphorus elimination at the WWTP. Overall water consumption has increased by almost 7% since 2014, in line with a population growth of 7,6% in the last 10 years.

The city conducts regular on-site inspections to ensure compliance with the legal prohibition on fertilization in riparian buffer zones. Several measures have been undertaken on watercourses, including adjusting straightened river paths, removing obsolete drop structures like former weir systems, levelling steep embankments, and establishing buffer zones. To increase the water protection standards, Heilbronn has designated two new protection areas and executed several river restoration projects. Currently, 29% of its territory is delineated as water protection zones. Initiatives to procure land within riparian buffer zones and promote the natural development of these areas have also played a role in upholding good water quality.

C. Future Plans

Heilbronn has clearly defined objectives for 2030 and 2050. Significantly, this is accompanied by detailed budget allocations and implementation schedules to achieve these goals. The city's targets include expanding self-water extraction and enhancing reservoir capacity. A key initiative is the "Smart Water Supply" project, focusing on detecting water leakages through advanced water meters and analytical tools. Plans also involve modernizing the network flushing system and consolidating water zones. By 2030, Heilbronn aims to modernise its sludge treatment processes, boost self-generated electricity to almost 70%, and introduce photovoltaic installations and energy-saving measures to align with the UWWTD. Furthermore, the city plans to recover phosphorus from sewage sludge by 2029 and address trace contaminants by 2050.

To achieve good ecological and chemical statuses for all water bodies by 2050, Heilbronn intends to initiate renaturation projects and reduce nitrate levels in groundwater through continuous enforcement of the Protected Area and Compensation Ordinance (SchALVo).

The application includes well-considered and budgeted measures for all relevant objectives, grounded in Heilbronn's Climate Protection Master Plan, with strategic commitments that support

ambitious plans to minimize rainwater discharge and enhance water bodies. Enhancing public engagement and collaborating with neighbouring municipalities is recommended for the successful execution of these plans, as well as involving residents in water conservation and promoting tap water use through targeted awareness campaigns.

4.2.3 Biodiversity, Green Areas, and Sustainable Land Use

A. Present Situation

Heilbronn houses 3% green space within the inner city and 13% across the entirety of the city, which are relatively modest figures. However, the city has an impressive total of 62 Natura 2000 sites, 5 nationally significant biodiversity sites, and 478 locally designated biodiversity sites. In total this encompasses approximately 1,500 hectares. The city describes itself as a green city, mostly because of its abundant 48,000 urban trees. The Green Concept, established in 1992 and further elaborated in a 2004 feasibility study has significantly influenced its urban development direction. Heilbronn actively safeguards biodiversity through the conservation of protected natural areas such as nature reserves, diverse habitats, landscape protection zones, natural landmarks, and safeguarded biotopes. The city lacks independent monitoring programs for species and habitats but relies on data provided at the state and regional levels.

As outlined in the Landscape Plan 2030, a key aspect of Heilbronn's approach is the deliberate integration of nature into urban infrastructure and design. This involves the incorporation of green infrastructure elements throughout the inner city, including nature-inspired features like green roofs, living walls, green facades, and rain gardens. Heilbronn is working together with national and regional governments on improving biodiversity, green areas, and sustainable land use. The city's role in this collaboration involves designating protected areas, granting permits for environmental activities, and assessing the environmental impacts of development projects.

Heilbronn has initiated several programs managing urban expansion and preventing soil sealing, to align with EU initiatives regarding soil conservation. Additionally, subsidy schemes have been implemented to curb soil erosion.

To involve the local populace, the city has outlined numerous activities through a dedicated Participation Portal. This engagement strategy has been ongoing since 2013 and is exemplified by the collaborative creation of "Guidelines for Participatory Citizen Involvement."

B. Past Performance

In Heilbronn, the total area of public green spaces has largely remained constant over the past decade. With an additional 17 ha, park area increased slightly. Efforts to increase the number of street trees have involved greening and de-sealing initiatives. Despite ongoing urban development processes, the extent of protected areas has remained unchanged for the past 20 years.

The city made some remarkable steps in the development of parks and green areas. A good example of this is the restoration of a specific brownfield site (also part of the 2019 Federal Garden Show) as part of a high-quality urban residential zone featuring ample green spaces and water bodies. This redevelopment adhered to the principles of blue-green infrastructure, aligning with the concept of a sponge city.

No specific information on trends in habitat and flora & fauna was provided. However, the city has introduced various biodiversity projects to offset the decline in flora and fauna. This includes the establishment of an amphibian breeding ground in the city's forest in 2023. Despite these efforts, biodiversity in the inner city, outside of nature reserves, has decreased due to intensive farming practices, rapid urban growth, and the increasing prevalence of gravel gardens adopted by private households. Two brownfield sites have been revitalised in the past decade. It is recommended to provide more specific details about biodiversity initiatives and their impact to ensure the comprehensive monitoring of these initiatives.

C. Future Plans

Heilbronn's future strategies for enhancing and preserving green and safeguarded areas are limited to a concise yet fairly general set of goals. However, clear indications of economic resources with associated timelines are provided for various projects and initiatives.

In Heilbronn's plans, biotope networks are set to be established in the urban zone, further detailed in localised Biotope Network Plans for specific neighbourhoods. As part of the "Insect Buffet" scheme, sections of grasslands within green spaces and parks are being transformed into biodiverse meadows. Within inner-city green areas, a significant portion of seasonal flower beds are converted into drought-resistant perennial beds. It is mentioned that this has not only practical benefits but also serves as a powerful symbol of resilience to the community.

Plans are also in place for Biotopes Network Planning in vineyards, supported by agro-strips to support ecological growing and vineyard support schemes enhanced by public funding. The establishment of a dedicated Biotopes Network Ambassador is on the agenda. This will be financed fully by the state of Baden-Württemberg for a five-year tenure. It is expected that additional funding will be required for this and other initiatives supporting the expansion of green spaces.

With the Landscape Plan 2030, the city has developed a planning instrument that serves as a tool for environmental education. Ongoing monitoring of species conservation zones within urban land use planning is underway. Plans for monitoring biotope connectivity are set to commence in 2025.

4.2.4 Waste & Circular Economy

A. Present Situation

Heilbronn's existing waste management system is comprehensive, nearly covering 100% of the population. Aiming to incentivize waste minimisation, the city uses various collection methods for different waste categories such as residual, organic, paper, and light packaging. These methods offer flexibility in container sizes and collection frequencies. In 2022, the city produced almost 480 kg of municipal waste per capita, with a recycling rate of 50% and an incineration rate of 34%. The rest is landfilled.

To encourage residents to separate waste effectively, the city established economic mechanisms like "Pay as you throw" (PAYT). This involves varied fees based on waste container sizes and collection frequencies, alongside reduced biowaste collection charges. Public awareness campaigns are facilitated through a waste management app, informational guides, social media platforms, and diverse community events.

Heilbronn's dedication to waste management and the circular economy is evident in its procurement policy, which adheres to the EU Green Public Procurement (GPP) criteria and prioritizes sustainable product acquisition. The city's circular economy initiatives include municipal orchards, second-hand goods stores, and repair cafés aimed at promoting reuse practices and reducing waste. Overall, the current system demonstrates significant integration of waste collection, processing, and community involvement. However, further enhancements in recycling rates, biowaste collection efficiency, and overall waste reduction efforts are recommended.

B. Past Performance

Over the past decade, Heilbronn has achieved a 17% reduction in per capita waste, with a notable 12% decrease in residual waste as a result of the implementation of incentivising measures such as variable fees based on waste container sizes and collection frequencies. The city has established an extensive separate waste collection system for different streams, ensuring high participation and efficiency. Most measures were introduced over 20 years ago, hence improvements in the last decade have mainly been incremental.

A network of recycling centres, including a mobile service, facilitates the recycling of all waste streams at single locations. This reduces travel distances and enhances convenience for citizens. Although some construction waste is still sent to landfills and waste quantities vary with economic activity, the city has overall enhanced its recycling efforts.

To improve public engagement, Heilbronn implemented various communication channels and barrier-free information access has supported these improvements. Initiatives promoting reuse and repair, such as second-hand stores and repair cafés, further strengthen the city's circular economy initiatives. Heilbronn's past performance reflects a strong commitment to waste reduction, efficient management, and fostering a circular economy. Continuous effort is advised to maintain and build upon these achievements.

C. Future Plans

Heilbronn's future waste management strategies are aimed at advancing the circular economy by diminishing residual waste and increasing separate collection systems. The primary goals set for 2030 encompass the introduction of incentive systems to curtail waste generation, digitalizing waste collection procedures and fee invoicing, and improving the standards of biowaste collection.

Beginning in 2026, a €2.1 million container identification scheme will be implemented to enable digital recognition and billing for actual waste collections, aimed at enhancing operational efficiency and reducing waste output. Additionally, the city intends to modernise recycling centres, enhance citizen services, and intensify public outreach campaigns to advocate waste reduction and circular economy principles.

By 2030, stringent sustainable procurement guidelines will be enforced across all procurement activities. Continued partnerships with second-hand stores and repair shops, along with public awareness campaigns, will support initiatives focused on reusing and repairing items. These ambitious strategies exemplify a methodical approach towards meeting European targets, placing significant emphasis on community engagement and infrastructural enhancements. However, it is noted that apart from the container identification scheme, the other activities planned to enhance waste management and circular economy in the city need more information on budget estimations and scheduling.

4.2.5 Noise

A. Present Situation

Heilbronn has a comprehensive overview of noise data, as outlined in the updated noise map (2023). These data are combined with a clear outline of national noise limit values and the number of complaints received. The maps are supported by a description of different sources (mainly roads, aggregated in various ways) and the estimated number of people living in areas exposed to noise pollution. Heilbronn thoroughly reports on the implementation of noise-reducing asphalt (which leads to a reduction by 3 dBA), roads subject to speed restrictions, and streets eligible for window support programs, in accordance with the latest Noise Action Plan (2019). Also, speed monitoring in 15 identified hotspots and the designation of two quiet areas were taken into account. Approximately 26% of residents live within a 300-meter to a quiet area.

The Noise Action Plan Stage IV is under development. It encompasses an elaboration of the actions planned in the previous plan, such as noise-reducing asphalt in seven more streets, speed limits of 30 km/h in two more streets, measures to prioritise public transport, and speed monitoring at noise hotspots. Community engagement is robust, as is shown by the reception of 23 suggestions for the Noise Action Plan Stage IV and with further public consultations on the agenda. However, to further optimise the efficiency of the cities' noise management strategies, it is recommended to incorporate in-depth impact assessments for each intervention.

B. Past Performance

Heilbronn offers a clear and complete summary of an impact analysis across the four stages of the Noise Action Plans, based on data from 2009 to 2024. Although the data is not directly comparable due to different calculation methods (END, CNOSSOS EU), trends can clearly be identified. Trends are presented in the number of exposed people during, as well as the number of noise protection measures implemented in recent years as a result of the Noise Action Plans and the Mobility Concept. The presented information shows an increasing number of noise protection measures and an expected decrease in the number of exposed population.

The first basis for the Heilbronn Mobility Concept 2030 was carried out in 2015 and approved in 2020. It included measures directly connected to road noise mitigation including traffic and access regulation, car-free zones, speed limits, and the successful campaign "Walking to schools".

Heilbronn's efforts to engage citizens are reflected by only one but significant awareness action: the Summer Zone. From 2022 a recreational area was created in the city centre, transforming a noisy road into a multi-purpose pedestrian area. It is recommended that Heilbronn incorporates a robust mechanism for public feedback and engagement to enhance its noise management strategies further.

C. Future Plans

The city clearly outlines its targets for noise reduction for 2030 and 2050. Heilbronn is aiming to reach greenhouse gas neutrality by 2035. These targets are also reflected in the Mobility Concept (as part of the Climate Mitigation Concept) which shows a holistic approach to urban planning. An ambitious modal shift strategy has been in effect since 2015 and will continue until 2030. A dedicated noise section is incorporated into the Landscape Plan 2030. It focuses on enhancing noise conditions by greening roads and railway lines, as well as improving public transportation systems by reactivating two railway lines to surrounding areas and piloting with financial incentives for citizens. Budgets are allocated for noise-reducing asphalt and soundproof windows.

Heilbronn is also working indirectly on noise reduction, by taking air quality measures. These are outlined and visually depicted in a comprehensive overview of mobility initiatives. Noteworthy is the innovative initiative targeting neurodivergent individuals needing quiet spaces. This involves the implementation of "silent hours" and designated noise-reduced areas and timeframes within public spaces and commercial establishments. Additional initiatives are scheduled for the redevelopment of the city centre, aiming to modify the routing and environmental characteristics of two main streets. To further enhance its noise management strategy, it is recommended that Heilbronn implement a continuous noise monitoring system with a corresponding public information platform.

4.2.6 Climate Change: Mitigation

A. Present Situation

Heilbronn employs a robust monitoring system for energy and CO₂, including regular Municipal Energy Reports and CO₂ reduction plans, complemented by the Baden-Württemberg standard "BISKO" for comprehensive tracking. The transport sector represents 29% of energy consumption and 26% of CO₂ emissions. In response, the city has undertaken significant measures such as installing solar panels on municipal buildings and expanding the tram network to better connect the inner city with neighbouring areas. The 2023 campaign "Heilbronn, das Klima und WIR" showcases local climate efforts for homes, businesses, and industries. This is followed by the 2024 climate protection campaign "WIR-Pakt".

The city outlines strategic goals in the 'Climate Mitigation Concept' which include promoting renewable energy and improving energy efficiency. However, it does not delve into detailed implementation steps. To ensure Heilbronn meets its climate goals, experts deem it essential to develop a Sustainable Energy and Climate Adaptation Plan (SECAP) with specific, measurable

targets for greenhouse gas reduction and energy efficiency, allowing for regular monitoring and evaluation.

Heilbronn thoroughly addresses transport emissions and has developed a Mobility Concept 2030 and an E-mobility Concept to guide actions for reducing emissions in the transport sector. A Sustainable Urban Mobility Plan (SUMP) and a Sustainable Urban Logistic Plan (SULP) are incorporated into the Mobility Concept for 2030. Within the Heilbronn policy structure, climate protection had been upgraded to a separate unit. It is advised to incorporate a strong unit that is able to influence strategic decisions related to other sectors, to integrally tackle climate change mitigation challenges.

Since 2015, Heilbronn's energy demand is 10% renewable. This suggests a high reliance on non-renewable energy, which could slow the city's carbon reduction goals. Therefore, it is recommended that Heilbronn invest more in renewable energy. This might include more wind energy and the European Solar Rooftops Initiative. Incentives for private and commercial enterprises to embrace renewable energy solutions are also advised to increase the city's renewable energy mix.

B. Past Performance

Heilbronn's application describes that the creation of the Climate Protection Office and Municipal Energy Management in 2012, significantly advanced structural energy and climate mitigation efforts, leading to measures that fostered E-mobility and enhanced energy efficiency in municipal buildings. However, no recent data from the years 2015-2024 is provided to quantify the impact of these initiatives.

The city has actively promoted renewable energy through initiatives such as the installation of solar panels on municipal buildings. Currently, they supply around 25% of the total electricity demand for these buildings. Additionally, the city has facilitated the establishment of energy cooperatives to encourage investment in renewable energy by residents and businesses. Specifically, Heilbronn has supported the formation of two energy cooperatives; Citizen Energy Cooperative Heilbronn and Renewable Energy Citizen Energy Heilbronn. While transport represents the largest portion of energy consumption for Heilbronn, unfortunately, no measures for this sector are outlined.

Despite successful initiatives in certain areas, Heilbronn's per capita energy consumption has risen over the past decade, suggesting the need for a more holistic approach to reducing energy use across all sectors.

C. Future Plans

Heilbronn's future plans are aligned with the target of the German national government to achieve negative emissions. The city's Climate Mitigation Concept outlines strategies for renewable energy, energy efficiency, and comprehensive stakeholder engagement to exceed its 2035 net greenhouse gas neutrality goal. For the transport sector, Heilbronn's ambition is to increase alternative fuels to 53% and to reduce private motorised transport by 22%. Currently, these ambitious climate mitigation strategies mainly focus on energy transition and transport. Measures for the building sector are less advanced. Therefore, it is recommended that the city strengthen measures in the buildings sector, to ensure integration with the broader Climate Mitigation Concept and alignment with the city's overall climate goals. Examples that are mentioned, include the development of a detailed action plan for retrofitting existing buildings with energy-efficient technologies and promoting the adoption of energy-efficient building standards for new constructions.

The city is planning to increase the use of renewable energy significantly, including developing the Stöckach Wind Park and participating in hydrogen research projects like the "H2-Innovationslabor." The expansion of rooftop photovoltaics on private housing through awareness campaigns and networking also highlights a comprehensive approach to increase renewable energy use.

To boost energy savings, the Energy Agency Heilbronn is advised to enhance awareness campaigns, offer additional consultations, and provide financial incentives for homes, businesses, and industries.

4.2.7 Climate Change: Adaptation

A. Present Situation

Climate risks in Heilbronn are an increase in heat days concomitant with highly sealed urban areas, resulting in urban heat islands, and urban flash floods caused by intense rainfall. The city has a good overview of these risks, although it is recommended to identify exposure factors more thoroughly.

Approved in 2021, the Climate Adaptation Concept encompasses six key action areas: green space, agriculture, health, social infrastructure, housing, and water management. This integrated approach facilitates effective, cross-sectoral implementation of climate adaptation measures. It is recommended to expand these efforts to other sectors to identify key synergy opportunities between climate change adaptation and mitigation and accelerate the implementation of actions. The first pilot projects with PV panels and green roofs will be carried out in 2024.

Heilbronn is also incorporating the larger region in its interdisciplinary planning approach, directed at the development of mixed-age deciduous forests. This is very noteworthy. For nature-based solutions, the Landscape Plan 2030 describes the development of interconnected blue-green infrastructure. Although mentioned in this plan, it is recommended that nature-based solutions are identified more thoroughly. The municipality has a dedicated office for climate change mitigation. Adaptation is also one of the topics this office is focusing on. Generally, this is very positive, although the specific tasks of this office are not clearly outlined. The presented information about specific actions is quite generic, as a result of which the expected impact is not clear.

B. Past Performance

Temperature and precipitation data have been recorded by Heilbronn since 1997. The first Climate Analysis was published in 2017, followed by the Landscape Plan 2030 in 2021. In 2022, an Executive Office was established to implement the Mitigation and Adaptation Concepts. The climate change adaptation agenda of Heilbronn was aimed at greening the urban area. Renaturalisation of brownfield sites for recreational purposes has been a focal point since the 1990s.

To create more green space, the city has revitalised a railway brownfield site, creating 17 ha of green space as well as a climate-adapted neighbourhood. The latter showcases green facades and an innovative water management system separating rainwater. The city has also implemented two climate forests, one of which has an area of 800m². The city mentions that several prizes were awarded for this forest. One was awarded the German Landscape Architecture Prize 2021 because it disrupts one of the city's largest traffic intersections. For the one covering almost 800 square meters, the city won the Special Prize for "Sustainability and Climate Adaptation in Urban Areas" at the Baden-Württemberg Landscape Architecture Prize 2024. Also, the city created "Summer Zones" equipped with green walls, plants, and seating areas. It is recommended to enhance the effectiveness of existing measures by providing comprehensive information on their systemic nature. For example, consider integrating green and blue infrastructures within ventilation corridors or implementing surface desealing strategies to address the city's identified priorities, such as the Urban Heat Island (UHI) effect and flash flooding.

Heilbronn has effectively identified policy and planning tools, but it remains unclear how specific initiatives and projects are connected to these tools. While all projects contribute to climate change adaptation, not all were specifically designed with this goal in mind.

C. Future Plans

A Spatial Adaptation Concept that will spatially locate measures is forthcoming in 2024. The role of this concept as a driver of actions for climate change adaptation is not yet known. In line with various EU strategies, short-, medium-, and long-term goals have been defined to reduce vulnerability, increase resilience, raise awareness, and integrate climate change adaptation at all action levels. Adaptation measures are integrated with several other general and sectoral level plans, such as Land Use, Water Development, and the Biotopes Network. Federal funding has been procured to revitalize another railway brownfield site and redesign two key urban streets. The latter are designed as de-sealed, car-free and rainwater managed with water features.

By 2030, Heilbronn will implement flood protection walls and by 2050 individual green spaces, green rings, and parks will be expanded and interconnected. The effects of these adaptation measures are subject to monitoring using digital remote sensing tools, although no details are provided about who is responsible for these monitoring activities. All the presented measures are commendable, but it is recommended to make more explicit how this plan connects to the landscape of the broader region e.g. agricultural and forested areas. It is recommended to expand on the systemic approach in the planning to be able to evaluate e.g. the cooling effect of green infrastructure in terms of climate change mitigation as a co-benefit. Also, further explicit analysis of other co-benefits of biodiversity and other ecosystem services is advised.

5. Technical Assessment Klagenfurt on Lake Wörthersee

5.1 Introduction Klagenfurt on Lake Wörthersee

Klagenfurt on Lake Wörthersee, with a population of 104,578 residents, is the 6th largest city in Austria. It serves as the regional capital of Carinthia. Located in the Southern part of Austria, Klagenfurt offers proximity to Italy and Slovenia, with Ljubljana and Udine being just an hour away. The city has a diverse population, with over 20,000 non-Austrian residents making it a modern international hub. Known for its wide geographical surface of 120 km² and low population density, Klagenfurt is situated at around 450 meters above sea level, next to the prominent "Ulrichsberg" mountain reaching 1022 meters. Located on the eastern shore of Lake Wörthersee, a popular tourist destination known for its warm waters, Klagenfurt prioritizes green infrastructure and climate change adaptation initiatives such as sustainable tree planting. Culturally rich, the city offers numerous attractions including theatres, concert halls, and museums, showcasing a vibrant arts scene. As the economic and administrative centre of Carinthia, Klagenfurt hosts a university, attracting over 12,000 students, along with various businesses from small to large enterprises. Accessible by rail, road, and air, the city is set to benefit from the upcoming Koralm railroad line, promising reduced travel times to cities like Graz and Vienna in the near future. Facing environmental challenges due to climate change, Klagenfurt is actively working on both mitigation and adaptation strategies, with initiatives like the Smart Climate Lab Klagenfurt paving the way for a sustainable future.

Table 5.1 – Klagenfurt Key Performance Indicators EGCA 2026

Indicator	Number	Unit
Air Quality		
Number of days where the daily limit value for PM10 has been exceeded per year for each sampling point	5	No.
Number of hours in which the hourly limit value for NO ₂ has been exceeded per year for each sampling point	0	No.
Water		
Domestic water usage (drinking water)	185	l/capita/day
Proportion of water losses from the distribution network	14	ILI index
Proportion of population connected to the wastewater collecting system and treatment plant(s)	99.5	%
Biodiversity, Green Areas, and Sustainable Land Use		
Population density in built-up areas (city area minus green and blue)	44	inhabitants/ha
Percentage of people living within 300 m of green urban areas of >5,000 m ²	55.15	%
Waste and Circular Economy		
Amount of municipal waste generated per capita	446.6	kg/capita/year
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)	38.5	%
Noise		
Share of the population exposed to total noise values of Lden above 65 dB(A)	4.7	%
Share of the population exposed to total noise values of Ln (night noise indicator) above 55 dB(A)	5.3	%
Climate change mitigation		
Total CO ₂ emissions/capita	3.2	t CO ₂ /capita
Energy usage/capita	22 153	kWh/capita

5.2 Results per Environmental Indicator Klagenfurt on Lake Wörthersee

5.2.1 Air Quality

A. Present Situation

Data about monitoring stations and information about available air quality levels are provided clearly. Klagenfurt has a comprehensive monitoring program that goes beyond the basic requirements. It includes PM_{2.5}, PM₁₀, NO₂, and Benzo(a)pyrene.

The city's air quality is consistently good, even in traffic-exposed areas, with vehicular transport and local heating being the primary emission sources. No large-scale industries are present to contribute to pollution. Monitoring stations are strategically placed and deemed representative. Air quality maps from 2010 highlight traffic-related hotspots. Although daily air quality reports are available online via the Umweltbundesamt, they are not easily accessible. The city is advised to enhance accessibility by linking to this information directly on its website. Furthermore, it is noted that the establishment of a mechanism for collaboration with the civic sector could complement these technological achievements. Besides modelling and monitoring, various activities are undertaken, which show commitment to achieving/preserving good air quality levels. This includes air quality plans, adopting generating heating systems with the latest technology, citizen involvement, and participation in EU-funded projects.

B. Past Performance

Air quality trends are reported for the last 20 years and show a very positive evolution for the city. In this period, the air quality has been below limit values, except for a small number of years. PM₁₀ levels were high until 2011. An air quality plan has been in place since 2003, and joint action programs of Klagenfurt and the region have been in place since 2006 (PM₁₀) and 2009 (NO₂).

Air quality is a key component of the Smart City climate strategy launched in 2018. The successful implementation of this strategy has significantly improved air quality to its current high standards. Effective measures, such as information tables, shuttle buses connecting P+R sites to public transport, PM cleaning methods, and early information campaigns, stand out as excellent examples of measures for this success. A district heating system has been developed, to which about 50% of households are connected. This is a major achievement. Citizen engagement too has developed, from information measures towards a more holistic approach aiming to change behaviour in a climate-friendly way. The knowledge building in the municipality over the past years provides an excellent basis for future decisions. In addition, the city has collaborated with similar cities and with the wider region. In these collaborations, the city takes an integrated approach to air quality and noise, where co-benefit measures have been developed through joint development programs.

C. Future Plans

The city has a comprehensive plan with objectives in line with EU targets for 2030 and WHO targets for 2050. The plan is aimed at the two main sectors: vehicular transport and local heating. It is envisaged to continue the implementation of measures that are already in place, but also to implement new measures. Local heating is addressed by further expansion of the district heating system. Alongside the traditional measures related to transport such as electrification and modal shift, the city also pays attention to city logistics. Noteworthy is the introduction of mobility hubs with package delivery boxes. The target is to have a box available within 300 m for each citizen. Another good example is the introduction of electric cargo scooters for last-mile delivery. Unfortunately, no information about budgets and investments has been provided.

It is noted that in the future, even Klagenfurt will have to reduce air pollution further. To this end, it is recommended to increase stakeholder and community engagement. Experts state that this will require developing and implementing new governance models.

5.2.2 Water

A. Present Situation

Klagenfurt maintains excellent drinking water quality, meeting all EU Drinking Water Directive standards in 2022. However, in 2023, consumption was relatively high at 185 litres per capita per day, with households accounting for 64% of the total use, while the remainder is used by services and industry. Additionally, water losses from the distribution network stand at 14%, which is notably high. This indicates a need for improvement in reducing water losses through enhanced leak detection and repair systems. The quality of the local aquifers as the city's only source of drinking water is high. There is no risk of overuse or contamination by agriculture because water comes from the protected areas. This ensures a steady and high-quality water supply. The city actively promotes tap water use by providing free drinking water fountains and conducting awareness programs at elementary schools.

Klagenfurt meets the Urban Waste Water Treatment Directive (UWWTD) standards at the national level. Almost 100% of the population is connected to the wastewater system. For those who are not connected, the use of cesspools is problematic, even though they are cleaned with high-pressure flushing. It is recommended to explore other solutions such as septic tanks and small biological sewage treatment plants, which might be more appropriate. 100% of wastewater is treated in 3 purification stages at the Waste Water Treatment Plant (WWTP). Up to 90% of the wastewater treatment plant's energy requirements are covered by biogas produced through anaerobic processes.

The high number of 20 instances of untreated wastewater discharge, due to high volumes during heavy rain, highlights a need for increased capacity and improved rainwater management. For this, Klagenfurt plans to modernise the 57-year-old WWTP to enhance its efficiency and capacity. The city is not using reclaimed water for cleaning streets, as this is not allowed in Austria.

In Klagenfurt, most surface water has a fair to good ecological status. Some structures are already made fish-passable. Groundwater maintains good quantitative and chemical status. Lake Wörthersee, despite having excellent microbiological bathing water quality, is rated as having a moderate ecological condition, suggesting room for ecologic improvement.

B. Past Performance

Over the past decade, Klagenfurt demonstrated a slight upward trend in water consumption due to population growth and new commercial developments. The city has taken significant steps to manage water use and reduce losses. It invests approximately €10 million annually in renewing the pipe network. This investment has helped maintain water quality and reduce leakages. Although water loss from the water supply distribution network was reduced from 18% to 14% during the last 10 years, this remains a challenge. Klagenfurt has expanded its sewer network over the previous ten years, adding more than 2.5 km of wastewater sewer, but only 200 m of stormwater sewers. It is recommended that the stormwater system should be strengthened to limit the number of overflows.

Water protection areas in Klagenfurt are regularly monitored. Since 2021 a research project has tested an "intelligent" water supply system enabling constant monitoring of pressure and quality parameters. The water company has made agreements with farmers to prevent nitrogen- and pesticide accumulation in the groundwater bodies for 47% of the protection areas.

Significant measures have been taken in flood protection: lowering certain areas, constructing dams, and securing bridges and pipelines. The city has often done this in combination with river restoration projects. This includes the "Flood Protection Glanfurt" project and stream renaturation efforts. These projects have enhanced ecological continuity and habitat quality, improving biodiversity. Klagenfurt has also established water management concepts to ensure long-term water quality and broadened rivers to restore natural meandering and habitats.

C. Future Plans

Klagenfurt's primary objectives for 2030 and 2050 are to maintain high drinking water quality and ensure a sustainable supply. To achieve this, the city has initiated a supra-regional effort to build the "Carinthian Water Association" which will secure water supply for surrounding cities. This involves planning transfer lines between cities and expanding groundwater sources and reservoir capacity. However, the costs and benefits for Klagenfurt from this initiative are unclear. The existing water sources are deemed sufficient to cover the expanding long-term needs of the city itself.

With a budget of €70 million, the city aims to increase its WWTP capacity to 330,000 population equivalents and add a fourth stage of purification while also improving its energy efficiency. Additionally, Klagenfurt plans to implement canal relief and surface drainage measures to manage precipitation water on-site and intends to enhance the ecological status of its surface water bodies and improve bathing water quality. The city is continuing its effective investments in reducing water losses and enhancing public awareness of water conservation, measures to ensure timely implementation of its modernization plans, and collaborative efforts with local farmers to maintain groundwater quality.

As no plans for monitoring the impact of implemented measures were provided, it is recommended to develop these, for policy decisions in the future.

5.2.3 Biodiversity, Green Areas, and Sustainable Land Use

A. Present Situation

The maps Klagenfurt has provided show information about land use and population density. The integration of green/blue areas into urban spatial planning is shown separately in a very clear map. Klagenfurt's inner town has a significant percentage of public green areas. This is almost 32% for the inner city and 37% for the overall city. Also quite good is the percentage of private green areas, with 28% for the inner city and 19% for the overall city. Klagenfurt also has a relevant tree canopy coverage of almost 20% in the inner city. In total, the city's area consists of 62% dedicated green areas, including 29% agricultural area, 32% forest area, and some small areas of managed gardens and parks. Water areas make up 2% of the city. They mainly consist of Lake Wörthersee, several rivers, other smaller streams, and standing waters and swamps as well as moor areas.

The natural monuments, biotopes, replacement biotopes, water protection areas, landscape protection areas, and Natura 2000 sites are well represented with maps. The city has 3 Natura 2000 sites inside its administrative boundaries, which cover almost 85 ha. It also has 1 designated site of national- (approximately 78 ha) and 49 sites of local biodiversity importance (around 1.750 ha). These sites coexist with built-up areas.

Klagenfurt's green space strategy relies on networked greenbelts, providing crucial habitats for endangered species, including Carinthia's sixth Ramsar site. A Ramsar site is a wetland of international importance designated under the Ramsar Convention treaty established by UNESCO in 1971. Various specific ordinances are applied for protective measures and regular monitoring. These are further elaborated through concrete management plans for protected areas to preserve species worthy of protection or targeted focus areas on biodiversity monitoring. This is supported by funding procurement from the EUNextGeneration Fund.

Currently, an extensive participation process is ongoing, to work on the new urban development concept. The city runs several preservation and monitoring programs for wet habitats, species, and landscapes, complying with the legal requirements of the Habitats Directive, Carinthian Nature Conservation Act 2002, and other specific national laws. Some participatory approaches were delivered through the Nature in Klagenfurt campaign, Smart City climate strategy, GEO Days, and Tree Talks. The city was also selected to the EU Cities Mission for 100 climate-neutral and smart cities by 2030.

A. Past Performance

In the past decade, the total green area in Klagenfurt has increased steadily due to urban planning and environmental protection initiatives including the integration of green roofs, vertical gardens, and pocket parks into new construction projects, as well as the maintenance, improvement, and expansion of existing parks and green corridors. The same positive trend has been reported for areas designated for nature conservation and biodiversity protection such as the European Natura 2000 sites. The application states that the number of areas designated for nature conservation and biodiversity protection in the city has increased significantly. However, no quantitative data is provided to support these trends.

The designated Ramsar site is described as an important habitat, but also an essential water and CO₂ reservoir as well as a recreational area. Linking climate change mitigation to the topic of nature conservation is commendable. Klagenfurt has also undertaken efforts to stop and reverse the decline of reeds, and to establish new reed beds.

Under the "City meets Nature" project, Klagenfurt has introduced numerous measures to protect and maintain habitats and species. These efforts include designating nature and visitor zones, creating connectivity with features like small animal tunnels, and establishing sanctuaries for seven specially protected species. This contributes significantly to regional biodiversity conservation efforts. However, to substantiate these measures, which are potentially very positive, more detailed information is needed on their scope and impact.

A map with the location of 7 brownfields is provided but no data or description of these sites and the type of project and/or intervention is given.

B. Future Plans

The city focuses on preserving green spaces by aiming to minimize soil sealing. Some relevant projects (SPADES, GREENsChOOLENERGY, ADAPT-UHI) have been implemented. They aim to improve and extend urban green areas by focusing on greening and de-sealing strategies and enhancing biodiversity. The publicly implemented GREENsChOOLENERGY project is very innovative. It shows how to combine greening and irrigation measures with photovoltaic elements. This is commendable for being innovative and especially for linking biodiversity with climate change mitigation and adaptation measures. Various other projects and initiatives are in place.

To permanently pass on knowledge in the areas of biodiversity etc. to the next generations, the UNESCO Chair for Sustainable Management of Protected Areas was established at the local University of Applied Sciences in 2020.

While current initiatives are commendable, enhancing the level of detail is crucial for a thorough evaluation of the potential impact and scope of these actions. It is therefore recommended to define clear objectives for green spaces, biodiversity, and brownfield site restoration for both 2030 and 2050. Future plans should include detailed measures to achieve these goals, as well as strategies, policies, and monitoring programs.

5.2.4 Waste & Circular Economy

A. Present Situation

Klagenfurt's waste management system comprehensively serves the entire population, featuring separate collection for biowaste, paper, lightweight packaging, and residual waste, while adhering to the "polluter pays" principle. Charging is based on waste generation volumes. The city reports a recycling rate of almost 39%. Over 61% of waste is incinerated. The 12% landfilling likely includes the disposal of incineration residues, as the reported values add up to 112%. These numbers indicate a clear need to enhance recycling efforts to meet the EU's 2030 and 2035 targets and reduce dependence on incineration.

Green Public Procurement (GPP) criteria are embedded in procurement processes and emphasize eco-efficiency and sustainable practices. Circular economy initiatives include Re-Use

libraries and raising awareness. The city intensively promotes a circular economy, through various initiatives including a garbage marathon organized by young citizens every year. The noteworthy InvestCEC project runs competitions for novel circular economy initiative ideas.

B. Past Performance

Over the past decade, Klagenfurt's per capita municipal waste generation has remained largely stable with only slight improvements. However, the city has seen a modest reduction in packaging waste and a 15% increase in glass collection, likely driven by its waste prevention initiatives. Since 2019, a significant reduction of 19% has been made in the collection of paper. This is mainly due to the decreased use of printed paper since the pandemic, reflected across Europe.

GPP criteria have been progressively integrated, promoting sustainability. The initiative of "Green Events Carinthia", which aims to make the Carinthian event industry sustainable, embeds the relevant criteria from the Sustainable Public Procurement Action Plan. Circular economy projects have reduced waste total per capita waste production by almost 3%. These projects include the "Together" food initiative and other used non-food-products sharing initiatives and green events. Despite these efforts, the city's recycling rate falls short of the EU's 65% target by 2035, necessitating further measures to shift from incineration to recycling.

C. Future Plans

Klagenfurt's future plans include various elaborate actions to enhance the environmental performance of waste management and increase prevention and recycling. Objectives were defined but not specified for 2030 and 2050 horizons. Activities proposed to achieve these objectives are appropriate however no budget estimates nor scheduling was given. It is recommended to clearly specify measures and budget commitments (at the city or regional level) in relation to achieving EU recycling targets to comply with EU legislation. Achieving the EU recycling targets will require a transition from incineration to enhanced recycling and composting efforts. Continuous monitoring and strategic adjustments are crucial to meet these goals. However, the mentioned measures do include implementing a deposit-refund system for plastic bottles and cans by 2025 (country-level action). The city will continue integrating GPP criteria and promoting sustainability through projects like Lindwurmerde.

5.2.5 Noise

A. Present Situation

Klagenfurt finalized its latest noise map in 2020, followed by a noise action plan in 2023, indicating a favourable noise situation in the city. However, there is an inconsistency between the noise map and the population exposure data year, as data of population exposure to Lden above 55/65 dB(A) and Ln above 50/55 dB(A) are referred to 2022. The main noise criticalities seem to be caused by road and railway traffic. The local airport is small and has only a few flights per day. Therefore, it is assumed that the impact on noise pollution is relatively low. In general, it is recommended to increase information on the noise levels of individual sources.

The percentage of citizens living within 300m of quiet areas is not provided. This is probably because Klagenfurt has not officially designated quiet areas following the European Environmental Noise Directive (END), despite already preserving several recreational forests within residential areas. It is likely that not defining quiet areas is due to the low noise levels in the city.

Several actions are in place to reduce noise levels in the city. These actions include funding of sound-insulation windows, promotion of the use of public transport, improvement of mobility management, and preservation of roads. The promotion of guidelines for correct spatial planning also minimises noise levels).

Events to involve the population in noise-related actions are in place. However, few details are provided concerning the number of people involved as well as the specific objectives and activities for each event.

B. Past Performance

Although the population of Klagenfurt has increased considerably over the last ten years, increasing the number of circulating cars and leisure activities, the city has demonstrated effective noise regulation and reduction measures, preventing the noise levels from rising significantly. This has been possible due to a noise protection regulation in force since 2015 and several noise reduction measures. These measures include noise barriers, soundproof windows, and road and railway maintenance. However, no clear trends related to noise exposure/noise levels in the last ten years have been provided. It is therefore difficult to evaluate the effect of measures implemented to reduce noise in the city. The implementation of the LIFE SPAS project concluded in 2009, shows evidence of the city's commitment to develop an innovative system to protect the city from noise and air pollution exposure. The system consists of noise and fine-dust filters integrated into a wall. Commitment is also shown by setting up two permanent noise monitoring systems in crucial areas and the fact that a local directive regulates noise generated by construction works. All initiatives carried out by the city are fully transparent to citizens. However, no details on the initiatives to promote noise awareness have been provided.

To evaluate the effectiveness of the implemented measures, it is recommended that Klagenfurt develops more comprehensive comparative data on noise exposure trends over the past decade.

C. Future Plans

Klagenfurt has many ambitious plans to prevent increasing noise levels in the city. This includes the transition to electric vehicles and enhancements in public transport. Investments for noise-insulating walls and barriers will be maintained, with a projected horizon for work completion in 2028. Starting from 2025 an increase in the volume of freight trains is expected. However, by only allowing quiet freight wagons, available data shows that this will lead to lower noise levels than in 2010. The phasing out of the sale of combustion engine cars in the mass market is anticipated, accompanied by the promotion of electric vehicles, improvements in public transportation, and implementation of traffic management measures. Furthermore, as a notable best practice, an initiative is outlined to deploy a fleet of electric vehicles with the necessary infrastructure.

It is recommended that Klagenfurt incorporates specific time frames for all planned interventions in its noise management strategy to ensure prompt implementation and facilitate progress monitoring. Additionally, the city is advised to define noise reduction objectives quantitatively. For example, specifying targets for reducing the percentage of people exposed to high noise levels or decreasing the average noise levels in the city is deemed crucial. Moreover, including budget allocations and policy commitments within the noise management plan is seen as an essential part of a dedicated approach toward successfully achieving the outlined objectives.

5.2.6 Climate Change: Mitigation

A. Present Situation

The municipality works according to a Sustainable Energy and Climate Action Plan (SECAP) which is regularly updated. The city's Sustainable Urban Mobility Plan (SUMP) and Sustainable Urban Logistics Plan (SULP) are key to its strategy to reduce transport-related emissions and promote sustainable transportation. Several activities are in place. The actions vary from those where the municipality sets an example (decarbonization of municipal transport), provides services to the population (good connectivity in the city by bike paths), and encourages the public through push measures (energy efficiency program and energy consultancy). Klagenfurt joined the Covenant of Mayors for Climate and Energy.

Klagenfurt uses 53% renewable energy, with 90% of its district heating coming from coming from three biomass plants providing green electricity. The biomass seems to come from residual forest timber sourced from the region. It showcases an efficient and green system. Despite this, the

city's per capita energy consumption exceeds 22,000 kWh, highlighting the need for enhanced energy efficiency. For example, the transport sector accounts for more than 45% of the city's total CO₂ emissions. It underlines the importance of addressing transport emissions and enhancing overall energy efficiency to meet EU goals aiming to reduce final energy consumption by nearly 12% by 2030 and to become climate-neutral by 2050.

It is recommended that Klagenfurt intensifies its efforts to promote sustainable transport options. Experts advise to include the expansion of electric vehicle infrastructure, enhancements to public transportation services, and the promotion of active transport methods. Additionally, it is advised to implement more robust energy efficiency programs, which could significantly reduce per capita energy consumption. Possibilities are upgrading building insulation and encouraging using energy-saving appliances. Strengthening these initiatives will not only benefit the environment but also enhance the overall sustainability of the city.

B. Past Performance

Over the past decade, Klagenfurt has achieved significant reductions in GHG emissions. The emissions decreased by almost 400,000 tonnes of CO₂ eq. between 2011 and 2021. This was primarily due to significant improvements in energy usage, the conversion to green electricity, and the city's pioneering role in low-emission district heating. The district heating system increased its biogenic energy share from 30% in 2015 to a remarkable 90% in 2021. Klagenfurt is recognized as an energy-efficient municipality by being appointed an "e5" municipality (European Energy Award program) since 2011.

Renewable energy technology has improved throughout the city. Supporting the European Solar Rooftops Initiative, the "KDSG Klagenfurt Dachstrom GmbH" was instrumental in using city-owned rooftops for photovoltaic systems. Klagenfurt participated in the Interreg project Nachhaltige Energie für Kommunen (NEKTEO) and the Community of Practice - Cities on Power. These projects have improved the city's energy efficiency through innovative approaches like visualized energy monitoring and energy-saving programs for public employees. Local mobility initiatives, including bike paths and support for e-mobility, have further contributed to reducing GHG emissions.

There remain areas for further improvement, particularly in energy consumption. While the city has made significant progress in integrating renewable energy and enhancing energy efficiency, continuing to expand renewable energy projects and enhancing energy efficiency programs are deemed to be essential for maintaining and building on the progress made in the past decade.

C. Future Plans

Klagenfurt has the ambitious target of reaching climate neutrality by 2030 and it wants to continue progress towards a sustainable energy system by 2050. The city's Climate City Contract (CCC) was approved by the European Commission. The CCC outlines 17 key measures to reduce GHG emissions by 81% from 2011 levels by 2030, with the remaining 19% to be compensated. These measures are aligned with the city's overarching Smart City Climate Strategy and the SECAP.

Klagenfurt plans to implement the European Solar Rooftops Initiative through extensive photovoltaic installations and the development of energy storage and smart grid solutions. The city plans to promote zero-emission transport by electrifying the bus fleet, expanding e-car sharing, and enhancing infrastructure for active mobility and public transportation. It is recommended to highlight reducing energy consumption by businesses and households, for example by upgrading building insulation and encouraging using energy-saving appliances.

While the 2030 goals are well-defined, the strategy for 2050 remains less detailed, which could hinder long-term planning and investment decisions. It is recommended to outline specific measures and intermediate targets to ensure steady progress towards the 2050 objectives.

5.2.7 Climate Change: Adaptation

A. Present Situation

In recent years, Klagenfurt has started developing measures to address climate change, including efforts to formulate a Sustainable Energy and Climate Action Plan (SECAP). The city's initiatives target mitigating Urban Heat Island (UHI) effects and managing flooding. Detailed mapping has been conducted to address UHI, while flood management follows the Sponge City principle, incorporating tree planting in highly sealed areas and installing green roofs. However, current de-sealing efforts are primarily focused on industrial and commercial sites. Large-scale de-sealing or incentives for private land de-sealing are not specified. Most adaptation measures are described without much detail, including the "Mobile consultation hours" for city councillors and citizens, and the "Masterplan Walking". The main focus of Klagenfurt is the implementation of 5 inner-city weather stations and climate modelling. Through the project ADAPT-UHI, the UHI Risk Index for Klagenfurt has been developed to monitor the UHI trends.

For proactive planning and effective climate change adaptation actions, it is recommended to analyse the relationship between climate risks and local vulnerabilities. Additionally, it is advised to develop a wider range of participatory actions, to strengthen climate action and awareness.

B. Past Performance

Past activities have primarily focused on urban climate modelling. Efforts included simulations of climate change effects from 1981 to 2010, extending projections up to 2100. Overheating during summer, and particularly the Urban Heat Island (UHI) effect, has been identified as the most significant risk. As shown on a clear map, the combination of the expected increase of high rain events and high groundwater tables is also identified as a key risk for large parts of Klagenfurt.

Regarding green space development, national and international environmental standards are adhered to, but not much more information is given. The Green City plan focuses on recreational uses and pedestrian accessibility. Local microclimate studies have highlighted the role of trees and green infrastructure to enable tolerable temperatures in summer, but only in a small area of the city. It is innovative that contractual agreements have been made in the form of urban development contracts binding housing authorities to consider climate-relevant aspects, but few details are given. For a clear understanding of how climate actions effectively affected the described trends and changes over the last ten years, it is recommended to note correlations between actions and trends.

C. Future Plans

Specific objectives for 2050 and 2100 have been drawn up according to the trends, as shown in detailed UHI maps, although a specific reference to European Green Deal objectives has not been made. Concrete measures have been listed for dealing with UHI-increasing scenarios and incorporated into the Smart City Climate Strategy and the upcoming SECAP. The city's present Roadmap to 2030 and 2050 focuses on increasing the green factor in the city to increase evaporative cooling.

Measures focus on sustainable irrigation for both public and private green spaces, with subsidies encouraging the installation of green roofs. The roadmap highlights strategies, such as increased shading in public areas with solar panels, integrated green and blue space planning, protection of cold air zones, and regional collaboration with neighbouring municipalities to develop a joint action plan against the Urban Heat Island (UHI) effect. The key aspect of de-sealing is broadened to include public spaces. A new urban development plan integrating these aspects is due in 2025. However, as details are limited for all aspects, the potential impact of the measures is not clear. For the future it is recommended to extend the use of nature-based solutions beyond the present limited application in the form of planting trees. Also, in future plans, it is advised to scale up de-sealing by providing incentives for private landowners e.g. through tax rebates, as already practiced in other cities.

Additionally, it is noted that Klagenfurt can enhance green infrastructure by integrating native, drought- or flood-resistant species, and incorporating plants and trees like fruit-bearing or

medicinal varieties, along with aesthetic elements. It is also advisable to include participatory approaches, budget allocations, and monitoring programs.

Appendices

Appendix A - Application Form



European Green Capital Award and European Green Leaf Award 2026

Application Form

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Please complete the submission for the EGCA 2026 Awards in this Application Form. **Applicants must read the Guidance Note** before completing their application and consult this document while undertaking their responses.

The application form consists of nine sections: the 'City Introduction and Context' section, a section on each of the seven environmental indicators and the 'Good Practices' section. All seven environmental indicators carry equal weight. Each environmental indicator consists of the following sections:

1. Present Situation – 50% of the weight
2. Past Performance – 25% of the weight
3. Future Plans – 25% of the weight
4. References (pdf documents in a language other than English including other documents that cannot be automatically machine translated by a web browser, cannot be taken into account).

All sections must be answered and all questions should be addressed. When an applicant cannot provide an answer to a question, reasons must be provided in the relevant section. Please note, the '**City Introduction and Context**' section does not form part of the overall assessment however it is a key component of the application and therefore must be completed.

Under each section the maximum word count is indicated. **Word exceedances** will not be accepted and applicants must complete the **Word Count Check** at the end of each Indicator to verify that their response is within the word limits outlined in the application form.

Even though the Application Form for both Awards is the same, **EGL applicants are evaluated less strictly than EGC applicants**. EGL applicants should try to provide as much information and data as possible, but it is accepted that they do not have all the information and data because of the smaller scale of EGL cities. **If EGL applicants lack certain data, they should describe the situation as accurately as possible. When plans/programs are developed at the regional and national levels, it is crucial to provide information on how these are implemented at the city level.**

City Introduction and Context

1. Provide an overview of the city and a general background to the application, including examples of environmental, social and economic sustainability in the city.
2. Describe the key environmental challenges the city faces, including factors which have influenced the city's development.
3. Provide the following two maps:
 - a. Layout of urban areas, geographical and other features across the city.
 - b. City in the context of the wider surrounding area.

Please also complete the following tables:

Table 1: Benchmarking Data - City Introduction and Context

Indicator		Units	Year of data
Population		Number of inhabitants	
Area		km ²	
Population Density		Inhabitants/km ²	
GDP		€/capita	

Table 2: Other commitments and awards

Commitment/Awards	Yes/No	Description
Signed Covenant of Mayors for Climate and Energy 2030	☐	When: [year]
Signed Green City Accord ¹	☐	When: [Year]
Winner of other City Awards	☐	[...list here]
Other commitments at European level ²	☐	[...list here]

(max. 1000 words and five graphics, images or tables plus the two requested maps as detailed above)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
Introduction		1000

¹ https://environment.ec.europa.eu/topics/urban-environment/green-city-accord_en

² For example signed [Climate Pact](#), etc.

1 Air Quality

1.1 Present Situation

Please complete the following table with the most recent official data from sampling points reporting under the Ambient Air Quality Directive (AAQD, 2008/50/EC) as per Commission Decision 2001/850^{3,4} (hereafter “AAQD sampling points”).

Table 3: Benchmarking Data - Air Quality

Indicator for each sampling point reporting under AAQD		Unit	Year of data
Number of sampling points reporting PM _{2.5}		No.	
Annual average PM _{2.5} concentration for each sampling point		µg/m ³	
Number of sampling points reporting PM ₁₀		No.	
Annual average PM ₁₀ concentration for each sampling point		µg/m ³	
Number of days where the daily limit value for PM ₁₀ of 50 µg/m ³ has been exceeded per year for each sampling point		No.	
Number of sampling points reporting NO ₂		No.	
Annual average NO ₂ concentration for each sampling point		µg/m ³	
Number of hours in which the hourly limit value for NO ₂ of 200 µg/m ³ has been exceeded per year for each sampling point		No.	

Please elaborate on the benchmarking data entered in the table above. Please provide the following information when available, and use this information to identify the air pollution issues facing the city - if there are any - and to justify the measures taken:

1. Emissions inventory:
 - a. Provide a breakdown of the sources of pollutant emissions per sector that affect the air quality in your city (i.e. an emissions inventory). If possible, also provide a breakdown of the sources of air pollution (e.g. the contribution of different local sources and from long-range transport to the annual mean concentration of PM_{2.5}, PM₁₀ and NO₂, as mentioned in the table above). In case there are other problematic air pollutants besides PM_{2.5}, PM₁₀ and NO₂, please mention them. Identify problematic sectors and discuss associated measures.
2. Maps of air pollutant concentrations:
 - a. If available, please present maps showcasing air pollutant concentrations. If additional sampling points beyond AAQD reporting exist, please provide data. Clearly differentiate between AAQD reporting and supplementary sources of information.
 - b. Comment on these maps and explain the pollution issues, including details on polluted areas and concentration levels.
3. Air quality plan:

If applicable, describe the air quality plan(s) for the air quality zone in which your city is located and its current status of implementation. Specify the geographical scale to which the plan applies and clarify the city's role in executing this plan.
4. Citizen Engagement:

Detail current strategies for informing, raising awareness, and engaging citizens on air quality. Include concrete actions, such as data dissemination, awareness campaigns, and mechanisms for citizen involvement.

³ <https://www.eea.europa.eu/themes/air/air-quality-concentrations/classification-of-monitoring-stations-and>

⁴ <https://www.eea.europa.eu/themes/air/explore-air-pollution-data>

5. Infringements:

If the air quality zone in which your city is located is currently subject to an ongoing an infringement procedure related to the Ambient Air Quality Directive (Directive 2008/50/EC), please explain the reasons for the procedure and outline the measures the city is taking to ensure compliance with the Directive is achieved as soon as possible.

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

1.2 Past Performance

The aim of this section is to make clear how air quality has evolved in your city over the past ten years. Please provide the following information, if available, and most importantly discuss the evolution of air quality in correlation with the measures implemented across the various sectors.

1. Air quality:

- a. Present charts depicting trends over the past decade for each AAQD sampling point, clearly marking instances of limit values for:
 - Annual mean concentrations of PM_{2.5}, PM₁₀ and NO₂.
 - Number of daily limit value exceedances for PM₁₀ per year.
 - Number of hourly limit value exceedances for NO₂ per year.
 - Other problematic air pollutants, if any.
- b. Outline the measures implemented by the city authorities in the last ten years that significantly influenced the trends mentioned under point 1, categorizing by sector (Mobility and road traffic, Heating building and housing, Industry, Others). Discuss the evolution of air quality in connection with these measures.

(max. 600 words and five graphics, images or tables plus the requested charts detailed above)

1.3 Future Plans

1. Objectives:

Outline the objectives 2030 and 2050 for air quality, with a specific emphasis on PM_{2.5} and NO₂ levels.

2. Planned measures to achieve objectives:

- a. Outline the key planned measures, including participatory approaches. Provide information on the expected reductions in pollutant emissions, budget allocations, and implementation schedules. Also specify if these measures have additional environmental benefits or connections to other environmental criteria.
- b. Explain how air quality measures are integrated into broader city plans, such as a Sustainable Energy and Climate Action Plan (SECAP), Sustainable Urban Mobility Plan (SUMP), or Climate City Contract under the EU Mission on Climate-Neutral and Smart Cities.
- c. Provide information on participatory approaches. Describe some concrete and significant actions.

3. Support ambitions and measures:

- a. Highlight strategic and policy commitments supporting the outlined objectives and measures.
- b. Outline plans for monitoring the impacts of implemented measures.

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

1.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
1.1		1000
1.2		600
1.3		600S

2 Water

2.1 Present Situation

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

Table 4: Benchmarking Data – Water

Indicator	Unit	Year of data
Drinking water		
Drinking water consumption	Litres/capita/day	
Proportion of water losses from the distribution network	Infrastructure leakage index	
Wastewater		
Capacity of each urban waste water treatment plant (UWWTP)	No. , population equivalents	
Proportion of population connected to the waste water collecting system and treatment plant(s)	%	
Proportion of the treated waste water to which only primary treatment level is applied	%	
Proportion of the treated waste water to which primary and secondary treatment level are applied	%	
Proportion of the waste water to which more stringent treatment level is applied	%	
Number of times sewer overflows occur per year	No. / year	
Surface water bodies		
Ecological status of surface water bodies identified under the Water Framework Directive (WFD)	Ecological status	
Classification of existing bathing sites according to requirements of the Bathing Water Directive	Classification	

1. Drinking water:

- Describe to what extent the requirements of the EU Drinking Water Directive (EU) 2020/2184 (recast) are met. If the parametric value of a parameter set out in Annex I, part A and B of the EU DWD has been exceeded in the last year, indicate for this parameter the ratio of non-compliance i.e. the number of exceedances versus the total number of samples taken.
- Provide a breakdown of the drinking water consumption for the different sectors (households, industry, agriculture, etc.) over the last 1 year (or 3 years if the last year is not representative).
- Indicate the sources of drinking water. Refer to aquifers, river basin management, non-conventional resources and water recycling initiatives.
- Describe if the city promotes the use of tap water, such as offering free water fountains, and grants access to vulnerable or marginalised groups.

2. Wastewater:
 - a. Describe to what extent the requirements of the [EU Urban Waste Water Treatment Directive \(91/271/EEC\)](#) (UWWTD) are met (collection and treatment). Also mention any additional treatment steps beyond requirements of the UWWTD.
 - b. Explain treatment methods applied to the fraction of wastewater not connected to the waste water collecting systems (individual or other appropriate systems).
 - c. List any energy efficiency measures or initiatives for reducing of greenhouse gas emissions for UWWTPs. These measures go beyond the current UWWTD, but align with the [proposed revisions to the UWWTD](#).
 - d. Beyond the current UWWTD, if applicable, explain whether the city uses reclaimed water for environmental, industrial or urban purposes (e.g. urban green spaces, cleaning of streets).
3. Surface and ground water bodies:

Describe to what extent the requirements of the [EU Water Framework Directive \(2000/60/EC\)](#) are met.
4. Infringements:

If the city is currently undergoing an infringement procedure related to the relevant EU legal frameworks on Water, please explain the reasons for the procedure and outline the measures the city is taking to ensure compliance.

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

2.2 Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years.

1. Drinking water:
 - a. Provide an overview of the total water consumption and a breakdown of water usage for various sectors (households, industry, agriculture, etc.) over the last ten years. Detail the measures that have been implemented to save water consumption and to reuse water.
 - b. Elaborate on strategies employed for leakage management and network rehabilitation.
2. Wastewater:
 - a. Outline the extent of connection to the wastewater collecting system over the last ten years.
 - b. Discuss stormwater management over the last ten years, including the frequency of stormwater overflows, and elucidate the utilization of natural water retention measures and/or sustainable urban drainage systems.
 - c. Provide insights into advancements in wastewater treatment over the last ten years.
3. Surface and groundwater bodies:
 - a. Report on efforts made to achieve and maintain good status for the ecology, chemistry and quantity of waters of the last ten years.
 - b. Report on river restoration efforts, such as resurfacing rivers and naturalizing previously channelled rivers over the last ten years.

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

2.3 Future Plans

1. Objectives:

Specify the objectives for 2030 and 2050 in terms of:

 - a. Drinking water, including water saving.
 - b. Wastewater collection and treatment, including ambitions to adapt to the requirements of the [proposal for a revised UWWTD](#). Use of reclaimed water (if applicable).
 - c. Surface water and ground water bodies, including improving bathing water quality, monitoring new bathing sites and restoring rivers.

2. Planned measure to achieve these objectives:

Outline the key planned measures, including participatory approaches, and provide information on budget allocations and implementation schedules to achieve the objectives in terms of:

- a. Drinking water
- b. Wastewater
- c. Surface and ground water bodies

3. Support ambitions:

- a. Highlight strategic and policy commitments supporting the outlined objectives and measures.
- b. Outline plans for monitoring the impacts of implemented measures.

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

2.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
2.1		1000
2.2		600
2.3		600

3 Biodiversity, Green Areas and Sustainable Land Use

3.1 Present Situation

Please complete the following tables:

Table 5: Benchmarking Data – Land use within the administrative boundary of the city.

Indicator	Inner city ⁵	Overall city ⁵	Unit	Year of data
Land Use Data				
Public Green Area			% of total surface area	
Private Green Area			% of total surface area	
(Urban) Agricultural Land			% of total surface area	
Water			% of total surface area	
Urban tree canopy cover data				
Urban tree canopy cover			% of total surface area	
Population Data				
Population density in built-up areas (city area minus green and blue)			Inhabitants/ha	
Percentage of people living within 300 m of a public green urban area of >5,000 m ²			%	

⁵ Please refer to Guidance Note on how to delineate 'Inner City' and 'Overall City'.

3.2 Past Performance

Indicator (for area within the administrative boundary of the city)	Number	Total area (ha)
Natura 2000 sites (partially or wholly within the administrative boundary of the city)		
Designated sites of national biodiversity importance (habitat/species management areas)		
Designated sites of local (city) biodiversity importance (habitat/species management areas)		

This section is aimed at providing information on the current importance of green areas and biodiversity in your city.

1. Green urban areas:

Provide maps with the following information, and briefly comment on the provided data and maps:

- Land use, showing the municipality boundaries delineating the overall city area and the inner-city area.
- Green and blue (water) areas in the city, and their connectivity and coherence.
- Describe how green areas are integrated into the city's spatial planning.

2. Biodiversity:

- Provide maps indicating protected areas, sites, habitats, ecosystems or biotopes. Briefly comment on the provided data and maps.
- Outline the species and habitat monitoring programmes your city has in place and how they relate to the EU legislation on nature and biodiversity and the EU Biodiversity Strategy.

3. Engagement:

- Describe your city's approach to involving and engaging residents, visitors, business and institutions in planning and action for nature.

4. EU Missions:

Describe if or how your city is involved in the EU Mission on Soil, and/or the EU Mission Restore our Ocean and Waters

5. Infringement:

If the city is currently undergoing an infringement procedure related to the EU Birds and Habitat Directive, please explain the reasons for the procedure and outline the measures the city is taking to ensure compliance.

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

3.2 Past Performance

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

1. Green urban areas:

Provide trends on total green area within the administrative boundary of the city over the last ten years and detail the most significant measures that affected these changes.

2. Biodiversity:

- Provide trends on the area protected for nature and biodiversity over the last ten years and detail the most significant measures that affected these changes.
- Provide trends on the presence of habitat and species over the last ten years and detail the most significant measures that affected these changes.
- When applicable, explain the city specific or region-specific drivers of biodiversity loss and connect them with the trends elaborated.

3.3 Future Plans

1. Objectives:

Specify the objectives for 2030 and 2050 in terms of:

- a. Improvement, extension and maintenance of green urban areas, including tree canopy cover (publicly and privately owned) and the goal to reduce net land take (EU Soil Strategy).
- b. Biodiversity, if possible, in reference to EU Biodiversity Strategy and the proposal of [EU Nature Restoration Law](#).
- c. Rehabilitation of brown field sites (derelict and/or contaminated land).

2. Planned measure to achieve these objectives:

- a. Outline the key planned measures, including participatory approaches, and provide information on budget allocations and implementation schedules to achieve these objectives.
- b. Please also indicate if your city has developed an Urban Greening Plan as per guidance available at European level⁶.

3. Support ambitions:

- a. Highlight strategic and policy commitments supporting the outlined objectives and measures.
- b. Outline plans for monitoring the impacts of implemented measures.

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

3.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
3.1		1000
3.2		600
3.3		600

⁶ https://environment.ec.europa.eu/topics/urban-environment/urban-greening-platform_en

4 Waste and Circular Economy

4.1 Present Situation

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

Table 7: Benchmarking Data – Waste

Indicator	Data	Unit	Year of data
Municipal waste			
Amount of municipal waste generated per capita		kg/capita/year	
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)		%	
Percentage of municipal waste sent to incineration (R1 code)		%	
Percentage of municipal waste sent to landfill (or other forms of disposal (D codes))		%	
Percentage of recycled packaging waste		%	
Separate collection for hazardous and specific waste			
Waste from electrical and electronic equipment		kg/capita/year	
Batteries		kg/capita/year	
Waste oils		kg/capita/year	
Household chemicals		kg/capita/year	
Asbestos		kg/capita/year	
Construction and demolition waste		kg/capita/year	
Unused pharmaceuticals		kg/capita/year	

1. Waste collection and treatment system:
Describe the current waste collection system, detailing the types of waste collected separately and specifying the extent of system rollout (percentage of population coverage).
2. Economic instruments:
Outline the application of the 'polluter pays' principle and economic instruments. Include information on differentiated taxes and fees ('Pay as You Throw' initiatives), landfill and incineration charges.
3. EU Green Public Procurement (GPP) criteria:
Provide information on how the GPP criteria have been used in competitive tendering and decision-making in public procurement.
4. Circular economy:
Describe the actions and measures taken by the municipal authorities to enable and promote circular economy, in particular repair, reuse and sharing economy as well as to accelerate circular business models.
5. Infringement:
If the city is currently undergoing an infringement procedure related to the Waste Framework Directive (WFD), please explain the reasons for the procedure and outline the measures the city is taking to ensure compliance.

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

4.2 Past Performance

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

1. Waste collection and treatment system:

Provide trends over the last ten year on the following and highlight the most significant measures that have influenced these changes:

- Amount of municipal and packaging waste produced per capita in the city.
- Separate collection systems.
- Percentage of municipal waste sent to incineration, landfill or other forms of disposal.

2. GPP-criteria:

Provide insights into the use of the GPP-criteria in competitive tendering and decision-making in public procurement over the last ten years.

3. Circular economy:

Provide insights in the development of a circular economy over the last ten years and detail the most significant measures taken to foster a repair, reuse and sharing economy.

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

4.3 Future Plans

1. Objectives:

Outline the objectives for 2030 and 2050 for waste management, emphasizing the achievement of the related European targets. This includes specific objectives addressing plastics and preventing of food waste.

2. Planned measure to achieve these objectives:

Outline the key planned measures, including participatory approaches, and provide information on budget allocations and implementation schedules to achieve these objectives. Specify measures for the following:

- Waste management
- Use of GPP criteria in competitive tendering and decision-making in public procurement.
- To promote sustainability and circular economy such as repair, reuse and sharing economy.

3. Support ambitions:

- Highlight strategic and policy commitments supporting the outlined objectives and measures.
- Outline plans for monitoring the impacts of implemented measures.

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

4.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
4.1		1000
4.2		600
4.3		600

5 Noise

5.1 Present Situation

Please complete the following table providing the most recent data that is available⁷.

Table 8: Benchmarking Data – Noise

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 50 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	%	
Which limits or reference value does the city apply to residential areas? ($L_d/L_e/L_n$ /other national or regional limits – please give name and description))		
In the last year how many noise complaints did the city receive related to leisure or recreational activities?		

1. Noise maps:
Present the city's latest noise maps, ensuring they are no older than five years as per the Environmental Noise Directive (2002/49/EC) (END). Additionally, include figures detailing noise exposure from individual sources such as road, rail, air, industry, and leisure.
2. Noise action plan:
Provide information the city's latest noise action plan, ensuring it is no older than five years as per the END. Additionally, describe interventions in place to effectively reduce noise.
3. Quiet areas:
Share details about formally defined and delimited quiet areas and sound-improved areas.
4. Citizen engagement:
Discuss citizen engagement and public awareness initiatives.
5. Infringement:
If the city is currently undergoing an infringement procedure related to the END, please explain the reasons for the procedure and outline the measures the city is taking to ensure compliance.

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

5.2 Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years.

1. Noise:
 - a. Present the trends or changes in terms of noise within the city over the last ten years.
 - b. Outline the actions and measures implemented by city authorities in the past decade that have significantly influenced the trends and changes mentioned in point 1.
2. Noise awareness:
Provide information on initiatives carried out by the city over the last ten years to improve noise awareness, emphasizing their significant and measurable results.

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

⁷ In case (some of) the requested benchmarking data is not available, please briefly outline the present situation regarding noise in the city.

5.3 Future Plans

1. Objectives:
Specify the objectives for 2030 and 2050 for the quality of the acoustic environment.
2. Planned measure to achieve these objectives:
Outline the key planned measures, including participatory approaches, and provide information on budget allocations and implementation schedules to achieve these objectives.
3. Support ambitions:
 - a. Highlight strategic and policy commitments supporting the outlined objectives and measures.
 - b. Outline plans for monitoring the impacts of implemented measures.

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

5.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
5.1		1000
5.2		600
5.3		600

6 Climate Change Mitigation

6.1 Present Situation

This section is aimed at providing information on the current situation in relation to energy and CO₂ emissions (and other greenhouse gases) in the city. Please complete the following table with most recent data available.

Table 9: Benchmarking Data - Climate Change Mitigation

Indicator			
Energy consumption		Units	Year of Data
Final energy consumption		MWh	
Final energy consumption per capita		kWh/capita	
Share of renewable energies of final energy demand		%	
Share of locally produced renewable energies of final energy demand		%	
Energy performance of municipal buildings (mean)		kWh/m ²	
CO ₂ (and other greenhouse gas) emissions		Units	Year of Data
Total CO ₂ equivalent emissions per year		t CO ₂ eq.	
Total CO ₂ equivalent emissions per capita		t CO ₂ eq./capita	
Total CO ₂ equivalent emissions per MWh energy consumed		t CO ₂ eq./MWh energy consumed	
Emission reduction targets	Base Year	Target Year	% Reduction
City's emissions reduction targets			

Table 10: Benchmarking Data – Energy consumption and CO₂ emissions per sector

Sector	Total energy consumption	Unit	Total CO ₂ equivalent emission	Unit
Agriculture and fisheries		%		%
Industrial and commercial				
Transport				
Domestic				
Services				
Other				
Total	100		100	

1. Energy sources:

Present a breakdown of the sources of energy. Note the existence of a Sustainable Energy and Climate Action Plan (SECAP) under, providing respective references.

2. CO₂ emissions monitoring:

Discuss the current system in place for monitoring CO₂ emissions.

3. Organisation:

- Outline the city's organizational structure responsible for managing energy performances across various sectors such as buildings, transport, and industry.
- Explain how the city collaborates with governmental bodies, private sector service providers, enterprises, and citizens to reduce emissions.

4. Transport:

Detail the modal share of transport, including the proportions for car, public transport, and active transport. Additionally, mention the city plans such as a sustainable urban mobility plan (SUMP)⁸ or sustainable urban logistics plan (SULP)⁹.

5. Whole life carbon of buildings and infrastructure:

Describe current strategies and initiatives regarding the whole life carbon of buildings and infrastructure, stimulating the use of materials with low embodied carbon, low global warming potential and/or high stored carbon content.

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

6.2 Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years.

1. CO₂ and other greenhouse gas emissions:

Provide trends in CO₂ and other greenhouse gas emissions over the last ten years and detail the most significant measures that affected these changes.

2. Energy consumption and energy efficiency:

Provide trends in energy consumption and energy efficiency over the last ten years and detail the most significant measures that affected these changes.

3. Renewable energy:

Provide trends in use of renewable energy technology over the last ten years and detail the most significant measures that affected these changes.

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

⁸ [Sustainable urban mobility planning and monitoring \(europa.eu\)](https://europa.eu)

⁹ [Sustainable Urban Logistics Plan](#)

6.3 Future Plans

1. Objectives:

Specify the objective for 2030 and 2050 for further emissions reduction and the development of a sustainable energy system. An existing SECAP should be referenced.

2. Planned measure to achieve these objectives:

Outline the city's overall strategy for climate change, detailing how it aligns with the objectives described in point 1 and its integration with other environmental areas. Specifically:

- Explain the city's strategy concerning the renewable versus non-renewable energy mix, including the plans to implement the European Solar Rooftops Initiative.
- Detail the most significant planned measures impacting the total energy use and CO₂ emissions, including budget allocations and implementation schedules.
- Describe the planned measures to promote the transition towards zero-emission transport including active mobility (i.e. walking and cycling). Include details on budget allocation and the implementation schedule. Additionally, outline plans for the development of a SUMP and SUDP if these do not already exist.
- Outline the planned measures to ensure changes in industries, consumers' behaviour and import and export chains, including budget allocation and the implementation schedule.
- Detail the planned measures regarding the whole life carbon of buildings and infrastructure, including budget allocation and the implementation schedule.

3. Support ambitions:

- Highlight strategic and policy commitments supporting the outlined objectives and measures.
- Outline plans for monitoring the impacts of implemented measures.
- Detail your city's involvement in the EU Mission Climate-Neutral and Smart Cities, if applicable. This includes information on whether your city is a selected city, has submitted a Climate City Contract, has been awarded the Mission Label, or is participating as a pilot city, twin city, or research partner.

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

6.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
6.1		1000
6.2		600
6.3		600

7 Climate Change: Adaptation

7.1 Present Situation

This section aims to present the current situation of climate change adaptation in the city.

1. Climate risks, vulnerabilities and adaptivity:
 - a. Describe each climate risk the city faces (e.g., heat, droughts, floods) along with the city's vulnerability to these risks across infrastructure, people and urban nature.
 - b. Describe measures taken to adapt to the identified climate change impacts. An existing SECAP should be referenced.
 - c. Outline the impacted sectors (e.g., transport, energy, water management, health) and how they are affected.
2. Nature-based solutions:

How your city uses nature-based solutions as a means of addressing the challenges posed by the identified impacts.
3. Planning and organisation:

Explain the planning and organisation for climate adaptation actions in the city. Clarify which departments lead these actions, how collaboration between departments is organised and how the implementation of strategies or urban plans is organised.
4. Monitoring and evaluation:

Describe the monitoring and evaluation framework and approach, detailing how the progress of measure implementation and the reduction of actual risks and vulnerability are monitored.
5. Stakeholder engagement:

Explain how the city involves stakeholders, in the planning and implementation of climate change adaptation actions.
6. EU Missions:

Indicate if and how your city is involved in the EU Mission Adaptation to Climate Change.

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

7.2 Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years.

1. Climate risks and vulnerability:

Provide information on the development of the actual risks and vulnerability in the city to the different aspects of climate change.
2. Climate adaptivity:

Outline the actions and measures taken by the city authorities in the last ten years that significantly affected the trends and changes mentioned under point 1. Provide concise details to showcase the policy and planning initiatives and the progress made in climate change adaptation.

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

7.3 Future Plans

1. Objectives:

Specify objectives of 2030 and 2050 regarding climate adaptation. Identifying a relation of climate adaptation objectives of your city to the objectives outlined in the European Green Deal will be positively noted. Reference an existing SECAP.

2. Planned measure to achieve these objectives:

a. Indicate the existence of a climate change adaptation strategy and/or action plan, providing details on:

- Targets and their current implementation status.
- Impacts and sectors considered.
- Integration with overall city planning and other relevant plans and strategies. Note any cross-referencing with sectoral plans.

b. Outline the key planned measures, including participatory approaches, and provide information on budget allocations and implementation schedules to achieve these objectives.

3. Support ambitions:

- Highlight strategic and policy commitments supporting the outlined objectives and measures.
- Outline plans for monitoring the impacts of implemented measures.

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

7.4 References

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

(max. 400 words)

Word Count Check

Please complete the below word count check.

Section	Number of words in body of text	Max. words
7.1		1000
7.2		600
7.3		600

Good Practices

Please provide details of one current or future flagship project that demonstrates the city's commitment to an integrated approach to the management of the urban environment.

For EGC applicants, please provide one and maximum three additional good practices, relating to any indicator(s) that demonstrate how the city is improving its environmental record. Please identify to which indicator(s) the good practice is relevant. **For EGL applicants** only one additional good practice is requested.

(max. one A4 for the flagship project and one A4 for each of the good practices)

Appendix B - Expert Panel Profiles

Alena Bartonova – Expert Air Quality

Dr Alena Bartonova, PhD, senior scientist at NILU (Norway) with main expertise in air quality management and exposure assessment. Her main research interests include providing actionable information on urban and indoor air quality and human exposure assessment to decision-makers at all levels of decisions, and how best to use citizen science in her field of research. Alena serves as Research Director, coordinator for EU research and Manager, European Topic Center for Human Health and the Environment.

Wieslaw Fialkiewicz – Expert Water

Wieslaw Fialkiewicz is an assistant professor at Wroclaw University of Environmental and Life Sciences in Poland and the head of Hydrodynamics Modelling Section in the Institute of Environmental Engineering. He obtained MSc in civil engineering at Agricultural University of Wroclaw (Poland) and MSc in regional hydrology at Wageningen Agricultural University (The Netherlands). During his post-doctoral position at Bureau de Recherches Géologiques et Minières in Orléans (France) Wieslaw gained experience in quantitative hydrogeology, modelling of geological structures and groundwater flow, estimation of aquifer parameters and transport of contaminants.

His scientific interest is devoted to modelling groundwater and hydrological processes, all interactions between water and the environment as well as water footprint assessment. He was involved in several European research projects related to water. He reviewed over 150 manuscripts for high-ranked peer-reviewed journals. Wieslaw is also an external expert of the European Commission and The Polish National Centre for Research and Development. Wieslaw's academic activities are devoted to giving lectures and practical classes in the application of computer sciences in environmental engineering.

Daniele La Rosa - Biodiversity, Green Areas and Sustainable Land Use

Daniele La Rosa (Ph.D.) is an associate professor of Urban and Environmental planning at the Department of Civil Engineering and Architecture, the University of Catania, Italy. His research topics include sustainable planning, ecosystem services, GIS applications for urban and landscape planning, environmental indicators, environmental strategic assessment, land use science and landscape studies.

Katia Lasaridi - Waste and Circular Economy

Katia Lasaridi is Professor in Environmental Management and Technology at Harokopio University, Athens, Greece. She works on all aspects of waste management in the context of circular economy with emphasis on food waste prevention, valorisation and treatment, waste electrical and electronic equipment (WEEE) management, and Extended Producer Responsibility (EPR), where she has extensive research and consultancy experience. She has served as President of the Board of the Hellenic Recycling Agency, and in Harokopio University as member of the Governing Board, Deputy Rector, and Head of the Geography Department. She is currently a member of the Scientific Committee of the Hellenic Institute of Local Authorities.

Sergio Luzzi – Expert Noise

Sergio Luzzi is Adjunct Professor of “Risks from Physical agents” at the University of Florence (Italy), Honorary Visiting Professor at USURT University of Ekaterinburg (Russia) and Scientific Director of the OSHNET SCHOOL for high certified education in Occupational Hygiene (Izmir, Turkey).

He is president of the International Institute of Sound and Vibration, president of AIDII (Italian Occupational Hygienists Association) and was general secretary of AIA (Acoustical Society of Italy) from 2022 to 2024, President of PESCAS - Association of Experts for the Protection and Culture of

the Environment and Health. Coordinator of noise awareness campaigns INAD IN EUROPE (2017), head of the student competition office for the International Year of Sound (2020-2023).

Sergio Luzzi is President and Technical Director of "Vie en.ro.se. Ingegneria", a certified company of consultancy and design founded in 1992, leader in applied acoustics. He has relevant international experience, as a leader or partner in EU-funded projects on Acoustics, widespread national and international consultancies, also in forensic matters, in collaboration with universities and research institutes from several countries. He is also an ad hoc expert of the EU Commission for URBACT and Horizon 2020 programs.

Anna Ternell - Climate Change Mitigation

Anna Ternell is a project manager at the Research Institute of Sweden (RISE) and a Ph.D. Research Fellow in Geography at the University of Pecs, Hungary. She holds a master's degree in economic geography and a bachelor's degree in transport economics from Gothenburg University, Sweden. She has worked on numerous international development projects and co-creation projects over the last three decades. Tasks include analysis, evaluations, and advisory services in the fields of societal and sustainable cities. In recent years, the work has focused on innovative business and financial models for climate mitigation and adaptation, sustainable land-use models, interlinkages between climate and biodiversity in urban-rural areas, as well as interlinkages between climate change, water, agroforestry, and land-use developments. Her research is focused on aquatic ecosystems and the deep relationships between biological, ecological, and economic processes.

Daphne Keilmann-Gondhalekar - Climate Change Adaptation

Dr. Daphne Gondhalekar is an urban planner and Assistant Professor at the Chair of Urban Water Systems Engineering, Department of Civil and Environmental Engineering, Technical University of Munich (TUM), Germany, where she leads the Water-Energy-Food (WEF) Nexus Lab. Dr. Gondhalekar specializes in integrated urban and regional planning, climate change mitigation and adaptation synergies, water reclamation with integrated resource recovery, and multi-stakeholder processes in Africa and Asia. From 2009-13, she was a Senior Researcher at the Center for Development Research (ZEF), University of Bonn, and from 2007-8 a Postdoctoral Associate at the Department of Urban Studies and Planning at the Massachusetts Institute of Technology (MIT), USA. Dr. Gondhalekar holds a B.Arch. (Honours) from the University of Glasgow, an M.Sc. in Architecture from the Swiss Federal Institute of Technology (ETH) Zurich, and a Ph.D. in Ecosystem Studies from the University of Tokyo. Dr. Gondhalekar consults the European Commission, UN-Habitat, UNOPS and GIZ.