

## Article

# The European Green Capital Award—Is It a Dream or Reality for Belgrade (Serbia)?

Marijana Pantić \*  and Saša Milijić

Institute of Architecture and Urban & Spatial Planning of Serbia, 11000 Belgrade, Serbia; sasam@iaus.ac.rs

\* Correspondence: marijana.d.pantic@gmail.com

**Abstract:** An agreement of cooperation and transmission of knowledge regarding the nomination for the European Green Capital Award (EGCA) was signed between the mayors of Belgrade and Ljubljana (EGCA 2016 winner) in September 2018. The candidacy of Belgrade was finally realized in October 2019. Great hope was placed in this endeavour because internationally recognized awards, such as the EGCA, represent enormous capital for both the city and the state. The EGCA requires serious preparation and significant fulfilment of preconditions. Many economically strong and environmentally responsible cities competed for the award, but did not win. On the other hand, the capital of Serbia does not appear to be an obvious winning candidate, especially as it is differentiated from the previous winners by being a non-EU city and by the fact that it is still undergoing an intense urban transformation, characteristic of transitional countries. Therefore, the main aim of this article is to present a review of the current state of Belgrade's environmental qualities and its comparison with the EGCA criteria and with Grenoble as one of the winning competitors. The article gives a full overview of the EGCA requirements with certain details on required indicators, gives relevant insight into the procedure, which could be of use for any future candidacy, and discusses potential benefits for winners, losers and repeat candidacies.

**Keywords:** urban planning; urban development; European Green Capital Award; environment; Belgrade; Southeast Europe



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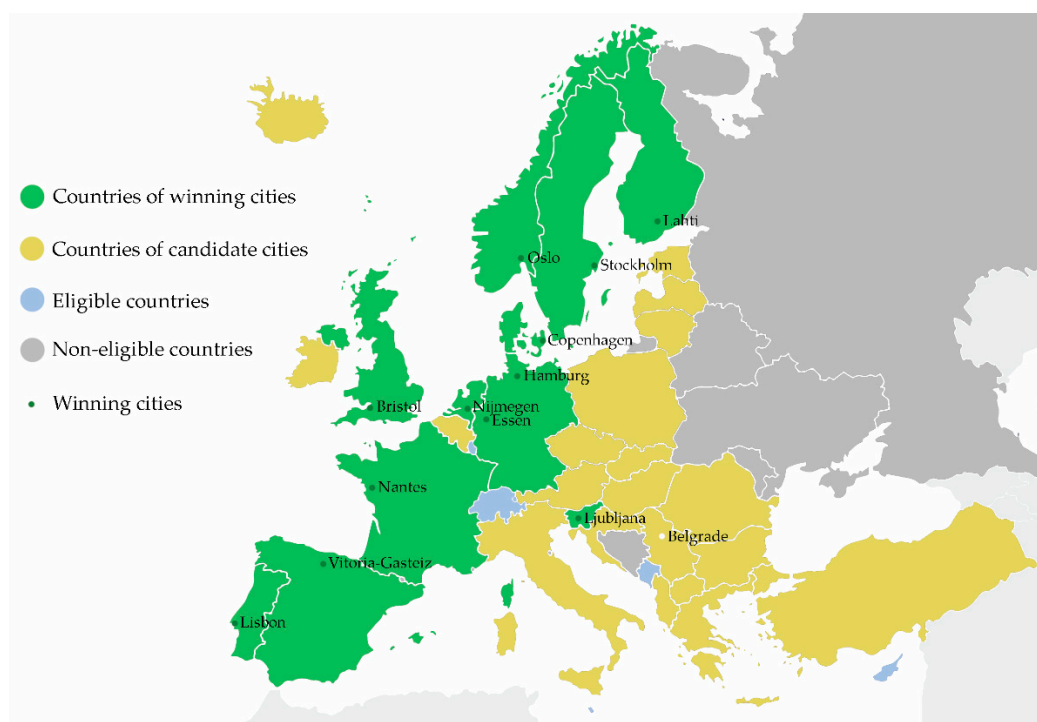
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## 1. Introduction

The European Capital of Culture award was established in 1985, and it is nowadays just one of many designations, titles and prizes designed for cities to promote their sustainable urban development. The persistence over time of one award is certainly an incentive for establishing others, such as the European Capital of Sport (since 2001), the European Youth Capital (since 2009), the European Green Capital Award (EGCA) (since 2010) and the European Capital of Innovation (since 2014). Most of these awards represent a title that a winning city is designated for a year. Some awards come together with financial support, and others can be awarded to more than one city in the same year, but a common factor in each case is hard work and a committed preparation process for the nominees starting as early as the application phase, which is similar to a nomination for mega-events such as the Olympic Games.

So far, the European Commission (EC) has proclaimed 13 EGCA winners, starting with the City of Stockholm in 2010 [1]. Other cities that have found their place on the list are Hamburg (Germany), Vitoria-Gasteiz (Spain), Nantes (France), Copenhagen (Denmark), Bristol (UK), Ljubljana (Slovenia), Essen (Germany), Nijmegen (Netherlands), Oslo (Norway), Lisbon (Portugal), Lahti (Finland) and Grenoble (France), which shows that holders of the title have been primarily EU cities. Some of them competed more than once [1], which is also intended by the City of Belgrade [2]. Belgrade's mayor announced the candidacy for the 2021 award in September 2018, but it was not realized at that time. The city entered the competition for the first time in October 2019, thus aspiring to win the EGCA

status for 2022 [3]. However, Grenoble won the award, leaving Belgrade, other competing cities and finalists Dijon (France), Tallin (Estonia) and Turin (Italy) behind [4]. If it had won, Belgrade would have been the first non-EU winning city from a developing country, even though it was not the first to attempt. Other non-EU cities such as Skopje (North Macedonia) and Tirana (Albania) applied for the candidacy for the year 2021 (Figure 1).



**Figure 1.** The City of Belgrade in the EGCA context (2010–2022).

The main goal of initiatives such as the EGCA is the promotion of a certain urban value (e.g., culture, environment, innovation), where cities, by competing, improve their cooperation and their regeneration; thus, they become internationally visible and recognized. With large investments and efforts, cities aim at even larger gains after winning an award [5]. The most commonly addressed form of gain is economic, both by candidate countries and in the research literature [6–9], but positive effects are not only limited to this. On the contrary, the effects are also noticeable in the social, physical and environmental spheres [5,10–16].

According to [17], an increase in revenues from tourism related to the organization of a mega-event or award designation is not certain. Even though some cities manage to produce long-term effects, there are still awarded cities where an increase in the number of tourists or a positive economic impact does not occur at all, or it occurs only for a short time after the year in which they were designated the title, as was the case of Montreal, the host of the Summer Olympics in 1976, and Stockholm in 1998, Rotterdam and Porto in 2001, Genoa in 2004 and other European Capital of Culture host cities [17–19]. Therefore, it is evident that not all cities gain the same and expected results [20], but cases analysed by [19] confirm that those cities that create a nomination strategy from the perspective of long-term development have far more success in the long run. Moreover, when it comes to mega-events or designations that last for over a decade, positive effects are expected not only at the city level but also at a broader level that might influence countries as a whole [21].

In the environmental field, the EGCA was established more than a decade ago. The initial idea was to motivate life quality improvement and reduce global pressures on the environment in urban areas [22]. Therefore, besides social and economic benefits, the

EGCA has also been proven to foster many environmental projects with a positive impact on the environment through their implementation.

The following sections present a short history of the EGCA, compare environmental indicators for the City of Belgrade with EGCA requirements and indicators for Grenoble as a winning city, and discuss how certain it is for Belgrade to reach the milestone any time soon.

## 2. Materials and Methods

### 2.1. Problem Statement

Cities are continuously competing with each other in life quality provision in order to attract population, economy and innovations. In some cases, the competition becomes formal when cities compete for an award such as the EGCA. The competition is high, but the cities are aware that the competing process itself can result in benefits so that winning is not the only achievement. This is the kind of benefit that particularly suits economically challenged cities; hence, the competing candidates might be cities that are not obvious winners.

As climate change and environmental protection are currently highly engaging topics, this paper focuses on the EGCA. Specific to this article is an analysis of the City of Belgrade, which has still not been designated the title, but which has submitted two candidacies in 2019 and 2020. The second candidacy is still pending. Its case is similar to other European cities that repeated the candidacy, and even more similar to cities from Southeast Europe and EU candidate countries that have not managed to win the EGCA yet. The goal of the study is to raise awareness about environmental issues in cities and the EGCA as a tool to inspire environmental change by presenting requirements for obtaining the EGCA designation and discussing its meaning for the city government, its citizens and contribution to EU values. The hypothesis is that the EGCA initiative creates positive effects on a candidate city regardless of whether it wins or loses.

### 2.2. Methodological Approach

This paper combines qualitative and quantitative approaches. A qualitative approach was applied to estimate Belgrade's qualifications for the EGCA regarding the qualitative selection criteria set by the EC and performed by the EGCA expert panels and juries, such as documents and projects developed and implemented by the city and principles recognized in the documents and projects. A quantitative approach was applied to estimate the EGCA criteria that can be quantified, which are statistical data on environmental quality.

Belgrade, as the chosen case study, was analysed following the EGCA competition criteria arranged within 12 topics: (1) climate change mitigation; (2) climate change adaptation; (3) sustainable urban mobility; (4) sustainable land use; (5) nature and biodiversity; (6) air quality; (7) noise; (8) waste; (9) water; (10) green growth and eco-innovation; (11) energy performance; and (12) governance [23]. The structure of the paper follows each topic and its criteria. In order to estimate how far Belgrade is from winning, one section of the paper compares a range of indicators for Belgrade with Grenoble, which is the winner for the year 2022, the latest proclamation where Belgrade lost. As an EU candidate country, Serbia's and implicitly Belgrade's monitoring system is still not up to the EU standards, and it does not measure some indicators. This was a limitation in the analysis, mitigated by the interpretation of other thematically related indicators.

### 2.3. Data Collection Methods

Data relevant for understanding the context, criteria and evaluation process for the EGCA were derived from the EGCA documents, including jury reports since the establishment of the competition up to the report published in 2020 (referring to the 2022 finalists), as well as the expert panel's evaluations, recommendations and guidance notes.

The qualitative and quantitative data were found in strategic, planning and programme documents adopted by the City of Belgrade. Other, predominantly quantitative,

data sources are reports published by the Environmental Protection Agency of Serbia (SEPA), Institute for Nature Conservation of Serbia, Institute for Public Health of Serbia, and the Statistical Office of the Republic of Serbia (SORS). A relevant source of both quantitative and qualitative data was an internal database created from 2018 to 2020 for the Green City Action Plan project (GCAP)—a document that is currently in the adoption process.

The information on the city's status within international organizations and the city's plans and visions was drawn from the official city webpage, webpages of international portals (e.g., the Covenant of Mayors for Climate & Energy), online newspapers, etc.

### 3. Results

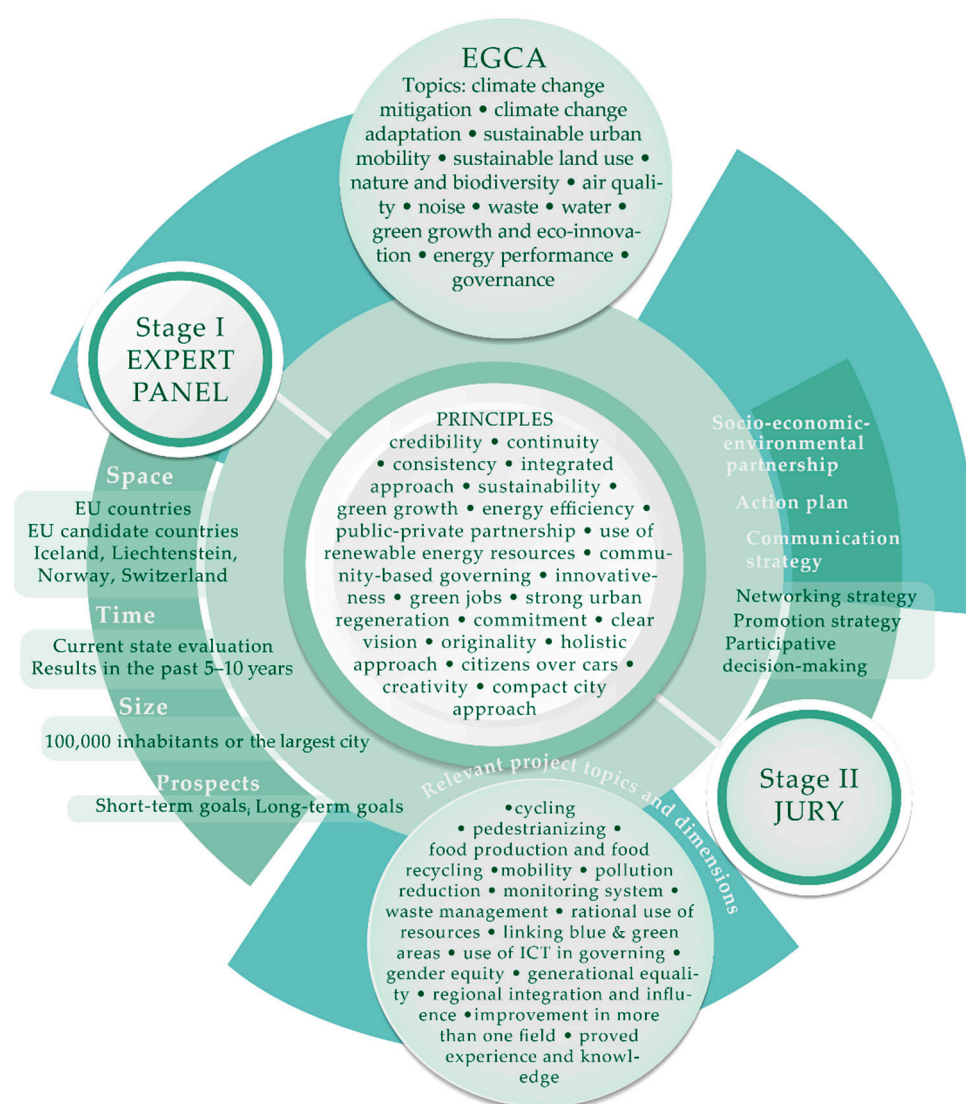
#### 3.1. Eligibility and Selection Criteria

Even though the EGCA is an EU initiative, EU candidate countries (Albania, the Republic of North Macedonia, Montenegro, Serbia and Turkey) as well as Iceland, Liechtenstein, Norway and Switzerland are also eligible to compete (Table 1). Entities that apply for the competition are cities themselves (represented by the mayor), but only if they exceed 100,000 inhabitants or they are the largest city in the country [24].

**Table 1.** EGCA—countries eligible to compete.

EU Countries		EU Candidate Countries	Other Countries
Austria	Latvia	Albania	Iceland
Belgium	Lithuania	North Macedonia	Liechtenstein
Bulgaria	Luxembourg	Montenegro	Norway
Croatia	Malta	Serbia	Switzerland
Cyprus	Netherlands	Turkey	
Czechia	Poland		
Denmark	Portugal		
Estonia	Romania		
Finland	Slovakia		
France	Slovenia		
Germany	Spain		
Greece	Sweden		
Hungary			
Ireland			
Italy			

The evaluation process consists of two stages: shortlisted candidates are chosen in the first stage and finalists in the second. The expert panel, assigned to conduct a peer review and qualitative evaluation of submitted application forms, bases its decision prevalently on provided indicators arranged by 12 EGCA criteria topics (listed in Section 2.2. and Scheme 1). Applicants are expected to document well the state of the art for each indicator topic and the set of measures implemented in the past five to ten years, present short- and long-term goals, and clarify their planned approach for achieving the set goals [25]. Shortlisted candidate cities are evaluated by the jury based on presentations they prepare in the second round of the competition. In the presentation, the cities convey their communication strategies and accompanying action plans. By justifying their commitment to promote the “green” city idea and positively influence other European cities in 12 criteria topics, competing cities try to elevate themselves to the winning position [26,27].



**Scheme 1.** EGCA evaluation stages and criteria.

Besides the evaluation criteria set by the EGCA, the analysis of the EGCA jury reports, the expert panel reports [28] and the justification of their evaluation decisions shows that the city governments are particularly valued by the set of 20 principles (Scheme 1).

In order to become a winner, it is necessary to show exceptional ambition that is at the same time credible and feasible. The credibility needs to be proven with time; therefore, recent achievements are not highly appreciated, and neither is a large success with limited impact. They are simply not regarded as sufficient to make a city the winner. The winner must show capacity for complex, multiple, durable achievements and activities that are in mutual synergy. The expected norm is innovative, original and creative solutions that are simultaneously transferable to other cities of similar size or similar challenges. The credibility of a city's strategy also comes from the spread of the strategy's positive outcomes: the impact is expected to exceed the city area and reach the surrounding region or even beyond. The success from the past needs to be proven and it should be promising for the future, too. A combination of both short- and long-term measures is estimated to be better than just one of the two.

A winning city should show the capacity to promote the EGCA concept and values, which is in the first place evaluated through the capability to promote itself and its ideas and to reach a large "audience". One of the aspects that prove this capability is the power of the city government to engage a wide range of participants and professions in the



decision-making process. This can be manifested through the number of daily visitors to the city's webpage or through the establishment of a meaningful network with other cities within the country and abroad. A serious commitment to the goal should be reflected in the city's budget plan, thus complying with the EGCA value system. In addition to the financial aspect, the chosen projects should carry exceptional urban transformation power and visible urban regeneration results.

The goal is that the best urban quality environment in Europe is rewarded [28]. The jury reports show that the success of shortlisted candidates lies in an entire set of strategies and measures implemented in the field of cycling, pedestrianizing, food production and food recycling, overall mobility, pollution reduction (CO<sub>2</sub> and other gases and particles), environmental monitoring systems, waste sorting and re-use, reduction in the use of resources, interconnectivity between green and blue areas, etc.

The "additional points" go to cities that manage to successfully connect the environmental field to the social and economic spheres. Creation of green jobs and development of the green economy are perceived by the EGCA jury as highly relevant because they show that those cities give an added value to environmental care. The use of technologies in governance is a plus (it can be listed under the innovativeness principle), but the technologies must be in the function of the environmental quality.

If competitors comply with the evaluation criteria to a similar extent, other EU values such as gender equity or generational equality become relevant evaluation factors.

Few jury reports [28] transparently stated more concrete reasons for which shortlisted cities did not win the prize. The reasons were insufficient regional integration and influence, insufficient elaboration and improvement in several fields simultaneously, and absence of experience and knowledge. Otherwise, the EGCA reports indicated solely affirmative aspects of the finalist cities.

### 3.2. Review of the City of Belgrade

#### 3.2.1. Climate Change Mitigation, Adaptation and Air Quality

Climate change mitigation evaluation is based on indicators related to CO<sub>2</sub> emission, which is the main "contributor" to climate change effects [29]. Whether it is about total emission or emission from traffic, the city lacks monitoring of CO<sub>2</sub> (all the data related to absence of monitoring are drawn from the Green City Action Plan and Sustainable Energy Action Plan project, which has been in progress since August 2018). Therefore, the current emission cannot be measured, but the future reduction is estimated only indirectly (e.g., the overall reduction is estimated based on the number of electric buses that replace regular buses in public transport, as the difference in CO<sub>2</sub> emission between those two types of buses is known from the declaration). However, estimations might vary significantly because the best-expected results can be significantly altered by the local road conditions [30], which indicates that estimations of CO<sub>2</sub> reduction in Belgrade can be only provisional and inaccurate. Interestingly, the city is currently in some projects (e.g., GCAP, SECAP) that consider CO<sub>2</sub> reduction as a focal point and the primary goal. According to these projects, the city has committed to reducing CO<sub>2</sub> emission by 40% by 2030 [31].

Monitoring stations with the highest NO<sub>2</sub> pollution in the country are located in Belgrade [32]. In general, the overall territory of the city has five monitoring stations for PM<sub>10</sub> and PM<sub>2.5</sub>, and six stations for NO<sub>2</sub> [33]. The inner city has for each of the parameters one station less. They are mostly located at critical points, where the most pollution is expected, but cannot be relevant for the entire territory of the city. Annual average values of all listed air quality indicators exceed desirable values [31]. Emission of SO<sub>2</sub> is the only one that did not exceed the highest acceptable concentration in the air in 2016.

#### 3.2.2. Noise

The noise metering station network in Serbia is not complete yet. Belgrade is one of the cities that does not have a continual 24 h monitoring system [34]. Besides that, Belgrade

was one of the cities in Serbia that had  $L_{\text{dan}}$  levels between 65 and 69 dB(A) in 2017, which is above the highest acceptable value. It is the same with the night noise indicator. The eager use of cars and rarity of electric vehicles contribute to the noise on the streets.

### 3.2.3. Water

The aimed value for water consumption per capita per day in Europe is 130 L [35]. The indicator measures 83 L of domestic use of drinking water per capita per day in Belgrade [36], but in the case of total usage, the value goes up to 227 L per capita per day, thus including water used in industry or elsewhere as well as in households [37], which goes far beyond the desirable value. The problem is leakage and losses in pipelines, which take one third of the water (33%). Due to the outdated pipeline network that is costly to repair, losses are huge. Another striking problem regarding water management is the absence of wastewater treatment facilities. An aim set by the City of Belgrade Development Strategy (2017) [38] is to treat at least 10% of wastewater before releasing it into the final recipient (the Danube River) by 2021. The city's ambition is also to build four large water treatment facilities, but it does not define a time framework for its realization. Until the project is implemented, there will be no treatment or re-use of wastewater, except by private (industrial) companies, which are legally obliged to install wastewater treatment units. There is no summarized record of the number of such companies and the amount of water they treat and re-use. Nevertheless, the industry consumes only 11% of water, while households consume 71% and other consumers 18% [37].

In Belgrade, 69% of drinking water is sourced from groundwater, while 31% is from the Sava and the Danube River [39]. The quality is mainly considered satisfying, so tap water can be consumed for drinking in the broader inner city. When it comes to testing, one of the reports (for 2017) indicates that 10.5% of the tested samples were not in compliance with the national drinking water directive [40]. Considering the quality of water in water bodies, biochemical oxygen demand (BOD) in rivers is low (below 2 mg per L), and for the past few years, it has shown a decreasing trend [41–48]. In contrast, the level of ammonium  $\text{NH}_4$  concentration in rivers is slightly increased (between 0.15–0.2 mg per L), and in the past seven years it has shown an increasing trend.

Since the end of the Second World War, the city has constructed a separate system for atmospheric and faecal water, but there is still a significant urban tissue (the city centre and pre-war settlements) covered with a combined drainage system only. Sixty percent of the built-up area of the city was covered by the atmospheric water drainage system, and only 75% of households had a connection to the sewage system in 2016 (although the works have significantly intensified since 2017).

In conversation with a representative of the Secretariat for Environmental Protection of the City of Belgrade (SEPCB), it was stated that small streams represented a significant environmental challenge because of the level at which they were polluted. Since wastewater treatment, including industrial wastewater, does not exist and a part of the city's territory is not covered by the sewage system, small rivers and streams usually play the role of collectors. In addition to wastewater, the state of the streams is endangered by illegal solid waste disposal. The problem has escalated so that the city has difficulties making a financial plan to treat it directly; therefore, it will be treated indirectly, through completion of the sewage system and the introduction of obligatory environmentally friendly behaviour by companies that operate within the city's administrative area.

### 3.2.4. Waste

Data collection on waste production, waste collection and waste treatment is rather poor. Even though data might be available within responsible institutions, they are not publicly revealed or systematized. For example, there are no data on how much packaging waste is being recycled or recovered, or at what percentage the household waste is being sent to landfill. On the other hand, recycling statistics are easy to calculate because there is no separation of organic waste and no waste is being sent to thermal treatment or another

type of re-use. Waste production is estimated at 360 kg/year/capita, which is moderate, with an inclination to reach the desired category below 300 [31]. The waste reduction should at least ease the pressure on the sole landfill in the city, whose life cycle has expired (reached planned capacity).

There is a developed waste separation system but it is not fully functional. The reasons for this are: firstly, because citizens are not very well informed about how to become a part of the system; secondly, because individuals that re-sell recyclables directly to recycling companies take away the separated waste without permission (it is being disposed of in public space in order to make it accessible for city services); and thirdly, because the separated waste is being disposed of together with non-separated waste [49]. Therefore, the system can be said to be useful only as a test for citizens' willingness to separate waste and as an awareness raising lesson. There is no sanitary landfill yet, although a project and public–private partnerships on the creation of such a landfill have occurred on and off over the past few years.

### 3.2.5. Sustainable Land-Use, Nature and Biodiversity

The green area within the inner city was 13.2% in 2010, and it was planned by the Belgrade Master Plan (2016) [50] to increase it to 14.8% by 2021. In 2010, green and forest areas constituted 19.6%, whereas the expected share was set to 27.6% by 2021. Neither do these values differentiate private from public green areas nor does a database on private green areas exist. According to [50], agricultural land within the Belgrade Master Plan area will be reduced more significantly than any other type of area—from 49.1% to 5.9% in the same period. Blue areas (water and water land) are planned to increase from 4.9% to 18.4%, as well as residential areas (from 16.8% to 19.8%) and industrial and commercial areas (from 2.0% to 6.3%). Even though there is a significant number of deserted industrial zones scattered over the city, there was no official analysis done or record kept on the actual surface of brownfield areas. In a city where illegal construction was a trend for over a decade [51,52], and where it is only partially under control, it is hard to estimate the percentage of sealed surfaces because the situation changes without consistent control by official institutions. However, in the architectural heritage, there is no building constructed according to the Green Building parameters [31].

Connectivity and accessibility are among the two primary goals defined by the Belgrade Master Plan [50] and the General Regulation Plan for Green Areas System of Belgrade [53]. However, no study measures the current accessibility level or indicates the future levels of progress. The Green Regulative Project recognized areas that are used for urban agriculture in the form of allotment gardens. However, these locations are mostly the result of spontaneous land-use by socially vulnerable individuals who decided to bring “life” into parcels that are not actively maintained by the city or any other individual [54], rather than the action of the city [55]. So, this is often the case with the state-owned (or city-owned) land in green belts, protected zones or simply parts of the city that still have not been brought to a designated use. In some cases, groups of citizens are coming around with a common idea of organizing themselves for organic production.

Finally, tracking biodiversity quality in the city is not really in the jurisdiction of the city institutions, but in the hands of national academic organizations. As data are not collected with particular regard to administrative limitations, it is not easy to extract them for this study or similar projects. What is known is that no area in Serbia, hence in Belgrade, holds Natura 2000 designation [56]. However, there are 46 areas protected by national standards, which occupy 1.76% of the total city area [38].

There is a huge project going on at the right bank of the Sava River. Nominally, the project is meant to reconnect citizens with the river by removing the railway (which was a physical obstacle), refurbishing walking areas, introducing urban infrastructure and building large-capacity buildings (both for residential and commercial purposes) [57]. However, this project has no relation to water quality improvement. On the contrary, such a concentration of residents and non-resident users might induce new environmental challenges.



### 3.2.6. Energy Performance

Final energy consumption in all sectors for the city is 25 TWh [58], or 14,845 kWh/capita. Energy performance in residential buildings is almost 80 kWh/m<sup>2</sup> (EU aim is below 20–21 kWh/m<sup>2</sup>). It is also close to 80 kWh/m<sup>2</sup> in buildings of all types (desirable values below 47 kWh/m<sup>2</sup>), and it even reaches 190 kWh/m<sup>2</sup> in non-residential buildings (desirably below 120 kWh/m<sup>2</sup>) [31]. So far, energy production from renewable resources is low (about 8.28% in 2012) [59] and it is not adequately statistically reported [38], even though it is prioritized in relevant development documents [38,58,59]. It is estimated that by 2030, Belgrade will use only 0.08% more renewable energy than in 2012 [58,59]. Biomass, wind energy and geothermal energy are particularly underlined as renewable energy sources in the city. Therefore, there is a plan to increase energy production from these sources in those parts of the administrative region where it is feasible, as well as a plan to establish the first facility for combined heating and electricity energy production [38].

### 3.2.7. Sustainable Urban Mobility

The most common modes of commuting are public transport (47.9%), private cars (25.7%) and walking (23.8%) [60]. Bicycle and motorcycle together represent only 1.3% of commuting. Expected trends in prognosis for 2035 are an increase in private car transport, in contrast to passenger and public transport, which is expected to decrease. Currently, the number of vehicles per capita (motorization rate) is 0.39 (desirable value is 0.4), but, as the analysis has shown, the trend is increasing [31]. The alterations planned in the city urban structure are rather large for a city with a humble economic capacity such as in the case of the City of Belgrade. Anyway, the government aims to shorten commuting time, displace as much traffic as possible from the city centre, and speed up the flow of vehicles [38,39]. The city is also working on the popularization of cycling [38] by introducing a bike share system and by indicating bike lanes within the existing infrastructure. However, it will take considerable effort and most probably time until the system gets to a level where cyclists feel secure in the traffic and also connected throughout the city. Safe cycling requires higher participation of infrastructure separated from the motor traffic and connectivity of different parts of the city, especially outside of recreation zones. In 2016, there was 65 km of bike lanes in the city [31]. The freight traffic used to be integrated into some central parts of the urban fabric, which improved in 2014 due to the construction of a new bridge on the Danube River, upstream from the city centre.

The most common type of vehicle in public transport is bus (44% in overall traffic), followed by tram (only 2%) and trolleybus (1.3%) [60]. As the most common transport means in the city, buses do not reach significant speed. To the contrary, it is only 13.3 km/h, with a decreasing trend in recent years [39]. Since 2016, the city of Belgrade has run five city-owned electro-buses on one of the bus lines [61]. The number of electro-buses owned by the city was planned to exceed 100 by the end of the year 2019 [38], but this, unfortunately, did not happen. In contrast, the city does not own electro-cars. The overall number of electro-vehicles in the country is only 128, out of which 90 vehicles are registered in the city [62].

### 3.2.8. Governance

According to the city's webpage, SEPCB is the most active and productive among the secretariats in the City Government. It has published the greatest number of strategic documents and action plans [63]. The Secretariat has produced environmental documents such as the Afforestation Strategy for the City of Belgrade (2009) [64], Local Waste Management Plan of the City of Belgrade 2011–2020 (2011) [65], Action Plan for Climate Change Adaptation with Vulnerability Assessment (2015) [66], Environmental Protection Program (2015) [58], Air Quality Plan (2016) [67], Revitalization of the Topčiderska River by Biological Systems for Purification of Waste Water (2016) [68], Annual Approximation Plans for Furnace Extinguishment (2018, 2019 and 2020) [69–71] and Brochure on Energy Efficiency in Houses and Residential Buildings (2018) [72]. Some of the documents were developed

in cooperation with academic institutions and NGOs. Since 2012, the Secretariat has also published Environmental Quality Reports [63].

When it comes to environmental protection and quality, the Secretariat for Energy, in cooperation with the University of Belgrade–Faculty of Architecture, published the Belgrade Thermovision Atlas in 2012 [73], while the Secretariat for Traffic, in cooperation with the University of Belgrade–Faculty of Transport and Traffic Engineering and the Centre for Urban Development Planning (CEP), produced a user manual titled Updating the Transport Model of Belgrade with Travel Pattern Research (2015) [74]. In contrast to the results of particular segments of the City Government, the media and the City of Belgrade webpage occasionally report about ambitious commitments of the city but these announced implementations are often postponed or cancelled. Namely, the media announced that the mayor of the City of Belgrade signed contracts for building a pipeline from the thermal power plant in Obrenovac (outskirts of the administrative area of the city) to the central area for heating purposes and the establishment of a wastewater facility in 2017 [75]. There is still no proof that the implementation has commenced.

The former mayor announced that he had signed the Covenant of Mayors for Climate and Energy and the Paris Pledge for Action in 2016 [76]. Neither the webpage for the Paris Pledge [77] nor the webpage for the Covenant of Mayors [78] list Belgrade as a signatory country, even though the webpage of the City of Belgrade re-announced the same actions by the newly elected and current mayor [79]. Similarly, the mayor first announced candidacy for the EGCA in 2018 [80], which did not occur, so it was announced again in 2019 [81], which finally resulted in the application submission in October 2019.

The Belgrade GCAP and Belgrade SECAP projects are currently in the adoption procedure after several drawbacks and deadline prolongations. The projects have been hindered by the lack of the city's response in some phases and the lack of cooperation between the City Governance bodies (secretariats, public utility companies and the mayor's office) (an internal observation between project participants was enabled by participation of one of the authors of the paper in the Belgrade GCAP project). This was the reason why the project was pending for half a year before “defrosting” again.

The city does not have a biodiversity action plan nor a plan for actions in case of floods (unlike some smaller municipalities in the country). Unfortunately, the adoption of the Energy Strategy has failed, despite the efforts by the Secretariat for Energy to accentuate its relevance (information gathered from the participants of the City of Belgrade Development Strategy).

Before concluding this section, it is relevant to mention the efforts of some other city institutions. For example, the Institute of Urbanism of Belgrade prepared the Belgrade Master Plan (2016) [50], embedded with environmental principles and measures. One of the comprehensive initiatives that came out of the plan is the Green Regulative of Belgrade Project, with GIS of green areas and the General Regulation Plan for Green Areas System of Belgrade [53]. The Regional Spatial Plan for the Administrative Area of the City of Belgrade (2011) [82], as the top document at the city level, was among the first documents in Serbia to refer to climate change and similar environmental issues, which appeared to be a good basis for other urban planning documents in the city. One of them is the Belgrade SMART PLAN [60], whose primary goal was the development of sustainable city traffic and diversification of transport means.

### *3.3. Comparison of Belgrade with Grenoble*

The City of Belgrade competed for the EGCA 2022 with 17 other cities from 10 countries [83]. Belgrade, Budapest and Sofia were the only applicants with over one million inhabitants, and 16 cities were signatories of the Covenant of Mayors, including Belgrade. However, Grenoble won.

By comparing available data for Belgrade and the data for Grenoble presented in the Application Form [84], it becomes clearer where the City of Belgrade stands as a contestant (Table 2). Even though it is 10 times larger (population-wise), Belgrade disposes of three

times less financial power to invest in development than Grenoble. The distribution of the population, which is almost seven times more scattered in Belgrade than in Grenoble, represents an additional challenge to the infrastructural endowment. The world university ranking also shows the advantage of Grenoble, which is directly related to the capacity for innovation. Both cities got involved in the Covenant of Mayors, although Grenoble has almost 10 years more experience regarding the initiative. Apart from the Covenant of Mayors, Grenoble showed its commitment towards green development by competing for the European Capital of Innovation (rank 2 in 2014) and the European Access City Award (rank 2 in 2014). It won the European Energy Award 2019 and the EGCA 2022.

**Table 2.** Belgrade–Grenoble comparison regarding some of the EGCA indicators.

Indicator/Year	Belgrade	Grenoble
Population size (2015)	1,679,895	160,649
Population density (2015)	1280 inhabitants/km <sup>2</sup> (in 10 urban municipalities)	8861 inhabitants/km <sup>2</sup>
GDP (2018)	10,508 €/capita	31,639 €/capita
Academic ranking of universities (2019)	401–500	101–150
Covenant of Mayors signatory	since 2016	since 2008
Air pollution (2020)	average PM2.5: 24.3	average PM2.5: 10.7
	rank in Europe: 43	rank in Europe: 2224
	category: moderate	category: good
CO <sub>2</sub> reduction plans by 2030	–40%	–50%
Renewable energy sources in district heating network (2018)	less than 3%	72%
Public rental bicycles	5 test-bikes released in 2013 900–1000 planned in 2020	7000
Journeys undertaken by (2010)	car: 18.4%	car: 18.8%
	public transport: 48.9%	public transport: 16.8%
	cycling: 0.8%	cycling: 6.1%
	foot: 24.3%	foot: 51.2%
Number of electric vehicles owned by the municipality (2019)	5	152
Land-use (2010)	forests: 6.4%	forests: 53%
	agricultural land: 49.1%	agricultural land: 19%
	built-up areas: 26.4%	built-up areas: 22%
Municipal waste that is recycled (composting and digestion of biowaste included) (2018)	0.0%	48.8%
Water use (2018)	domestic: 83 L/capita	domestic: 109 L/capita
	total: 227 L/capita	total: 150 L/capita
Final energy consumption	14,845 kWh/capita	24,463 kWh/capita
Share of renewable energy in final energy consumption	10.0%	18.3%

Sources: [36,50,60,61,81,84–89].

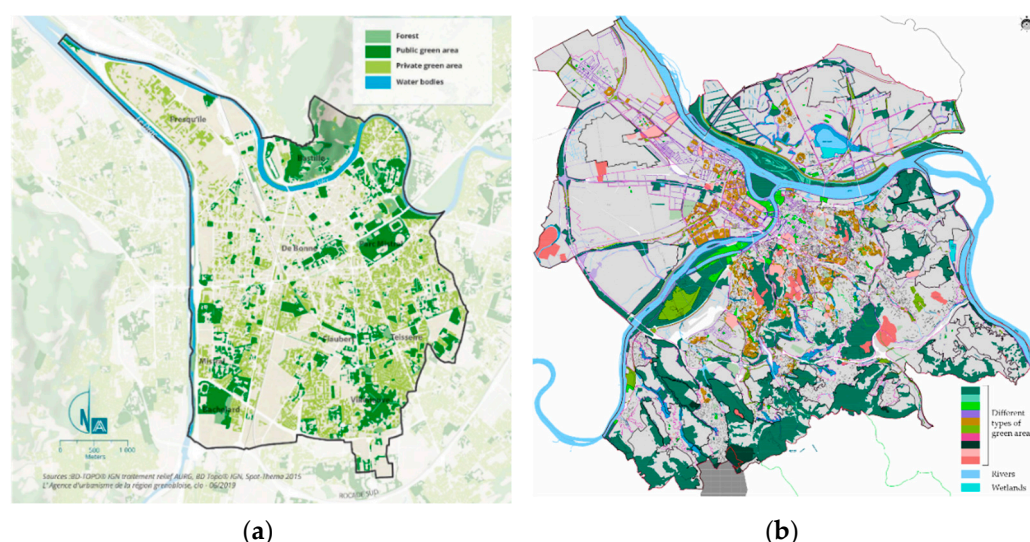
According to the World's Most Polluted Cities ranking for 2020, Belgrade is much closer to the top of the list than Grenoble (Table 2). On the IQAir webpage [87] it is stated that “Belgrade sees some serious problems occurring with its air quality . . . placing it amongst the top most polluted cities ranked worldwide, as well as warranting a ‘unhealthy

for sensitive groups' rating ( . . . ) It can be determined that Belgrade has much to do to improve upon the quality of its air if it is to see any prominent improvements in the coming years." Improvement of the monitoring system is one of the aspects that requires effective engagement. The monitoring system is more advanced in Grenoble: for example, it measures CO<sub>2</sub> emissions in tonnes, per capita and per sector.

As the reduction of greenhouse gases depends on renewable energy sources (RES) used for heating and electricity production, these indicators show again a huge discrepancy between Belgrade and Grenoble when it comes to district heating and a less obvious difference regarding RES use in energy consumption. The dominant energy source in the district heating network in Belgrade is gas (96%) [90], whereas Grenoble produces biogas from the wastewater treatment plant. In contrast, Belgrade's plans for the installation of wastewater treatment plants and biogas production in the new landfill are still at the level of documents, news for the press and difficult public–private partnerships that take years to make a step forward. Grenoble set the goal to cover all the electricity needs for its residents from green sources by 2022. Belgrade's story is different: the majority of electricity in the country is produced from lignite, the lowest rank of coal, and so is the energy produced for consumers in Belgrade [91].

The distribution of passengers by transport means also indicates the level of environmental pressure. Belgrade and Grenoble are similar regarding the use of cars, but quite different when it comes to public transport, cycling and walking. Maybe this is due to its size, but passengers in Belgrade use public transport more than in Grenoble, whereas passengers in Grenoble are fonder of cycling and walking (Table 2).

The convenience of cycling and walking certainly depends on urban design, public space quality and distribution of green areas. The Institute of Urbanism of Belgrade worked hard on the creation of the Green Regulation of Belgrade from 2001 until the realization of the project in 2019 when the General Regulation Plan for the Green Area System was adopted. The share of built-up areas in Belgrade is similar to Grenoble, but Grenoble has significantly more forests and a more balanced distribution of green areas and corridors (Table 2 and Figure 2).



**Figure 2.** Green areas of (a) Grenoble (current state) and (b) Belgrade (planned state). Adapted from Refs. [50,84].

A comparison of significant projects in Belgrade and Grenoble indicates an understanding of urban transformation in those two cities. One initiative of Grenoble is the transformation of brownfields into eco-neighbourhoods (Figure 3). In Belgrade, a brownfield at the attractive location of the Sava River bank is seen as an area for luxurious residency, hotels, a huge shopping mall and cultural events (Figure 4). Belgrade and its



citizens needed a modern strolling and cycling way by the river. The Belgrade Waterfront offers some recreation areas, although with a limited green surface [57]. However, the denial of participation and transparency in the processes represent the most severe drawbacks of this project. Shepard [92] describes it as follows: “The entire project was reputedly planned in secret, with no public participation. Having been classified as a project of national significance . . . Belgrade Waterfront was fast-tracked, which meant that certain bureaucratic hurdles could be sidestepped—such as the otherwise mandatory competition for the project’s architectural design. (The government claimed that there actually was a competition, but it was held in Abu Dhabi and no Serbian architects were apparently invited, and who actually designed the project is still unknown). There was also no open bidding process for the tender, as is standard operating procedure. When it was highlighted that Serbia’s government was violating its own laws, such as the building codes which are outlined in Belgrade’s General Urban Plan, they reputedly just changed the laws”.



**Figure 3.** Riverbank projects in Grenoble: (a) Mikado and (b) Park des Berges. Adapted from Ref. [84].



**Figure 4.** Belgrade Waterfront: high-class living, shopping and cultural area. Adapted from Ref. [93].

#### 4. Discussion and Conclusions

The main goal of initiatives such as the EGCA is the promotion of environmental urban values and promotion of competing cities, by which the cities improve their cooperation, regenerate urban tissue, and become internationally visible and recognized. The City of Belgrade replied to the basic EGCA requirements to enter the competition (space, time, size and prospects), but that was not sufficient to proceed to stage II. When compared with

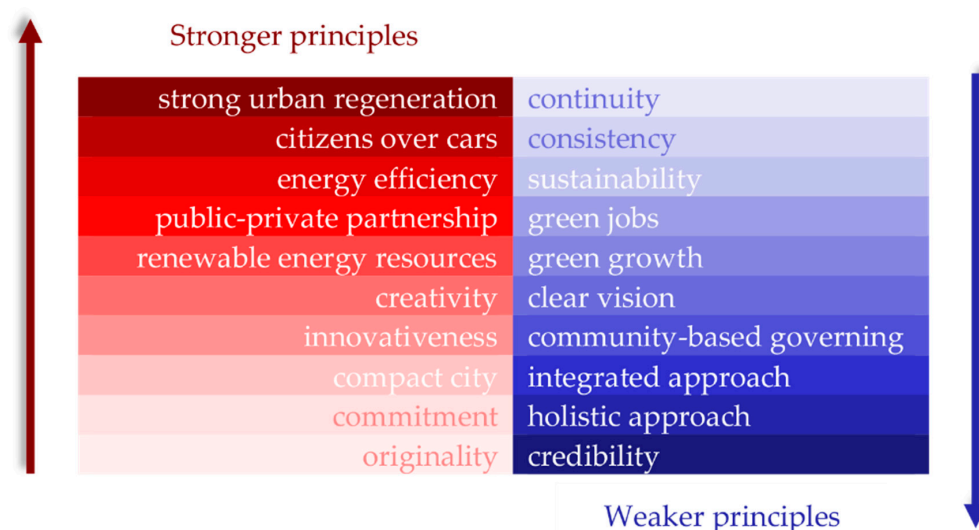


the previous winners (all EU cities or cities in developed countries), the expectations were not high, although the competition organizers also encourage applicants from uncompetitive countries by claiming that “a city with low urban environment quality may receive the award if it has recently implemented innovative and efficient measures and aims to continue to do this in the future” [28] or that cities “which inherited an overall deteriorated environment from previous regimes” would not be excluded from the competition [28]. However, they also admit that “as the starting point for most eastern European cities is still difficult and many are still struggling with substantial environmental problems from the past, the favourite candidate to receive the title will probably be a wealthy western European city” [28].

Despite the odds, the City of Belgrade has applied for the EGCA 2023 competition. Even cities that won the award sometimes had to compete several times before achieving the goal. Besides Belgrade, EGCA 2023 applications have been resubmitted by Tallinn (Estonia), Cagliari (Italy) and cities from Southeast Europe—Sofia, Skopje and Zagreb. As candidacy goes along with a certain responsibility, the EGCA hopes that awareness about environmentally friendly actions will be raised both in the winning and losing cities [94]. Even though [18,19] argue that mega-events do not necessarily bring economic benefit to the host cities, Demaziere’s research [95] showed that branding under the title of a “green city” brings environmental gains. Therefore, even though Belgrade’s progress did not change significantly between the two candidacies, it is certain that it has a slight positive effect on awareness raising about environmental responsibilities within the government and among citizens. The mayor and the government created an appearance of being active in the environmental field by announcing the first candidacy twice and placing the second application the second year in a row. Thus, this increased the expectations of citizens, who will demand tangible results sooner or later.

The plans to compete for the first EGCA candidacy moved the city’s networking activities forward. The signed cooperation contract with the EGCA 2016 winner—the City of Ljubljana—speaks in support of this. When combined with other strategies, an increasing number of tourists before the COVID-19 pandemic occurred (913,150 in 2016; 1,035,205 in 2017; 1,160,582 in 2018; 1,258,348 in 2019), thus proving that the city had found its way to promote itself as a touristic destination [36,37,96,97]. The second candidacy could be taken as the quality of consistency, continuity and commitment (Figure 5). Belgrade is also active in urban regeneration. A tangible aspect of the regeneration refers to the regulation of traffic and implementation of transport solutions that should improve the traffic flow through and around the city. On the one hand, the regeneration leads towards pedestrianizing the city centre, opening the city to the rivers, and recognition of the citizens-over-cars principle. Additionally, some city initiatives show interest in connecting green and blue areas by the riverbanks in the vicinity of the city centre. On the other hand, the changes in urban tissue are not necessarily environmentally friendly. Namely, rivers, as water bodies, play a significant role in diminishing “heating island” effects in cities [98], as does the Sava River. However, the Belgrade Waterfront project rather acts as a physical barrier between the cooling effect of the Sava River and the city centre.

The most revealing obstacle for Belgrade to win the EGCA is the lack of a comprehensive monitoring system concerning inclusion of indicators (in the case of some indicators, they are entirely missing, or in the case of others, partially missing), consistency in measuring, and real-time measuring. Besides the poor monitoring system, the city has serious problems with losses of resources (district heating network and water supply system), lasting for decades. The losses are so large that they are difficult to justify, although they can be related to the economic humbleness of Belgrade when compared with Grenoble or similar cities. On the other hand, actions, such as recycling, have already been implemented for years, but with no record of improvement, thus showing that success is also a matter of good organization, which the city lacks, and not only fiscal power.



**Figure 5.** The City of Belgrade: a provisional gradation of the recognition of principles in governing.

Considering the social aspect of the gains, there are two improvement levels: city governance and community empowerment. Firstly, in the process of candidacy, city governments strive to become active members of networks where other cities with alike experiences cooperate and exchange know-how. The necessity for a strategic approach usually leaves cities with developed policies that bring benefits even after the competition. It also changes the thinking paradigm in governance and improves the participative approach [99]. Secondly, the entire process inspires citizens to get involved, participate and interact, thus giving a positive boost to social cohesion [100–102]. It also evokes a sense of pride and willingness to change behavioural patterns and lifestyle [16].

Analysis of the case of Belgrade indicates that the City Government has started the EGCA process with social changes and internal (local and national) promotion of the city. Nevertheless, instead of directing energy towards green city policy development, changes in the thinking paradigm, and improvement of a participative approach that would inspire citizens to get involved in decision-making, the government of the City of Belgrade seems to have empowered high-handedness in decision-making, excluded citizens from the processes, and provoked them and professionals in urban development to engage against the city when it comes to projects that have an irreversible impact on the environment and cultural heritage (e.g., interfering with the recognizable city skyline by building multi-storey buildings at the riverbanks, attempting to build a cable car infrastructure from the historical Kalemegdan Fortress to New Belgrade by cutting down 150 mature trees, etc.). High-handedness and lack of implementation of planning documents have been seen in other cities in the country, too [103].

Regarding EGCA principles, the persistency, tradition in good practice projects, and innovativeness are necessary, which Belgrade lacks. The city should also consider relevant changes in the participatory approach in order to meet the sustainability of implemented projects and citizens' needs, not only for the EGCA requirements, but also for the well-being of the community [54,104]. The city should also strengthen the control over unacceptable actions such as illegal building and ignorance of public interest. On the other hand, some spontaneous changes, which are still not legally defined, should be embraced in future regulations (and possibly national legislation), such as urban gardening, garden colonies and organized initiatives by citizens in this field [105]. By institutionalization of such processes, the city would have higher control over general benefits for initiative members, other citizens and the city itself.

Considering the current state of the environmental quality, innovativeness of projects and speed of the city's actions after the first announcement of EGCA candidacy, the probability that Belgrade will become a finalist or a winner any time soon can be estimated

as rather low. The EGCA reports used to include arguments against the selection of a city, which was a learning base for future applicants. This is not the practice in recent years, which makes competitors work harder, as the City of Belgrade should have done for at least five years in a row before submitting its application to the EGCA competition. Even though the EC explicitly stated that there are strong doubts that a city from a transitional country without a tradition in advanced urban development could win the EGCA, they gave the chance to cities such as Belgrade to benchmark their competitive strength against cities from developed economies. In the competition process, the City of Belgrade and similar cities learn from the competitors, raise awareness about development possibilities and environmental issues, and increase their visibility on the European map. Although the effects might appear to be negligible, they are significant because any progress in the field of environment and social engagement prepares cities for times of better economic prosperity.

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