Chapter 3

Climate Neutral and Smart Cities Mission of Izmir: Present and the Future

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Abstract

As the role of cities becomes critical in combating climate change, the EU's "Climate-Neutral and Smart Cities Mission" provides a systemic innovation framework for urban decarbonization. This study examines the strategic road map developed by Izmir, one of the 112 cities selected under the Mission, to accomplish climate neutrality by 2030. The study utilizes a mixed-method approach, combining the analysis of Climate City Contract (CCC) documents with semi-structured interviews conducted with stakeholders and decision-makers. The study reveals how Izmir integrates existing strategies, such as the Sustainable Energy and Climate Action Plan, with the "GCC-SYNERGY" pilot project, which digitalizes energy consumption, and the multi-stakeholder "Global Climate Community" governance model. The findings show that while the city exhibits a high level of technical readiness and local stakeholder engagement, it faces systemic barriers regarding access to financial resources and capacity for large-scale implementation.

1. Introduction

Climate change poses a critical universal challenge, and cities are both major sources of the problem and central to the solutions; despite covering less than 2% of the earth surface, urban areas consume 78% of global energy and produce more than 60% of greenhouse gas emissions (Giacomelli et al., 2025). To address this, the EU established the "Climate Neutral and Smart Cities Mission" in line with the European Green Deal, aiming to transform

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112 selected cities (which received applications from 362 eligible cities and municipalities) into climate-neutral hubs by 2030 and position these cities as innovation centers for other destinations to follow by 2050 (Huovila & Hukkalainen, 2025). This mission adopts a systemic innovation approach that requires cities to go beyond traditional research and development and integrate technological, organizational, and institutional changes (Komninos & Panori, 2025).

The strategic mechanism for this transformation is the Climate City Contract (CCC), a dynamic document encompassing climate neutrality commitments, action plans and investment strategies involving various stakeholders (Kaufmann et al., 2023). Izmir, one of the 12 cities from associated countries participating in the project alongside the 100 EU member cities, applied to the Mission Platform (Managed by the NetZeroCities consortium) with an 80% carbon reduction commitment and became the first non-EU city to receive the "Mission City Label" by the commission (European Commission, 2021; NetZeroCities, 2023; Izmir Metropolitan Municipality, 2024). Izmir has announced its first project, "Digital Solutions for Electricity Consumption by Global Climate Community Izmir (GCC-SYNERGY)," to be granted by the EU for the Mission Cities, the Pilot Cities Program (NetZeroCities, 2024a). Furthermore, Izmir is a leading example of smart and sustainable urban transformation by actively utilizing data-driven tools such as the "Carbon Map" and the "Infrastructure Information System" to monitor and optimize its urban ecosystem (Turkish Republic Ministry of Environment, Urbanization and Climate Change, 2024a; 2024b; 2024c).

Therefore, the study aims to assess Izmir's commitments to becoming a "Mission City" through its "Smart City" themed strategies. Another important objective expected from the study's output is its prospective evaluation by those who have contributed to or will contribute to the city's mission work.

2. Literature Review

The EU has declared its goal to become the first carbon-neutral continent in the world by 2050 in response to the worldwide climate crisis (European Commission, 2019). Cities are at the center of this transformation because, despite covering a small portion of the global surface, they are responsible for 78% of energy consumption and over 60% of greenhouse gas emissions (Giacomelli et al., 2025). Furthermore, 93% of GHG emissions are beyond the local government's direct control. While municipalities are on the front lines of the fight against climate change, they cannot succeed alone (Cartron et al., 2024). In this context, the EU has gone beyond traditional R&D projects

and adopted a "systemic innovation" approach that combines technological, social, and governance dimensions, and presented the "Climate Neutral and Smart Cities Mission" (European Commission, 2021). The mission targets to make 100 European destinations climate neutral by 2030 and position them as centers of experimentation/innovation for other destinations by 2050 (Huovila & Hukkalainen, 2025; Komninos & Panori, 2025).

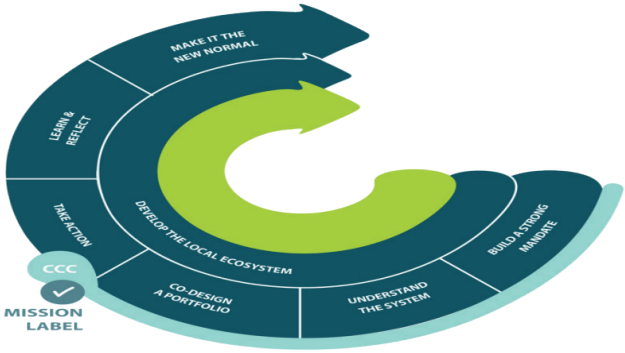

Figure 1: Climate Transition Map

Reference: (NetZeroCities, 2022).

The Climate City Contract (CCC) is the key strategic mechanism that cities must develop to achieve the mission's objectives. The CCC consists of a political commitment, an action plan that includes a timeline for actions, and an investment plan that details the financing of these actions (Kaufmann et al., 2023). This process requires cities to not only meet emissions reduction targets but also address socioeconomic inequalities and ensure environmental justice with "smart city" technologies (Beretta & Bracchi, 2023). However, the literature indicates that cities struggle to plan for the unprecedented capital investments required for this transformation, and their current financial readiness remains inadequate (Ulpiani et al., 2023).

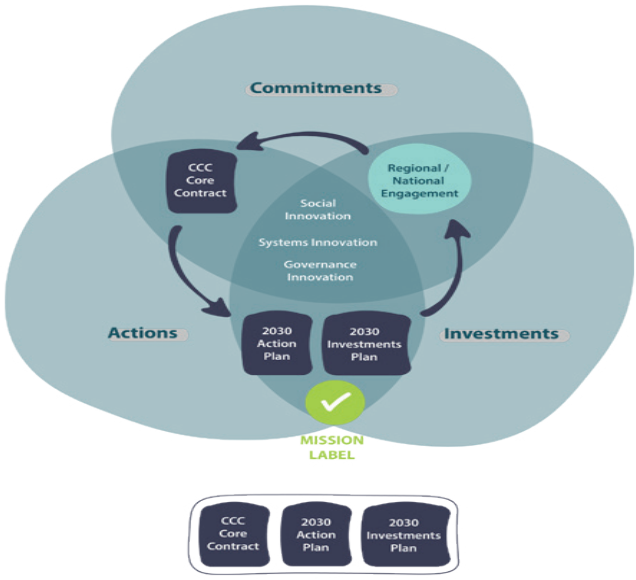

Figure 2: Conceptualization of the EU Cities Mission Climate City Contract

Reference: (NetZeroCities, 2022)

In the context of Turkey, in studies classifying smart city strategies of cities in the developing countries category, Izmir, together with Istanbul and Ankara, exhibits a high potential for implementation by being in the "Leaders" group (Samasti et al., 2025; Boz & Cay, 2024). As one of 112 cities selected under the Mission, Izmir has implemented a comprehensive CCC process, building on previous strategies such as the Sustainable Energy and Climate Action Plan (SECAP) and the Green City Action Plan (GCAP) (Cihan, 2024; Sevincli & Turan, 2025). The city has committed to decreasing emissions by 80% by 2030 and has implemented the "Global Climate Community Izmir" (GCC Izmir) governance model, which brings together the public, private sector, and civil society in pursuit of this goal (Izmir Metropolitan Municipality, 2024).

As part of the process to receive the Mission Label, Izmir was accepted into the Pilot Cities Program run by NetZeroCities and was awarded support for the "GCC-SYNERGY" project (NetZeroCities, 2024a). This pilot project aims to decarbonize the city's electricity consumption and increase energy efficiency by monitoring it through digital solutions (Izmir Metropolitan Municipality, 2024; NetZeroCities, 2024). Furthermore, Izmir exhibits a holistic approach that transforms theoretical goals into practical field applications by integrating data-driven smart city applications such as the "Carbon Map" and "Infrastructure Information System" to optimize urban

infrastructure and emission management (Turkish Republic Ministry of Environment, Urbanization and Climate Change, 2024a; 2024b; 2024c). This digital infrastructure is further supported by the municipality's extensive portfolio of smart city applications, which play a crucial role in enhancing urban efficiency and citizen engagement through established platforms like Geographic Information Systems (GIS) and the "Izmirim Card" system (Tasci, 2020).

3.Methodology

3.1. Study Design

The study uses a qualitative research method, specifically the semi-structured interview technique, to deeply analyze Izmir's transformation process, the obstacles encountered, and governance practices within the scope of its "Climate Neutral and Smart Cities Mission" This method was chosen because it provides participants with a specific framework while allowing them to detail the complex dynamics of the process and their subjective experiences. The research aims to answer the "how" and "why" questions regarding Izmir's strategic positioning within the Climate City Contract (CCC) process and its implementation phase.

3.2. Study Group

The research sample was determined using the purposive sampling method. A total of 11 participants consisted of stakeholders (key informants) who actively participated in the Mission process, including relevant units of Izmir Metropolitan Municipality, academia, chambers of industry, and civil society organizations, and who held decision-making or implementation positions.

To document the representativeness and diversity of the sample, demographic data on participants' age, gender, and education level, as well as their sector of employment, areas of expertise, and professional experience were recorded. This data allows for the interpretation of responses according to sectoral or experiential differences (like differences in perception between decision-making bureaucrats and technical experts) during the analysis phase. The selected participant profile offers a holistic perspective encompassing not only the managerial but also the technical and sociological dimensions of the process.

3.3. Data Collection Tool and Process:

The key questions, prepared on December 30, 2025, were answered by 11 participants between January 08 and January 19, 2026 from Google Forms

platform. The interview form used in the data collection process was structured around seven main axes, referring to key areas of discussion in the literature:

1. Strategic Differentiation: Questions aimed at understanding the difference between Izmir's existing plans (SECAP and GCAP) and the new Mission process, and the motivation created by the CCC, are based on the inter-plan alignment discussions mentioned in the literature (Cihan, 2024; Sevincli & Turan, 2025).
2. Governance and Cooperation: Questions measuring multi-level governance success and stakeholder alignment examine the effectiveness of Izmir's "Global Climate Community" model (Izmir Metropolitan Municipality, 2024) and the level of stakeholder participation (NetZeroCities, 2022).
3. Smart City Perception and Readiness: The city's smart city status and human resource capacity were examined to verify, from the perspective of on-the-ground actors, the classification of Izmir in the "Leaders" group in the literature (Samasti et al., 2025).
4. Implementation Barriers: Financial and structural barriers to achieving the 2030 target were addressed in the context of the lack of capital investment highlighted in the literature (Ulpiani et al., 2023).
5. Social Impact and Inclusion: The impact of projects on citizens and the environmental justice dimension were included in the questions, based on the principle that smart cities should be inclusive as well as technological (Beretta & Bracchi, 2023).
6. Sustainability and Resilience: Whether the mission has transformed into institutional memory and its independence from political changes were investigated considering urban resilience discussions (Sevincli & Turan, 2025).

4. Findings & Discussions

The 11 individuals interviewed were first asked about their education level, age, gender, years of professional experience in Izmir, the sector and job title, and whether they had been directly involved as stakeholders in the Mission process in the past.

The group interviewed showed a homogeneous distribution, ranging from 25 to 61 years old. All members were university graduates, with 55% (6 participant) having completed their master's and/or doctoral studies after their undergraduate education. In terms of gender, the predominantly female

structure in the sustainability sector is also reflected in the interview group, with 64% (7 participant) being female. Although the group primarily works in the field of sustainability, 27% are university-level academics. 64% (7 participant) of the group have over 20 years of professional experience in Izmir. The remaining 4 individuals have less than five years of experience in Izmir, which easily reveals convergences and divergences in ideas across generations and experiences in the findings. The group's sectoral range is as follows: The scope is quite broad, encompassing various sectors such as automotive, energy, tourism, packaging, architecture, and consulting. While 73% of the group (8 participant) participating in the interview demonstrated partial familiarity with the process due to having been involved in the mission process in the past, the remaining 27% (3 participant) consisted of individuals who, although not directly involved in the "Climate Neutral and Smart Cities Mission," possessed sufficient knowledge.

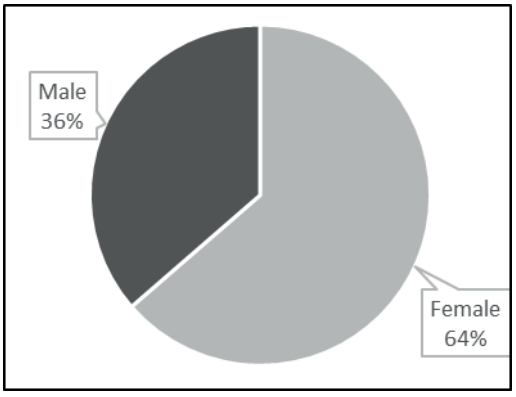

Figure 3: Distribution of interview participants by gender

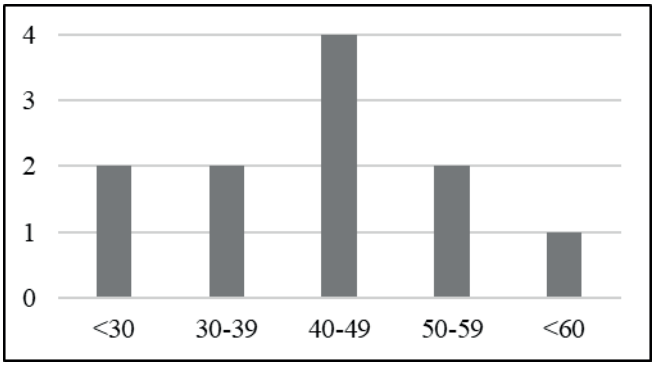

Figure 4: Distribution of interview participants by age

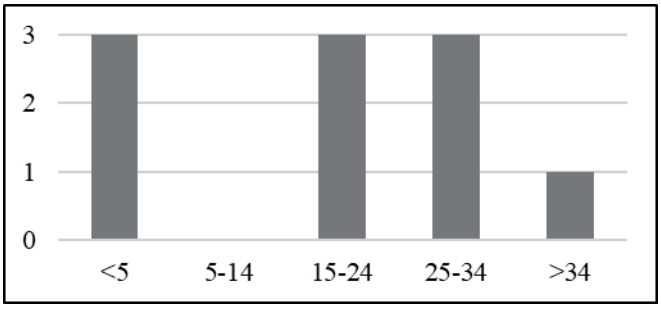

Figure 5: Distribution of interview participants by professional experience in Izmir

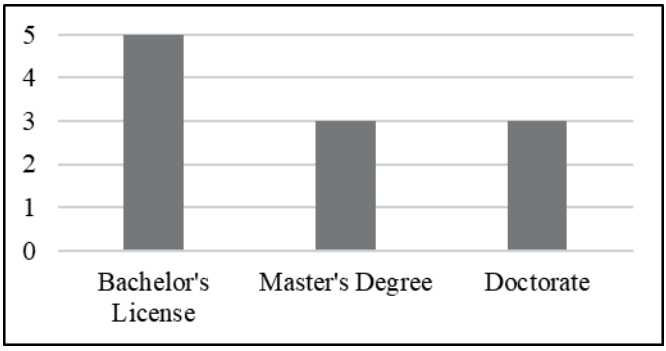

Figure 6: Distribution of interview participants according to their educational level

The seven key questions asked to the participants and their answers can be evaluated under five fundamental points:

1. Strategic Differentiation and Motivation: When participants were asked about the differences between the Climate City Contract (CCC) and Izmir's existing plans (SECAP and GCAP), the main emphasis was on "feasibility" and "monitoring". Participants stated that previous documents were more in the nature of "statements of intent" or "strategic positions," but the Mission process includes sharper commitments and a rigorous monitoring mechanism.

This finding aligns with the necessity of concretizing action plans, as stated by Cihan (2024) in the literature. However, a significant difference of opinion among the participants is noteworthy: It was stated that there were high motivation and enthusiasm at the beginning of the process (2022-2023), but this enthusiasm "faded" over time due to changes in local administration and political uncertainties. One of the participants stated as, "Although the process generated high enthusiasm in Izmir in the past, the sustainability of the project decreased with the change in the municipality," thus confirming the

risk of "urban resilience's dependence on institutional memory" highlighted by Sevincli and Turan (2025).

2. Governance and Multi-Stakeholder Structure: When asked about Izmir's "Global Climate Community" (GCC) model and the alignment of stakeholders (universities, industry, NGOs), the majority of participants painted a positive picture. There is a consensus that the culture of stakeholder collaboration in Izmir is more developed compared to other cities in Turkiye, and that institutions can "gather around the same table".

Participants, particularly referring to the strength of civil society and professional chambers in Izmir, stated that the collaboration is not merely theoretical. This indicates that the "multi-level governance" goal emphasized in the NetZeroCities (2022) guidelines is reflected in Izmir in terms of social capital. However, some participants noted that bureaucratic slowdowns still exist in translating this alignment into implementation projects.

3. Smart City Perception and Readiness: The responses to the question "Is Izmir a Smart City?" reveal a realistic picture that contradicts the optimistic classifications in the literature (Samasti et al., 2025). Nearly all participants stated that Izmir is not yet a fully-fledged "Smart City," and that there are shortcomings, particularly in infrastructure, data collection systems, and transportation integration.

However, participants emphasized that Izmir is much better prepared than other cities in terms of "Human Resources" and "Social Sensitivity." One participant summarized the situation by saying, "The infrastructure is weak, but people are quite sensitive to such issues. We can say that this demographic structure is Izmir's strongest asset." This finding supports the view that human capital, not just technological equipment, is a critical leverage in smart city transformation (Komninos & Panori, 2025). Izmir stands out more for its potential for "social innovation" than its technological infrastructure.

4. Barriers and Challenges: Participants cited economic challenges (Ulpiani et al., 2023), frequently discussed in the literature, as well as administrative instability as the biggest obstacles to achieving the 2030 target. They emphasized that political disagreements between local and central government, and frequent changes in municipal administration, threaten the continuity of projects.

One participant's statement, "The constant change in local administration and the incompetence of the current local administration in managing processes. This process has changed hands four times within the municipality in the last two years," demonstrates that governance discontinuity, rather than a lack

of technical capacity, is the main barrier for Izmir. This situation proves that the success of technical projects within the Pilot Cities Program (e.g., GCC-SYNERGY) is directly related to political commitment.

5. Public Awareness and Future Outlook: One of the most striking findings of the study concerns the awareness of the "average citizen." Participants agree that the awareness of the Mission process and projects among citizens is very low. It is noted that the projects are confined to technical reports, lacking the aspects that directly impact on the public (launch, campaign, tangible benefits). This situation carries the risk of an "elitist smart city" approach, as criticized by Beretta and Bracchi (2023); that is, the danger of the transformation being discussed only among institutions and not disseminated to the grassroots level.

Future expectations are characterized by "cautious optimism." While participants do not expect a 100% climate-neutral Izmir by 2030, they foresee a decrease in emissions and an increase in awareness. However, the common consensus is that "Even if the system is designed based on institutional memory rather than individuals, continuity will remain fragile."

5. Conclusion

This study aimed to evaluate Izmir's strategic positioning, governance capacity, and systemic readiness within the scope of the EU's "Climate-Neutral and Smart Cities Mission". Through a comprehensive analysis of the Climate City Contract (CCC) process and semi-structured interviews with key stakeholders, the research has revealed a complex dichotomy between the city's high adaptive capacity and its implementation challenges.

The findings indicate that Izmir distinguishes itself from other candidate cities through its strong social capital rather than its physical infrastructure. As highlighted in the interviews, the "Global Climate Community" (GCC) model has successfully fostered a collaborative culture among local stakeholders such as universities, NGOs, and industrial organizations. This multi-level governance structure validates the leaders classification found in recent literature (Samasti et al., 2025), proving that Izmir possesses the necessary intellectual and social resilience to drive the transition. However, the study also uncovers a critical implementation gap. While the CCC provides a more concrete financial roadmap compared to previous documents like SECAP and GCAP, the transition from planning to execution is hindered by systemic barriers.

Two major challenges emerge from the field data. First, the lack of integrated smart city infrastructure, specifically the disconnection between data collection systems and decision-making mechanisms, prevents Izmir from being a truly "Smart City." The city currently operates as a "digital

adopter" rather than a system optimizer. Second, and perhaps more critically, governance discontinuity poses a significant threat to long-term targets. The frequent changes in local administration and the lack of alignment between national and local policies create a volatile environment that dampens the initial motivation of stakeholders and delays large-scale capital investments. In addition, constantly changing municipal administration and the current administration's weakness in crisis management prevent the current poor financial situation from being neglected.

To sum up, achieving the 2030 Climate Neutrality target for Izmir is not merely a technological challenge but a governance one. The city's readiness level is half-way through and separately; it is socially and strategically ready but technically, financially and politically lagging. Izmir must transition from a project-based approach to a systemic transformation model for succeeding in the Mission. This requires institutionalizing the climate governance structure to withstand political cycles and prioritizing "smart" investments that solve chronic infrastructure problems rather than serving as digital showcases. Municipal administrations should focus not on actions to be taken during their term, but on investments and opportunities that will yield marginal benefits in the long term. Future research should focus on long-term and sustainable studies to monitor whether the financial obligations outlined in the Climate City Contract are being met and how the "Climate Neutral and Smart City" label affects direct investment inflows in Europe and even globally in the coming years.

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