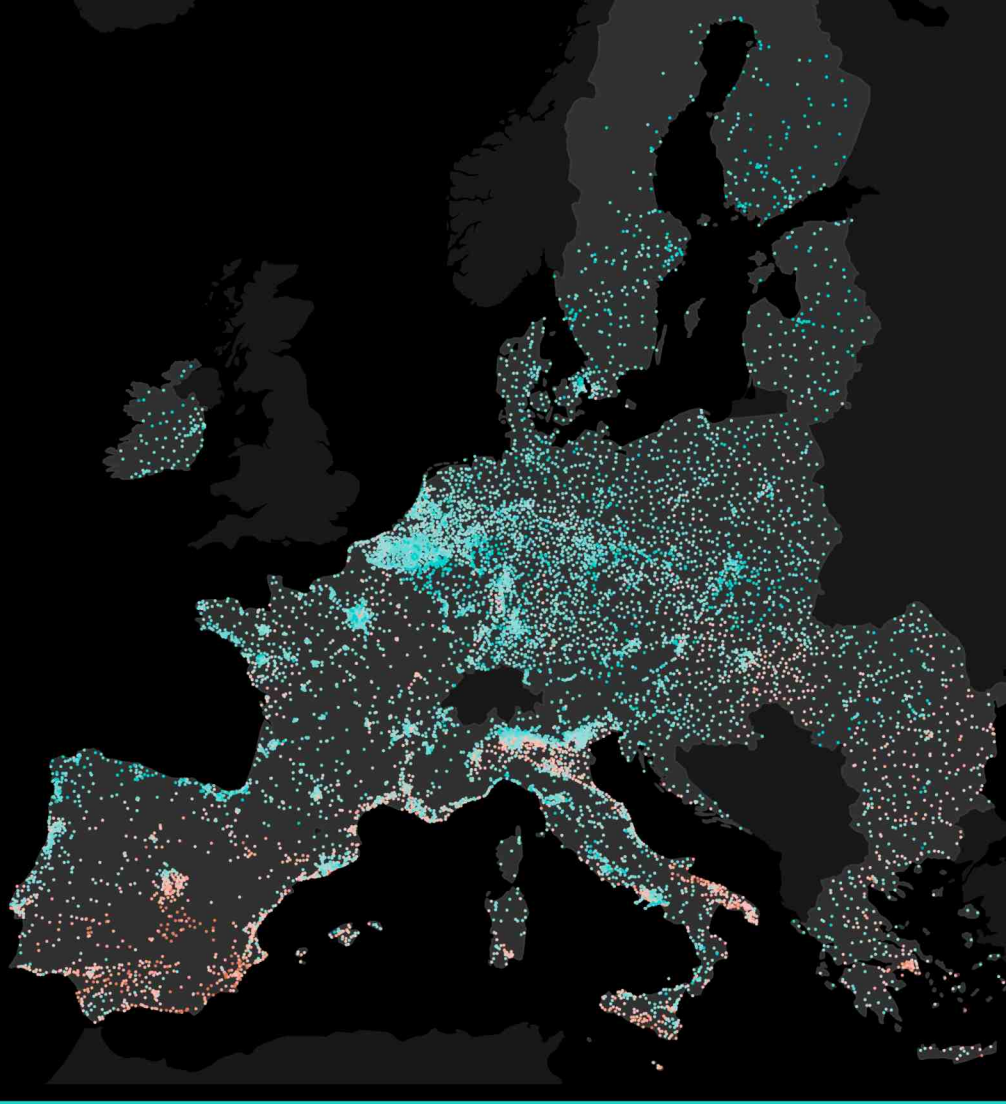
REPORT

COOLCITY
Index 2026

Adaptive potential
of 11,041 European Union cities



Editorial team

The report presents analyses based on data from the COOLCITY Index 2026 database, covering 11,041 cities in the European Union.

The COOLCITY Index 2026 Report was created as part of the project "Use of remote sensing for management of blue-green infrastructure in the process of city adaptation to climate change" (LIFECOOLCITY) spanning 2023-2029, by a consortium: **MGGP Aero (leader), City of Wrocław, University of Warsaw, University of Łódź, Ingenieurgesellschaft Prof. Dr. Sieker mbH.**

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About the report

Climate change is an enormous challenge for European cities. In the face of increasing frequency of flash floods, climbing exposure to droughts and heatwaves, and ongoing ecosystem degradation, local governments must know how to build resilience and ensure a good quality of life for their residents.

Our ambition is to provide key knowledge and universal tools to support cities in adapting to climate change based on nature. That is why we created this report and the COOLCITY Index platform, presenting our analyses of the state of blue-green infrastructure in over 11,000 cities across the European Union.

What does it present?

The COOLCITY Index 2026 report is an in-depth analysis of the environmental state of European cities in 2025. The report characterises distinctive city profiles in various EU regions and examines the situation in each of the 27 EU countries. It diagnoses the challenges cities face today, reveals their causes, and suggests how to address them. The report and platform will be updated and published annually, enabling monitoring of changes over time.

Who is it for?

The report is aimed at anyone wishing to deepen their knowledge and make decisions based on reliable and objective data. This includes decision-makers at European, regional, and national levels; scientists, educators, media representatives, NGOs, and anyone interested in the impact of climate change on cities and their inhabitants.

How was it created?

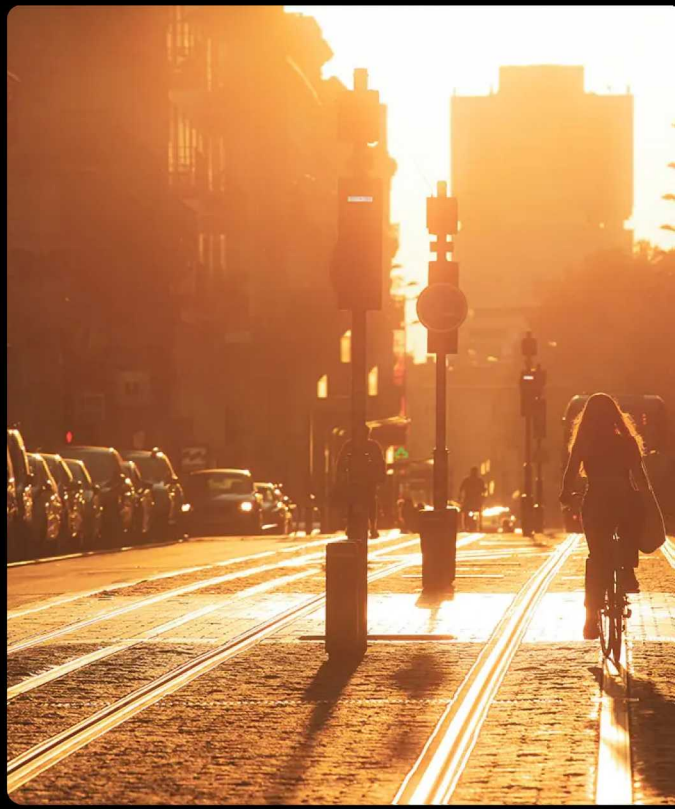
The report interprets data available on the COOLCITY Index 2026 platform. It is a comprehensive database on urban areas of the EU, containing administrative, demographic, geographic, and climatic information from publicly available official sources such as satellite data from ESA, NASA, Google DW, EUROSTAT, IMERG, IPCC, and GloH2O, as well as our proprietary COOLCITY indicators measuring cities' adaptive potential based on their environmental resources.

Foreword

Today's increasing interaction of urbanization processes and climate change within the material structure of cities - especially the high proportion of sealed surfaces, loss of biodiversity, and the density of population and infrastructure concentration - amplifies our exposure to extreme events. Under such conditions, episodes of high temperatures, periods of water scarcity, or intense rainfall directly impact the functioning of urban systems and public health. At the same time, it is precisely in cities that management processes occur, enabling the integration of spatial, environmental, and health policies to strengthen resilience [1].

Current knowledge indicates that the configuration of the urban environment is directly linked to residents' health risks. High surface temperatures, intensified by the urban heat island effect and the predominance of impermeable, heat-retaining materials, increase health burdens, especially in densely built-up areas. Simultaneously, appropriately selected features of the city's spatial layout - including the share of greenery, water availability, building form, and mobility organisation - allow for influence on exposure levels to these threats [2].

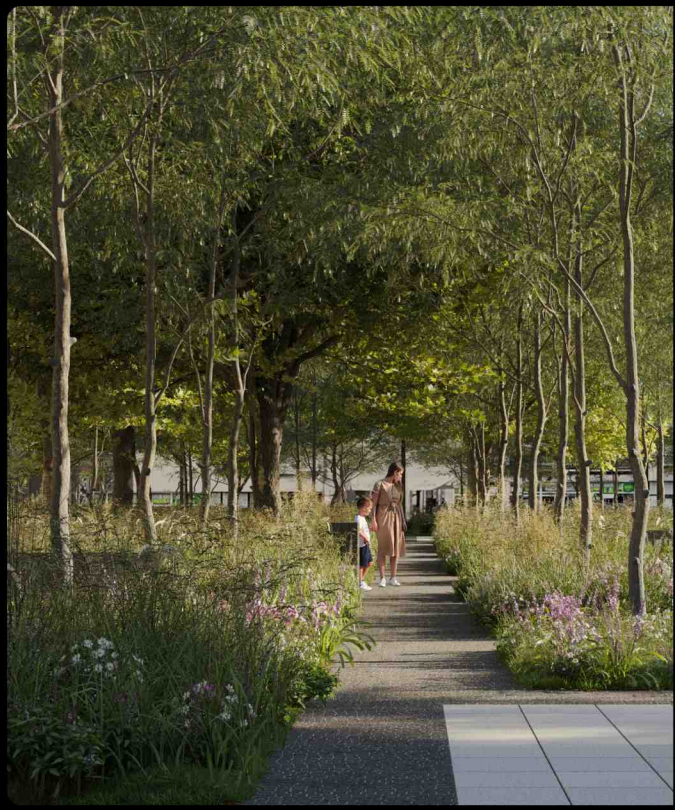
Nature-based solutions and blue-green infrastructure should therefore be regarded as key elements of climate resilience strategies. Systems combining vegetation, water, and ecological functions can simultaneously increase retention, improve water quality, reduce heating, and support urban habitat functioning [3]. This approach aligns with the conclusion of the Pontifical Academy of Sciences workshop "Resilience of People and Ecosystems under Climate Stress." Nature-based solutions at the building and city scale were presented as contributing to reduced energy consumption, supporting natural cooling, humidification, and air purification, and strengthening the long-term resilience of ecosystems [4].



The significance of this approach goes beyond a single study, as the workshops resulted in a set of recommendations forming the basis of the Vatican's memorandum for the 2022 UN summit in Sharm el-Sheikh, with a clear shift in emphasis from mitigation alone to adaptation and resilience building.

Thus, investments in urban nature should be understood as multifunctional interventions, important both for climate adaptation and for public health and the sustainability of urban systems. In this context, comparing cities solely through the lens of individual sectoral indicators is methodologically insufficient. Analyses conducted for hundreds of European cities show that population density, building morphology, and access to natural areas coexist with variations in urban heat island intensity, pollution, and health indicators. It is particularly important that compact cities can combine lower per capita emissions with limited access to green spaces and deterioration of certain local environmental parameters if densification is not accompanied by appropriate quality and scale of green infrastructure [5].

The significance of the COOLCITY Index 2026 platform lies precisely in the need to synthesise this complexity into a comparable, scalable, and operationally useful form. The value of this approach lies not only in aggregating data for over 11,000 urban areas but above all in establishing a common diagnostic model for assessing the environmental adaptive potential of cities. In conditions of growing demand for evidence-based decisions, synthetic tools provide an important, organised, and complementary addition to local diagnosis.



Effective adaptation requires the intentional multifunctionality of green infrastructure, understood as designing solutions that simultaneously benefit water balance, thermal conditions, biodiversity, and residents' well-being. The adaptive potential of green spaces is spatially and qualitatively uneven. Global analyses of cooling generated by urban greenery show that thermal benefits depend on both the quantity and quality of greenery, with their distribution varying significantly between cities and world regions [6]. Meanwhile, epidemiological modelling indicates that increased greening can lower ambient temperatures, leading to a statistically significant reduction in heat-related mortality [7]. Consequently, assessing adaptive potential should encompass not only the area of green spaces but also their condition, structure, interconnections, and ecological functionality [8].

Incorporating biodiversity into urban resilience analyses is crucial, as it supports ecosystem services, enhances adaptive capacity, and delivers measurable benefits for human health and well-being, while simultaneously facing spatial competition pressures, especially where management integration is insufficient [9]. This means that diagnostics of blue-green infrastructure should be conducted systemically - as an analysis of the relationships between water, vegetation, temperature, permeability, habitat continuity, and urbanisation pressure.

In Europe, this approach is particularly necessary due to the strong variation in climatic conditions and urban development trajectories. Water deficits, overheating, densification pressures, and topographical constraints occur with varying intensity across different parts of the continent, so interpreting adaptive potential requires simultaneously considering comparative metrics and regional context. The COOLCITY Index 2026 report addresses this need by combining a common assessment method with the ability to interpret results through the lens of diverse environmental profiles.

A particular value of the COOLCITY project is that it does not stop at the measurement stage. The integration of the Index, View, and Design tools aligns with the increasingly prevalent logic in urban research: from integrated diagnosis, through priority identification, to the selection of interventions tailored to local constraints and resources. This approach enhances the practical utility of environmental data in planning and management, where climate adaptation must take the form of spatial, investment, and operational decisions.

In this sense, the COOLCITY Index 2026 is not just a compilation of results but a tool that organises knowledge about the environmental conditions of urban resilience. It demonstrates that adaptive capacity stems from measurable environmental properties and city structure. At the same time, it reminds us that a climate-resilient city is also a healthier city, more efficiently managed, and better integrated with natural processes.

Therefore, the report should be read not only as a diagnosis of the current state but also as a comparative and analytical instrument supporting the design of future actions. Where indicators show high environmental resources, it can strengthen relationships and knowledge exchange between cities and the identification of good practices. Where it reveals deficits, it can form the basis for more precise intervention planning. Nature-based adaptation is linked to a model of city shaping in which climate safety, public health, and ecological integrity are treated as interdependent goals of urban policy.



Barbara Widera, PhD, DSc, Arch.
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Member of the EU Mission Board on Climate Change Adaptation

Project context

Vulnerable Cities of the Future

The future of Europe is urban. By 2021, the European Union had approximately 447 million inhabitants, of whom around 337 million lived in urban and suburban areas. This means that urban spaces are the daily environment for three-quarters of the EU population [10]. It is estimated that this number will rise to 83% by 2050 [11].

The quality of urban space therefore determines the quality of life for Europeans. A city is not just a layout of buildings, roads, and technical infrastructure. It is a human living environment. Its form decides whether residents have access to shade, water, greenery, places to rest, and daily contact with nature. It affects physical and mental health, ease of movement, opportunities for recovery, social activity, and a sense of security. The WHO emphasises that interventions related to urban greenery can support people's health and wellbeing, including mental health, prevention of cardiovascular diseases, and physical activity [12].



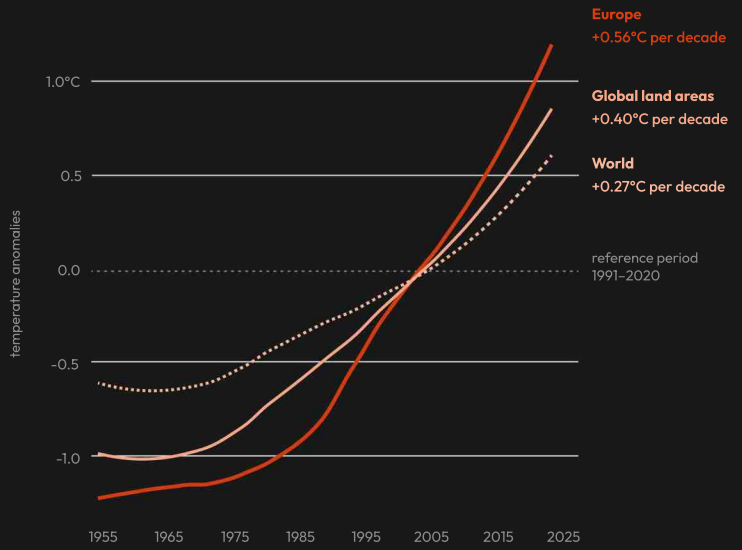
Project context

Increasing Climate Threats

The importance of the urban environment and its impact on human well-being is growing, especially under increasing climate pressure. Recent years have been among the warmest on record [13], and Europe is the fastest-warming continent – with temperature increase rates twice the global average. And heatwaves claim the deadliest toll among climate threats [14].

In Europe, an average of over 175,000 people die annually due to extreme temperatures. The WHO indicates that with ongoing climate change, urbanisation, and an ageing population, these numbers may only rise. Historical records confirm this trend: of the 23 most severe heatwaves to hit Europe since 1950, 19 have occurred since 2000 [15].

The effects of climate change are felt particularly strongly in cities. Population concentration, a high proportion of impermeable surfaces, and dense development exacerbate challenges related to heatwaves, local overheating, drought, rapid stormwater runoff, and flooding [16]. Therefore, appropriate quality of the natural environment becomes one of the key conditions for ensuring the safety of city residents today.



TEMPERATURE ANOMALIES WORLDWIDE AND IN EUROPE

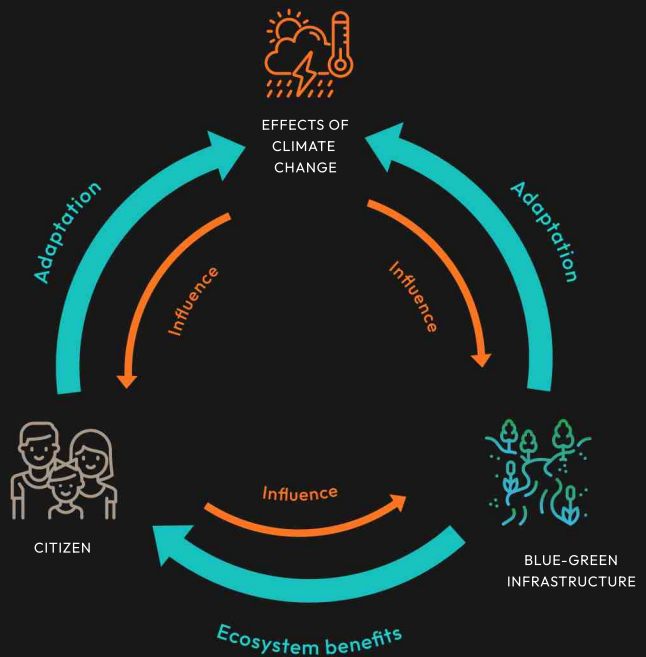
Source: C3S/ECMWF • https://climate.copernicus.eu/esotc/2025/why-europe-warming-so-quickly

Adaptation Based on Nature

The relationship between humans and the urban environment amid increasing climate threats is becoming a prerequisite for equitable access to good living conditions. Deficits in greenery and biodiversity, surface impermeability, and adverse water and thermal conditions are interconnected problems that affect the resilience of cities and the health of their inhabitants, who must adapt to living in a warmer, more extreme climate.

Therefore, blue-green infrastructure (BGI) should be regarded as strategic urban infrastructure. **Climate adaptation in the European Union is increasingly focused on implementing nature-based solutions (NBS).** The EU Adaptation Strategy [17] promotes the use of BGI in cities as an effective tool to mitigate the impacts of heatwaves, floods, and droughts, and emphasises the importance of NBS as multifunctional actions that can provide greater social and environmental benefits than traditional technical solutions [18].

Adaptation requires the conscious development of the city's natural resources. BGI works in two ways: it increases the city's resilience to climate change while simultaneously improving residents' living conditions through the ecosystem services it provides. It is a valuable asset that also requires protection. Without proper planning, maintenance, and preservation of space for nature, it can degrade, causing the city to lose part of its natural capacity to mitigate climate change effects. Adaptation thus requires balance: humans benefit from nature's services but must also create conditions in which urban nature can thrive.



COOLCITY as a response to the needs of cities

COOLCITY Index 2026

City managers, planners, and residents need current, clear, and comparable knowledge about the urban environment. Without it, it is difficult to identify where the city has the greatest adaptive potential, where deficits accumulate, and which areas require further diagnosis. Thus, the key question is not only how to improve quality of life in the city but also how to obtain data and translate it into decisions.

The answer to this need is the COOLCITY Index 2026, a platform and report presenting data on the adaptive potential of European cities. At its core is the COOLCITY Index (CCI) – a synthetic measure describing the state of blue-green infrastructure. The index is calculated for over 11,000 urban areas, with values on a scale from 0 to 10 (the higher the value, the better), allowing for a consistent analysis and placement on a common map of Europe.



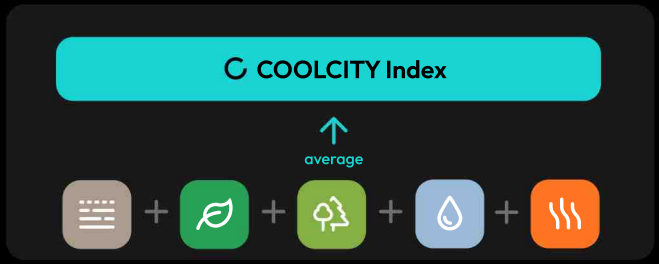
IMAGE OF EUROPEAN CITIES SEEN FROM SATELLITE:
PIWNICZNA ZDRÓJ, STOCKHOLM, ATHENS
Source: modified Copernicus Sentinel data from 2025

More about defining city boundaries on page 105.

Many challenges, one measure

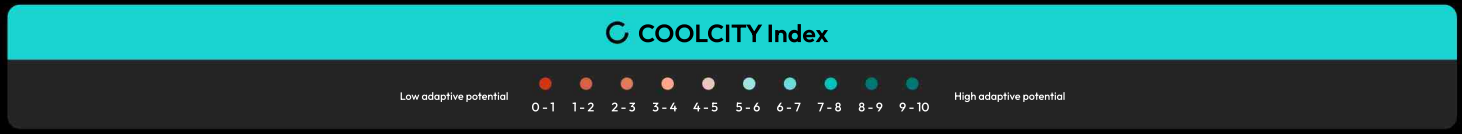
The CCI index is created based on satellite data and GIS. These allow us to analyse "cities" as urban areas defined by a single, consistent method. CCI enables systematic monitoring of many cities on the same scale, according to the same principles and based on comparable data. It does not replace local diagnosis but allows for a quick recognition of the overall state of green infrastructure and adaptive challenges.

CCI integrates five key elements of the urban environment: surface permeability, vegetation state, biodiversity, water conditions, and thermal conditions. These components are in continuous interaction, mutually enhancing or limiting the city's resilience. Together, they create a synthetic overview of whether the urban environment supports nature-based adaptation.



More about the methodology of CCI development on page 106.

Adaptive challenges



Surface permeability

0-10

This is the degree of surface sealing in the city and its ability to infiltrate rainwater. High index values indicate a large proportion of biologically active surfaces that promote water retention and the functioning of urban ecosystems, while low values indicate a high degree of imperviousness and a limited capacity for natural water circulation.

Vegetation state

0-10

Indicates vegetation coverage and its condition, with particular emphasis on tall vegetation. High index values indicate well-developed and lush vegetation that supports the city's resilience to climate change and the preservation of ecosystem services. Low values indicate a deficit or deteriorated state of greenery requiring protective or restorative actions.

Biodiversity

0-10

Describes the degree of diversity and naturalness of vegetation, as well as the connectivity of ecological corridors in the city. High indicator values show the presence of diverse forms of vegetation that support biodiversity conservation, while low values indicate a lack of networked natural structures and limited conditions for the functioning of living organisms.

Water conditions

0-10

They define the city's ability to retain water and maintain water-related ecosystems. They take into account the land's retention potential and the proportion of wetland areas.

High values of the indicator show favourable water conditions and greater resilience of the city to the effects of drought and heavy rainfall, while low values indicate limited retention.

Thermal conditions

0-10

This refers to the city's susceptibility to overheating and the severity of the urban heat island, taking into account surface temperature and the radiative properties of the ground. High index values indicate favourable thermal conditions and greater resilience of the city to heatwave effects, while low values suggest an increased risk of overheating.

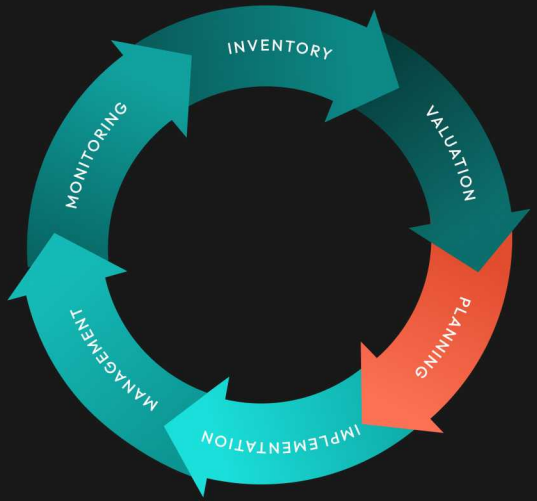
What the COOLCITY Index offers European cities

The European challenge framework

The greatest value of the **COOLCITY Index Report and platform** lies in the ability to view cities as a unified European system. The COOLCITY Index addresses questions that cannot be seen from the perspective of a single city: where environmental conditions are relatively best, where deficits accumulate, how small, medium, and large cities differ, and how a city's conditions compare to those of its country, region, or to the entire Europe. This allows the platform not only to present data on the urban environment but also to organise the spatial arrangement of adaptive challenges, translating complex environmental data into clear information about the adaptive potential of cities.

Global perspective, local action

The CCI indicator enables an overview of the whole spectrum of perspectives, from a global view of the state of Europe's urban ecosystems to detailed local-level analyses, providing information on the internal diversity of BGI resources within any city. COOLCITY Index, together with COOLCITY View and COOLCITY Design products, forms three mutually complementary tools that support local governments at every stage of the adaptation process – from environmental diagnosis, through strategic planning, to the implementation of specific nature-based actions.



Tools for cities

COOLCITY consists of three tools based on the CCI: the freely accessible COOLCITY Index and the commercial solutions COOLCITY View and COOLCITY Design. They support cities in diagnosing environmental conditions, planning climate change adaptation, and designing nature-based solutions.

The COOLCITY Index allows for an initial, comprehensive diagnosis of the adaptive potential of European cities and identifies the main challenges related to blue-green infrastructure.

More detailed environmental diagnosis and planning support are provided by the View and Design tools:

COOLCITY View is a strategic tool based on satellite data, comprising a spatial data platform and an expert report. It supports diagnosis and monitoring of environmental conditions, identification of priority areas requiring action, and climate adaptation planning. For analysed spatial units, it also indicates the recommended direction of blue-green infrastructure actions: protection, redevelopment, or introduction of new solutions.

COOLCITY Design is a decision support system based on detailed aerial data, consisting of a spatial data platform and an expert report. It assists cities in making decisions regarding the implementation of NBS. It enables analysis of various implementation scenarios, considering ecosystem services, costs, and environmental benefits resulting from planned interventions. This helps assess which actions can bring the greatest adaptive and environmental effect in specific locations.

You can learn more about COOLCITY on the platform coolcity.eu.

COOLCITY Index



Satellite data

COOLCITY View



Satellite data

COOLCITY Design



Aerial data

COOLCITY Index in the European Union

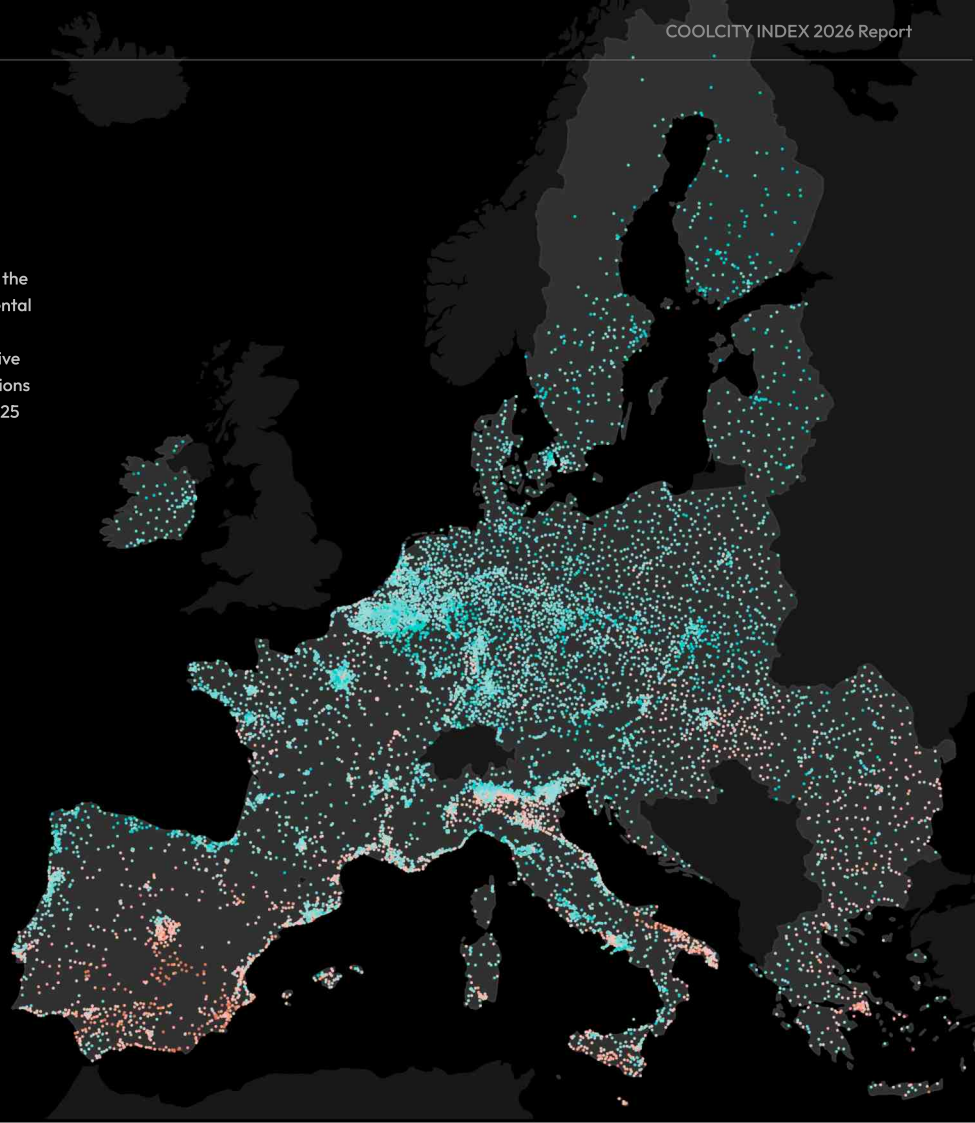
The COOLCITY Index, covering 11,041 European cities, is one of the largest data sources enabling the assessment of the environmental adaptive capacity of urban areas in the European Union. The inclusion of such a large number of cities allowed for comparative analyses, pattern identification, and the formulation of conclusions regarding the state of the blue-green infrastructure (BGI) in 2025 and the challenges facing European cities.

COOLCITIES IN NUMBERS

11,041
cities

289 million
inhabitants

134,000 km²
Urban area



COOLCITY Index

0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10

Low potential — High potential

Key findings

The analysis shows that European cities vary significantly in terms of BGI status and adaptation needs, both within individual countries and geographic regions, as well as between groups of different population sizes. Dividing cities into regional profiles helps compare centres with similar conditions and highlights places with the greatest deficits, even in regions with relatively favourable BGI conditions in Europe.

Read more about profiles→

The highest adaptive potential is found in very small cities, under 10,000 inhabitants, regardless of region and profile.

Read more →

90.5 million (31.3%)

of Europe's population lives in urban areas with an unfavourable environmental profile.

49.5 million (17.1%)

people live in resilient cities with a favourable profile and very good BGI condition.

Read more →

In over 800 EU cities, the environmental condition is very good and there is a high potential for climate change adaptation (CCI >7). The highest proportion of such cities is in Finland (almost 60%).

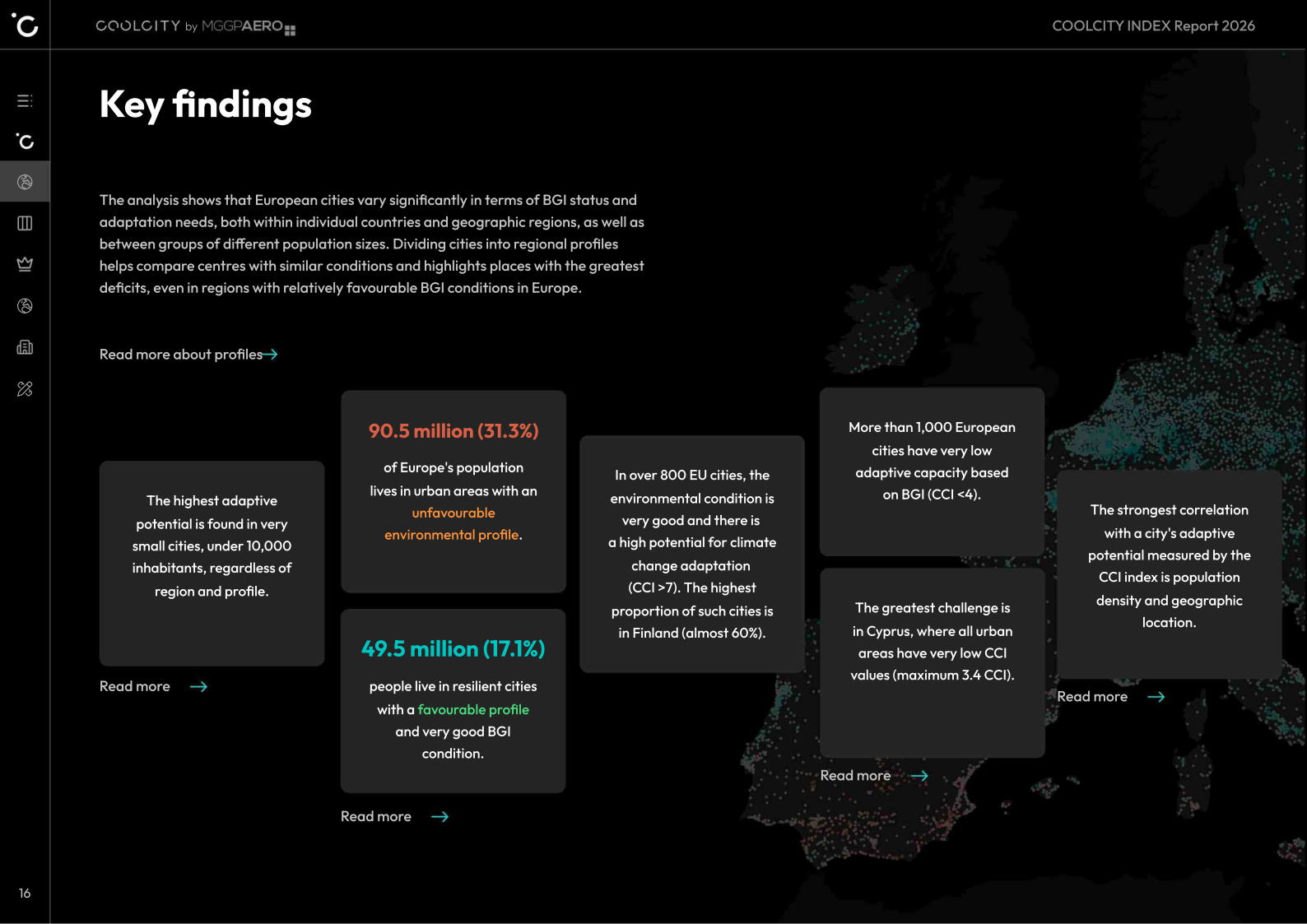
More than 1,000 European cities have very low adaptive capacity based on BGI (CCI <4).

The greatest challenge is in Cyprus, where all urban areas have very low CCI values (maximum 3.4 CCI).

Read more →

The strongest correlation with a city's adaptive potential measured by the CCI index is population density and geographic location.

Read more →



One index, many realities

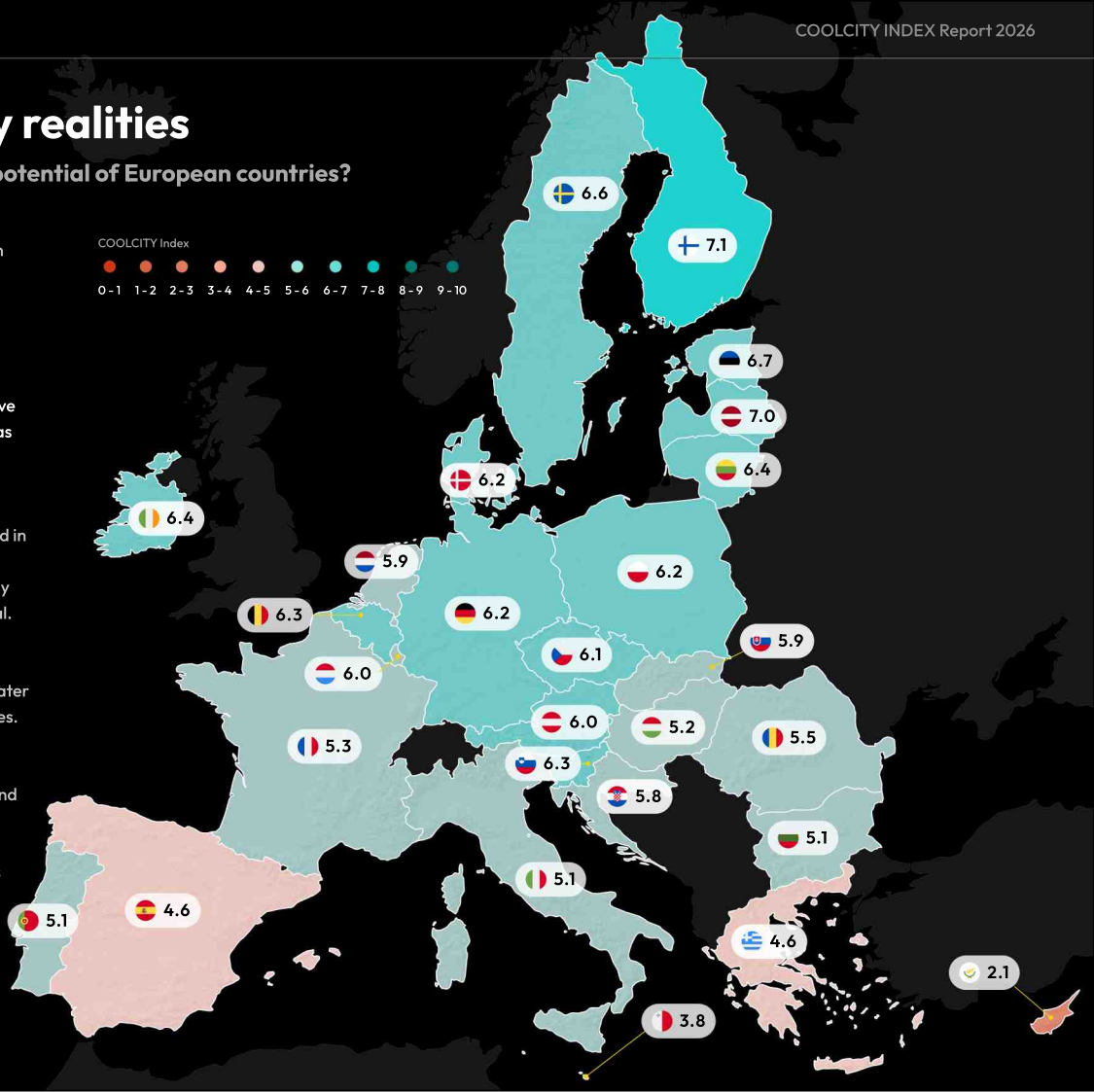
What is the current adaptive potential of European countries?

We examined the COOLCITY Index values in cities across EU countries to assess how prepared they are for current and future climate challenges.

The distribution of the index across Europe reveals significant variation in cities' adaptive potential. A clear spatial pattern emerges: as you move northwards in Europe, CCI values gradually increase.

The highest adaptive potential was recorded in Finland, with an average index value of 7.1. Alongside Latvia (CCI 7.0), these are the only countries with a very high adaptive potential. At the opposite end are Cyprus, with an average of 2.1, and Malta, with 3.8. Both countries have low potential, indicating greater challenges in adaptation using NBS resources.

These results highlight a general trend observed continent-wide: cooler climates and conditions typical of northern Europe more often support building resilience based on nature. They illustrate the different realities in which individual countries operate.



Four regions of potential

Regions in the European Union

Cities face unequal starting points on the path to adaptation due to their location on the map of Europe, so it is crucial to view them through the lens of regional conditions.

Dividing European cities into regions allows for comparing their adaptive potential under similar geographical conditions, while also capturing differences in green infrastructure resources within the regions themselves.

The report highlights 4 regions:

- Northern Europe
- Western Europe
- Central-Eastern Europe
- Southern Europe



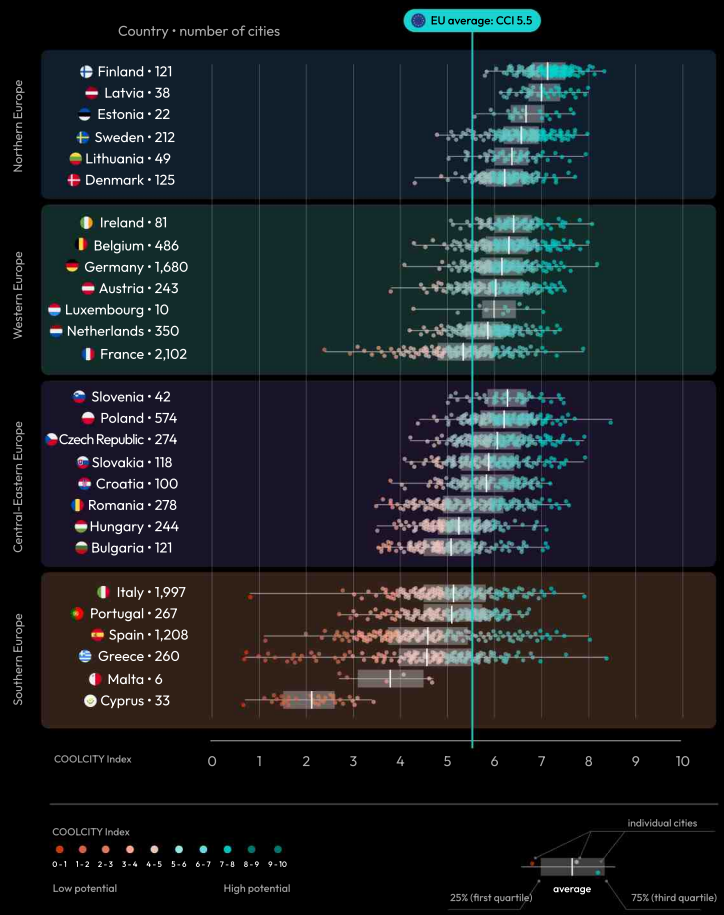
How varied is the state of the BGI across EU regions?

The most favourable pattern of adaptive potential is visible in Northern Europe. The region includes 567 cities, with an average CCI value of 6.6, the highest in the entire EU. As many as 96% of northern cities achieve a score equal to or above the European average of 5.5 CCI, and 26% reach values above 7 CCI. The highest proportion of cities with such high adaptive potential is found in Finland (almost 60%). The low variability of results in northern countries shows that cities in the region have uniformly high potential linked to favourable environmental conditions.

A different picture is seen in Southern Europe. The average indicator value for cities in the region (3771) is 4.9. Only 1 in 3 southern cities reaches the EU average score. At the same time, this region shows the greatest contrasts – alongside areas with relatively high potential, there are cities with clearly weaker environmental resources. Cities in the region range from 0.7 up to 8.4 CCI. An unfavourable BGI state is reached by 20% of cities here (CCI below 4). The most internally diverse countries are Greece (from 0.7 to 8.4) and Italy (from 0.8 to 7.9), due to the great geographical diversity within the country (from coastal cities to those located in higher mountain areas).

Western and Central-Eastern Europe form an intermediate pattern. They include 4952 and 1751 cities respectively, with an average indicator value of 5.8 in both regions. Cities in these parts of Europe generally score above average but do not show as clearly a favourable picture as in the North. In the West, 70% of cities achieve a CCI value equal to or above the EU average, and in Central-Eastern Europe 67%. The most diverse country is Poland, where the CCI range spans from 4.4 to 8.5 (including the highest individual city score in the entire EU).

CCI VARIATION IN EU COUNTRIES



Spectrum of city experiences

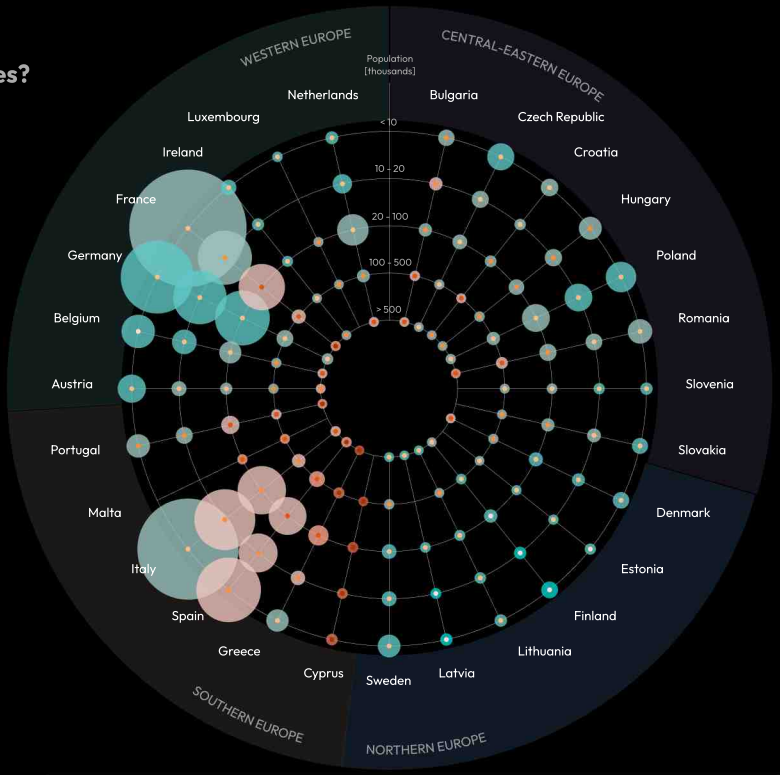
How does city size shape the potential in European countries?

Let's take a closer look at how adaptive potential depends on city population size and the share of built-up area in its spatial structure.
The division of cities by population classes clearly shows that larger cities generally have lower potential than smaller centres. The most favourable are the smallest cities, below 10,000 inhabitants, with an average CCI value of 5.8. The score gradually decreases: to 5.5 in cities of 10-20 k population, down to 4.9 in cities with over 100k residents. The problem of low urban environmental resilience is therefore most pronounced where the population is highest.

	VERY SMALL < 10k inhabitants	SMALL 10 - 20k inhabitants	MEDIUM 20 - 100k inhabitants	LARGE 100 - 500k inhabitants	VERY LARGE > 500k inhabitants
CCI	5.8	5.5	5.2	4.9	4.9
built-up area coverage	27.0%	30.1%	34.0%	37.2%	37.4%

This pattern is most clearly visible in France, where potential gradually falls from 5.7 CCI in very small cities, through 4.5 in medium-sized cities, to 3.5 in metropolises over 500,000 inhabitants. Meanwhile, neighbouring Germany shows less variability in BGI regardless of city size (respectively: 6.3, 6.0, 5.7).

In the largest cities, urbanisation pressures accumulate: strong densification, higher share of built-up areas, and less availability of BGI resources. The average built-up coverage rises from 27.0% in very small towns to 37.4% in very large ones (over 500,000 inhabitants). **The scale of challenges increases moving southwards.** Southern cities are clearly more compact and intensively built-up (34.8% built-up area), while northern cities have 12% less built-up area (22.8%). Urbanisation pressure is particularly visible in Cyprus and Spain, exacerbating adaptation difficulties. Large Southern cities face significantly greater challenges than small Northern cities.



VARIATION OF CCI IN EU COUNTRIES BY CITY SIZE CLASSES

Unequal starting points on the path to adaptation

What shapes the condition of the urban environment?

We already know that the adaptive potential of European urban centres depends on geographic location and population size. However, this does not provide the full picture. Cities do not start from the same baseline, and their blue-green infrastructure resources used to build climate resilience are not equal. What else influences the adaptive potential measured by the COOLCITY Index?

The key variables are:

population density – the higher the density, the lower the index values, indicating a greater share of built-up areas and pressure on blue-green infrastructure;

distance from the equator (latitude) – the further north, the better the conditions for nature-based adaptation, linked to favourable climatic conditions, i.e. lower temperatures and higher precipitation;

and terrain diversity – which creates barriers to development and helps preserve space for vegetation.

Therefore, the adaptive potential of cities is influenced not only by planning decisions but also by geographical conditions over which local governments have limited control. Hence, simply comparing the entire population of European cities without considering these factors can lead to oversimplified conclusions.

A lower COOLCITY index value should not be interpreted as weaker city actions. It often indicates a more challenging starting point. This is why assessing adaptive potential should consider both the current state of the urban environment and the context in which the city operates.

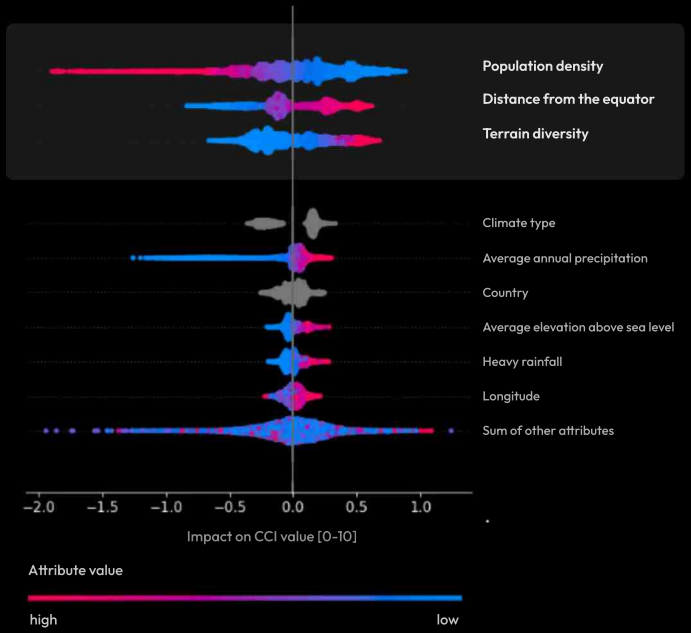


CHART OF THE IMPACT OF CITY ATTRIBUTES ON MODELLED CCI VALUES (SHAP)

Performance Index

Who performs best within their conditions

The value of the COOLCITY Index alone is not sufficient for a full interpretation of a city's adaptive actions. Therefore, we created an additional indicator to help assess whether cities effectively use their resources and develop high-quality blue-green infrastructure.

The Performance Index (PI) shows the difference between the COOLCITY Index value for a given city and the average value of other cities with similar socio-geographical conditions. It reflects the benefits gained from applying BGI in cities adaptation relative to local conditions and opportunities.

The index models the impact of socio-geographical conditions on the city's adaptive potential and allows assessment of how the state of BGI in a given city differs from that of cities developing under similar geographical conditions and levels of urbanisation. This way, it is possible to identify not only which cities have high adaptive potential but also which use their resources better than expected based on their conditions. A positive PI value indicates a better-than-expected result, while a negative value may indicate untapped potential, yet to be tapped by the city's governance.

How varied are PI values across European regions? The greatest range of the index is seen in Southern Europe, in very small towns, where values range from -1.8, which negatively assesses the current state of BGI compared to similar cities in the region, up to 1.5, showing how these centres effectively use their resources and shape a relatively high adaptive potential. The smallest variation in the PI index occurs in the Northern region, where cities range from -1.1 to 1.0 relative to the expected adaptive potential.



Blue-green city profiles

Blue-green city profiles allow for a more precise capture of the complexity of Europe's regional conditions, which do not conform to national borders. Similar challenge patterns may appear in cities across different parts of the region that share similar environmental conditions and urban characteristics.

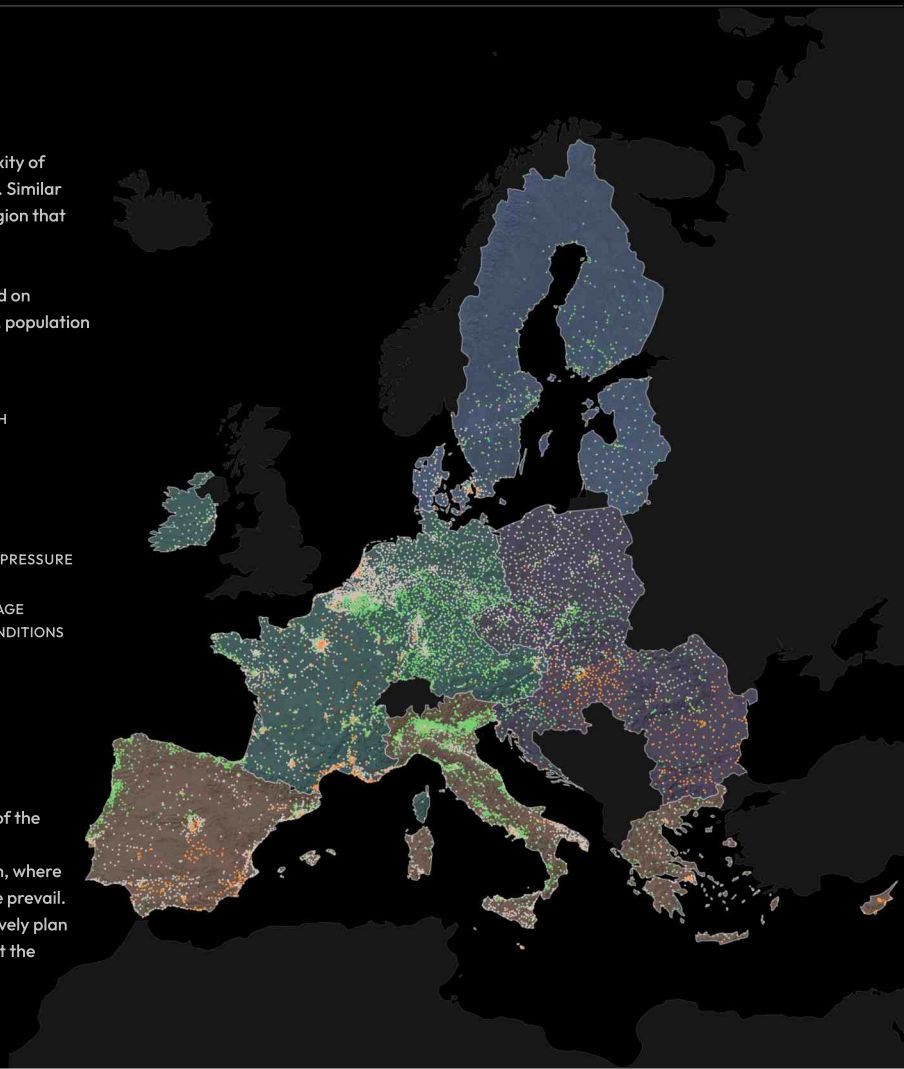
Therefore, in each EU region, we have identified 3 groups of cities based on COOLCITY Index values and adaptive challenges, as well as population, population density, rainfall, temperature, and altitude.

Northern Europe
- BLUE-GREEN TOWNS OF THE NORTH
- RAINY LOWLAND CITIES
- URBAN BALTIC CENTRES

Western Europe
- SMALL SPONGE TOWNS
- NEUTRAL WESTERN CITIES
- WESTERN METROPOLISES UNDER PRESSURE

Central-Eastern Europe
- UPLAND CITIES OF GREEN ADVANTAGE
- LARGE CITIES WITH MODERATE CONDITIONS
- DENSE WARM CITIES

Southern Europe
- SOUTHERN PLACES OF RESPITE
- TYPICAL MEDITERRANEAN CITIES
- HEATED CENTRES OF THE SOUTH



City profiles enable a deeper understanding of inequalities in the state of the blue-green infrastructure (BGI) and the resulting adaptive potential of European cities. They organise the pattern of challenges in the region, where relatively favourable and unfavourable conditions for building resilience prevail. Knowing what shapes the potential of each city type allows us to effectively plan adaptive actions tailored to the specifics of each centre, rather than just the general characteristics of the entire region.

How to read city profiles?

Profile pages present a synthetic overview of the adaptive potential of cities in European regions. To fully understand the information presented, it is helpful to follow four reading steps - from general context to detailed results:

1
Start with the region description
Get to know the general characteristics of the conditions prevailing in the region compared to Europe

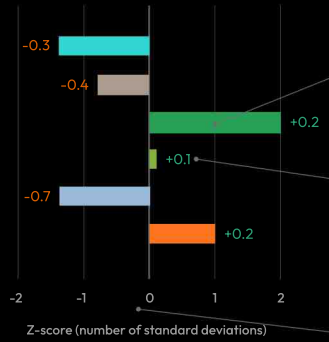
2
Read the profile descriptions
Discover the key features and examples of cities with a given profile

3
Check the deviation chart
See how cities in a given profile differ from the region average

4
See which profile dominates in a given country
Check the % of the population living in each profile within the countries of the region

HOW TO READ THE DEVIATION CHART?

COOLCITY Index	6.6 (± 0.2)
Surface permeability	5.8 (± 0.5)
Vegetation state	6.5 (± 0.1)
Biodiversity	5.5 (± 1.0)
Water conditions	7.3 (± 0.5)
Thermal conditions	6.3 (± 0.2)



Direction and strength of deviation
The direction of the bar shows whether the result is higher or lower than the average. Its length is the z-score, meaning the longer the bar, the stronger the deviation from the average

Label and interpretation
The label indicates the value of the profile's mean difference from the region average, and the colour shows how to interpret it (positively or negatively)

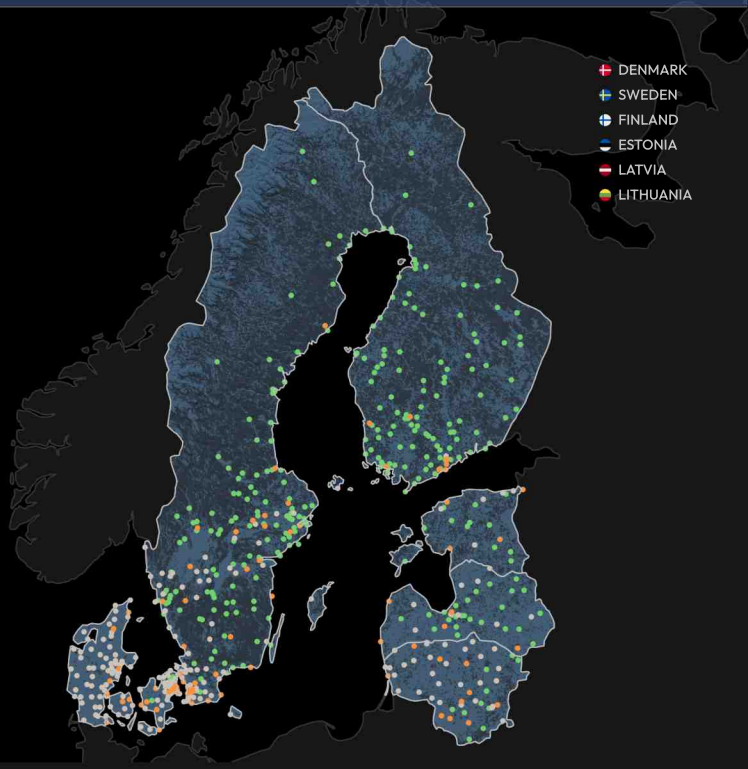
Reference point
The zero axis represents the average indicator values in the region

Northern Europe

The Northern Europe region stands out in Europe for its very favourable conditions for the development of blue-green infrastructure. Lower air temperatures and relatively high rainfall create an environment where it is easier to maintain healthy vegetation and more stable water conditions.

There is also a less intensive urban development pattern here, with lower population density and a smaller share of sealed surfaces, which supports the preservation of biologically active and retention areas, resulting in high adaptive potential values. This means that BGI does not need to be rebuilt from scratch but can rely on existing resources. Almost one quarter of the region's population (4.4 million) live in cities characterised by very favourable BGI conditions.

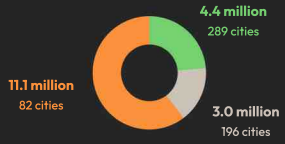
The problem of urban overheating in Northern Europe is not as widespread as in warmer parts of the continent, so local thermal pressure spots are particularly visible here – mainly larger and more sealed urban centres. In these places, the region's cool climate is insufficient to effectively reduce the urban heat island effect, making additional BGI necessary. This city profile is home to 60% of the region's population.



18.5 million
urban residents

567
cities

SHARE OF CITIES IN BGI PROFILES IN THE REGION:



- BLUE-GREEN TOWNS OF THE NORTH
- RAINY LOWLAND CITIES
- URBAN CENTRES ON THE BALTIC COAST

Blue-green city profiles in the region

BLUE-GREEN TOWNS OF THE NORTH

Example cities: **Jūrmala, Oulu, Hillerød, Kiruna, Haapsalu, Druskininkai**

- mostly the smallest population centres with low population density, where low urban pressure supports the preservation of natural resources
- CCI values for these cities are higher than the region average (6.6), showing that nature-based adaptation has particular potential here
- notable for high greenery per inhabitant and a large share of water and wetlands - the highest in the region and EU

Average indicators for profiles: **C 7.1**

- **15.2k inhabitants**
  1.1k people/km²
- **826 m²**
  green space area per capita
- **5.6%**
  share of **wetland ecosystems**

RAINY LOWLAND CITIES

Example cities: **Roskilde, Visby, Palanga, Valmiera, Rakvere, Mariehamn**

- usually small in population but more densely populated and urbanised than "Blue-Green Towns of the North"
- more common in the southern part of the region, where higher population density is linked to increased sealed surface area
- this group's advantage is high rainfall, which helps maintain good conditions for greenery development and local ecosystems

Average indicators for profiles: **C 6.3**

- **15.1k inhabitants**
  1.5k people/km²
- **26.1%**
  sealed surface area
- rainfall:
  861 mm annually

URBAN CENTRES ON THE BALTIC SEA

Example cities: **Stockholm, Helsinki, København, Tallin, Rīga, Vilnius**

- by far the largest cities in the region, highly urbanised, often located in coastal zones
- CCI value is on average 0.8 points lower than the region average (6.6), mainly due to greater sealing and lower vegetation cover
- despite the region's cool climate, these centres face local surface overheating problems, indicating their lower adaptive potential

Average indicators for profiles: **C 5.8**

- **135.9k inhabitants**
  2.6k people/km²
- **30.5%**
  sealed surface area
- surface temperature averaging 1.7°C higher than the region (32.1 °C)

Different conditions, a shared need for adaptation

What distinguishes each profile and how to enhance their potential?

	Region average (standard deviation)	BLUE-GREEN TOWNS OF THE NORTH	RAINY LOWLAND CITIES	BALTIC COASTAL URBAN CENTRES
Population (persons)	32 608 (± 102 587)	-17 446	-17 498	+103 310
Population density (persons/km²)	1460 (± 853)	-352	+34	+1157
Average annual temperature (°C)	6.0 (± 2.4)	-1.5	+1.7	+1.2
Annual precipitation total (mm)	784.0 (± 115.3)	-53.0	+77.2	+2.5
Average elevation (m above sea level)	59.6 (± 56.2)	+16.3	-13.9	-24.4
COOLCITY INDICATORS				
COOLCITY Index	6.6 (± 0.7)	+0.5	-0.3	-0.8
Surface permeability	8.1 (± 0.8)	+0.6	-0.4	-1.0
Impermeable area per capita (m²/person)	193.6 (± 73.8)	-3.4	+25.4	-48.5
Share of sealed areas (%)	22.8 (± 6.3)	-4.5	+3.3	+7.7
Vegetation state	5.8 (± 1.1)	+0.7	-0.8	-1.0
Green area per capita (m²/person)	676.7 (± 318.5)	+149.4	-72.1	-354.1
Vegetation cover (%)	76.2 (± 6.4)	+4.3	-3.0	-7.9
Share of high-vigour vegetation (%)	77.3 (± 7.2)	+3.7	-2.5	-6.9
Biodiversity	6.5 (± 0.7)	+0.2	+0.2	-1.0
Water conditions	5.5 (± 1.2)	+0.7	-0.7	-0.8
Surface retention capacity (%)	62.5 (± 6.4)	+4.7	-4.4	-6.3
Share of wetland ecosystems (%)	4.2 (± 4.8)	+1.5	-1.7	-1.0
Thermal conditions	7.3 (± 0.7)	0.0	+0.1	-0.4
Surface temperature (°C)	32.1 (± 2.5)	-0.4	-0.1	+1.7



How to increase their adaptive potential?

Recommended direction for adaptive actions based on nature and BGI for cities in this profile

Protection of natural resources and strengthening their continuity

Increasing ecological connectivity >19% improves the biodiversity index by an average of +0.5

Improvement of the quality and diversity of blue-green infrastructure

High vegetation cover >9% is associated with an average +0.6 higher green condition index

Implementation of nature-based solutions

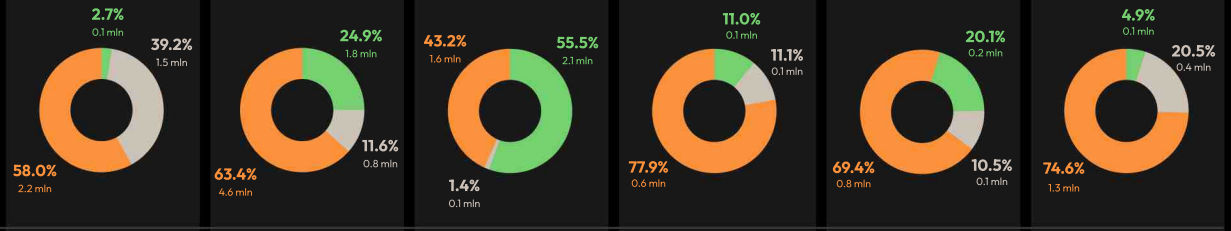
Increasing the surface retention capacity by 5% can improve water conditions by +0.6

Residents of profiles in countries

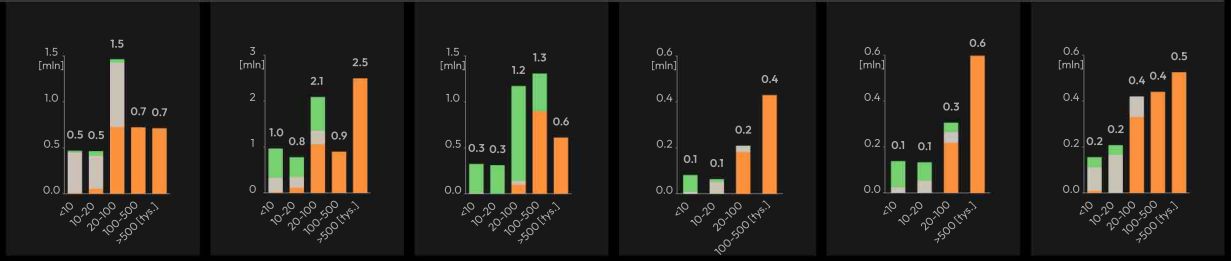
Comparison of the number of residents of individual profiles in the region's countries

	DENMARK	SWEDEN	FINLAND	ESTONIA	LATVIA	LITHUANIA
Number of cities	125	212	121	22	38	49
Population in cities	3.8 mln	7.2 mln	3.7 mln	0.8 mln	1.2 mln	1.7 mln
Share of city residents in the country's population	64 %	68 %	66 %	57 %	63 %	60 %

Population in environmental city profiles

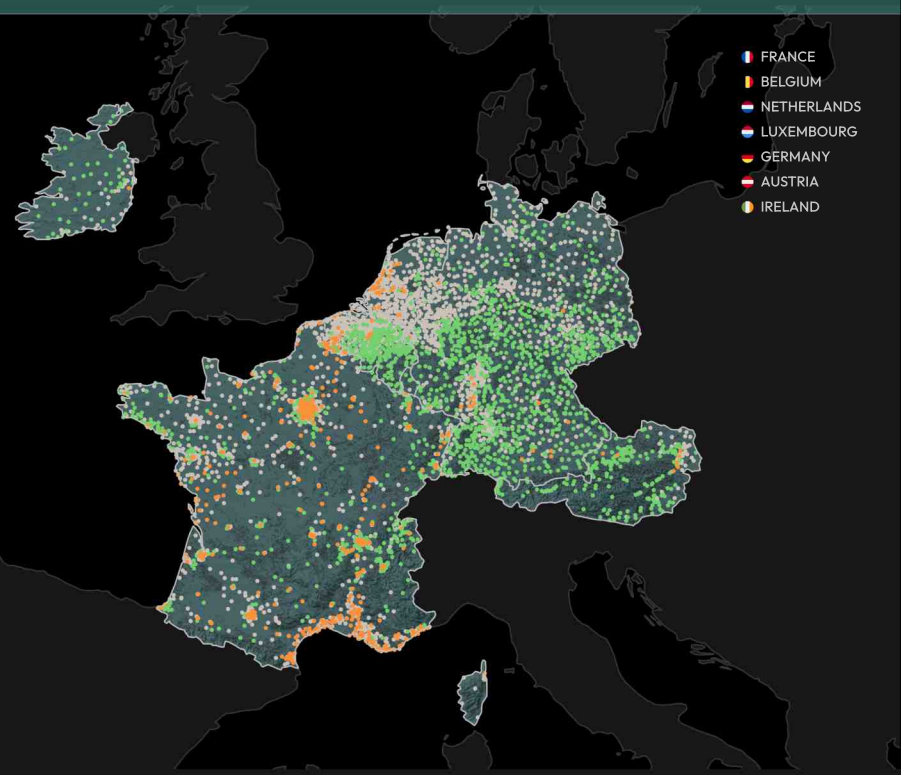


Population in environmental profiles by city size classes



BLUE-GREEN TOWNS OF THE NORTH RAINY LOWLAND CITIES URBAN CENTRES ON THE BALTIC COAST

Western Europe



Western Europe is the most urbanised region on the continent. It's nearly 5,000 cities are home to over 125 million people. In more than 600 centres, high building density and a large share of sealed surfaces limit the availability of biologically active areas, resulting in a low adaptive potential—one of the lowest in Europe. The problem of urban heat islands is particularly evident in these cities, intensifying adaptation challenges and creating adverse living conditions during heatwaves for 28% of residents.

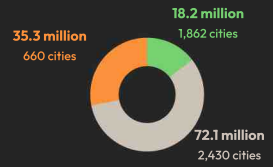
The region's temperate climate, including relatively high rainfall, partially mitigates the effects of urbanisation, so the vast majority of people live in areas with average (57%) or good (14%) conditions for building resilience based on the BGI.

The most favourable conditions in the region are found in "Small sponge towns." Thanks to a large share of permeable areas, their advantage is a high retention capacity. This allows them to more effectively retain rainwater, mitigate drought effects, and maintain more favourable thermal conditions than larger, more sealed cities.

125.7 million
urban residents

4,952
cities

SHARE OF CITIES IN BGI PROFILES IN THE REGION:



- SMALL SPONGE TOWNS
- NEUTRAL WESTERN CITIES
- WESTERN METROPOLISES UNDER PRESSURE

Blue-green city profiles in the region

SMALL SPONGE TOWNS

● Example cities: **Salzburg, Baden-Baden, Chamonix-Mont-Blanc, Spa, Killarney**

- mostly smaller towns with low urban pressure, where a smaller share of built-up areas supports the preservation of natural resources
- good water retention capacity combined with high rainfall creates favourable conditions for vegetation growth in the region's cities
- these conditions translate into better greenery status and a higher adaptation potential compared to other cities in the region

Average indicators for profiles: **C 6.5**

9.8k inhabitants
1.1k people/km²

62.0% surface retention capacity

Vegetation state +0.9
above the region average

NEUTRAL WESTERN CITIES

● Example cities: **Hamburg, Bruges, Graz, Cork, Arnhem, Luxembourg**

- cities of typical for the region size and population density, mainly located on lowland areas
- vegetation share is average here, but its condition is weaker than in other cities of the region
- achieve average resilience and BGI potential relative to the region and the entire EU, as indicated by moderate COOLCITY indicator values

Average indicators for profiles: **C 5.7**

29.7k inhabitants
1.6k people/km²

27.9%
sealed surface area

71.4% of the area **covered by vegetation,** including **64.9% with high vigour**

WESTERN METROPOLISES UNDER PRESSURE

● Example cities: **Paris, Brussels, Vienna, Dublin, Amsterdam, Antwerpen**

- the largest and most densely populated cities in the region
- despite similar location and rainfall as “Neutral Western Cities”, they experience greater urban pressure
- combined with higher air temperatures, this results in unfavourable thermal conditions and CCI values below the regional and European average

Average indicators for profiles: **C 4.3**

53.5k inhabitants
3.8k people/km²

44.9%
sealed surface area

surface temperature
3.1°C higher than the region (38.0 °C)

Different conditions, a shared need for adaptation

What distinguishes each profile and how to enhance their potential?

	Region average (standard deviation)	SMALL SPONGE TOWNS	NEUTRAL WESTERN CITIES	WESTERN METROPOLISES UNDER PRESSURE
Population (persons)	25 379 (± 92 311)	-15 579	+4 310	+28 082
Population density (persons/km²)	1694 (± 1 603)	-623	-93	+2100
Average annual temperature (°C)	10.3 (± 1.7)	-0.9	+0.3	+1.4
Annual precipitation total (mm)	945.3 (± 153.7)	+53.2	-30.2	-39.0
Average elevation (m above sea level)	169.7 (± 172.8)	+112.6	-68.2	-66.6
COOLCITY INDICATORS				
COOLCITY Index	5.8 (± 0.9)	+0.7	-0.1	-1.5
Surface permeability	7.5 (± 1.2)	+0.9	-0.1	-2.2
Impermeable area per capita (m²/person)	200.6 (± 75.2)	+7.6	-0.4	-19.9
Share of sealed surfaces (%)	27.4 (± 9.4)	-6.8	+0.5	+17.5
Vegetation state	4.9 (± 1.2)	+1.0	-0.3	-1.8
Green area per capita (m²/person)	604.6 (± 340.9)	+238.7	-81.1	-374.9
Vegetation cover (%)	71.9 (± 9.9)	+7.1	-0.5	-18.2
Proportion of high-vigour vegetation (%)	67.6 (± 12.9)	+10.4	-2.8	-19.0
Biodiversity	6.2 (± 1.0)	+0.6	-0.1	-1.3
High biodiversity areas (%)	54.6 (± 12.8)	+0.1	0.0	-0.3
Water conditions	4.4 (± 0.9)	+0.5	-0.1	-1.2
Surface retention capacity (%)	56.3 (± 7.1)	+5.7	-1.2	-11.6
Thermal conditions	6.0 (± 1.1)	+0.5	-0.1	-1.2
Surface temperature (°C)	38.0 (± 3.4)	-1.3	+0.1	+3.1



How to increase their adaptive potential?

Recommended direction for adaptive actions based on nature and BGI for cities in this profile

Protection of natural resources and retention potential

Improving retention capacity by 5% is associated with an average increase of +0.5 in the water conditions index

Improvement in the quality and diversity of blue-green infrastructure

In cities where ecological connectivity exceeds 86%, the biodiversity index increases on average by +0.8

Implementation of nature-based solutions

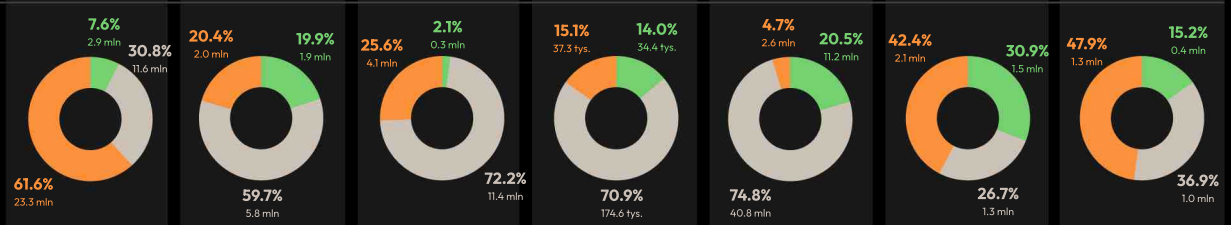
Limiting the share of high-temperature areas to 5% can improve thermal conditions by +0.7

Residents of profiles in countries

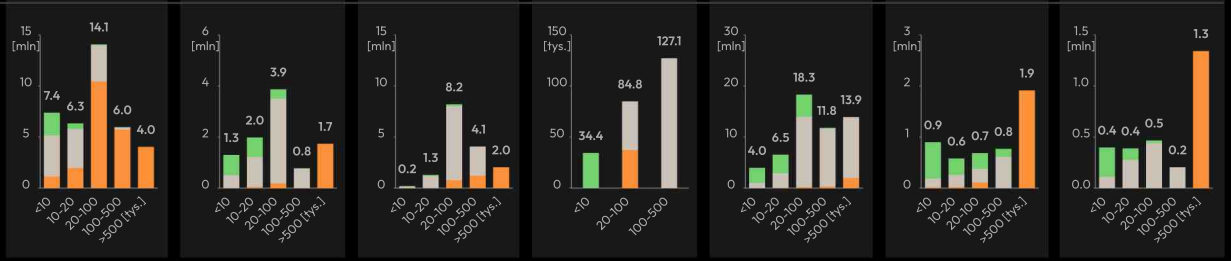
Comparison of the number of residents of individual profiles in the region's countries

	FRANCE	BELGIUM	NETHERLANDS	LUXEMBOURG	GERMANY	AUSTRIA	IRELAND
Number of cities	2 102	486	350	10	1 680	243	81
Population in cities	37.8 mln	9.7 mln	15.8 mln	0.2 mln	54.5 mln	4.8 mln	2.8 mln
Share of city residents in the country's population	55 %	81 %	88 %	36 %	65 %	53 %	51 %

Population in environmental profiles of cities



Population in environmental profiles by city size classes



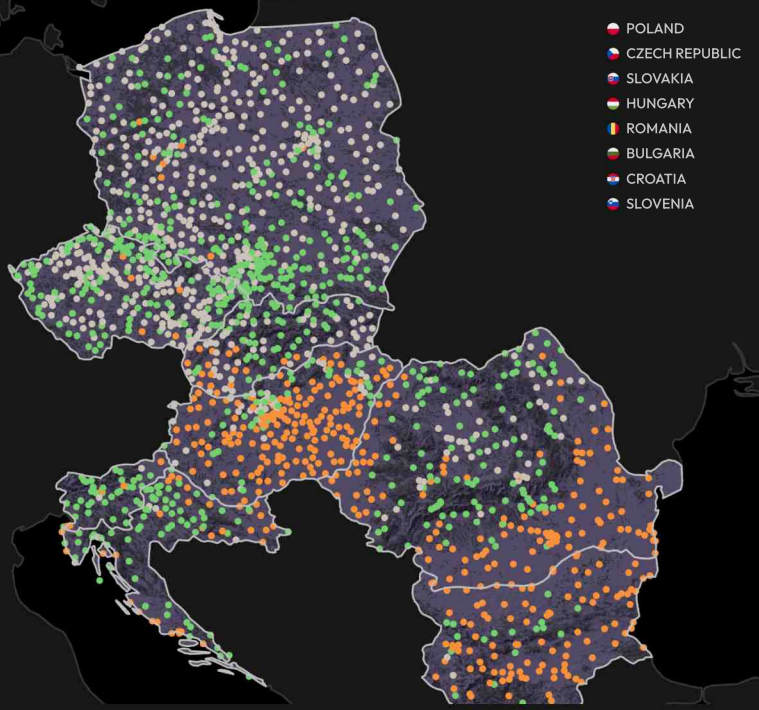
HIGHLAND SPONGE TOWNS • NEUTRAL WESTERN CITIES • WESTERN METROPOLISES UNDER PRESSURE

Central-Eastern Europe

Central-Eastern Europe holds an intermediate position between the most favourable conditions for BGI development in Northern Europe and the more demanding conditions of the South.

The best conditions are primarily found in cities located in upland areas. Higher rainfall totals and greater retention capacity support maintaining good vegetation health and greater biodiversity, enabling these cities to achieve the highest adaptive potential values in the region. About 13% of the population lives in locations with favourable conditions. At the same time, more than half of the inhabitants live in large centres with moderate conditions. The relatively low share of sealed surfaces and high vegetation cover help maintain a balance between urban development and BGI functioning.

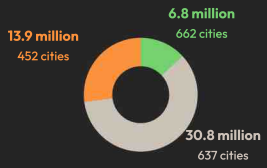
Higher sealing characterises southern cities in the region, so the problem of urban overheating is more pronounced there. It is precisely in these centres that BGI development can bring the greatest benefits, reducing the urban heat island effect and improving the resilience of the environment where nearly 14 million people live.



51.5 million
urban residents

1,751
cities

SHARE OF CITIES IN BGI PROFILES IN THE REGION:



- UPLAND CITIES OF GREEN ADVANTAGE
- LARGE CITIES WITH MODERATE CONDITIONS
- SEALED WARM CITIES

Blue-green city profiles in the region

UPLAND CITIES OF GREEN ADVANTAGE

Example cities: **Piwniczna-Zdrój, Karlovy Vary, Dubrovnik, Gabrovo, Celje**

- generally the smallest and least densely populated cities, usually located in upland and mountainous areas with high rainfall totals
- in this group, CCI values are above the region average, showing that nature-based adaptation has particular potential here
- favourable environmental conditions, especially vegetation state and water conditions, visible in high retention capacity

Average indicators for profiles: **C 6.6**

10,000 inhabitants
1,200 people/km²

vegetation state +1.1
above the region average

rainfall: **914 mm** annually
63% surface retention capacity

LARGE CITIES OF MODERATE CONDITIONS

Example cities: **Warsaw, Prague, Bratislava, Zagreb, Ljubljana**

- this group mainly includes the largest and most densely populated cities in the region, but with a relatively low share of impermeable surface per capita
- with moderate vegetation cover and typical regional green quality
- favourable thermal conditions in these cities mean urban pressure is felt less , and CCI values are only 0.3 lower than the region average

Average indicators for profiles: **C 5.7**

48,400 inhabitants
2,100 people/km²

150.7 m² of sealed surface area per capita

70.6% of surface covered by vegetation, including 71.4% with high vigour

SEALED WARM CITIES

Example cities: **Sofia, Bucharest, Split, Szeged, Koper, Leszno**

- mostly lowland, medium-sized cities, with average population density for the region
- high average annual air temperatures and significant surface sealing cause overheating problems in these centres
- adaptation using BGI is a greater challenge here compared to other cities in the region, reflected in the lowest COOLCITY indicator values

Average indicators for profiles: **C 4.8**

30,800 inhabitants
1,800 people/km²

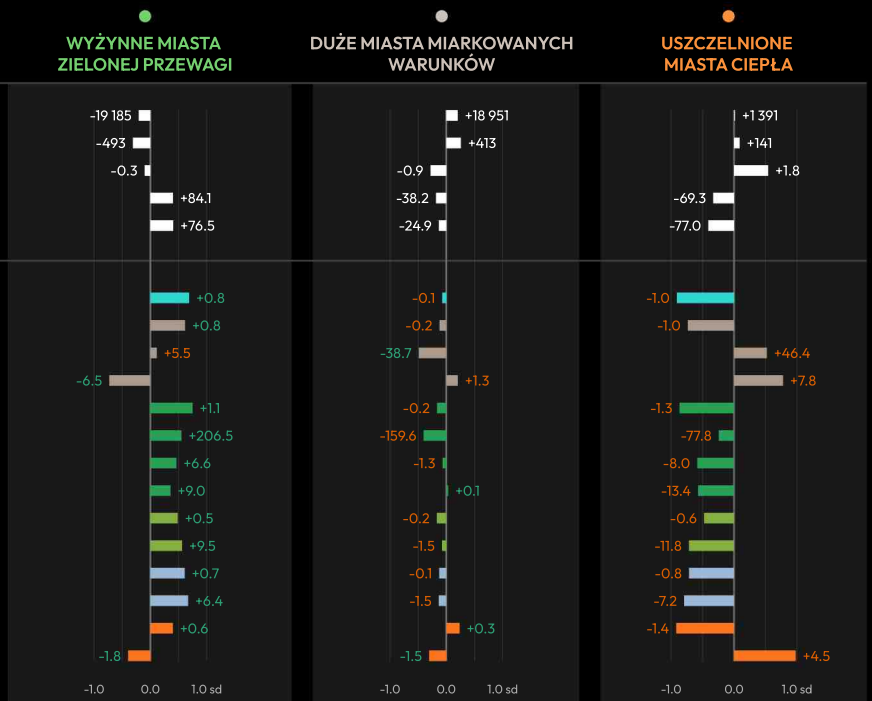
35.4%
sealed surface area

surface temperature
4.5°C higher than the region

Different conditions, shared need for adaptation

What distinguishes each profile and how to enhance their potential?

	Region average (standard deviation)	WYŻYNNE MIASTA ZIELONEJ PRZEWAGI	DUŻE MIASTA MIARKOWANYCH WARUNKÓW	USZCZELNIONE MIASTA CIEPŁA
Population (persons)	29 411 (± 98 059)	-19 185	+18 951	+1 391
Population density (persons/km²)	1670 (± 812)	-493	+413	+141
Average annual temperature (°C)	9.7 (± 1.7)	-0.3	-0.9	+1.8
Annual precipitation total (mm)	829.9 (± 166.8)	+84.1	-38.2	-69.3
Average elevation (m above sea level)	226.2 (± 158.7)	+76.5	-24.9	-77.0
COOLCITY INDICATORS				
COOLCITY Index	5.8 (± 0.8)	+0.8	-0.1	-1.0
Surface permeability	7.5 (± 1.0)	+0.8	-0.2	-1.0
Impermeable area per capita (m²/person)	189.4 (± 74.1)	+5.5	-38.7	+46.4
Share of sealed surfaces (%)	27.6 (± 7.7)	-6.5	+1.3	+7.8
Vegetation state	5.0 (± 1.3)	+1.1	-0.2	-1.3
Green area per capita (m²/person)	533.4 (± 280.7)	+206.5	-159.6	-77.8
Vegetation cover (%)	71.9 (± 7.9)	+6.6	-1.3	-8.0
Share of high-vigour vegetation (%)	71.3 (± 11.4)	+9.0	+0.1	-13.4
Biodiversity	6.3 (± 0.9)	+0.5	-0.2	-0.6
High biodiversity areas (%)	57.1 (± 13.7)	+9.5	-1.5	-11.8
Water conditions	4.4 (± 0.9)	+0.7	-0.1	-0.8
Surface retention capacity (%)	56.8 (± 7.0)	+6.4	-1.5	-7.2
Thermal conditions	6.0 (± 1.1)	+0.6	+0.3	-1.4
Surface temperature (°C)	37.9 (± 3.7)	-1.8	-1.5	+4.5



How to increase their adaptive potential?

Recommended direction for adaptive actions based on nature and BGI for cities in this profile

Protection of natural resources and strengthening their continuity

An increase in vegetation richness by 0.2 corresponds to an average +0.6 higher biodiversity index

Improvement of the quality and diversity of blue-green infrastructure

High vegetation cover above 9% is associated with an average +0.6 higher green condition index

Implementation of nature-based solutions

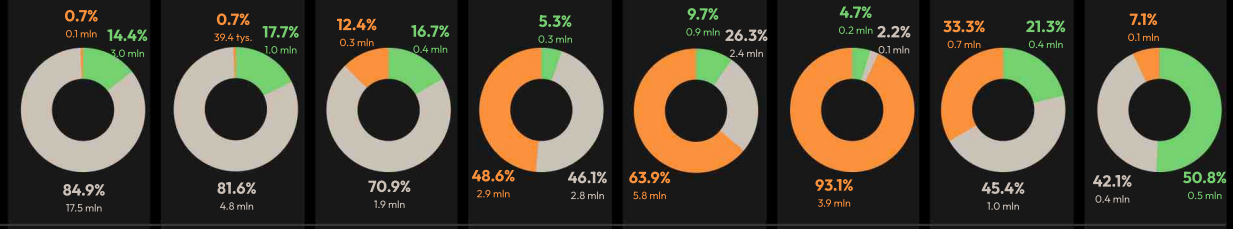
Reducing the share of areas with high temperature to below 4% is linked to an average +0.7 higher thermal condition index

Residents of profiles in countries

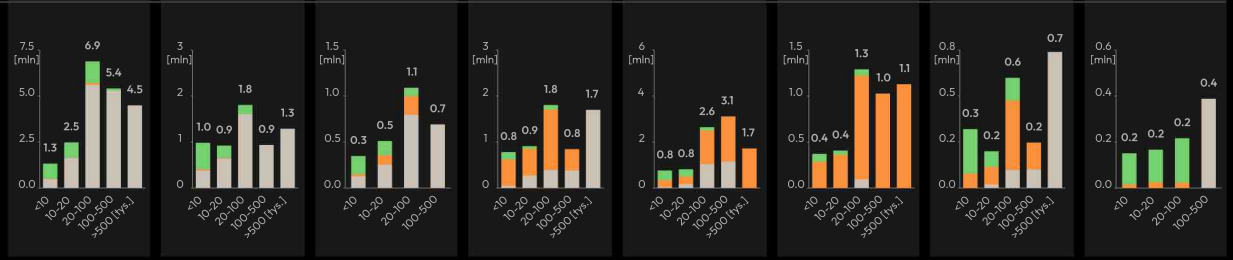
Comparison of the number of residents of individual profiles in the region's countries

	POLAND	CZECH REPUBLIC	SLOVAKIA	HUNGARY	ROMANIA	BULGARIA	CROATIA	SLOVENIA
Number of cities	574	274	118	244	278	121	100	42
Population in cities	20.6 mln	5.9 mln	2.6 mln	6 mln	9 mln	4.2 mln	2.1 mln	0.9 mln
Share of city residents in the country's population	56 %	54 %	49 %	63 %	48 %	66 %	54 %	43 %

Population in environmental city profiles



Population in environmental profiles by city size classes



SMALL CITIES WITH GREEN ADVANTAGE
LARGE CITIES WITH MODERATE CONDITIONS
DENSE WARM CITIES

Southern Europe

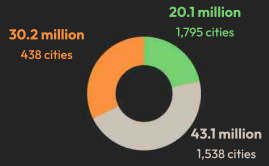
Southern Europe is the most geographically diverse region in Europe, which is reflected in the greatest variability of BGI development conditions. Large variations in temperature, precipitation, and altitude mean that alongside cooler, wetter upland and mountainous towns, there are hot, highly urbanised Mediterranean cities where the development of high-quality BGI faces the greatest constraints and the potential for adaptation is the lowest on the continent.

The highest potential is retained by small towns located in upland and mountainous areas. Lower temperatures and higher rainfall support vegetation maintenance, enabling these towns to achieve the best adaptive indicators in the region. Such towns are home to 22% of the population. Nearly half of the region's inhabitants (46%) live in typical Mediterranean cities where urban pressure coexists with less favourable climatic conditions and achieve average BGI status. The greatest challenges are concentrated in the largest agglomerations. High sealing levels, very high population density, and hot, dry climate mutually reinforce the urban heat island effect. These cities have the lowest adaptive potential in the EU and include every third person in the region.

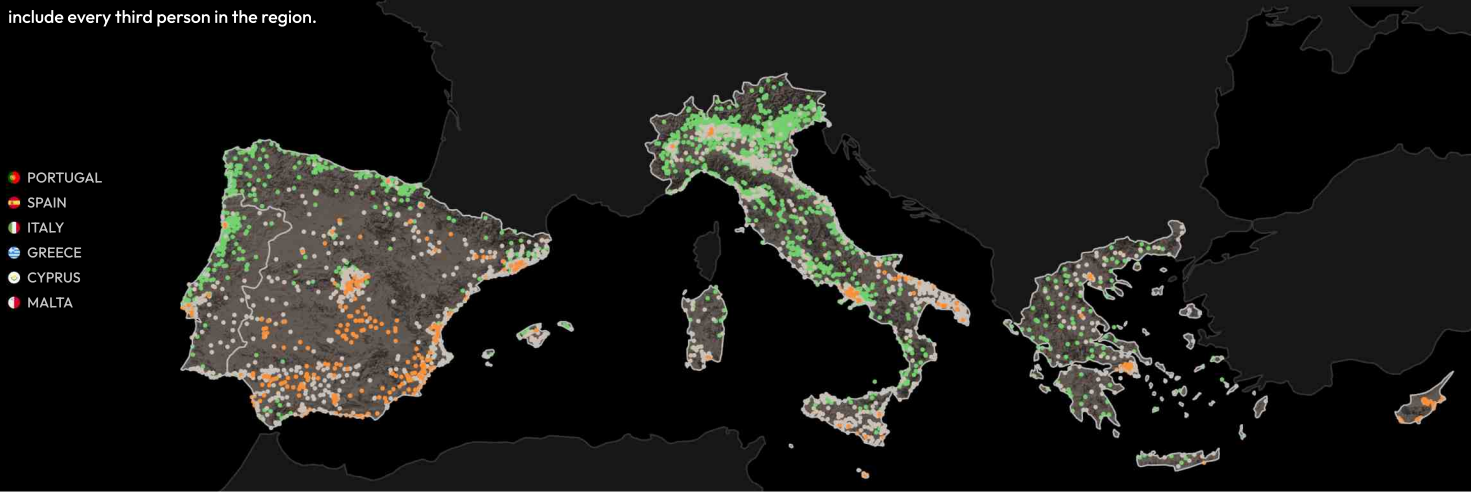
93.4 million
urban residents

3,771
cities

SHARE OF CITIES IN BGI PROFILES IN THE REGION:



- SOUTHERN REFUGE TOWNS
- TYPICAL MEDITERRANEAN CITIES
- HEATED SOUTHERN CENTRES



Blue-green city profiles in the region

SOUTHERN RETREAT TOWNS

Example cities: **Sorrento, Santiago de Compostela, Sintra, Corfu**

- towns with the lowest population and density in the region
- upland and mountainous centres with favourable climatic conditions providing lower temperatures and the highest rainfall totals among cities in the region and across the EU
- thanks to the highest CCI value in the region, cities of this profile stand out for their vegetation health and high water retention capacity

Average indicators for profiles: **CCI 5.8**

- **11.2k inhabitants**
  1.4k people/km²
- rainfall: 1,059 mm annually
  57.5% surface retention capacity
- **64% share of high vigor vegetation**

TYPICAL MEDITERRANEAN CITIES

Example cities: **Rome, Bilbao, Braga, Heraklion, Qormi**

- mostly small but more densely populated towns with fairly high sealing
- usually located by the sea, lowland, with a higher average temperature (15.7°C) and lower rainfall totals than the region average
- although they have higher vegetation cover than the region average, their vegetation state and share of high biodiversity areas are low, resulting in lower climate resilience

Average indicators for profiles: **CCI 4.4**

- **28k inhabitants**
  2.5k people/km²
- **38.4%**
  sealed surfaces
- **41% areas**
  with high biodiversity

HEATED SOUTHERN CENTRES

Example cities: **Barcelona, Lisbon, Athens, Nicosia, Valletta, Milan**

- the largest cities in the region, heavily urbanised, with the highest population density in the EU and the highest sealing levels
- unfavourable thermal conditions and low rainfall combine here with low water retention capacity
- high urban pressure and intense surface overheating are linked to low adaptive potential of these centres – the CCI value is 2 points below the region average and the lowest in the entire EU

Average indicators for profiles: **CCI 2.9**

- **68.9k inhabitants**
  4.8k people/km²
- **>55% sealed surfaces**
- **20 % fewer low-temperature areas than the region average**

Different conditions, shared need for adaptation

What distinguishes each profile and how to enhance their potential?

	Region average (standard deviation)	POŁUDNIOWE MIEJSCOWOŚCI WYTCHNIENIA	TYPOWE MIASTA ŚRÓDZIEMNOMORSKIE	ROZGRZANE CENTRA POŁUDNIA
Population (persons)	24 761 (± 90 172)	-13 555	+3 252	+44 130
Population density (persons/km²)	2225 (± 1839)	-817	+230	+2543
Average annual temperature (°C)	14.3 (± 3.4)	-1.7	+1.4	+2.3
Annual precipitation total (mm)	890.7 (± 274.3)	+168.8	-119.7	-271.4
Average elevation (m above sea level)	209.9 (± 219.9)	-1.6	-4.7	+23.2
COOLCITY INDICATORS				
COOLCITY Index	4.9 (± 1.2)	+0.9	-0.5	-2.0
Surface permeability	6.6 (± 1.5)	+1.0	-0.5	-2.7
Impermeable area per capita (m²/person)	200.9 (± 93.6)	+17.4	-12.6	-27.3
Share of sealed surfaces (%)	34.8 (± 11.7)	-8.1	+3.6	+20.4
Vegetation state	3.9 (± 1.6)	+1.2	-0.8	-2.3
Green area per capita (m²/person)	438.4 (± 306.7)	+189.4	-132.4	-311.1
Vegetation cover (%)	63.5 (± 13.2)	+9.2	-3.7	-24.7
Share of high-vigour vegetation (%)	48.8 (± 19.5)	+15.3	-11.4	-22.4
Biodiversity	6.0 (± 1.4)	+0.6	-0.1	-2.0
High biodiversity areas (%)	45.8 (± 17.7)	+8.6	-4.8	-18.2
Water conditions	3.7 (± 1.1)	+0.7	-0.4	-1.7
Surface retention capacity (%)	50.9 (± 0.1)	+6.5	-3.3	-15.2
Thermal conditions	4.2 (± 1.2)	+0.9	-0.6	-1.5
Share of low-temperature areas (%)	5.0 (± 7.6)	+1.4	-1.1	-2.0



How to increase their adaptive potential?

Recommended direction for adaptive actions based on nature and BGI for cities in this profile

Protection of natural resources and strengthening their continuity

Increasing the share of areas with high biodiversity >18% corresponds to an average +0.5 higher biodiversity index

Improving the quality and diversity of blue-green infrastructure

Increasing high vegetation cover >7% is associated with an average +0.5 higher green condition index

Implementation of nature-based solutions

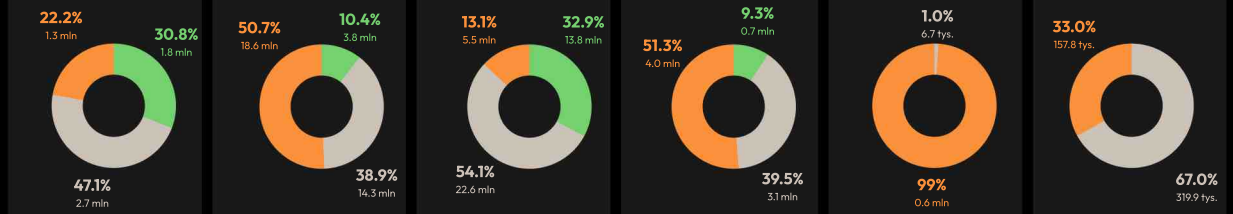
Increasing the share of areas with low temperature >4% corresponds to an average +1.0 higher thermal conditions index

Residents of profiles in countries

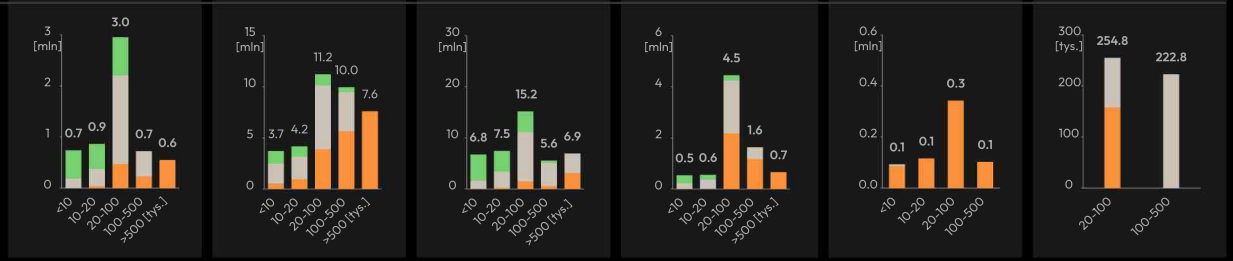
Comparison of the number of residents in each profile across the region's countries

	PORTUGAL	SPAIN	ITALY	GREECE	CYPRUS	MALTA
Number of cities	267	1 208	1 997	260	33	6
Population in cities	5.8 mln	36.7 mln	41.9 mln	7.8 mln	0.7 mln	0.5 mln
Share of urban population in the country's total population	54 %	75 %	71 %	75 %	67 %	83 %

Population in environmental city profiles



Population in environmental profiles by city size classes



SOUTHERN PLACES OF RESPITE · TYPICAL MEDITERRANEAN CITIES · HEATED CENTRES OF THE SOUTH

COOLCITY regional leaders

How can we jointly build resilient cities?

Cities of the European Union form a rich and diverse group that needs local leaders providing inspiration. Who has the greatest potential? We examined cities with the highest COOLCITY Index values across different size categories in various regions.

Individual leaders in the regions achieve scores from 5.3 in Southern Europe up to 8.5 in Central-Eastern Europe. This is the highest score among all cities and across Europe, achieved by Piwniczna-Zdrój – a very small mountain town in Poland. Large metropolises are led by Stockholm. COOLCITY regional leaders possess high-quality resources to build nature-based resilience and become drivers of change and inspiration in their regions.

	Northern Europe	Western Europe	Central-Eastern Europe	Southern Europe
VERY LARGE >500k people	Stockholm 6.7	Hamburg 6.3	Kraków 6.0	Genoa 5.3
LARGE 100k - 500k people	Jyväskylä 7.4	Bergisch Gladbach Koblenz 6.8	Rybnik 6.8	Trento 6.0
MEDIUM 20k - 100k people	Rudersdal Torslanda 7.7	Plettenberg Sundern 7.6	Konstancin -Jeziorna 7.4	Eibar 7.3
SMALL 10k - 20k people	Lempäälä, Nödinge-Nol 8.0	Boppard 8.2	Boguszów -Gorce 7.7	Viveiro 7.7
VERY SMALL <10k people	Ii 8.3	Bad Herrenalb 8.1	Piwniczna -Zdrój 8.5	Echinos 8.4



Cities with the highest COOLCITY Index values in EU regions - by size categories

Click on a city's name to view its profile and similar cities

Regional leaders Performance Index

How we can jointly build resilient cities?

Regional leaders in terms of the Performance Index (PI) are cities that most efficiently develop their blue-green infrastructure compared to cities with similar conditions. Although their absolute adaptive potential measured by the CCI indicator is not the highest in the regions, these towns utilise their BGI resources better than would be expected from their geographical or demographic conditions. Cities such as Basiglio (PI +1.5), Plopeni (PI +1.4), and L'ile Saint-Denis (PI +1.3) perform better than similar centres, indicating effective spatial policies and appropriate use of organisational and financial resources for BGI development by their local governments.

	Northern Europe	Western Europe	Central-Eastern Europe	Southern Europe
VERY LARGE > 500k people	Stockholm +0.3	Cologne +0.3	Wrocław +0.2	Genoa +0.3
LARGE 100k - 500k people	Jönköping +0.3	Erlangen +0.6	Zielona Góra +0.7	Santa Coloma de Gramenet +0.8
MEDIUM 20k - 100k people	Hillerød +1.0	Epe +1.2	Ajka +1.2	Chaidari +1.4
SMALL 10k - 20k people	Lillerød +0.9	Ville-d'Avray +1.3	Chodov +1.1	Santa Flavia +1.4
VERY SMALL < 10k people	Trakai +0.8	Glücksburg (Baltic Sea) +1.2	Poniatowa +1.4	Basiglio +1.5



Cities with the highest Performance Index values in EU regions - by size class

Click on a city to view its profile and similar cities

Best practices from the blue-green backyard

What actions are regional leaders taking?

Nature-based adaptation includes solutions such as developing a coherent network of green spaces in the city, planting street trees, green roofs and walls, as well as creating rain gardens and retention basins or restoring watercourses. Equally important is protecting existing blue-green infrastructure resources, including valuable wetlands. These actions reduce the urban heat island effect, improve water retention to lower flood risk, and increase ecosystem resilience and biodiversity. The range of solutions is broad, and the choice depends on local conditions and resources.

Let's look at example of actions taken by cities with the highest CCI scores in different European regions, which contribute to their strong climate resilience.



‘ROYAL SEAPORT’ DISTRICT

STOCKHOLM · Northern Europe

Very Large City: 1,830,764 inhabitants

6.7	8.4	6.2	5.6	6.4	6.7
+0.3	+0.2	+0.3	+0.3	+0.4	0.0

Stockholm Royal Seaport is a climate-resilient port district project. It is based on high standards for green spaces (Green Space Index) and stormwater management strategies. By 2024, over 14 hectares of green areas have been created here, with every resident having access to a park within 200 metres of their home. Rainwater is treated as a resource, stored in rain gardens with limited infiltration into the ground. The district also serves as an ecological corridor.

Similar cities: **Göteborg, Espoo, Helsinki, Vilnius, Berlin**



GREEN ROOF STRATEGY

HAMBURG · Western Europe

Very Large City: 1,822,082 inhabitants

6.3	8.2	5.3	5.6	6.0	6.6
+0.2	+0.1	+0.2	+0.1	+0.4	+0.2

In 2014, Hamburg introduced a comprehensive green roof strategy for the city. The strategy includes attractive subsidy programmes for residents and businesses, awareness campaigns, planning regulations, and scientific support from HafenCity Universität Hamburg. Its goal is to cover at least 70% of suitable roofs with vegetation (100 ha). Researchers have documented the benefits: cooling the area, reducing stormwater runoff (by up to 74%), lowering flood risk, and increasing biodiversity.

Similar cities: **Rīga, Warsaw, Essen, Cologne, Gdańsk**

Best practices from the blue-green backyard

What actions are regional leaders taking?



BLOOMING BAD HERRENALB

BAD HERRENALB · Western Europe

Very Small Town: 5,375 Inhabitants

8.1	9.9	9.9	6.0	6.6	8.0
+0.6	+0.6	+1.3	-0.8	+0.8	+0.9

This spa town located in the Schwarzwald Mitte/Nor Nature Park is implementing the “Blühendes Bad Herrenalb” (Blooming Bad Herrenalb) initiative in cooperation with the park and residents. The project aims to support biodiversity and create natural habitats for pollinating insects by transforming urban lawns into flowering meadows. It also includes educational activities promoting the creation of flower beds in gardens.

Similar towns: **Recoaro Terme, Ruhla, Dobšiná, Szczyrk**



CHYTEJ CO NAPADZE

RYBNIK · Central-Eastern Europe

Large City: 125,117 Inhabitants

6.8	8.7	6.7	5.7	5.8	6.9
0.0	-0.2	+0.3	-0.5	0.0	+0.1

Rybnik, as a member of the COOLCITY project advisory team, is an example of a post-industrial city actively working towards sustainable transformation and adaptation based on the BGI. The city focuses on local rainwater retention and reducing pressure on the sewage system. Environmental education campaigns are conducted alongside a subsidy program for residents called "Chytej co napadze" to create retention basins and rain gardens.

Similar towns: **Wałbrzych, Bergisch Gladbach, Borås**



BIO VALUE

TRENTO · Southern Europe

Large City: 114,302 Inhabitants

6.0	7.4	6.1	6.2	5.1	5.3
+0.2	0.0	+0.1	+0.6	+0.2	0.0

Trento incorporates the value of nature and ecosystem services into its policies. In the BioValue project, it is transforming the Fersina River from a regulated channel into an accessible socio-ecological space that supports biodiversity and city resilience while engaging residents in co-design. Plans include riverbank renaturation, introduction of riparian vegetation, linear parks along the valley, and increased floodplain areas.

Similar towns: **Saarbrücken, Žilina, Moncalieri, Maribor**

Best practices from the blue-green backyard

What actions are regional leaders taking?



PARCO AGRICOLO SUD MILANO

BASIGLIO · Southern Europe

Very small town: 7,071 inhabitants

6.2	8.6	5.3	6.2	4.6	6.4
+1.5	+1.8	+1.8	+0.8	+1.4	+1.6

Basiglio is a municipality entirely within the Parco Agricolo Sud Milano — a vast agricultural and natural park established to protect farming, the environment, and rural landscape. The historic irrigation network forms one of the most productive agricultural structures in Europe.

Similar towns: **Blomberg, Asolo, Pont-Évêque, Hadamar**



RIVER RENATURATION

Ii · Northern Europe

Very small town: 3,343 inhabitants

8.3	9.9	8.1	7.3	7.8	8.2
+0.5	+0.5	+0.9	+0.3	+0.2	+0.4

This is an example of a climatically active small municipality in Europe. The municipality of Ii carries out river renaturation projects for the Kuivajoki and Olhavanjoki rivers, and also participates in the Iijoki Old Riverbed Development Project, aimed at restoring the old Iijoki riverbed and improving fish migration conditions. Additionally, as a signatory of the Iijoki River Agreement, Ii is involved in activities including the restoration of drained peatlands and wetlands and the renaturation of streams throughout the Iijoki catchment area.

Similar towns: **Masku, Ādaži, Elva, Kramfors**

A place for your city's project on the COOLCITY blog

Submit a project

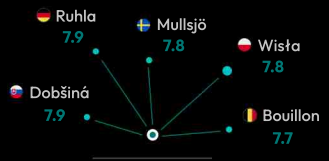
Shared challenges and adaptation opportunities

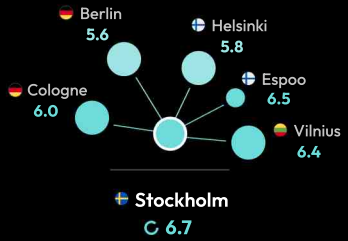
How to find similar cities and build partnerships?

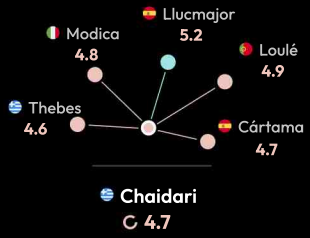
The COOLCITY Index helps identify cities that are leaders in their category and have the best blue-green infrastructure resources for adaptation, as well as those facing similar challenges with comparable development conditions. This makes it not only a diagnostic tool but also a platform supporting the exchange of knowledge and best practices among local governments.

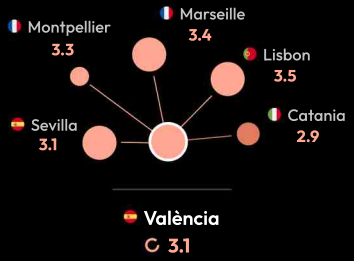
On the coolcity.eu platform, every city can find a list of similar cities—places with comparable geographical and demographic conditions and similar adaptive potential based on BGI resources. Comparisons with cities of a similar nature can be more valuable than referencing the largest metropolises, as they consider the actual capabilities and needs of the specific entity.

We encourage using the platform to establish cooperation, seek partners for experience exchange, and build a network of cities working together on climate change adaptation strategies.









Find your city on the coolcity.eu platform

→

Check which cities have similar conditions: geographical · demographic · adaptive

→

Build a network for experience exchange and act together!

COOLCITY Index in EU countries

How does adaptation potential vary across different countries?

European cities develop under diverse environmental, spatial, and social conditions, so their capacity to adapt to climate change is not uniform. Regardless of the starting point, it is crucial for local and national decision-makers to identify their own resources and manage adaptation based on measurable data.

European climate law requires member states to systematically strengthen resilience and monitor progress in implementing adaptation measures. To this end, the COOLCITY Index report and **platform** present indicators monitoring changes in urban ecosystems as outlined in European regulations [19, 20]. These indicators should be incorporated into strategic documents at both national and local levels. They include: the share of green areas in the city, tall vegetation coverage (tree canopies), percentage of impermeable surfaces, and indicators related to rainwater infiltration and urban heat.

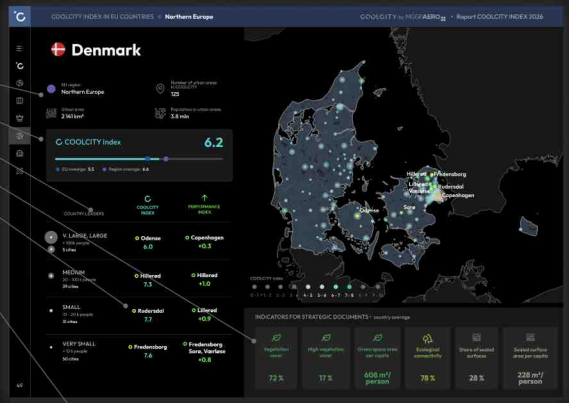
The next section of the report features profiles of 27 European Union countries, presenting an overall picture of the environmental adaptation potential of these states, as well as the opportunities and challenges linked to local green infrastructure resources. The profiles highlight national leaders with the highest COOLCITY Index and Performance Index values, and also present indicators monitoring the state of the urban environment.

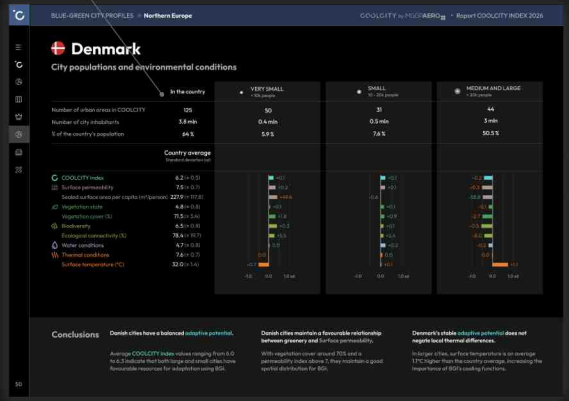
Northern Europe		Western Europe		Central Eastern Europe		Southern Europe	
Denmark	49	France	60	Poland	73	Portugal	89
Sweden	51	Belgium	62	Czech Republic	75	Spain	91
Finland	53	Netherlands	64	Slovakia	77	Italy	93
Estonia	55	Luxembourg	66	Hungary	79	Greece	95
Latvia	56	Germany	67	Romania	81	Cyprus	97
Lithuania	58	Austria	69	Bulgaria	83	Malta	99
		Ireland	71	Croatia	85		
				Slovenia	87		

How to read the EU countries' cards?

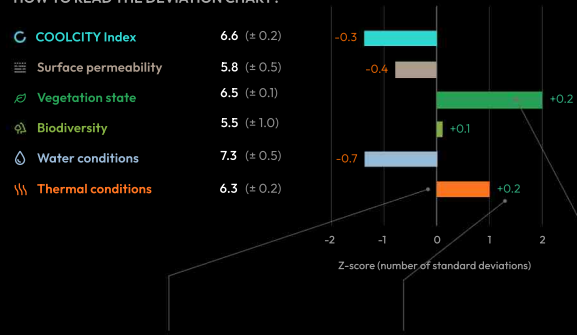
Each country card includes:

- The number of analyzed urban areas, their area and population
- The adaptive potential index of the country's cities relative to the EU average
- Leaders of the COOLCITY Index and Performance Index in different city size groups
- BGI monitoring indicators for strategic documents
- Links to city profiles on the COOLCITY Index platform – click on a city name to view its characteristics and similar cities
- Variation in indicator values across cities grouped by population size*





HOW TO READ THE DEVIATION CHART?



Reference point

The 0 axis indicates the average indicator values in the country

Label and interpretation

The label indicates the value of the group's difference from the average of all cities in the country. The colour shows how to interpret it (positively or negatively)

Direction of deviation and strength of difference

The direction of the bar shows whether the result is above or below the average. Its length is the z-score, meaning the longer the bar, the stronger the deviation from the average

*In selected countries, variation is not shown due to too few urban areas

Denmark

EU region
Northern Europe

Number of urban areas in COOLCITY
125

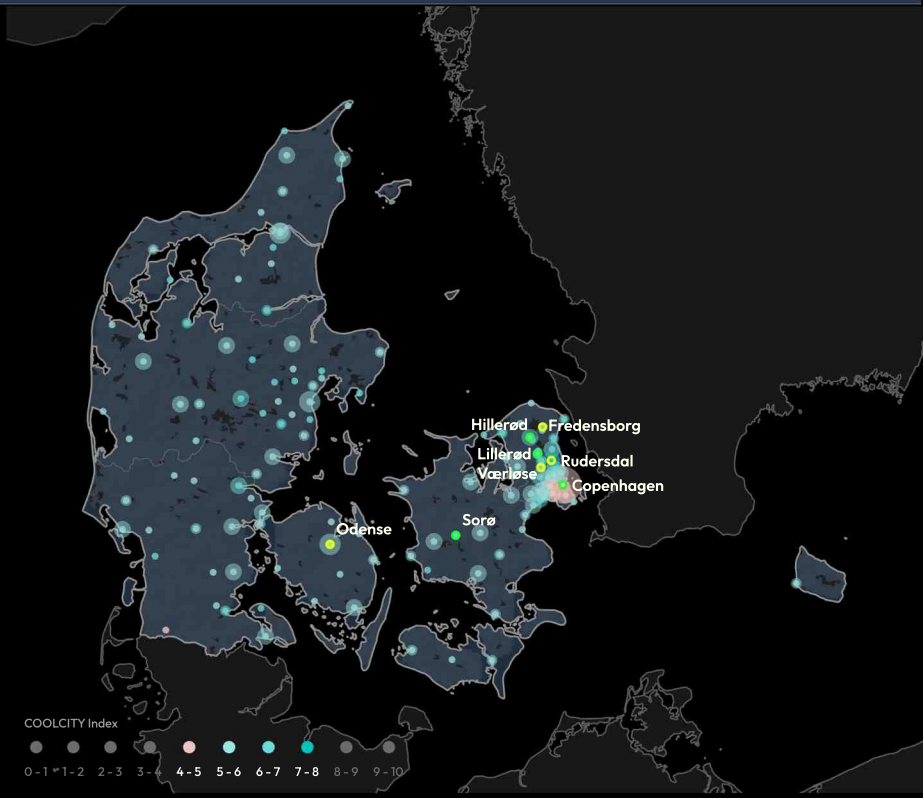
Urban area
2 141 km²

Population in urban areas
3.8 mln

COOLCITY Index 6.2

EU avearge: 5.5 • Region average: 6.6

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
V. LARGE, LARGE > 100k people 5 cities	Odense 6.0	Copenhagen +0.3
MEDIUM 20 - 100 k people 39 cities	Hillerød 7.3	Hillerød +1.0
SMALL 10 - 20 k people 31 cities	Rudersdal 7.7	Lillerød +0.9
VERY SMALL < 10 k people 50 cities	Fredensborg 7.6	Fredensborg Sorø, Værløse +0.8



INDICATORS FOR STRATEGIC DOCUMENTS • country average

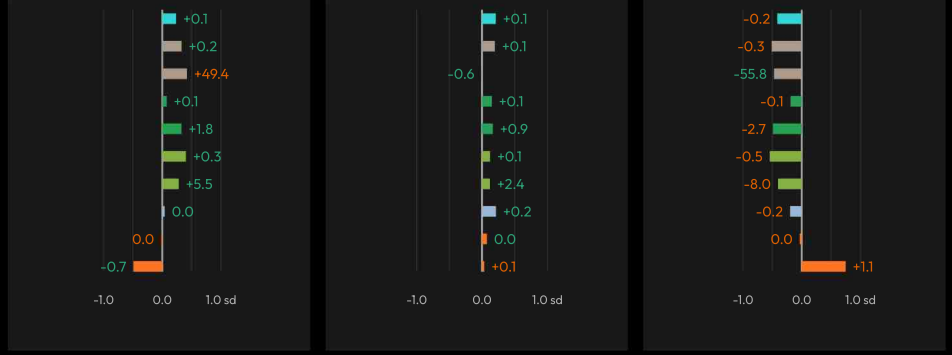
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
72 %	17 %	608 m²/ person	78 %	28 %	228 m²/ person

Denmark

City populations and environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM AND LARGE > 20k people
Number of urban areas in COOLCITY	125	50	31	44
Number of city inhabitants	3.8 mln	0.4 mln	0.5 mln	3 mln
% of the country's population	64 %	5.9 %	7.6 %	50.5 %

	Country average (Standard deviation (sd))
COOLCITY Index	6.2 (± 0.5)
Surface permeability	7.5 (± 0.7)
Sealed surface area per capita (m²/person)	227.9 (± 117.8)
Vegetation state	4.8 (± 0.8)
Vegetation cover (%)	71.5 (± 5.4)
Biodiversity	6.5 (± 0.8)
Ecological connectivity (%)	78.4 (± 19.7)
Water conditions	4.7 (± 0.8)
Thermal conditions	7.6 (± 0.7)
Surface temperature (°C)	32.0 (± 1.4)



Conclusions

Danish cities have a balanced adaptive potential.

Average COOLCITY Index values ranging from 6.0 to 6.3 indicate that both large and small cities have favourable resources for adaptation using BGI.

Danish cities maintain a favourable relationship between greenery and Surface permeability.

With vegetation cover around 70% and a permeability index above 7, they maintain a good spatial distribution for BGI.

Denmark's stable adaptive potential does not negate local thermal differences.

In larger cities, surface temperature is on average 1.1°C higher than the country average, increasing the importance of BGI's cooling functions.

Sweden

EU Region
Northern Europe

Number of urban areas in COOLCITY
212

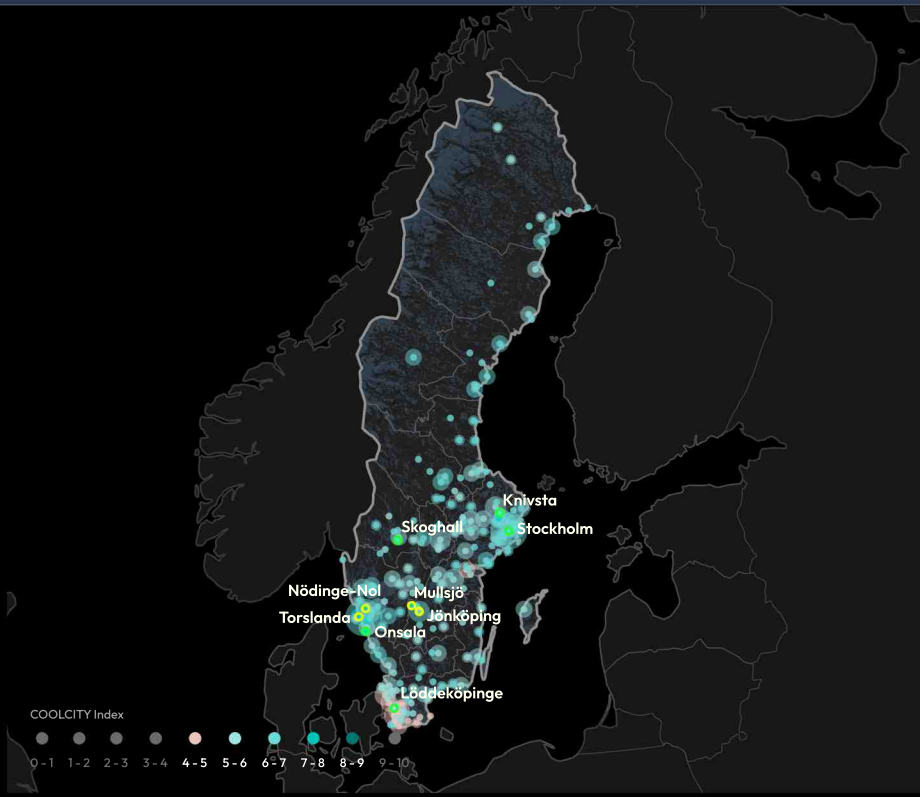
Urban area
3,984 km²

Population in urban areas
7.2 million

COOLCITY Index 6.6

EU average: 5.5 • Region average: 6.6

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 10 cities	Jönköping 7.0	Stockholm, Jönköping +0.3
MEDIUM 20k - 100k people 50 cities	Torslanda 7.7	Torslanda +0.7
SMALL 10k - 20k people 63 cities	Nödinge-Nol 8.0	Knivsta, Skoghall, Onsala +0.6
VERY SMALL > 10k people 89 cities	Mullsjö 7.8	Löddeköpinge +0.7



INDICATORS FOR STRATEGIC DOCUMENTS • country average

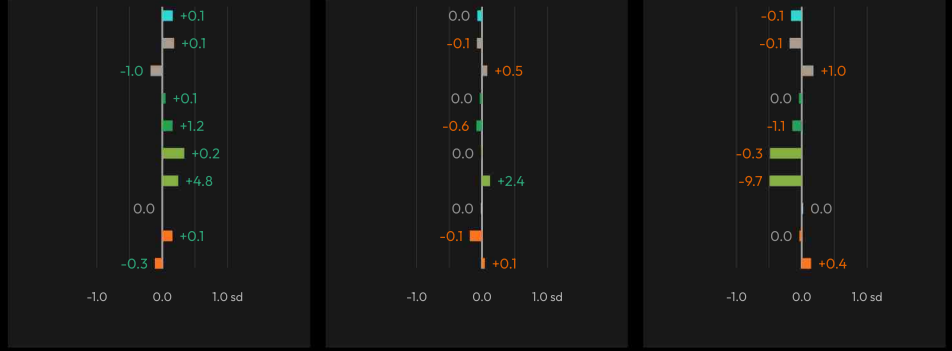
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed area per capita
76 %	30 %	613 m²/ person	74 %	23 %	189 m²/ person

Sweden

City populations and their environmental conditions

	W kraju	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM AND LARGE > 20k people
Number of urban areas in COOLCITY	212	89	63	60
City population	7.2 mln	0.6 mln	0.9 mln	5.7 mln
% of national population	68 %	5.5 %	8.3 %	54.4 %

	Country average (Standard deviation (sd))
COOLCITY Index	6.6 (± 0.6)
Surface permeability	8.0 (± 0.7)
Share of sealed surfaces (%)	23.2 (± 5.5)
Vegetation state	5.9 (± 1.0)
Share of high-vigour vegetation (%)	76.0 (± 7.4)
Biodiversity	6.4 (± 0.7)
Ecological connectivity (%)	74.0 (± 19.7)
Water conditions	5.6 (± 1.1)
Thermal conditions	6.9 (± 0.6)
Share of high-temperature areas (%)	2.9 (± 3.0)



Conclusions

Sweden has a very balanced adaptive potential across its cities.

Having average COOLCITY Index values range from 6.5 to 6.7, different city size groups have similarly favourable starting conditions for developing high-quality NBS and building climate resilience.

Very small Swedish cities stand out with higher biodiversity.

In this group, biodiversity score averages 6.6 and remains 0.2 above the country average, supporting natural values of NBS.

In larger Swedish cities, local overheating hotspots are evident.

Despite similar conditions for NBS development in Swedish cities, the largest centres show a higher share of areas with elevated temperatures (0.4 percentage points above the average).

Finland

EU Region
Northern Europe

Number of urban areas in COOLCITY
121

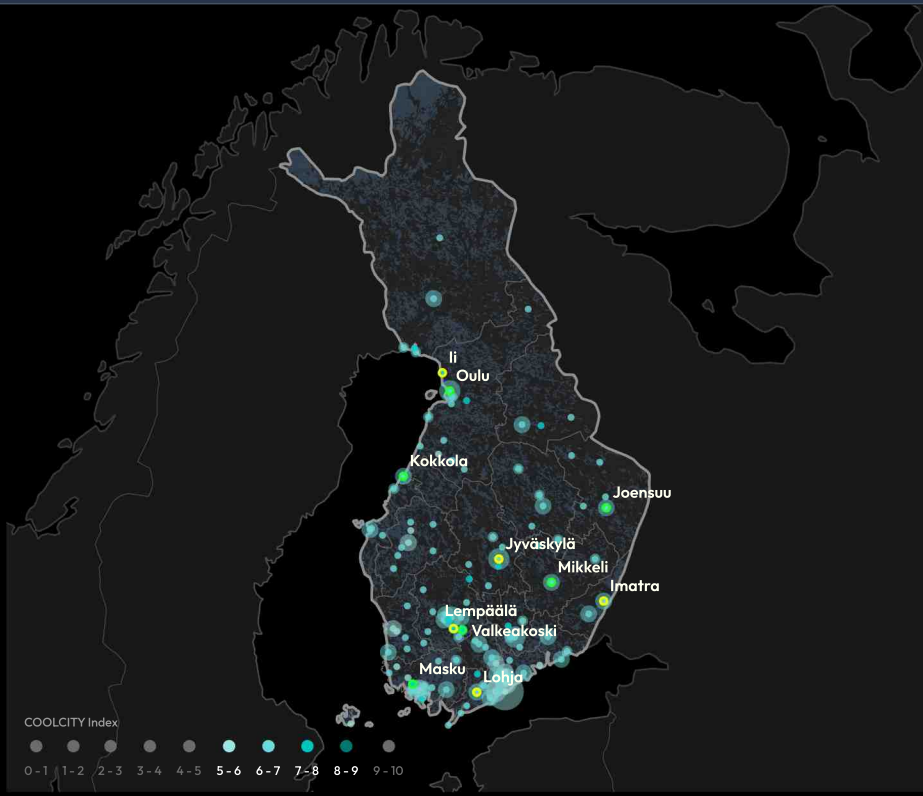
Urban area
2,945 km²

Population in urban areas
3.7 million

COOLCITY Index 7.1

EU average: 5.5 Region average: 6.6

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 8 cities	Jyväskylä 7.4	Jyväskylä, Oulu +0.2
MEDIUM 20k - 100k people 30 cities	Imatra, Lohja 7.6	Joensuu, Kokkola Lohja, Mikkeli +0.3
SMALL 10k - 20k people 22 cities	Lempäälä 8.0	Valkeakoski +0.5
VERY SMALL < 10k people 61 cities	Ii 8.3	Masku +0.7



INDICATORS FOR STRATEGIC DOCUMENTS • country average

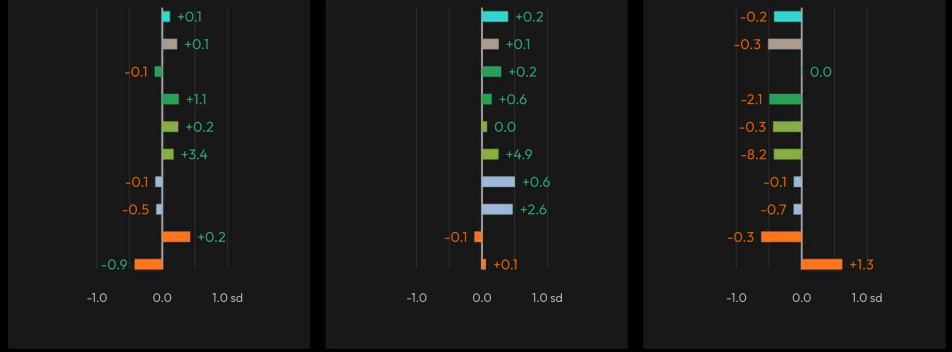
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed area per capita
82 %	35 %	996 m²/ person	76 %	17 %	204 m²/ person

Finland

City populations and their environmental conditions

	W kraju	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	121	61	22	38
Number of city inhabitants	3.7 mln	0.3 mln	0.3 mln	3.1 mln
% of the country's population	66 %	5.8 %	5.5 %	54.9 %

	National average (Standard deviation (sd))
COOLCITY Index	7.1 (± 0.5)
Surface permeability	8.9 (± 0.5)
Vegetation state	6.6 (± 0.8)
Vegetation cover (%)	82.2 (± 4.2)
Biodiversity	6.8 (± 0.6)
Ecological connectivity (%)	76.4 (± 19.2)
Water conditions	6.2 (± 1.1)
Share of wetland ecosystems (%)	5.4 (± 5.6)
Thermal conditions	7.2 (± 0.6)
Surface temperature (°C)	31.6 (± 2.1)



Conclusions

Finland has a balanced and stable adaptive capacity in its cities.

The average COOLCITY Index value is 7.1, with a standard deviation of 0.5, indicating a similar distribution of results regardless of city size category.

Waters and wetlands enhance the adaptive conditions of small Finnish cities.

Their share averages 8%, supporting retention and microclimate within the urban structure, resulting in a higher water conditions index (0.6 above the country average).

Higher surface temperatures are notable in Finland's large cities.

The average for this group is 1.3°C higher than the country average, indicating the presence of local heat islands in these cities and the need to apply green infrastructure to cool them down.

Estonia

EU Region
Northern Europe

Number of urban areas in COOLCITY
22

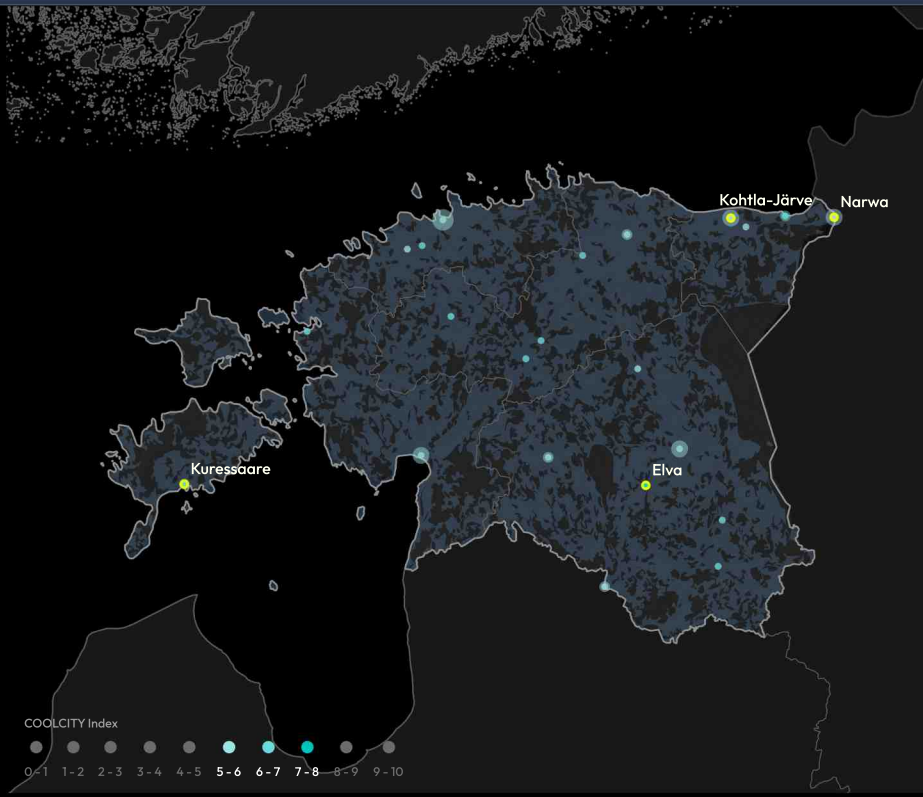
Urban area
299 km²

Population in urban area
784k

COOLCITY Index 6.7

EU average: 5.5 • Region average: 6.6

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
LARGE, MEDIUM 20 - 100k people 5 cities	Kohtla-Järve, Narva 6.4	Narva +0.5
SMALL 10 - 20k people 5 cities	Kuressaare 7.2	Kuressaare +0.4
VERY SMALL < 10k people 12 cities	Elva 7.7	Elva +0.5



INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green area per inhabitant	Ecological connectivity	Share of sealed surfaces	Sealed area per capita
77 %	25 %	534 m²/ person	75 %	22 %	138 m²/ person

Latvia

EU Region
Northern Europe

Number of urban areas in COOLCITY
38

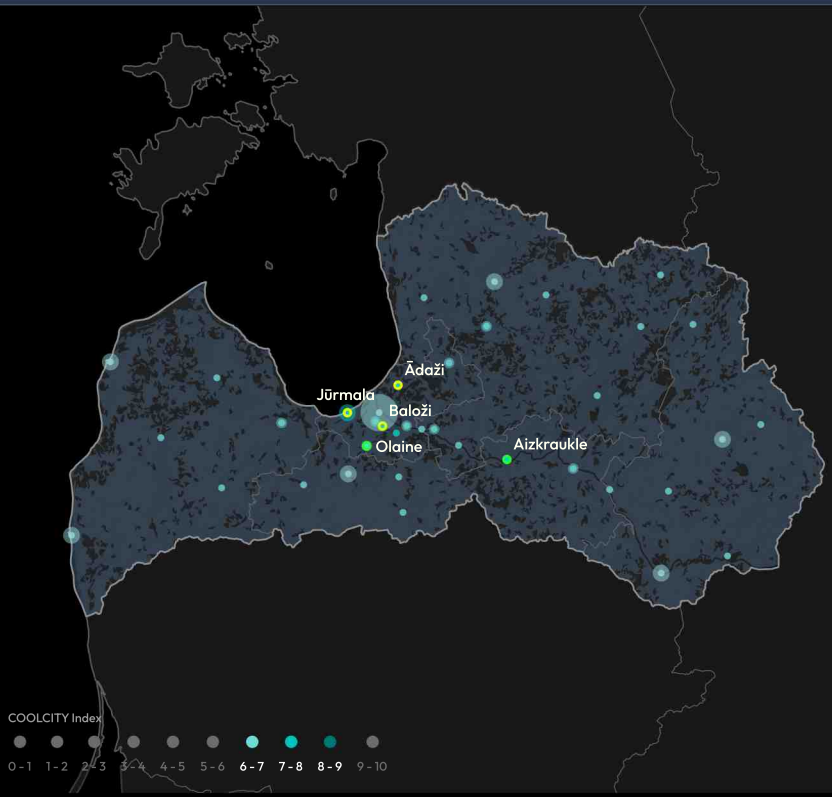
Urban area
557 km²

Population in urban area
1.2 million

COOLCITY Index 7.0

EU average: 5.5 • Region average: 6.6

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, MEDIUM 20 - 100k people 8 cities	Jūrmala 7.7	Jūrmala +0.6
SMALL 10 - 20k people 9 cities	Baloži 7.9	Olaine +0.6
VERY SMALL > 10k people 21 cities	Ādaži 8.0	Aizkraukle +0.6



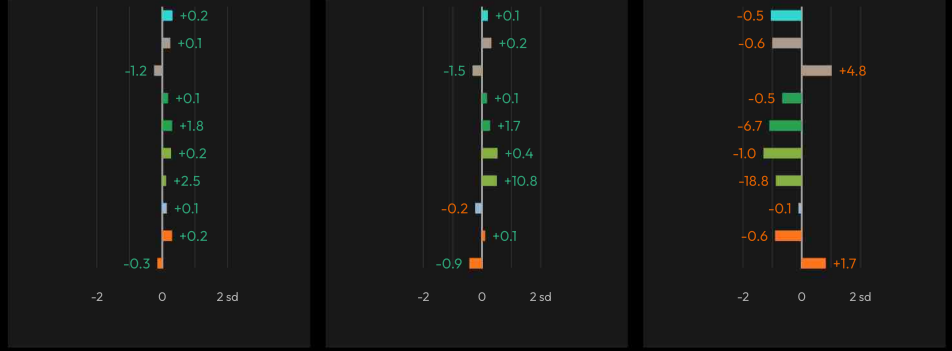
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green area per inhabitant	Ecological connectivity	Share of sealed surfaces	Sealed area per capita
80 %	29 %	600 m²/ person	62 %	19 %	143 m²/ person

Latvia

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	38	21	9	8
City population	1.2 mln	0.1 mln	0.1 mln	0.9 mln
% of national population	63 %	7.5 %	7.2 %	48.6 %
	National average Standard deviation (sd)			
COOLCITY Index	7.0 (± 0.5)			
Surface permeability	8.5 (± 0.6)			
Sealed surface area (%)	19.4 (± 4.7)			
Vegetation state	6.1 (± 0.8)			
Share of high-vigor vegetation (%)	82.7 (± 6.1)			
Biodiversity	6.6 (± 0.7)			
Ecological connectivity (%)	62.2 (± 21.3)			
Water conditions	5.9 (± 0.9)			
Thermal conditions	7.9 (± 0.6)			
Surface temperature (°C)	29.0 (± 2.1)			



Conclusions

In Latvia, the COOLCITY Index remains high, with moderate differences between city groups.

Average values from 6.5 to 7.2 show a stable foundation for building resilience based on the BGI index in the country.

Cities with 10k to 20k inhabitants in Latvia are notable for high biodiversity.

In this group, it is 7.0 and remains 0.4 above the country average, strengthening the natural potential of the BGI.

Vegetation state is lower in larger Latvian cities.

The average share of high-vigour vegetation is 76.0% and remains 6.7 percentage points below the country average, highlighting the need to strengthen the BGI in the largest cities.

Lithuania

EU Region
Northern Europe

Number of urban areas in COOLCITY
49

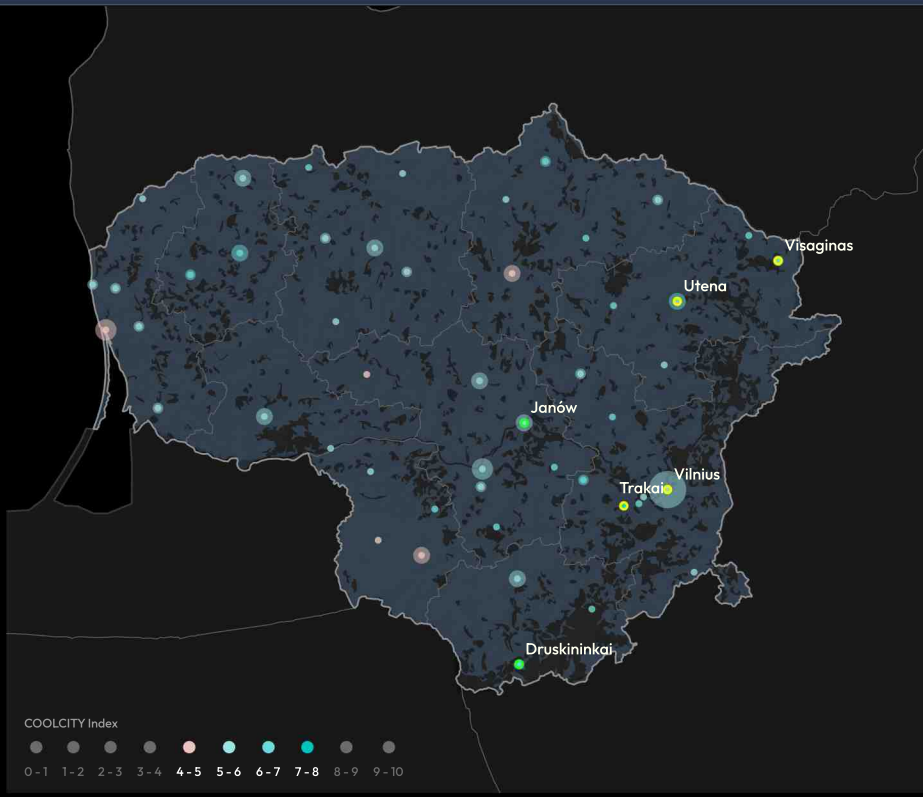
Urban area
811 km²

Population in urban area
1.7 million

COOLCITY Index 6.4

EU average: 5.5 • Region average: 6.6

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 3 cities	Vilnius 6.4	Vilnius +0.2
MEDIUM 20k - 100k people 10 cities	Utena 6.7	Jonava, Utena +0.2
SMALL 10k - 20k people 14 cities	Visaginas 7.4	Druskininkai +0.6
VERY SMALL > 10k people 22 cities	Trakai 7.9	Trakai +0.8



INDICATORS FOR STRATEGIC DOCUMENTS • country average

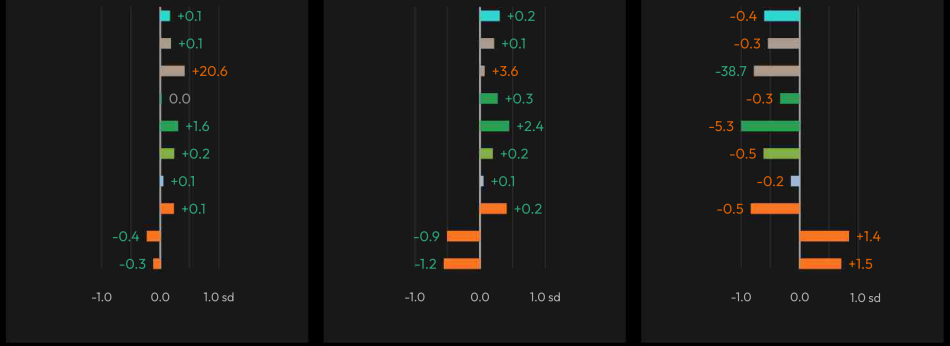
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed area per capita
73 %	22 %	465 m²/ person	60 %	26 %	167 m²/ person

Lithuania

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	49	22	14	13
Number of city inhabitants	1.7 mln	0.2 mln	0.2 mln	1.4 mln
% of the country's population	61 %	5.4 %	7.2 %	47.9 %

	National average (Standard deviation (sd))
COOLCITY Index	6.4 (± 0.6)
Surface permeability	7.7 (± 0.6)
Sealed surface area per capita (m²/person)	166.9 (± 49.5)
Vegetation state	5.3 (± 1.0)
Share of high-vigor vegetation (%)	77.7 (± 5.3)
Biodiversity	6.2 (± 0.8)
Water conditions	5.1 (± 1.2)
Thermal conditions	7.6 (± 0.6)
Surface temperature (°C)	30.7 (± 1.7)
Share of high-temperature areas (%)	2.2 (± 2.1)



Conclusions

Lithuania combines a high COOLCITY Index with a fairly consistent pattern of results across city groups.

Average CCI values between 6.0 and 6.5 indicate that cities have a stable adaptive capacity based on the BGI index regardless of size.

Cities with 10k to 20k inhabitants in Lithuania are notable for their good vegetation state.

The average share of high-vigour vegetation reaches 80.1% and remains 2.4 percentage points above the country average, enhancing the quality of green infrastructure.

Thermal conditions are less favourable in larger Lithuanian cities.

The average surface temperature is 32.1°C, which is 1.4°C higher than the country average, increasing the importance of the cooling role of BGI and indicating the need to implement NBS solutions in large cities.

France

EU Region
Western Europe

Number of urban areas in COOLCITY
2,102

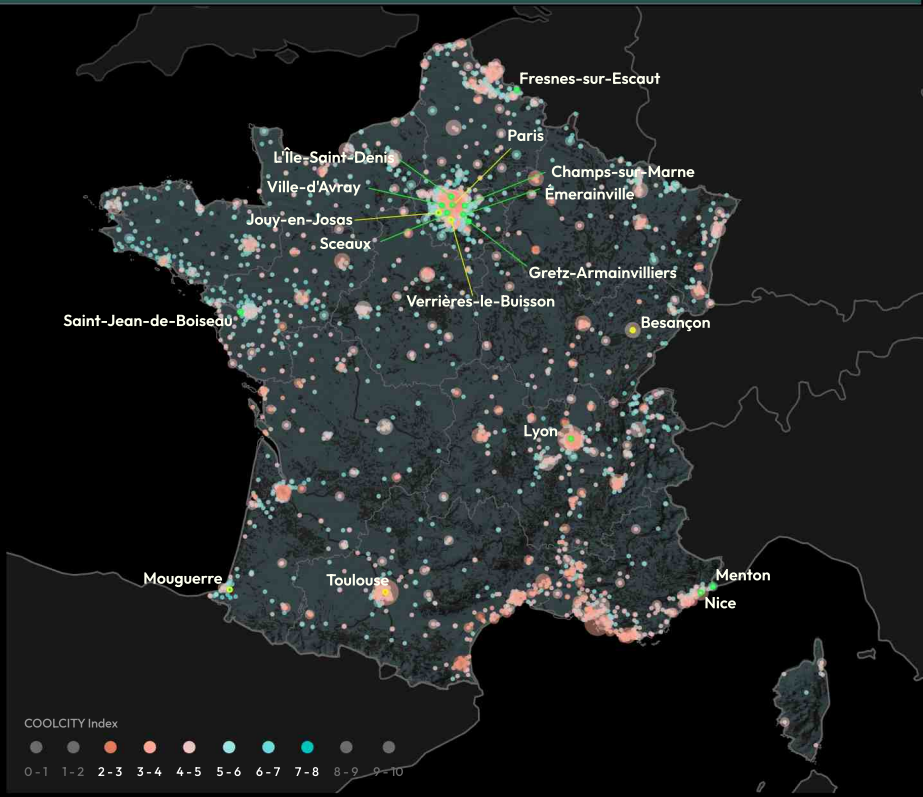
Urban area
16,353 km²

Population in urban area
37.8 million

COOLCITY Index 5.3

EU average: 5.5 • Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 4 cities	Toulouse 3.8	Lyon, Paris 0.0
LARGE 100k - 500k people 37 cities	Besançon 5.2	Nice +0.5
MEDIUM 20k - 100k people 372 cities	Verrières-le-Buisson 7.2	Champs-sur-Marne, Menton, Sceaux +1.2
SMALL 10k - 20k people 461 cities	Jouy-en-Josas 7.8	L'Île-Saint-Denis, Ville-d'Avray +1.3
VERY SMALL < 10k people 1,228 cities	Mouguerre 7.9	Émerainville, Fresnes-sur-Escaut, Gretz-Armainvilliers, Saint-Jean-de-Boiseau +1.2



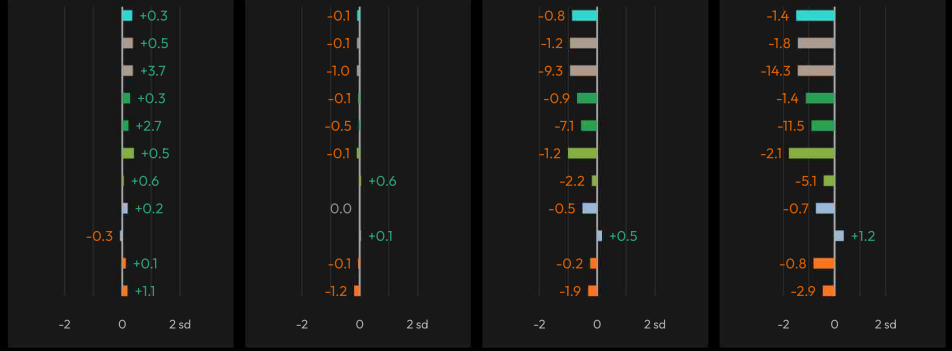
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
66 %	17 %	506 m²/ person	65 %	33 %	219 m²/ person

France

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE > 100k people
Number of COOLCITY cities	2,102	1 228	461	372	37
City population	37.8 million	7.4 mln	6.3 mln	14.1 mln	6 mln
% of national population	55 %	10.7 %	9.2 %	20.5 %	8.7 %
	National average Standard deviation (sd)				
COOLCITY Index	5.3(± 0.9)	+0.3	-0.1	-0.8	-1.4
Surface permeability	6.8(± 1.3)	+0.5	-0.1	-1.2	-1.8
Biologically active surface area (%)	67.0(± 10.0)	+3.7	-1.0	-9.3	-14.3
Vegetation state	4.4(± 1.3)	+0.3	-0.1	-0.9	-1.4
Share of high-vigour vegetation (%)	59.8(± 12.8)	+2.7	-0.5	-7.1	-11.5
Biodiversity	6.0(± 1.2)	+0.5	-0.1	-1.2	-2.1
Areas of high biodiversity (%)	55.1(± 11.9)	+0.6	+0.6	-2.2	-5.1
Water conditions	4.1(± 1.0)	+0.2	0.0	-0.5	-0.7
Share of water and wetlands (%)	1.7(± 3.3)	-0.3	+0.1	+0.5	+1.2
Thermal conditions	5.4(± 1.0)	+0.1	-0.1	-0.2	-0.8
Share of low-temperature areas (%)	5.0(± 6.2)	+1.1	-1.2	-1.9	-2.9



Conclusions

Small and very small French cities have the highest adaptive potential in the country.

This is the most numerous group of cities, where the COOLCITY Index remains close to the country average, while in medium and large cities it is lower by 0.8 and 1.4 points respectively.

In the largest French cities, vegetation vigour and biodiversity support are key.

The share of high-vigour vegetation is 11.5% lower than the country average, paired with significantly lower biodiversity, weakening adaptive potential in big cities.

Better water conditions in small cities are not only due to the presence of water bodies.

Despite a smaller share of rivers and wetlands, small cities achieve good water condition results, showing the importance of Surface permeability and high soil retention capacity when thinking about water in cities.

Belgium

EU Region
Western Europe

Number of urban areas in COOLCITY
486

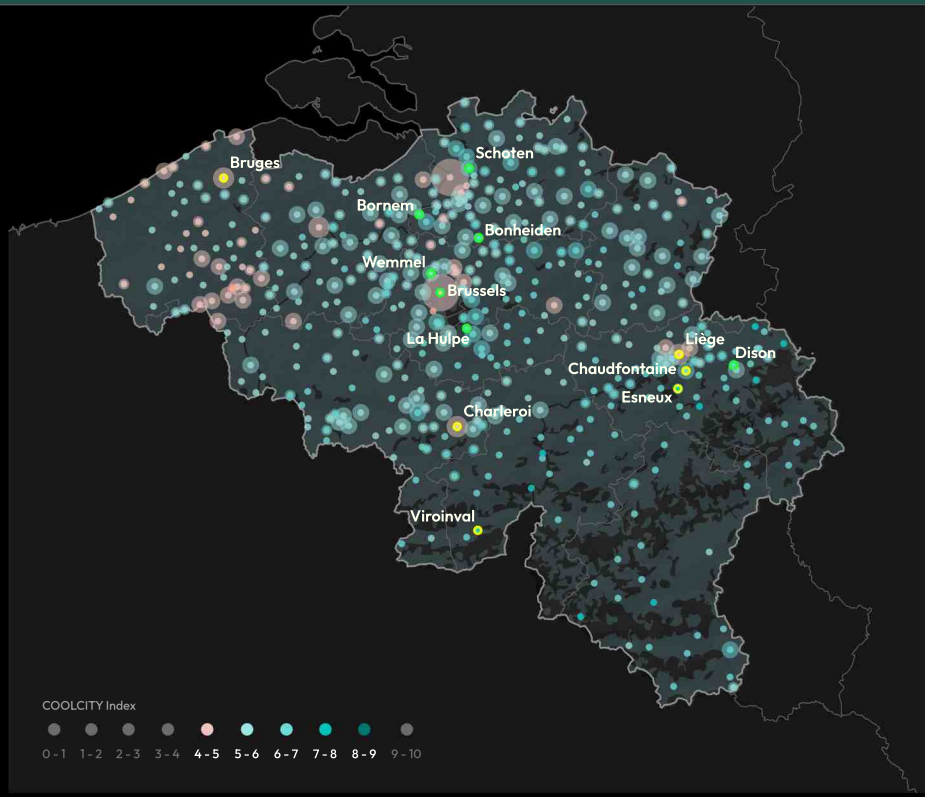
Urban area
7,491 km²

Population in urban area
9.7 million

COOLCITY Index 6.3

EU average: 5.5
Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 6 cities	Bruges, Charleroi, Liège 5.3	Brussels 0.0
MEDIUM 20k - 100k people 112 cities	Chaudfontaine 7.1	Schoten, Wemmel +0.8
SMALL 10k - 20k people 138 cities	Esneux 7.8	Bonheiden, Bornem, Dison +0.8
VERY SMALL < 10k people 230 cities	Viroinval 8.0	La Hulpe +1.2



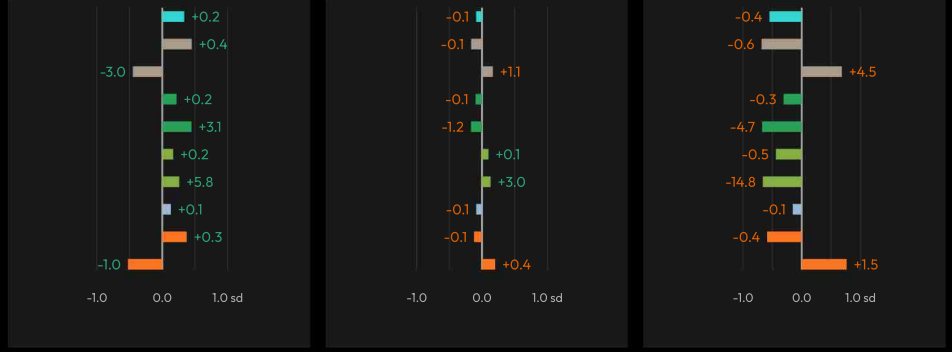
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
79 %	17 %	965 m²/ person	69 %	21 %	223 m²/ person

Belgium

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	486	230	138	118
City population	9.7 million	1.3 mln	2.0 mln	6.4 mln
% of national population	81 %	10.9 %	16.6 %	53.6 %
	National average Standard deviation (sd)			
COOLCITY Index	6.3(± 0.7)			
Surface permeability	8.4(± 0.8)			
Share of sealed surfaces (%)	20.6(± 6.6)			
Vegetation state	5.2(± 1.0)			
Vegetation cover (%)	79.0(± 7.0)			
Biodiversity	6.5(± 1.1)			
Ecological connectivity (%)	68.9(± 22.4)			
Water conditions	4.6(± 0.7)			
Thermal conditions	6.8(± 0.7)			
Surface temperature (°C)	34.6(± 1.9)			



Conclusions

Belgium maintains a consistency of urban adaptive potential across different cities.

The average COOLCITY Index value ranging from 5.9 to 6.5 for the categories indicates that urban resilience can be built on BGI across different city size classes.

Very small Belgian cities stand out for Surface permeability.

On average, it reaches 8.8 and remains 0.4 above the country average, creating favourable conditions for BGI development in these locations.

In larger Belgian cities, thermal conditions are the most significant challenge.

Average surface temperature reaches 36.1°C, 1.5°C above the country average, increasing the need to implement BGI as a cooling solution for urban spaces.

Netherlands

EU Region
Western Europe

Number of urban areas in COOLCITY
350

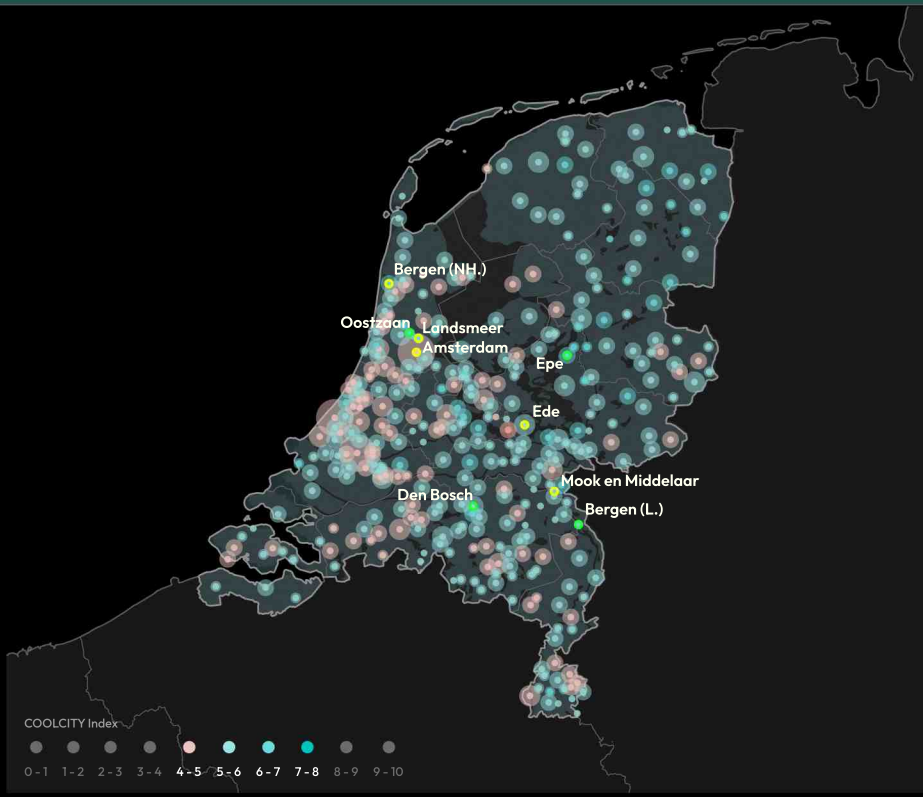
Urban area
7,306 km²

Population in urban area
15.8 million

COOLCITY Index **5.9**

EU average: 5.5 Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 3 cities	Amsterdam 5.2	Amsterdam +0.3
LARGE 100k - 500k people 26 cities	Ede 6.1	s-Hertogenbosch +0.4
MEDIUM 20k - 100k people 209 cities	Bergen (NH.) 7.4	Epe +1.2
SMALL 10k - 20k people 86 cities	Landsmeer 7.4	Oostzaan +1.0
VERY SMALL < 10k people 26 cities	Mook en Middelaar 7.1	Bergen (L.) +0.6



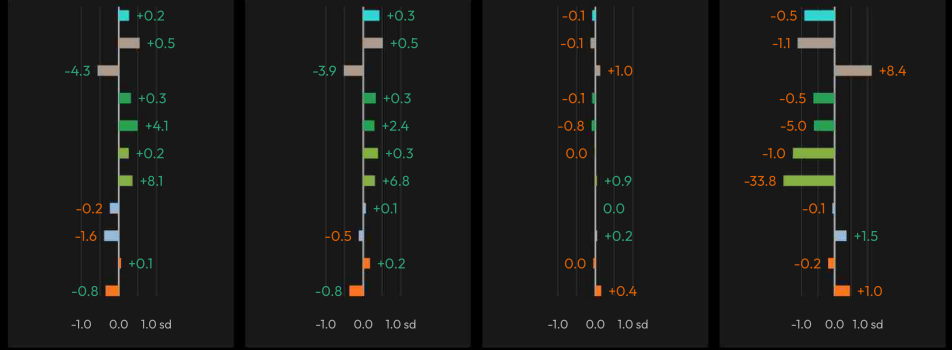
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
70 %	13 %	437 m²/ person	64 %	29 %	161 m²/ person

Netherlands

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE > 100k people
Number of COOLCITY cities	350	26	86	209	26
City population	15.8 million	0.2 mln	1.3 mln	8.2 mln	4 mln
% of national population	88 %	1.1 %	7.2 %	45.5 %	22.6 %
	National average Standard deviation (sd)				
COOLCITY Index	5.9 (± 0.6)				
Surface permeability	7.3 (± 1.0)				
Share of sealed surfaces (%)	28.6 (± 7.5)				
Vegetation state	4.4 (± 0.8)				
Share of high-vigor vegetation (%)	68.4 (± 8.0)				
Biodiversity	6.0 (± 0.8)				
Ecological connectivity (%)	64.4 (± 21.9)				
Water conditions	4.6 (± 0.9)				
Share of water and wetlands (%)	3.5 (± 4.1)				
Thermal conditions	6.9 (± 0.9)				
Share of high-temperature areas (%)	2.9 (± 2.3)				



Conclusions

In the Netherlands, adaptive potential gradually decreases as city size increases.

Average CCI values are 0.2 and 0.3 higher than the country average in very small and small towns, while in the largest cities they remain 0.5 lower, highlighting more pronounced adaptive challenges in large urban centres.

Water and wetlands are a natural foundation for adaptation, especially in larger cities.

In over one-third of Dutch cities, water and wetland areas cover more than 3% of the surface, supporting cities' capacity to mitigate drought and intense rainfall effects.

The largest cities feature the lowest Surface permeability.

In this group, it is 1.1 lower than the country average, indicating more limited space for BGI development and resulting in lower adaptive potential.

Luxembourg

EU Region
Western Europe

Number of urban areas in COOLCITY
10

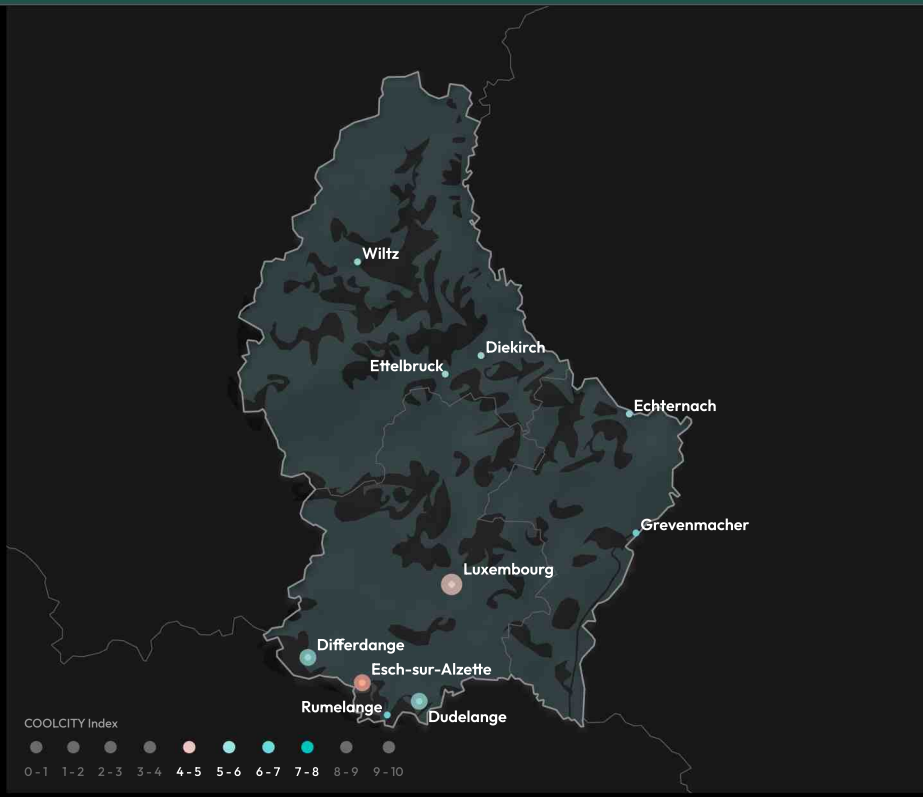
Urban area
92 km²

Population in urban area
246k

COOLCITY Index 6.0

EU average: 5.5 Region average: 5.8

CITIES IN THE COUNTRY		COOLCITY	PERFORMANCE INDEX
LARGE 100 - 500k people 1 city	Luxembourg	CCI 5.2	- 0.1
MEDIUM 20 - 100k people 3 cities	Dudelange	5.8	- 0.2
	Differdange	5.7	0.0
	Esch-sur-Alzette		- 0.8
VERY SMALL < 10k people 6 cities	Rumelange	7.0	+ 0.8
	Grevenmacher	6.7	0.0
	Echternach	6.5	0.0
	Diekirch	6.3	- 0.3
	Ettelbruck	6.2	+ 0.1
	Wiltz		- 0.3



INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
68 %	27 %	400 m²/ person	46 %	31 %	138 m²/ person

Germany

EU Region
Western Europe

Number of urban areas in COOLCITY
1,680

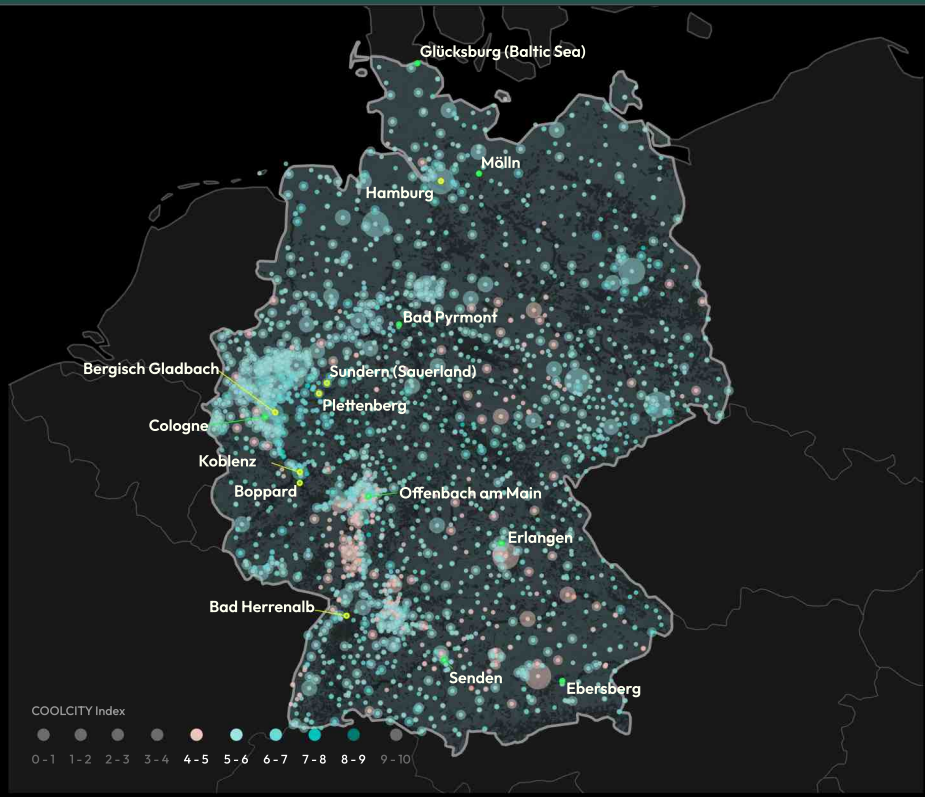
Urban area
28,555 km²

Population in urban area
54.5 million

COOLCITY Index 6.2

EU average: 5.5 • Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 14 cities	Hamburg 6.3	Cologne +0.3
LARGE 100k - 500k people 61 cities	Bergisch Gladbach, Koblenz 6.8	Erlangen, Offenbach am Main +0.6
MEDIUM 20k - 100k people 469 cities	Plettenberg, Sundern (Sauerland) 7.6	Senden +1.0
SMALL 10k - 20k people 454 cities	Boppard 8.2	Bad Pyrmont, Ebersberg, Mölln +1.0
VERY SMALL > 10k people 682 cities	Bad Herrenalb 8.1	Glücksburg (Baltic Sea) +1.2



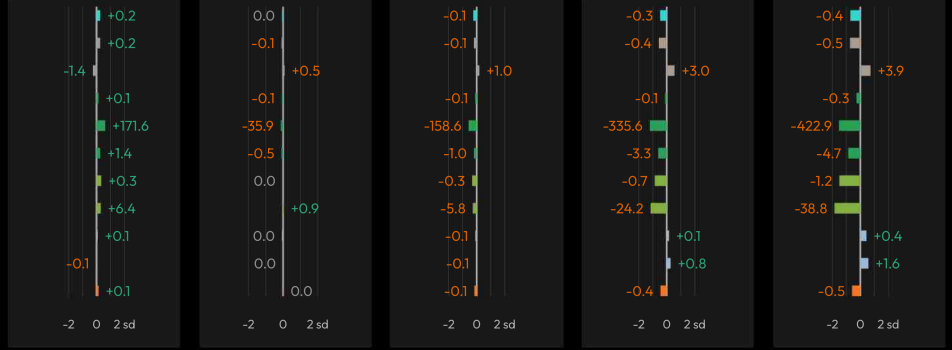
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
77 %	21 %	636 m²/ person	65 %	23 %	177 m²/ person

Germany

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE 100k - 500k people	VERY LARGE > 500k people
Number of COOLCITY cities	1,680	682	454	469	61	14
City population	54.5 million	4 mln	6.5 mln	18.3 mln	11.9 mln	13.4 mln
% of national population	65 %	4.8 %	7.8 %	21.9 %	14.1 %	16.6 %
	National average Standard deviation (sd)					
COOLCITY Index	6.2(± 0.6)	+0.2	0.0	-0.1	-0.3	-0.4
Surface permeability	8.1(± 0.7)	+0.2	-0.1	-0.1	-0.4	-0.5
Sealed surface share (%)	22.8(± 5.3)	-1.4	+0.5	+1.0	+3.0	+3.9
Vegetation state	5.4(± 1.0)	+0.1	-0.1	-0.1	-0.1	-0.3
Green area per capita (m²/person)	636.3(± 277.4)	+171.6	-35.9	-158.6	-335.6	-422.9
Vegetation cover (%)	76.8(± 5.4)	+1.4	-0.5	-1.0	-3.3	-4.7
Biodiversity	6.3(± 0.8)	+0.3	0.0	-0.3	-0.7	-1.2
Ecological connectivity (%)	65.4(± 21.0)	+6.4	+0.9	-5.8	-24.2	-38.8
Water conditions	4.6(± 0.8)	+0.1	0.0	-0.1	+0.1	+0.4
Share of water and wetlands (%)	1.3(± 2.7)	-0.1	0.0	-0.1	+0.8	+1.6
Thermal conditions	6.4(± 0.8)	+0.1	0.0	-0.1	-0.4	-0.5



Conclusions

In Germany, city size differentiates the adaptive potential.

Deviation of the COOLCITY Index from the country average ranges from +0.2 in very small towns to -0.4 in the largest, showing varied adaptive challenges depending on the size of the city.

The greatest differences concern biodiversity and the coherence of the natural system.

In the largest cities, biodiversity is 1.2 below the country average, and ecological connectivity is 39 percentage points lower, indicating a significant challenge in creating coherent BGI links in this group.

The largest cities combine lower Surface permeability with high water condition values.

Water conditions reach their highest values in very big cities, although permeability remains 0.5 below the country average. This points to the high importance of waters and wetlands (above 1.6 % from the average) in building resilience in these centres.

Austria

EU Region
Western Europe

Number of urban areas in COOLCITY
243

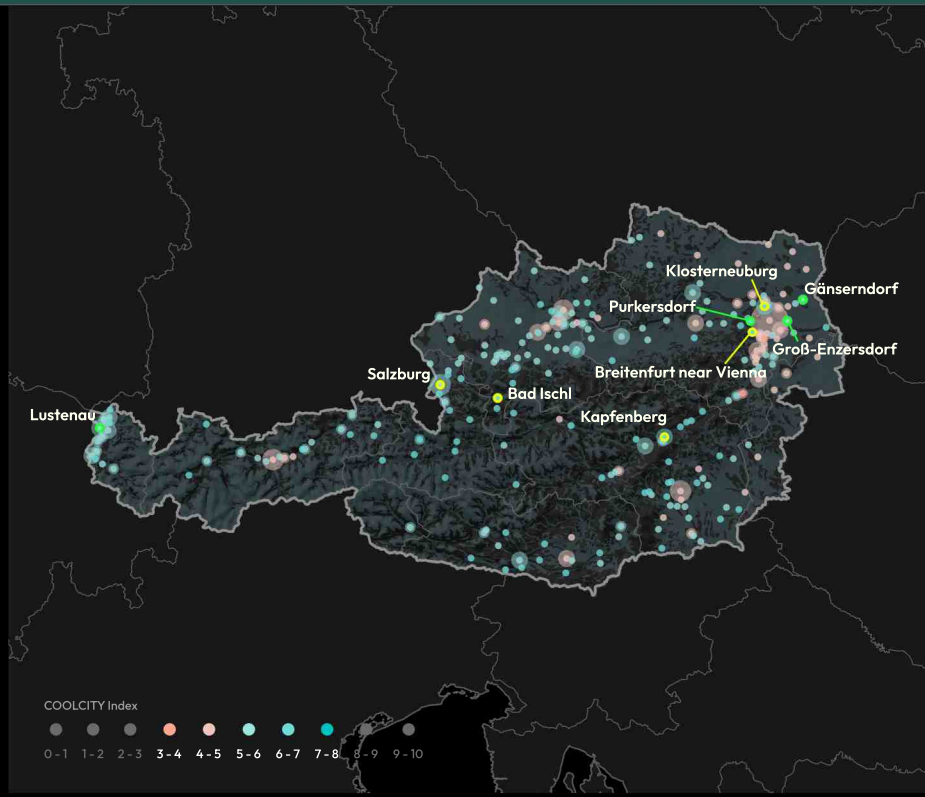
Urban area
2,305 km²

Population in Urban area
4.8 million

COOLCITY Index **6.0**

EU average: 5.5 • Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 5 cities	Salzburg 6.0	Salzburg +0.4
MEDIUM 20k - 100k people 19 cities	Kapfenberg, Klosterneuburg 6.7	Lustenau +0.3
SMALL 10k - 20k people 44 cities	Bad Ischl 7.0	Gänserndorf, Groß-Enzersdorf +0.4
VERY SMALL < 10k people 175 cities	Breitenfurt near Vienna 7.5	Purkersdorf +1.0



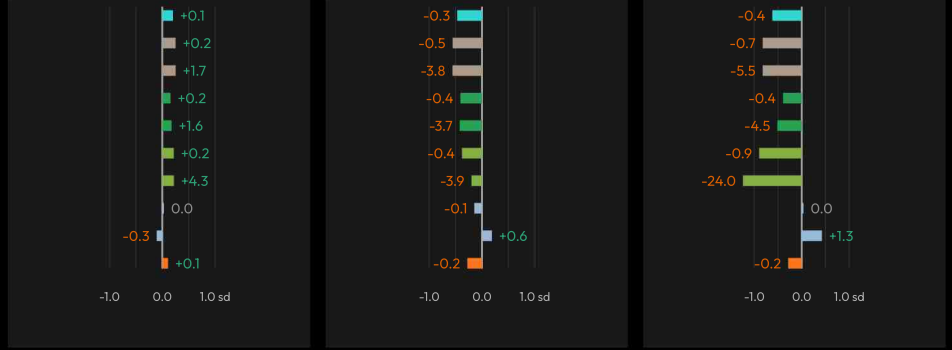
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
75 %	19 %	771 m²/ person	56 %	24 %	225 m²/ person

Austria

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	243	175	44	24
Number of city inhabitants	4.8 million	0.9 mln	0.6 mln	3.4 mln
% of country population	53 %	9.8 %	6.3 %	36.6 %
	National average Standard deviation (sd)			
COOLCITY Index	6.0 (± 0.7)			
Surface permeability	7.9 (± 0.9)			
Biologically active surface area (%)	75.8 (± 6.7)			
Vegetation state	5.2 (± 1.1)			
Share of high-vigor vegetation (%)	75.0 (± 8.8)			
Biodiversity	6.2 (± 1.0)			
Ecological connectivity (%)	56.4 (± 19.4)			
Water conditions	4.6 (± 0.9)			
Share of water and wetlands (%)	1.6 (± 3.1)			
Thermal conditions	6.3 (± 0.7)			



Conclusions

In Austria, the highest adaptive potential is concentrated in very small towns.

There the COOLCITY Index averages 6.1, while in other city groups the results are more similar – 5.6 CCI in small towns and 5.7 in medium and large ones.

Biologically active surfaces are an important element of the spatial structure of Austrian cities.

Their share usually ranges between 69% and 83%, indicating a broad resource of areas favourable for BGI development, though it decreases with an increase in city size.

Water bodies and wetlands are an important resource for medium and large centres.

They average 2.9% of city area, which is 1.3 % higher than the average of other cities in the country, although it does not translate to higher water condition values.

Ireland

EU Region
Western Europe

Number of urban areas in COOLCITY
81

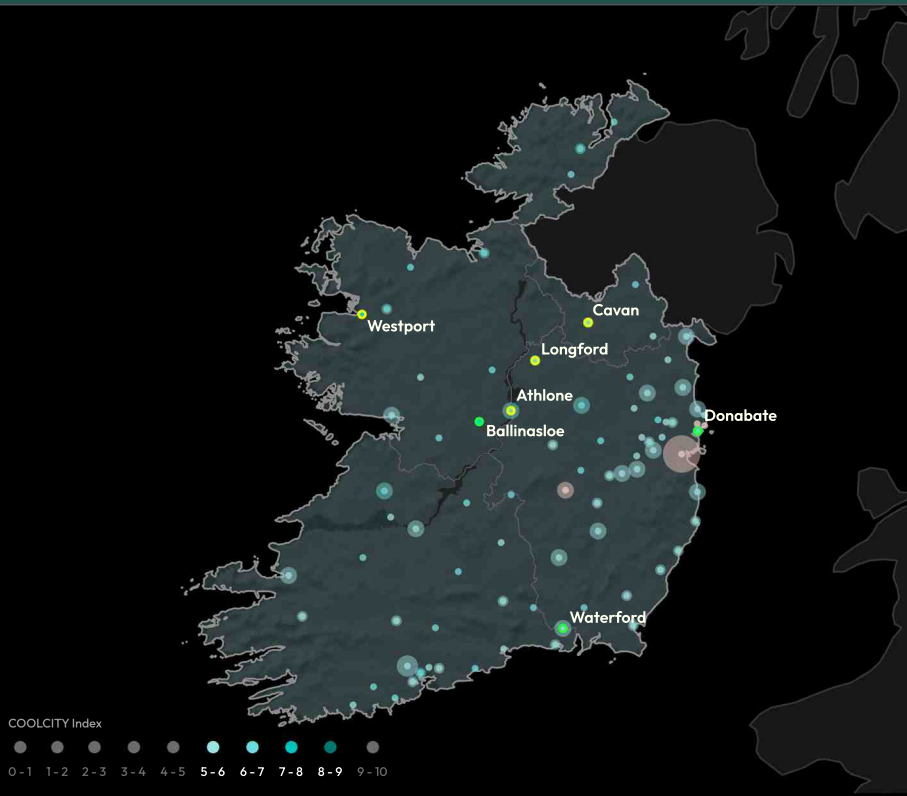
Urban area
1,369 km²

Population in urban area
2.8 million

COOLCITY Index 6.4

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE, MEDIUM >100k people 20 cities	Athlone 7.0	Waterford +0.4
SMALL 10k - 20k people 23 cities	Cavan, Longford 7.4	Donabate +1.0
VERY SMALL > 10k people 38 cities	Westport 8.1	Ballinasloe +0.7



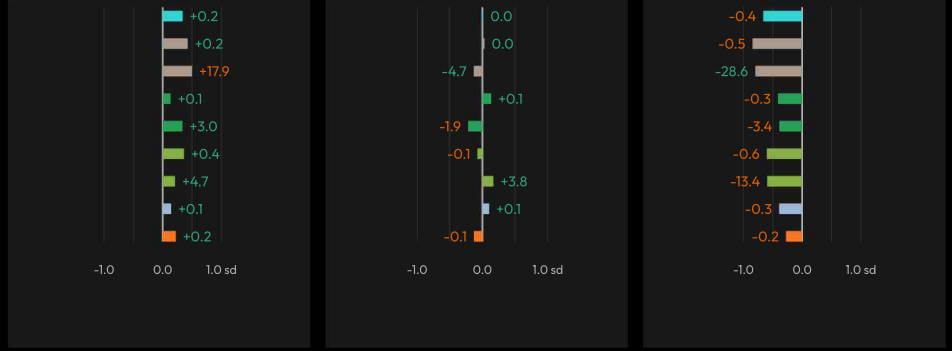
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
75 %	14%	589 m²/ person	64 %	24 %	183 m²/ person

Ireland

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	81	38	23	20
City population	2.8 million	0.3 mln	0.3 mln	2 mln
% of country population	51 %	5.0 %	5.9 %	40.6 %
	National average Standard deviation (sd)			
COOLCITY Index	6.4 (± 0.6)			
Surface permeability	7.9 (± 0.6)			
Impermeable area per capita (m²/person)	182.8 (± 35.8)			
Vegetation state	4.8 (± 0.7)			
Share of high-vigour vegetation (%)	74.9 (± 8.8)			
Biodiversity	7.3 (± 1.0)			
Ecological connectivity (%)	64.5 (± 22.5)			
Water conditions	4.7 (± 0.8)			
Thermal conditions	7.4 (± 0.9)			



Conclusions

Irish cities maintain a fairly consistent adaptive potential.

With COOLCITY Index averages from 6.0 to 6.6, the BGI maintains good condition across various city classes and serves as a resource for building resilience.

Very small Irish towns are notable for high Surface permeability.

Averaging 8.1, it remains 0.2 above the country average, supporting favourable conditions for BGI development.

In larger Irish cities, the vegetation is less connected.

The average ecological connectivity of vegetation stands at 51.1%, which is 13.4%bbelow the country average, indicating a lack of cohesion in the green network and a low level of biodiversity in these cities.

Poland

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
574

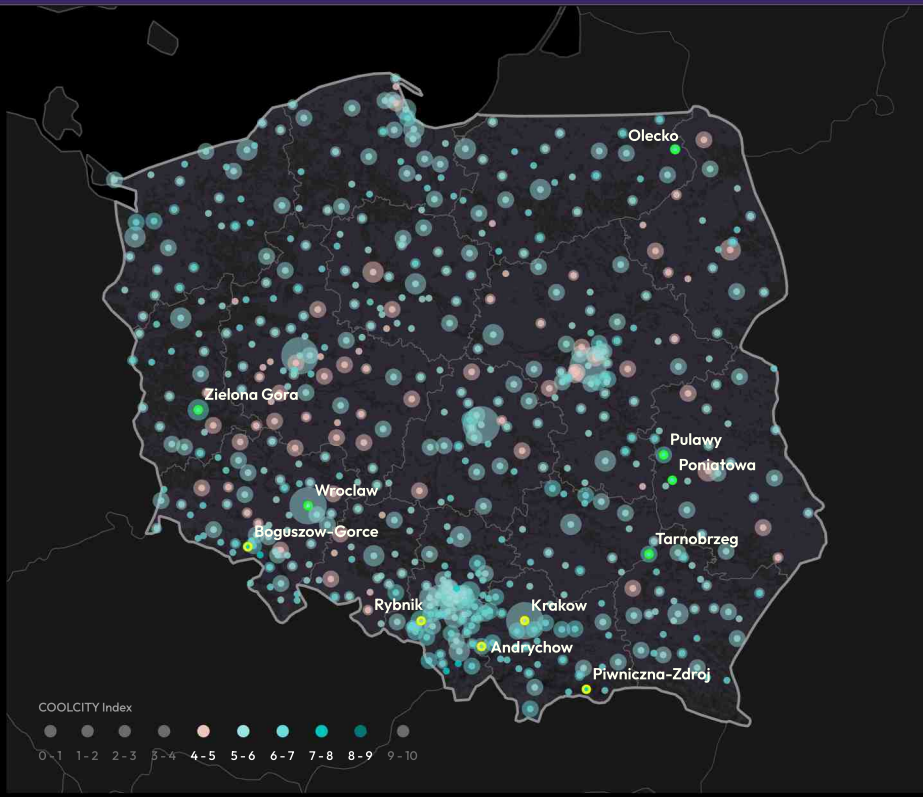
Urban area
9,353 km²

Population in urban area
20.6 million

COOLCITY Index 6.2

EU average: 5.5 • Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 5 cities	Krakow 6.0	Wroclaw +0.2
LARGE 100k - 500k people 29 cities	Rybnik 6.8	Zielona Gora +0.7
MEDIUM 20k - 100k people 171 cities	Andrychow 7.4	Pulawy, Tarnobrzeg +0.9
SMALL 10k - 20k people 170 cities	Boguszow-Gorce 7.7	Olecko +0.9
VERY SMALL < 10k people 199 cities	Piwniczna-Zdroj 8.5	Poniatowa +1.4



INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
74 %	23 %	511 m²/ person	64 %	25 %	158 m²/ person

Poland

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE > 100k people
Number of COOLCITY cities	574	199	170	171	29
City population	20.6 million	1.3 mln	2.5 mln	6.9 mln	5.4 mln
% of national population	56 %	3.6 %	6.8 %	18.9 %	12.3 %
	National average Standard deviation (sd)				
COOLCITY Index	6.2 (± 0.6)				
Surface permeability	7.8 (± 0.8)				
Biologically active surface area (%)	74.9 (± 6.2)				
Vegetation state	5.4 (± 1.1)				
Green area per capita (m²/person)	510.8 (± 259.9)				
Biodiversity	6.4 (± 0.8)				
Ecological connectivity (%)	64.0 (± 21.2)				
Water conditions	4.7 (± 0.8)				
Thermal conditions	6.7 (± 0.6)				
Share of low-temperature areas (%)	3.8 (± 5.1)				



Conclusions

In Poland, city size clearly differentiates adaptive potential.

In very small towns, the COOLCITY Index averages 6.5, while in large cities around 5.9, showing a change in potential with the growth of the urban centre.

Small towns strengthen the national biodiversity in urban areas.

In towns with fewer than 20k inhabitants, the biodiversity index is 6.6, compared to 5.5 in large cities, and ecological connectivity averages 71.2% – 7.2% above the country average.

In medium and large cities, Surface permeability becomes a challenge.

It is on average 0.3 lower than the country average, indicating a smaller share of spaces conducive to biodiversity. In these towns, the green area per capita is also significantly lower.

Czech Republic

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
274

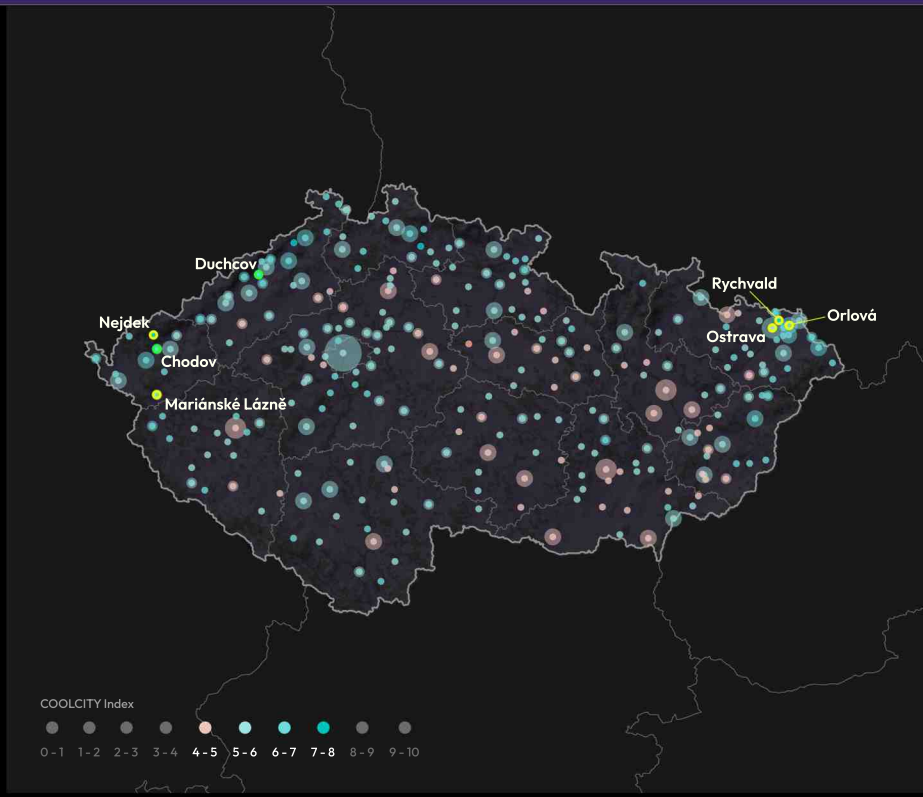
Urban area
2,779 km²

Population in Urban area
5.9 million

COOLCITY Index 6.1

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 5 cities	Ostrava 6.1	Ostrava +0.1
MEDIUM 20k - 100k people 43 cities	Orlová 7.3	Orlová +0.9
SMALL 10k - 20k people 63 cities	Mariánské Lázně 7.2	Chodov +1.1
VERY SMALL < 10k people 163 cities	Nejdek 7.9	Duchcov +1.2



INDICATORS FOR STRATEGIC DOCUMENTS • country average

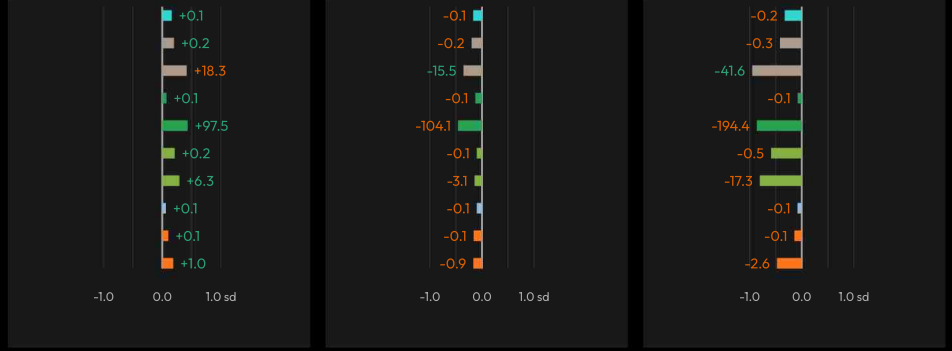
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
74 %	20 %	508 m²/ person	67 %	25 %	161 m²/ person

Czech Republic

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	274	163	63	48
Number of city residents	5.9 million	1 mln	0.9 mln	4 mln
% of the country's population	54 %	9.0 %	8.4 %	37 %

	Average in the country (Standard deviation (sd))
COOLCITY Index	6.1 (± 0.7)
Permeability of land	7.8 (± 0.8)
Sealed surface area per capita (m2/person)	161.4 (± 43.8)
Vegetation state	5.1 (± 1.1)
Green area per resident (m2/person)	508.0 (± 225.5)
Biodiversity	6.5 (± 0.9)
Ecological connectivity (%)	66.9 (± 21.5)
Water conditions	4.5 (± 0.8)
Thermal conditions	6.4 (± 0.7)
Share of low-temperature areas (%)	3.8 (± 5.5)



Conclusions

Czech cities have a balanced adaptive potential.

The COOLCITY Index deviation from the country average is: +0.1 in very small, -0.1 in small, and -0.2 in medium and large cities, so differences between groups are minor.

In medium and large Czech cities, vegetation fragmentation is more pronounced.

About 50% of vegetation patches remain unconnected, showing the challenge of ensuring ecological continuity in these cities.

In the largest Czech cities, the share of local cool spots is low.

Areas with lower temperatures cover only 1.2% of the cities, although overall thermal conditions in this group remain balanced compared to other cities in the country.

Slovakia

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
118

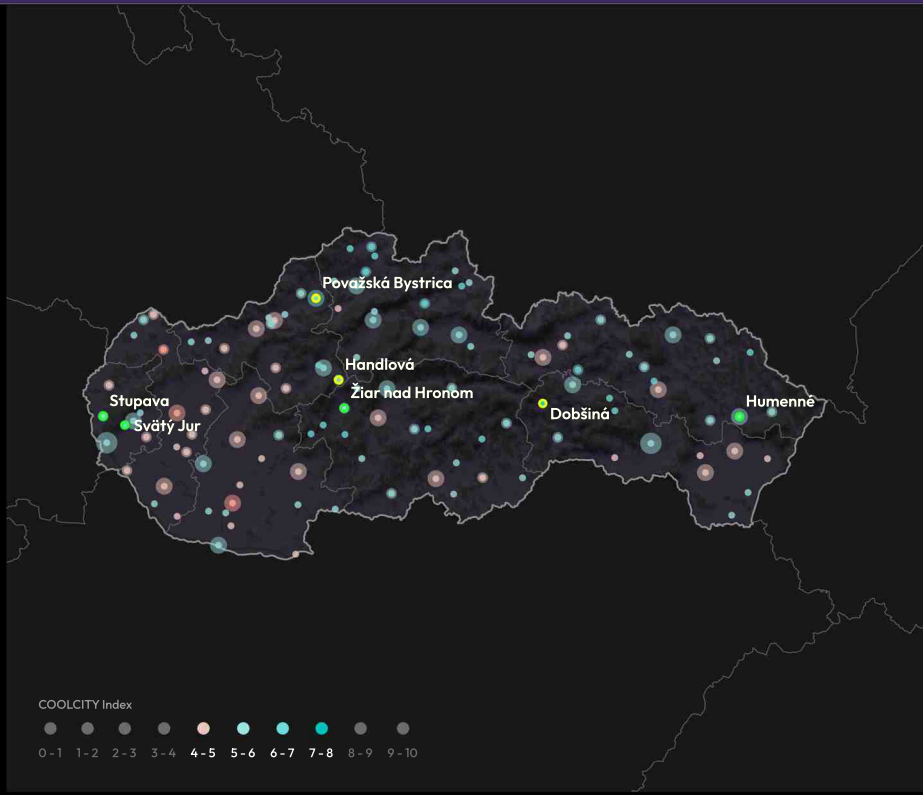
Urban area
1,169 km²

Population in Urban area
2.6 million

COOLCITY Index 5.9

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
LARGE, MEDIUM > 20k people 30 cities	Považská Bystrica 7.0	Humenné +0.6
SMALL 10k - 20k people 34 cities	Handlová 6.9	Stupava +0.7
VERY SMALL > 10k people 54 cities	Dobšiná 7.9	Svätý Jur +0.7



INDICATORS FOR STRATEGIC DOCUMENTS • country average

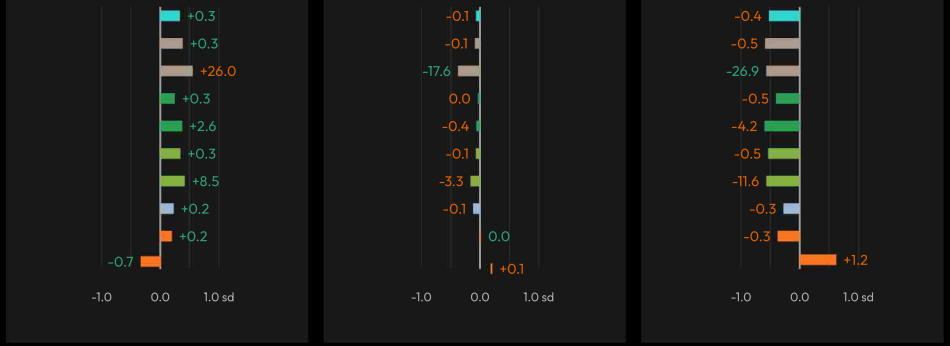
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
73 %	19 %	440 m²/ person	57 %	27 %	151 m²/ person

Slovakia

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	118	54	34	30
Number of city inhabitants	2.6 million	0.3 mln	0.5 mln	1.8 mln
% of country population	49 %	6.4 %	9.4 %	32.9 %

	National average (Standard deviation (sd))
COOLCITY Index	5.9(± 0.8)
Surface permeability	7.6(± 0.9)
Sealed surface area per capita (m²/person)	151.2(± 47.0)
Vegetation state	5.0(± 1.3)
Vegetation cover (%)	72.8(± 7.0)
Biodiversity	6.1(± 0.9)
Ecological connectivity (%)	57.5(± 20.4)
Water conditions	4.5(± 0.9)
Thermal conditions	6.2(± 0.8)
Surface temperature (°C)	3.9(± 5.2)



Conclusions

In Slovakia, the COOLCITY Index is moderately varied.

Average values ranging from 5.5 to 6.1 show that adaptive potential using BGI varies depending on city size.

Very small Slovak cities have high permeable surface resources.

Average Surface permeability is 7.9, remaining 0.3 points above the country average, providing favourable conditions for BGI development.

In larger Slovak cities, thermal conditions are less favourable.

Average surface temperature at 38.5°C is 1.2°C above the country average, increasing the importance of BGI's cooling functions.

Hungary

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
244

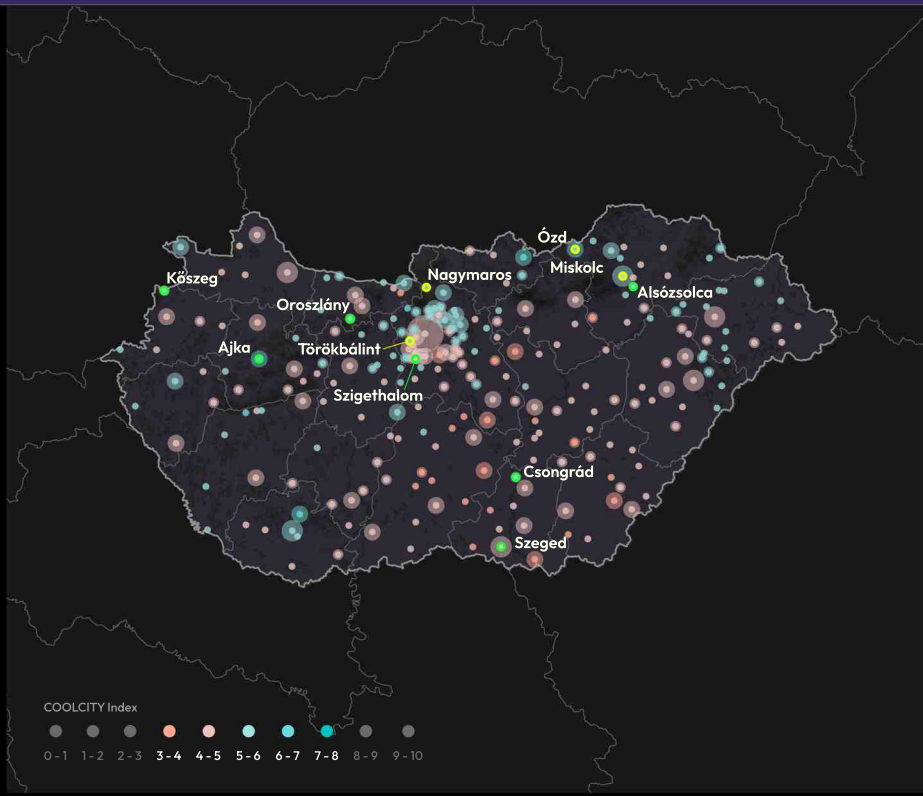
Urban area
3,259 km²

Population in urban areas
6.0 million

COOLCITY Index **5.2**

EU average: 5.5 • Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 7 cities	Miskolc 5.9	Szeged +0.5
MEDIUM 20k - 100k people 50 cities	Ózd 7.1	Ajka +1.2
SMALL 10k - 20k people 66 cities	Törökbálint 6.9	Csongrád, Kőszeg Oroszlány, Szigethalom Törökbálint +0.7
VERY SMALL > 10k people 121 cities	Nagymaros 6.9	Alsózsolca +1.0



INDICATORS FOR STRATEGIC DOCUMENTS • country average

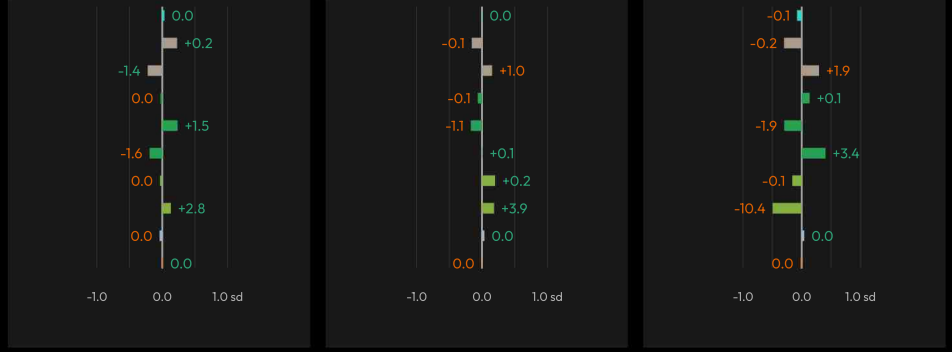
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
67%	12 %	567 m²/ person	67 %	32%	264 m²/ person

Hungary

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	244	121	66	57
City population	6.0 mln	0.8 mln	0.9 mln	4.3 mln
% of national population	6.3 %	8.2 %	9.5 %	45.6 %

	National average (Standard deviation (sd))
COOLCITY Index	5.2 (± 0.6)
Surface permeability	6.9 (± 0.8)
Proportion of sealed surfaces (%)	32.1 (± 6.3)
Vegetation state	4.2 (± 0.9)
Vegetation cover (%)	67.3 (± 6.3)
High vegetation cover (%)	12.4 (± 8.4)
Biodiversity	6.1 (± 0.8)
Ecological connectivity (%)	67.1 (± 21.1)
Water conditions	3.9 (± 0.8)
Thermal conditions	5.2 (± 0.8)



Conclusions

Hungarian cities have a balanced adaptive potential.

Average COOLCITY Index values remain similar across all city size classes, with the largest differences concerning individual BGI elements.

Larger Hungarian cities stand out with a high share of tall vegetation.

Their share is 3.9% higher than the country average, enhancing BGI's potential to reduce overheating and improve environmental conditions.

The greatest differences concern the continuity of the natural system.

In larger cities, ecological connectivity is 10.4% below the country average, which may limit BGI coherence.

Romania

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
278

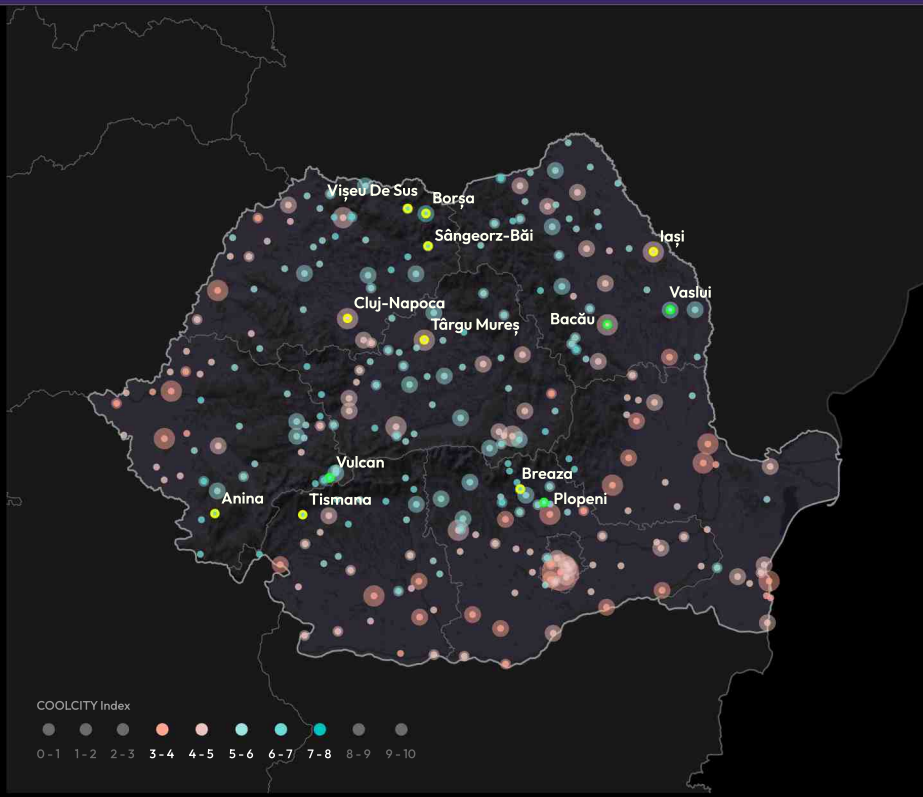
Urban area
3,364 km²

Population in urban areas
9.1 million

COOLCITY Index 5.5

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 18 cities	Cluj-Napoca, Iași Târgu Mureș 5.3	Bacău +0.6
MEDIUM 20k - 100k people 64 cities	Borșa 7.3	Vaslui +0.8
SMALL 10k - 20k people 60 cities	Breaza, Sângeorz-Băi Vișeu De Sus 6.9	Vulcan +0.7
VERY SMALL > 10k people 136 cities	Anina, Tismana 7.6	Plopeni +1.4



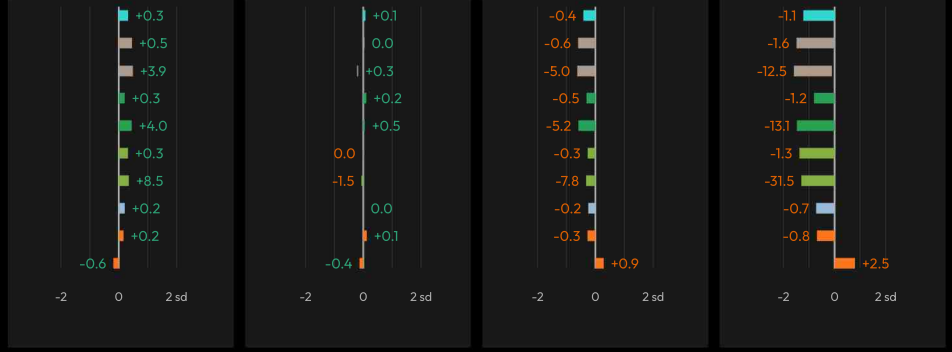
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
71 %	17 %	585 m²/ person	57 %	28 %	203 m²/ person

Romania

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM 20 - 100k people	LARGE > 100k people
Number of COOLCITY cities	278	136	60	64	18
Number of city inhabitants	9.0 million	0.8 mln	0.8 mln	2.6 mln	4.8 mln
% of country population	48 %	4.0 %	4.3 %	13.9 %	25.4 %
	Country average Standard deviation (sd)				
COOLCITY Index	5.5 (± 0.9)	+0.3	+0.1	-0.4	-1.1
Surface permeability	7.4 (± 1.1)	+0.5	0.0	-0.6	-1.6
	28.5 (± 8.4)	+3.9	+0.3	-5.0	-12.5
Vegetation state	4.8 (± 1.5)	+0.3	+0.2	-0.5	-1.2
Vegetation cover (%)	70.8 (± 8.9)	+4.0	+0.5	-5.2	-13.1
Biodiversity	6.0 (± 1.0)	+0.3	0.0	-0.3	-1.3
Ecological connectivity (%)	57.3 (± 24.3)	+8.5	-1.5	-7.8	-31.5
Water conditions	4.3 (± 1.0)	+0.2	0.0	-0.2	-0.7
Thermal conditions	5.3 (± 1.1)	+0.2	+0.1	-0.3	-0.8
Surface temperature (°C)	40.4 (± 3.2)	-0.6	-0.4	+0.9	+2.5



Conclusions

In Romania, the COOLCITY Index clearly differentiates city size classes.

Average values ranging from 4.4 to 5.8 show that BGI potential strongly depends on the size of the city. With the smallest cities showing the highest adaptive potential.

Very small Romanian towns stand out with a high share of biologically active surfaces.

It averages 75.4% and remains 3.9% above the country average, creating an important spatial base for BGI development.

The largest cities have the lowest vegetation cover.

It averages 57.7% compared to the country average of 70.8%, showing a smaller resource of greenery with cooling functions. With temperatures higher by 2.5 °C on average, introducing BGI here is particularly important.

Bulgaria

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
121

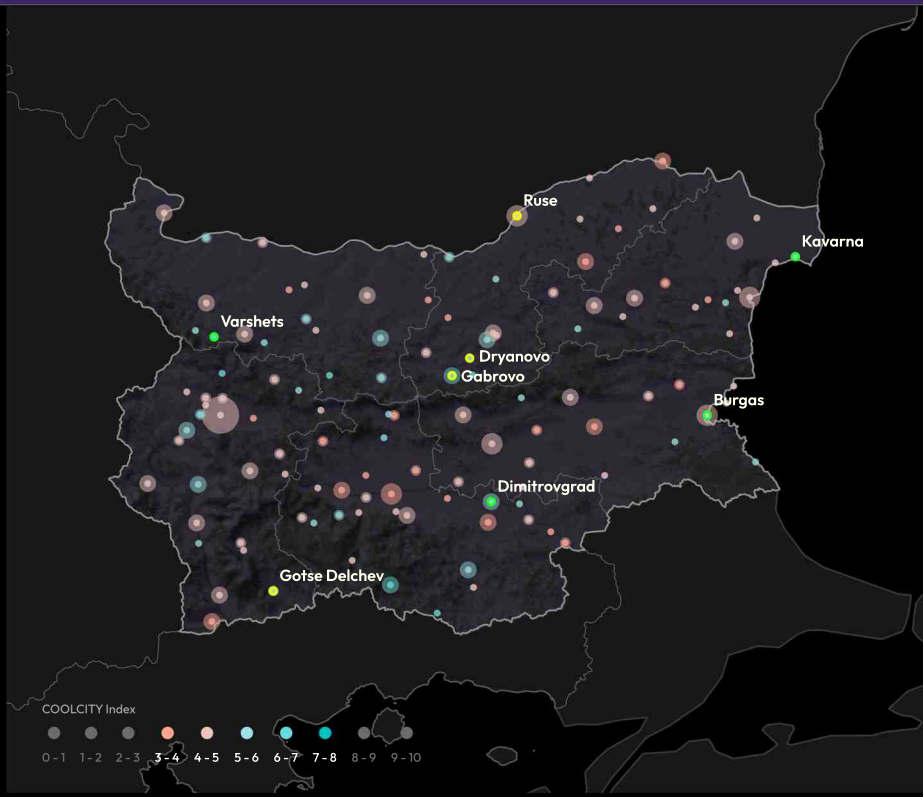
Urban area
1,365 km²

Population in Urban area
4.2 million

COOLCITY Index 5.1

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 6 cities	Ruse 5.0	Burgas, Ruse +0.3
MEDIUM 20k - 100k people 29 cities	Gabrovo 7.1	Dimitrovgrad +1.0
SMALL 10k - 20k people 29 cities	Gotse Delchev 6.5	Gotse Delchev +1.1
VERY SMALL < 10k people 57 cities	Dryanovo 7.1	Kavarna, Varshets +0.8



INDICATORS FOR STRATEGIC DOCUMENTS • country average

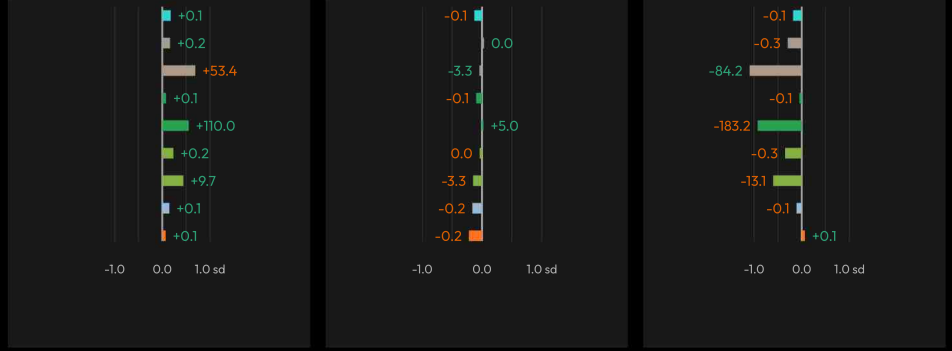
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
64 %	17 %	388 m²/ person	68 %	36 %	202 m²/ person

Bulgaria

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	121	57	29	35
Number of city residents	4.2 million	0.4 mln	0.4 mln	3.4 mln
% of the country's population	66 %	5.8 %	6.3 %	53.5 %

	Average in the country (Standard deviation (sd))
COOLCITY Index	5.1 (± 0.8)
Permeability of land	6.5 (± 1.0)
Sealed surface area per capita (m2/person)	202.0 (± 77.1)
Vegetation state	4.3 (± 1.3)
Green area per resident (m2/person)	387.9 (± 198.2)
Biodiversity	6.2 (± 0.9)
Ecological connectivity (%)	67.5 (± 21.9)
Water conditions	3.8 (± 0.9)
Thermal conditions	4.6 (± 1.1)



Conclusions

Bulgaria has a very balanced adaptive potential in its cities.

Average COOLCITY Index ranges from 4.9 to 5.2 showing that BGI can be a similar resource regardless of the size of the centre.

The largest Bulgarian cities have less green space per inhabitant.

On average, there are 204.7 m² of green space area per person, indicating that creating new green areas is the biggest challenge for this group of cities.

In larger cities, the vegetation is less continuous.

The average ecological Ecological connectivity is 54.4%, which is 13.1 % below the country average, indicating a deficit of green connections in building resilience using BGI.

Croatia

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
100

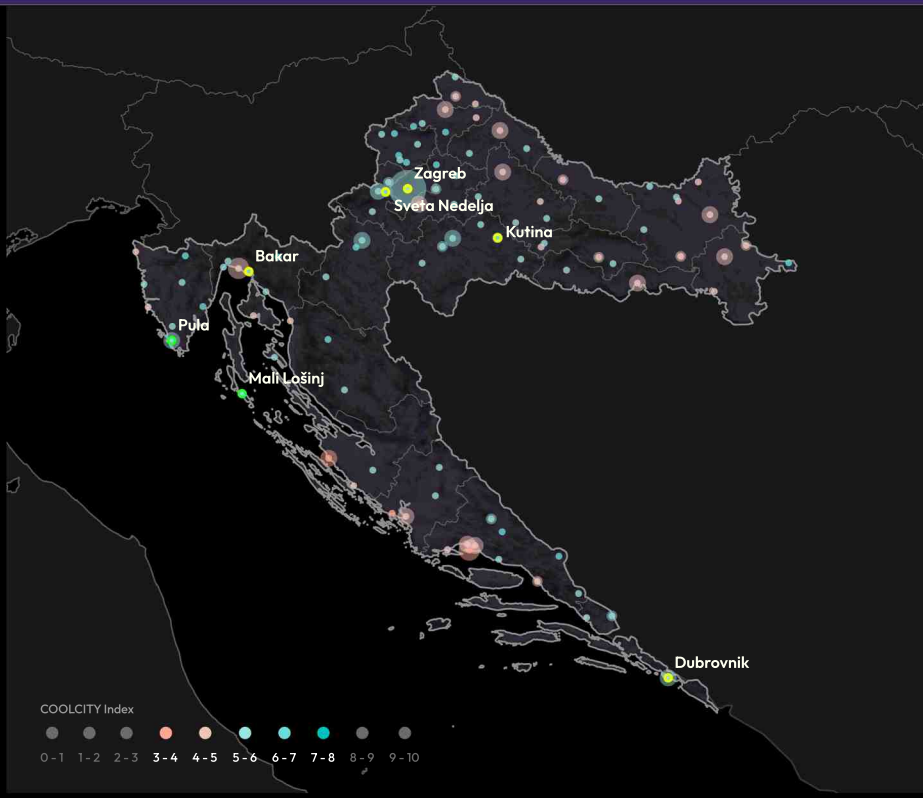
Urban area
1,205 km²

Population in Urban area
2.1 million

COOLCITY Index 5.8

EU average: 5.5 • Region average: 5.8

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 3 cities	Zagreb 5.8	Zagreb +0.1
MEDIUM-SIZED 20k - 100k people 16 cities	Dubrovnik 6.5	Pula +0.9
SMALL 10k - 20k people 13 cities	Kutina, Sveta Nedelja 6.6	Kutina +0.7
VERY SMALL < 10k people 68 cities	Bakar 7.2	Mali Lošinj +1.0



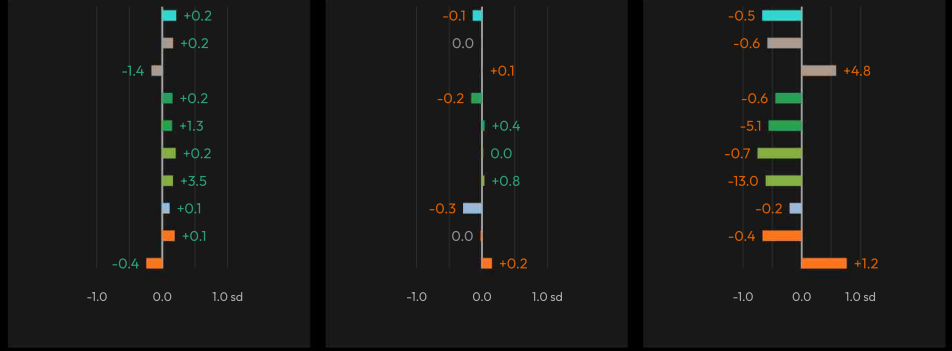
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
71 %	25 %	746 m²/ person	56 %	28 %	263 m²/ person

Croatia

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	100	68	13	19
City population	2.1 million	0.3 mln	0.2 mln	1.6 mln
% of national population	54%	8.3 %	5.1 %	41 %
	National average Standard deviation (sd)			
COOLCITY Index	5.8 (± 0.7)			
Surface permeability	7.4 (± 1.0)			
Share of sealed surfaces (%)	27.9 (± 8.1)			
Vegetation state	5.2 (± 1.2)			
Vegetation cover (%)	71.2 (± 8.9)			
Biodiversity	6.3 (± 0.9)			
Ecological connectivity (%)	56.4 (± 21.1)			
Water conditions	4.6 (± 0.9)			
Thermal conditions	5.6 (± 0.7)			
Surface temperature (°C)	39.5 (± 1.6)			



Conclusions

Croatia has a moderately varied COOLCITY Index among city groups.

With average CCI values ranging from 5.3 to 6.0, the BGI potential of cities remains moderate, although it clearly decreases in the largest centres (-0.5 from the country average).

Very small Croatian towns maintain a high biodiversity.

In this group, the index averages 6.4 and remains 0.2 points above the country average, supporting the natural dimension of BGI.

Thermal conditions are more dire in larger Croatian cities.

The average surface temperature reaches 40.8°C in cities with over 20k inhabitants and is 1.2°C higher than the country average, increasing the importance of BGI's cooling role.

Slovenia

EU Region
Central and Eastern Europe

Number of urban areas in COOLCITY
42

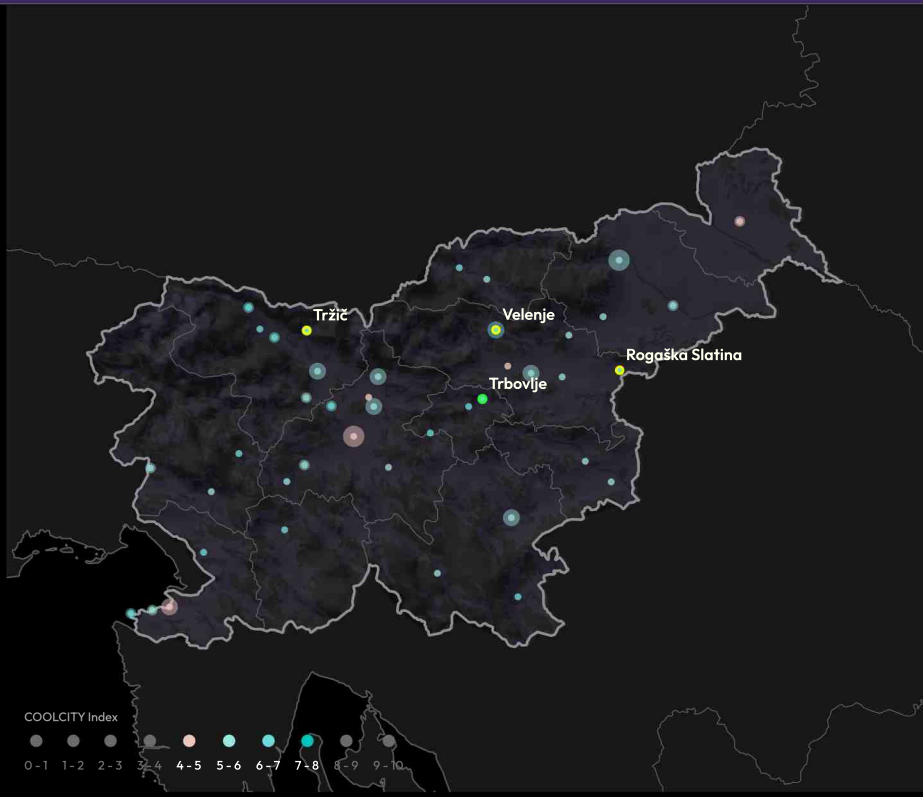
Urban area
584 km²

Population in Urban area
922k

COOLCITY Index 6.3

EU average: 5.5
Region average: 5.8

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
LARGE, MEDIUM > 20k people 9 cities	Velenje 6.7	Velenje +0.9
SMALL 10k - 20k people 12 cities	Tržič 7.4	Trbovlje +0.5
VERY SMALL > 10k people 21 cities	Rogaška Slatina 7.5	Rogaška Slatina +0.6



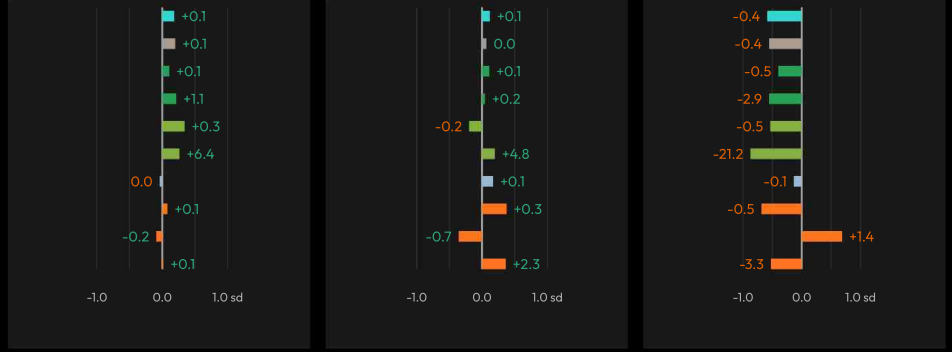
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
77 %	33 %	639 m²/ person	58 %	23 %	178 m²/ person

Slovenia

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	42	21	12	9
City population	0.9 million	0.2 mln	0.2 mln	0.6 mln
% of national population	43 %	7.1 %	7.8 %	28.4 %
	National average Standard deviation (sd)			
COOLCITY Index	6.3 (± 0.6)			
Surface permeability	8.1 (± 0.6)			
Vegetation state	6.2 (± 1.2)			
Vegetation cover (%)	77.0 (± 5.1)			
Biodiversity	6.4 (± 1.0)			
Ecological connectivity (%)	57.9 (± 24.2)			
Water conditions	5.0 (± 0.8)			
Thermal conditions	5.7 (± 0.7)			
Surface temperature (°C)	39.2 (± 2.1)			
Share of low-temperature areas (%)	4.0 (± 6.3)			



Conclusions

Slovenia maintains a fairly balanced adaptive potential of cities.

Average values between 5.9 and 6.4 indicate uniformly good conditions for adaptation based on BGI regardless of the size of the centre.

Very small Slovenian towns maintain a high biodiversity.

In this group, the index averages 6.7 and remains 0.3 above the country average, enhancing the natural potential of BGI.

Small towns stand out with the most favourable thermal conditions.

The average surface temperature there is 38.5°C, and the share of low-temperature areas reaches 6.3%, indicating the cooling potential of BGI.

Portugal

EU Region
Southern Europe

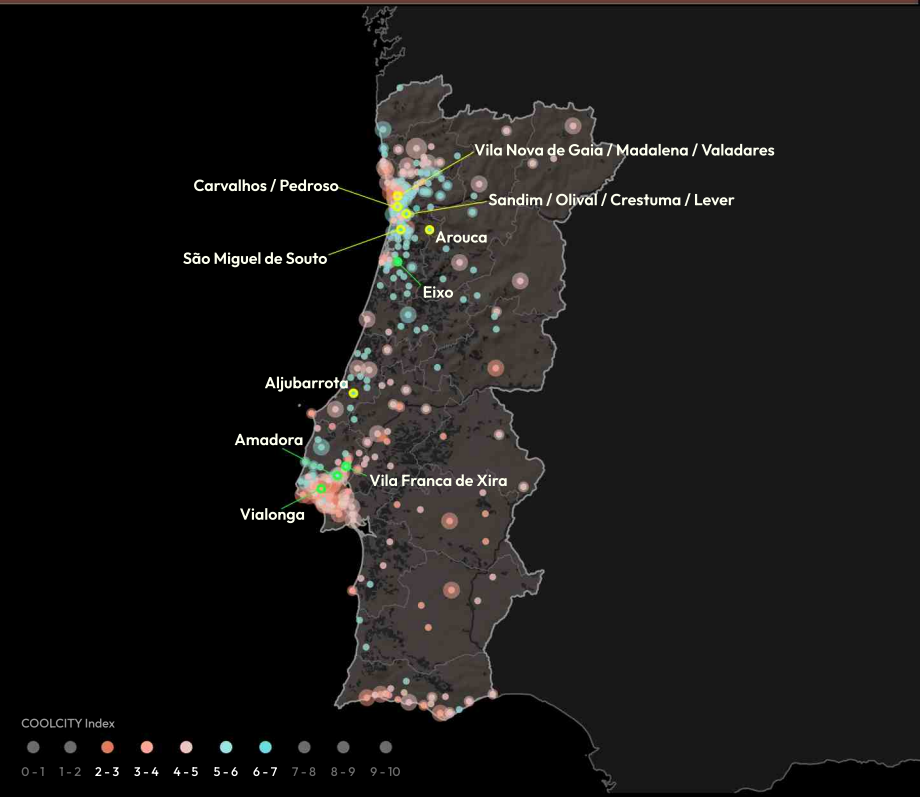
Number of urban areas in COOLCITY
267

Urban area
2,795 km²

Population in urban area
5.8 million

COOLCITY Index **5.1**

EU Average: 5.5 Region average: 4.9



LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 5 cities	Vila Nova de Gaia / Madalena / Valadares 4.6	Amadora +0.2
AVERAGE 20 - 100k people 74 cities	Carvalhos / Pedroso 6.1	Vialonga +0.8
SMALL 10 - 20k people 62 cities	Sandim / Olival / Crestuma / Lever 6.6	Vila Franca de Xira +0.7
VERY SMALL > 10k people 126 cities	Aljubarrota 6.7	Eixo +1.0

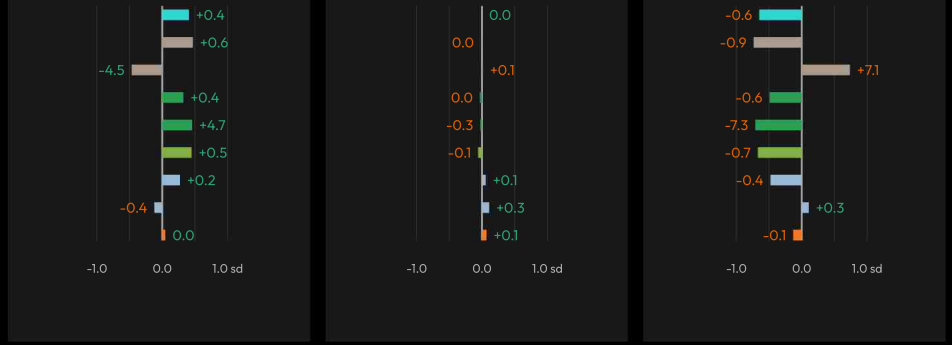
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
63 %	17 %	546 m²/ person	56 %	36 %	264 m²/ person

Portugal

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	267	126	62	79
City population	5.8 million	0.7 mln	0.9 mln	4.2 mln
% of national population	54 %	6.9 %	8.0 %	39.3 %
	National average Standard deviation (sd)			
COOLCITY Index	5.1 (± 0.9)			
Surface permeability	6.4 (± 1.2)			
Share of sealed surfaces (%)	36.0 (± 9.6)			
Vegetation state	4.1 (± 1.2)			
Vegetation cover (%)	62.9 (± 10.3)			
Biodiversity	6.3 (± 1.1)			
Water conditions	3.9 (± 0.9)			
Share of water and wetlands (%)	1.4 (± 2.9)			
Thermal conditions	4.8 (± 1.0)			



Conclusions

In Portugal, there is a strong contrast in adaptive potential between city groups.

The COOLCITY Index in very small towns is 0.4 above the country average, and in larger centres 0.6 below, indicating the greatest adaptive challenges in this group.

Surface permeability is the indicator that most differentiates cities in the country.

In larger cities, it sits 0.9 below the country average. The share of sealed areas in this group is over 11% higher than in very small towns.

The cities are also differentiated by vegetation state and environmental richness.

In cities over 20k inhabitants, vegetation cover is about 7% lower than the country average, with biodiversity - 0.7 lower.

Spain

EU Region
Southern Europe

Number of urban areas in COOLCITY
1,208

Urban area
10,309 million m²

Population in Urban area
36.7 million

COOLCITY Index 4.6

EU average: 5.5 Region average: 4.9

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 6 cities	Zaragoza 3.7	València +0.3
LARGE 100k - 500k people 52 cities	Donostia 5.9	Santa Coloma de Gramenet +0.8
MEDIUM 20k - 100k people 278 cities	Eibar 7.3	Caravaca de la Cruz +1.0
SMALL 10k - 20k people 290 cities	Viveiro 7.7	Guardamar del Segura +1.1
VERY SMALL > 10k people 582 cities	Orio 8.0	Altsasu +1.2



INDICATORS FOR STRATEGIC DOCUMENTS • country average

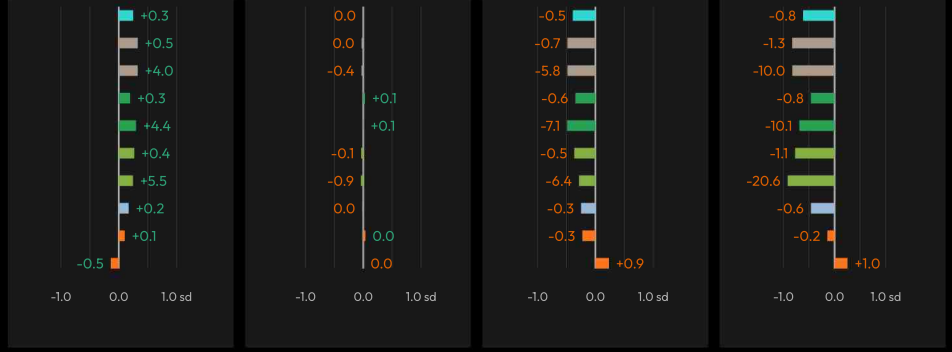
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
59 %	13 %	323 m²/ person	69 %	38 %	173 m²/ person

Spain

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM 20 - 100k people	LARGE > 100k people
Number of COOLCITY cities	1,208	582	290	278	58
Number of city inhabitants	36.7 million	3.7 mln	4.2 mln	11.2 mln	10 mln
% of country population	75 %	7.6 %	8.5 %	22.9 %	20.3 %

	Country average (Standard deviation (sd))	VERY SMALL	SMALL	MEDIUM	LARGE
COOLCITY Index	4.6 (± 1.3)	+0.3	0.0	-0.5	-0.8
Surface permeability	6.2 (± 1.5)	+0.5	0.0	-0.7	-1.3
Biologically active surface area (%)	62.5 (± 12.1)	+4.0	-0.4	-5.8	-10.0
Vegetation state	3.5 (± 1.8)	+0.3	+0.1	-0.6	-0.8
Vegetation cover (%)	59.1 (± 14.6)	+4.4	+0.1	-7.1	-10.1
Biodiversity	5.8 (± 1.4)	+0.4	-0.1	-0.5	-1.1
Ecological connectivity (%)	69.4 (± 22.5)	+5.5	-0.9	-6.4	-20.6
Water conditions	3.5 (± 1.3)	+0.2	0.0	-0.3	-0.6
Thermal conditions	3.8 (± 1.3)	+0.1	0.0	-0.3	-0.2
Surface temperature (°C)	44.7 (± 3.8)	-0.5	0.0	+0.9	+1.0



Conclusions

Spain has a highly varied adaptive potential in its cities.

The standard deviation of the COOLCITY Index is 1.3, showing a wide distribution of results that reflects Spain's diverse geographical conditions.

Very small towns in Spain maintain higher biodiversity.

In this group, it averages 6.2 and remains 0.4 above the country average. In large cities, developing diverse BGI is a challenge, visible in particularly low ecological connectivity.

Spain's largest cities have a more sealed character.

Average Surface permeability there is 4.9, 1.3 below the country average, indicating a strong need to recover space for BGI development and improve adaptive potential.

Italy

EU Region
Southern Europe

Number of urban areas in COOLCITY
1,997

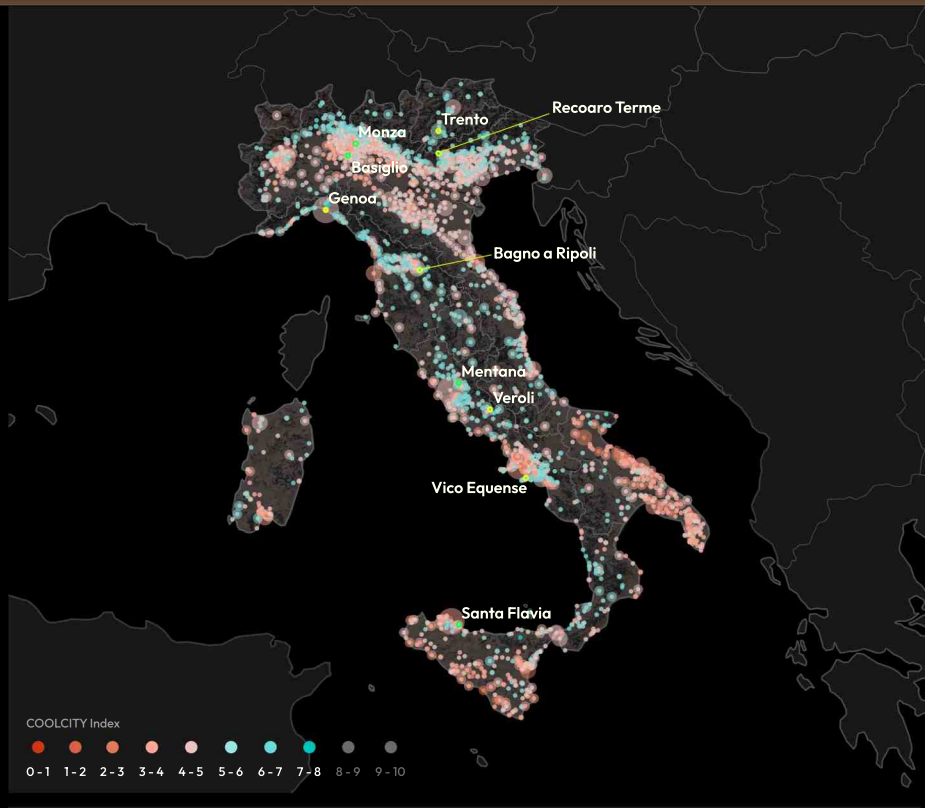
Urban area
19,959 km²

Population in Urban area
41.9 million

COOLCITY Index **5.1**

EU average: 5.5 Region average: 4.9

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE > 500k people 6 cities	Genoa 5.3	Genoa +0.3
LARGE 100k - 500k people 32 cities	Trento 6.0	Monza +0.7
MEDIUM 20k - 100k people 395 cities	Bagno a Ripoli 7.1	Mentana +1.2
SMALL 10k - 20k people 539 cities	Veroli 7.3	Santa Flavia +1.4
VERY SMALL < 10k people 1,025 cities	Recoaro Terme 7.9	Basiglio +1.5



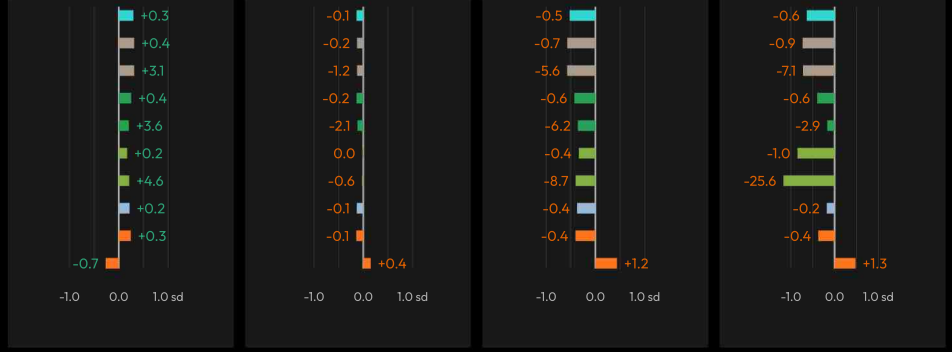
INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
67 %	14 %	478 m²/ person	72 %	32 %	197 m²/ person

Italy

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE > 100k people
Number of COOLCITY cities	1,997	1 025	539	395	32
City population	41.9 million	6.8 mln	7.5 mln	15.2 mln	5.6 mln
% of national population	71 %	11.5 %	12.7 %	25.8 %	9.4 %
	National average Standard deviation (sd)				
COOLCITY Index	5.1 (± 1.0)				
Surface permeability	6.9 (± 1.3)				
Biologically active surface area (%)	67.9 (± 9.8)				
Vegetation state	4.2 (± 1.4)				
Share of high-vigor vegetation (%)	56.4 (± 17.4)				
Biodiversity	6.2 (± 1.2)				
Ecological connectivity (%)	71.8 (± 21.8)				
Water conditions	3.8 (± 1.0)				
Thermal conditions	4.5 (± 1.0)				
Surface temperature (°C)	43.4 (± 2.8)				



Conclusions

In Italy, the COOLCITY Index changes depending on the size of cities.

Average adaptive potential values vary by city size category – from 4.5 in the largest centres to 5.4 in the smallest with the best BGI conditions.

Very small towns in Italy have more permeable surfaces.

Average Surface permeability reaches 7.3 and remains 0.4 points above the country average, supporting the spatial foundation for BGI development.

In Italy's largest cities, vegetation is less continuous, lowering biodiversity.

Average ecological connectivity is 46.2%, remaining 25.6% below the country average, highlighting the challenge of building BGI networks in this city size group.

Greece

EU Region
Southern Europe

Number of urban areas in COOLCITY
260

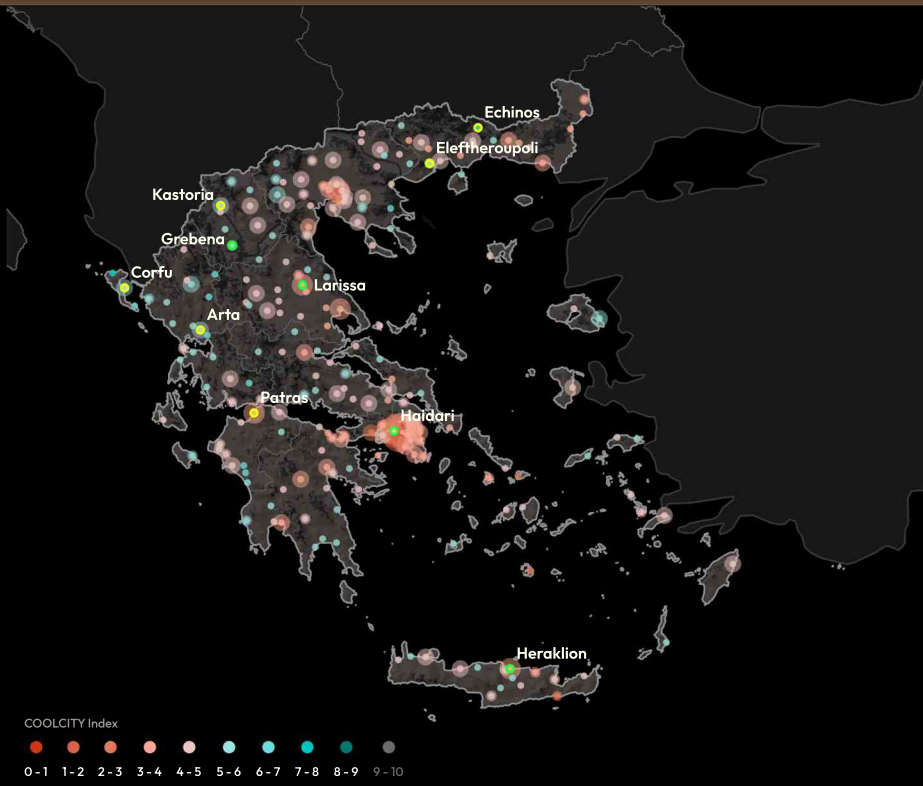
Urban area
3,059 km²

Population in urban area
7.8 million

COOLCITY Index 4.6

EU average: 5.5 Region average: 4.9

LEADERS IN THE COUNTRY	COOLCITY INDEX	PERFORMANCE INDEX
VERY LARGE, LARGE > 100k people 12 cities	Patras 4.3	Heraklion, Larissa 0.0
MEDIUM 20k - 100k people 94 cities	Arta, Corfu, Kastoria 6.0	Chaidari +1.4
SMALL 10k - 20k people 39 cities	Eleftheroupoli 6.5	Grebena +0.7
VERY SMALL > 10k people 115 cities	Echinos 8.4	Echinos +1.2



INDICATORS FOR STRATEGIC DOCUMENTS • country average

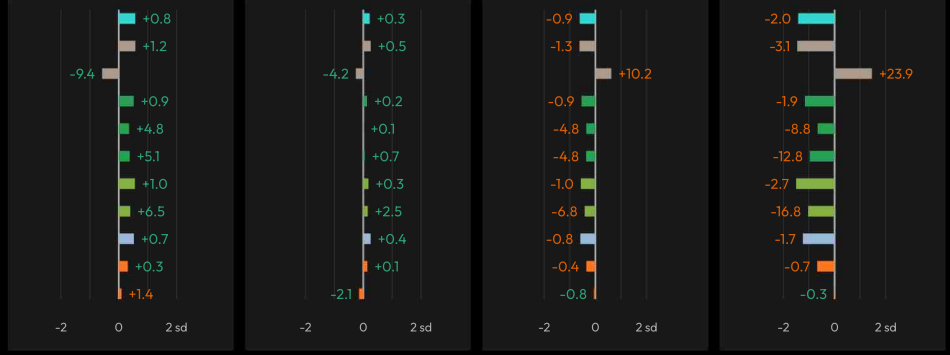
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
60 %	13 %	588 m²/ person	70 %	38 %	268 m²/ person

Greece

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10k - 20k people	MEDIUM 20k - 100k people	LARGE > 100k people
Number of COOLCITY cities	260	115	39	94	12
Number of city inhabitants	7.8 million	0.5 mln	0.6 mln	4.5 mln	2.3 mln
% of the country's population	75 %	5.2 %	5.3 %	42.8 %	22.0 %

	National average Standard deviation (sd)
COOLCITY Index	4.6 (± 1.4)
Surface permeability	6.1 (± 2.1)
Share of sealed surfaces (%)	38.3 (± 16.4)
Vegetation state	3.5 (± 1.7)
High vegetation cover (%)	12.5 (± 13.3)
Share of high-vigor vegetation (%)	36.8 (± 13.3)
Biodiversity	5.9 (± 1.8)
Areas with high biodiversity (%)	49.0 (± 16.2)
Water conditions	3.7 (± 1.4)
Thermal conditions	3.6 (± 1.0)
Share of high-temperature areas (%)	5.9 (± 14.5)



Conclusions

In Greece, the COOLCITY Index clearly differs between city size classes.

CCI values from 2.5 to 5.4 show that BGI potential strongly depends on the local context. In the largest centres, adaptive potential drops by 2 points below the country average.

Very small towns in Greece stand out for their permeable surface coverage.

Surface permeability there averages 7.3 and remains 1.2 above the country average, providing a good basis for BGI solutions.

Biodiversity is one of the main challenges in the country's largest cities.

The average index value remains 2.7 below the country average, and areas with potentially high biodiversity cover only 32.2% of the surface, reducing the natural potential of BGI.

Cyprus

EU Region
Southern Europe

Number of urban areas in COOLCITY
33

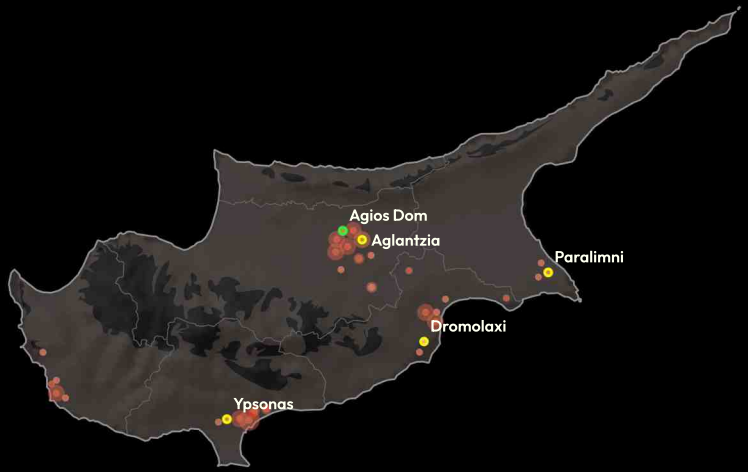
Urban area
324 km²

Population in urban area
654k

COOLCITY Index 2.1

EU average: 5.5
Region average: 4.9

COUNTRY LEADERS	COOLCITY INDEX	PERFORMANCE INDEX
LARGE, MEDIUM > 20k people 10 cities	Aglantzia 3.1	Aglantzia +1.1
SMALL 10 - 20k people 8 cities	Paralimni, Ypsonas 2.6	Agios Dom +0.5
VERY SMALL < 10k people 15 cities	Dromolaxi 3.4	Dromolaxi +0.6



COOLCITY Index
0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9 9-10

INDICATORS FOR STRATEGIC DOCUMENTS • country average

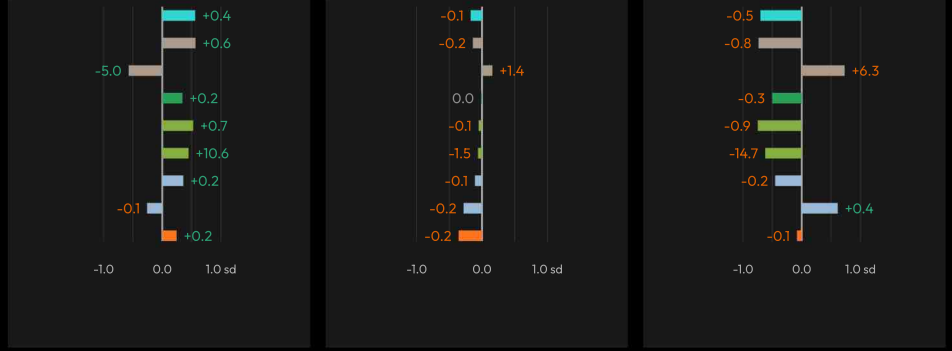
Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
31 %	1 %	234 m²/ person	47 %	62 %	411 m²/ person

Cyprus

City populations and their environmental conditions

	In the country	VERY SMALL < 10k people	SMALL 10 - 20k people	MEDIUM AND LARGE > 20k people
Number of COOLCITY cities	33	15	8	10
Number of city inhabitants	0.7 million	0.1 mln	0.1 mln	0.4 mln
% of country population	67 %	9.5 %	11.8 %	45.4 %

	Country average (Standard deviation (sd))
COOLCITY Index	2.1 (± 0.7)
Surface permeability	3.1 (± 1.1)
Share of sealed surfaces (%)	62.2 (± 8.7)
Vegetation state	1.1 (± 0.5)
Biodiversity	3.6 (± 1.3)
Ecological connectivity (%)	47.0 (± 23.6)
Water conditions	1.5 (± 0.5)
Share of water and wetlands (%)	0.2 (± 0.6)
Thermal conditions	1.3 (± 0.7)



Conclusions

In Cyprus, the variation in the COOLCITY Index divides the urban areas into three groups.

Adaptive potential is lowest in the largest centres, at only 1.6 CCI, increasing to 2.5 in very small towns. The BGI resource layout is therefore size dependent.

Very small towns in Cyprus are an important biodiversity reservoir.

In this group, it averages 4.3, exceeding the country average by 0.7, which strengthens the natural dimension of BGI.

In larger Cypriot cities, Surface permeability is lower.

It averages 2.2, which is 0.8 points below the country average, showing that space for BGI development is limited and should be increased.

Malta

EU Region
Southern Europe

Number of urban areas in COOLCITY
6

Urban area
165 km²

Population in Urban area
478k

COOLCITY Index 3.8

EU average: 5.5 • Region average: 4.9

CITIES IN THE COUNTRY		COOLCITY INDEX	PERFORMANCE INDEX
LARGE 100 - 500k people 2 cities	Saint Paul's Bay	4.1	+0.3
	Qormi		+0.3
MEDIUM 20 - 100k people 4 cities	Victoria	4.7	+0.1
	Rabat	4.6	0.4
	Valletta	2.9	-0.1
	Birkirkara		-0.2



INDICATORS FOR STRATEGIC DOCUMENTS • country average

Vegetation cover	High vegetation cover	Green space area per capita	Ecological connectivity	Share of sealed surfaces	Sealed surface area per capita
54 %	2 %	226 m²/ person	55 %	40 %	150 m²/ person

Wrocław

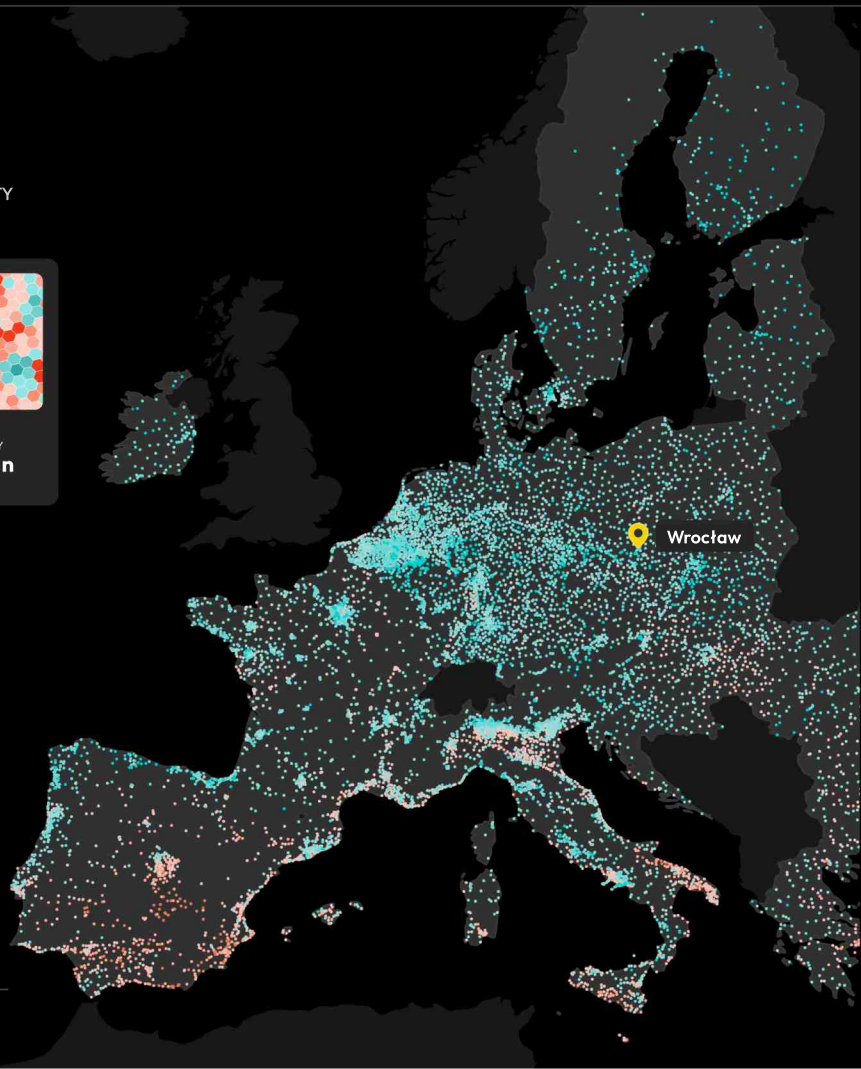
The First COOLCITY in Europe

Wrocław is the first city in Europe to use the full range of innovative COOLCITY tools: COOLCITY Index, COOLCITY View, and COOLCITY Design.



As the demonstration city for the Life project Wrocław has helped create and test solutions to meet real urban management needs from the very start.

COOLCITY provides comprehensive information about the urban environment and equips the city with practical tools to support decision-making. This enables officials to effectively build the city's resilience to climate change and improve residents' quality of life through nature-based solutions.



More about products for cities on page 14.

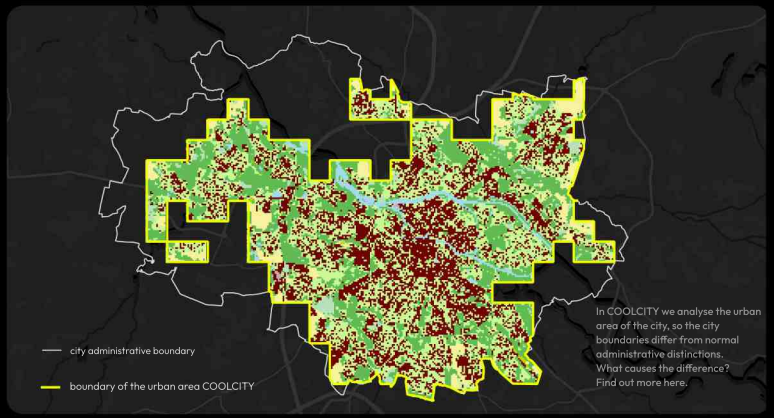
Wrocław in the COOLCITY Index 2026

Lower Silesian Voivodeship, Poland

COOLCITY Index

BASIC INFORMATION ABOUT THE CITY

- Population in urban area: **663,581 people**
- Average total rainfall: **761 mm**
- Urban area: **195.99 km²**
- Average annual temperature: **8.9°C**
- Population density: **3,386 people per km²**
- Average total rainfall: **119.53 m**



IN CITY RANKINGS

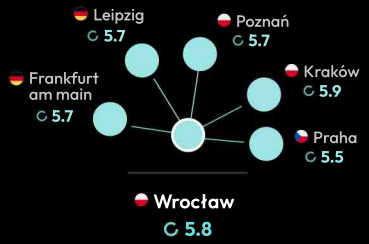
	Wrocław	Cities in Lower Silesian Voivodeship	Very large cities in Poland	Very large cities in EU Central-East
	Wrocław	Averages for 63 cities	Averages for 5 cities	Averages for 10 cities
COOLCITY Index	5.8	6.3	5.8	5.8
Surface permeability	7.5	8.0	7.4	7.5
Vegetation state	5.4	5.7	5.3	5.0
Biodiversity	5.2	6.6	5.4	6.3
Water conditions	5.0	4.6	4.8	4.4
Thermal conditions	6.0	6.6	6.1	6.0

LAND COVER



- Dense forests and tree stands 25%
- Low vegetation 3%
- Surface waters 3%
- Barren land 0.1%
- Shrubs 0.2%
- Managed green spaces 34%
- Arable land 7%
- Urban areas 30%

SIMILAR CITIES



They are similar in terms of:

Geographical conditions	Demographics	Adaptation challenges
8.0 - 9.1°C	541,900 - 1,288,216 people	7.3 - 8.0
81 - 270 m a. s. l.		4.9 - 5.5
689 - 959 mm		4.7 - 5.3
		4.7 - 5.2
		5.0 - 6.2

Wrocław

Potential of the city's blue-green infrastructure

COOLCITY Index

Surface permeability	Vegetation state	Biodiversity	Water conditions	Thermal conditions
7.5 +0.4	5.4 +0.5	5.2 +0.2	5.0 +0.3	6.0 -0.1

Share of sealed surfaces 28%	High vegetation cover 26%	Ecological connectivity 11%	Share of wetland ecosystems 3%	Surface temperature 37°C
Biologically active area 72%	Share of high-vigour vegetation 76%	High biodiversity areas 65%	Surface retention capacity 59%	Share of high-temperature areas 4%

Wrocław achieves a favourable surface permeability result, +0.4 higher than expected from the city's conditions. 72% of the urban area remains biologically active, preserving ample space for investments based on blue-green infrastructure.

Wrocław's space features a vegetation state index value +0.5 higher than expected based on its conditions. This shows that greenery is an important component of the city's adaptive potential, and its vigor is high – above every other very large city in Poland.

A biodiversity level of 5.2 is favourable compared to similar cities. Over 60% of urban areas have potentially high biodiversity with room for improvement in ecological connectivity. The 11% value is below average in very large Polish cities.

The city's water condition score is also higher compared to similar cities. An important natural resource is the extensive water network, which covers around 3% of its surface. These areas support fairly favourable water conditions in Wrocław. Overall, nearly 60% of the city's area has potential for rainwater retention and enhancing drought resilience.

Thermal conditions are less favourable compared to similar cities. The result is lowered by the average surface temperature of 37°C, which is 0.4 degrees higher than the average for other very large cities in the country. Areas with high temperature make up 4% of Wrocław's surface. These are areas in the city where blue-green infrastructure should be implemented to provide cooling.

+0.5 Performance Index

Nature-based adaptation

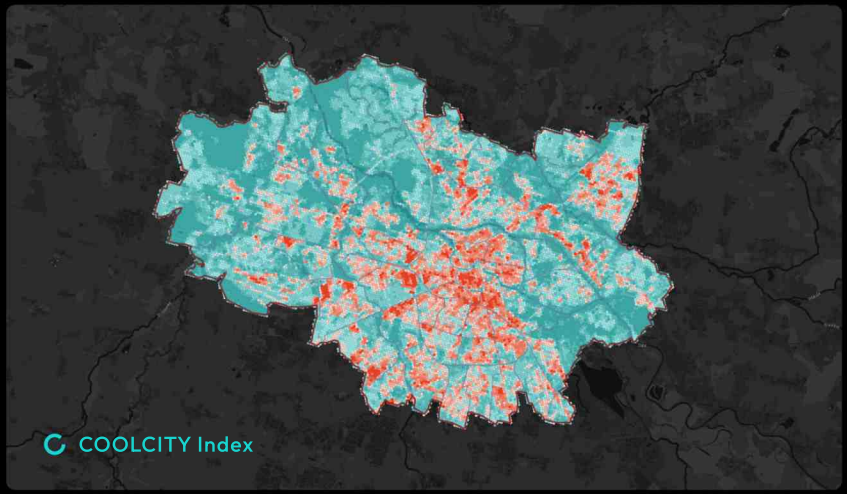
How is Wrocław implementing NBS?

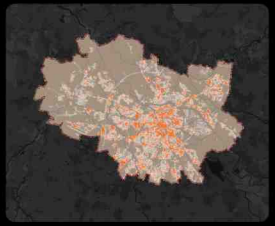
COOLCITY View

The first step to effective data-driven management is a thorough understanding of your natural resources. A comprehensive inventory of the city's environmental components allows for assessment indicating which areas have the greatest adaptation potential and which require improvement.

With the support of the COOLCITY View tool, Wrocław can make strategic decisions and set priorities and directions for action. Using spatial valuation of the city in terms of blue-green infrastructure, the city develops strategic documents such as the Urban Adaptation Plan.

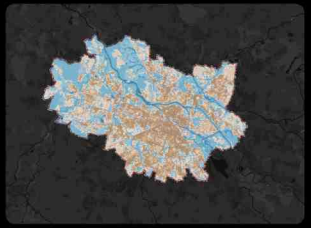
Explore the COOLCITY View for Wrocław.

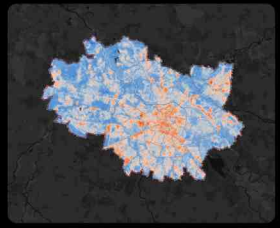



Surface permeability


Vegetation state


Biodiversity


Water conditions


Thermal conditions

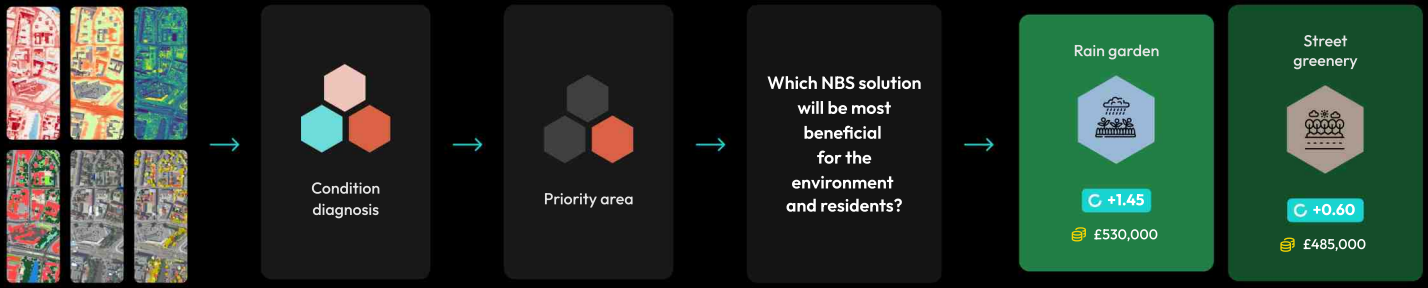
Data-driven management

How does COOLCITY support decision-making?

COOLCITY Design

The COOLCITY Design decision support system enables the city to plan implementations from a catalogue of nature-based solutions (NBS). Actions may include protection, maintenance changes, or introducing new elements of blue-green infrastructure. The system's recommendations consider both environmental benefits and residents' preferences.

COOLCITY DESIGN DECISION SUPPORT SYSTEM OPERATION SCHEME



Comparative analysis based on CCI

In the above example, the rain garden would be the winning solution

As part of the Life COOLCITY project, Wrocław will conduct pilot interventions aimed at improving local nature. By monitoring adaptive indicator changes, the city will be able to demonstrate the effectiveness of implemented NBS solutions both during the pilot and across the entire urban area.

The Life COOLCITY project provides Wrocław primarily with knowledge and professional tools to better manage greenery and urban space.

Thanks to modern technologies, we can precisely analyse the environmental condition and make targeted decisions that genuinely improve residents' quality of life. This tool will allow us not only to monitor changes but also to effectively counteract the negative effects of urbanisation and climate change by placing greenery where it will have the greatest impact in minimising the urban heat island effect and enhancing quality of life.



Katarzyna Szymczak-Pomianowska

Director of the Strategy and Sustainable Development Department
Wrocław City Hall

COOLCITY Design includes a decision support system that allows us to model various scenarios for implementing blue-green infrastructure in the urban space. This helps us identify priority areas for action and determine the specific measures to implement to maximise environmental and social benefits.



Małgorzata Brykarz

Director of the Climate and Energy Department
Wrocław City Hall

Methodology

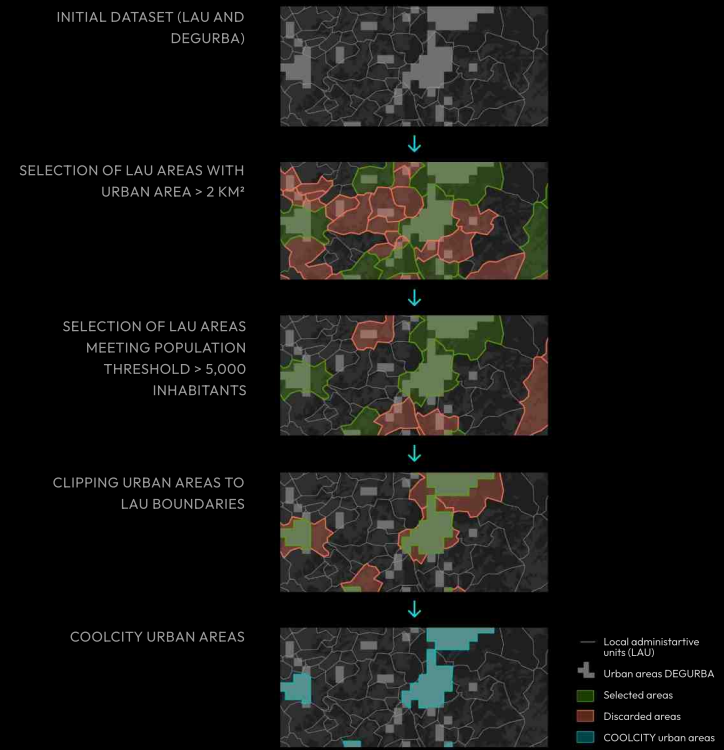
A city in COOLCITY

There is no universal definition of a city in the European Union. In COOLCITY we define cities as an urban areas managed by a single administrative authority.

To define the city area, we use two sets of input data:
- administrative division LAU (Local Administrative Units)
- degree of urbanisation DEGURBA, which considers population size, population density, and building density
- a point layer of cities supplemented with population data obtained from Eurostat

Based on this data, we identify urban areas that must meet specific demographic and area criteria:
- a population of at least 5,000 inhabitants according to local statistical offices
- an urban area size of no less than 2 km². Cities located in agglomerations are exempt from the area size criterion.

Ultimately, we found 11,041 urban areas in the European Union that meet these criteria.



Methodology

How is the COOLCITY Index (CCI) created?

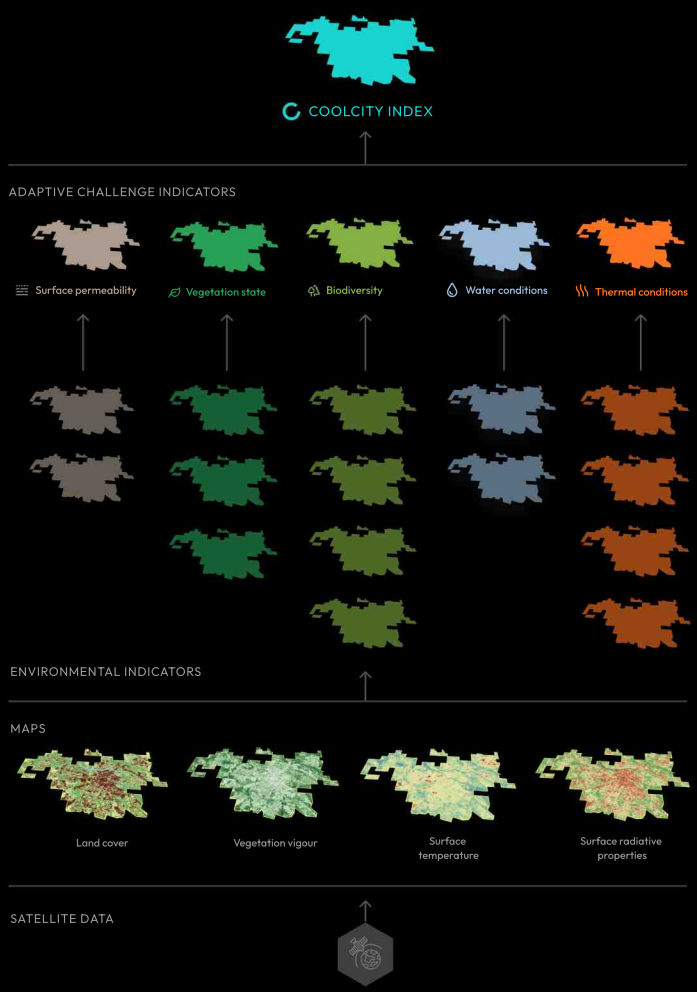
The COOLCITY Index platform and report are published annually and include data current for the previous calendar year.

Initially, we developed a set of thematic maps: land cover, vegetation vigour, surface temperature, and surface radiative properties. These provide a consistent source of spatial data for cities across the European Union and are based on satellite data from Sentinel-2, Landsat-8, Landsat-9, and Google Dynamic World. From these maps, we calculated 15 environmental indicators for each urban area (one indicator equals one value per city).

Next, we grouped and combined the indicators using a weighted average into 5 adaptive challenge indicators. These represent the state of a city's blue-green infrastructure in terms of key urban natural aspects: surface permeability, vegetation state, biodiversity, thermal conditions, and water conditions.

Finally, we calculated the COOLCITY Index (CCI) value as the average of the 5 adaptive challenge indicators. The CCI is a synthetic indicator of a city's adaptive potential, used to assess the state of blue-green infrastructure within urban areas.

The result is a diagnosis of 11,041 European cities regarding their environmental adaptive potential. Lower CCI values indicate lower potential and signal greater adaptive challenges, while higher values indicate greater potential to strengthen city resilience based on blue-green infrastructure.



Indicators

Complete list of maps and environmental indicators

Adaptive challenge indicators forming the COOLCITY Index	Environmental indicators	Description	Thematic maps
Surface permeability	Share of sealed surfaces [%]	Percentage share of sealed surfaces in the city area	Land cover map
	Biologically active area [%]	Percentage share of biologically active area in the city area	
Vegetation state	Vegetation cover [%]	Percentage share of vegetation in the city's land area	Land cover map
	High vegetation cover [%]	Percentage share of high vegetation in the city's land area	
	Share of high-vigour vegetation [%]	Percentage share of high-vigour vegetation (excluding arable land)	Vegetation vigour map Land cover map
Biodiversity	Ecological connectivity [%]	Degree of connections between vegetation patches in the city. Describes continuity and accessibility of green areas in the city	Land cover map
	Vegetation diversity [synthetic measure]	Degree of diversity of vegetation forms calculated based on area and share of individual vegetation classes. Indicator ranges from 0 to 1	
	Number of vegetation forms [synthetic measure]	Average number of vegetation classes in the reference unit. Indicator ranges from 0 to 6	
	Areas of high biodiversity [%]	Percentage share of areas with potentially high biodiversity in the city area	

Adaptive challenge indicators forming the COOLCITY Index	Environmental indicators	Description	Thematic maps
Water conditions	Surface retention capacity [%]	Potential water retention capacity of the area, expressed as a percentage and estimated based on land cover classes.	Land cover map
	Share of wetland ecosystems	Percentage share of water and wetland ecosystems in the city's area	
Thermal conditions	Surface thermal properties [synthetic measure]	Indicator defining the radiative properties of the land surface in relation to solar radiation. Values range from −1 to 0. Higher values indicate favourable substrate properties (high share of lush vegetation and low albedo), while lower values indicate unfavourable substrate properties (lack of vegetation or its poor condition and high albedo)	Map of thermal properties of the substrate
	Surface temperature [°C]	City surface temperature expressed in °C	
	Share of high-temperature areas	Percentage share of areas with high temperature in the city's area	Surface temperature map
	Share of low-temperature areas	Percentage share of areas with low temperature in the city's area	

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