NET ZERO CITIES SGA-NZC

Governance Innovation and Implementation in the Cities Mission

Theme 4: Multi-Level Integration

Authors: Duncan Edmondson (VC / KTH), Francesco Palmia (ICLEI), Claudia Fernández Cuñado (EuC), Joanna Komperda (ERRIN).

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Table of contents

List of figures

List of tables

Abbreviations and acronyms

Acronym	Description
CAP	Climate Action Plan
CCC	Climate City Contract
CIP	Climate Investment Plan
EIB	European Investment Bank
WP	Work Package
AFOLU	Agriculture, forestry, and land use
CA	City Advisor
CSG	City Support Group
EC	European Commission
ECF	European Climate Foundation
NZC	NetZeroCities
JTF	Just Transition Fund
GHG	Greenhouse Gases
TM	Transition Management
SECAP	Sustainable Energy and Climate Action Plan
IPPU	Industrial processes and products use

Summary

This report explores multi-level governance integration within the EU Cities Mission, focusing on how cities effectively leverage collaborative frameworks across governance levels to support their climate neutrality targets. The report focuses critical aspects of governance innovation, highlighting the alignment of municipal actions with national and EU funding sources.

The research employs a comparative case study methodology, featuring three cities to illustrate varying approaches to multi-level governance: Aachen (Germany), Kozani (Greece), and Turku (Finland). The analysis considers vertical coordination (interactions between different governance levels), horizontal city-to-city coordination, integrated governance approaches, and the financing strategies cities employ.

Key findings reveal diverse approaches shaped by unique national governance contexts. Aachen navigates Germany's federal structure by leveraging regional frameworks and robust municipal collaboration networks to advocate for greater local-level support. Kozani operates within Greece's centralized governance, and is more dependent on European funding sources, while striving to enhance municipal autonomy through networks like ClimaNet. Turku benefits from Finland's decentralized system, employing substantial fiscal autonomy and structured national agreements, while actively engaging in international city networks.

Despite contextual differences, common challenges identified include funding fragmentation, administrative and technical capacity constraints, regulatory barriers, stakeholder engagement complexities, and experiences in accessing competitive financing mechanisms like EIB loans. Cities have responded by pursuing hybrid financing solutions, enhancing cross-sectoral collaboration, and utilizing both vertical and horizontal integration platforms to bridge funding and capacity gaps.

The report suggests that enhanced multi-level governance alignment is essential for cities to achieve climate neutrality effectively. It emphasizes the importance of sustained funding mechanisms, robust technical and administrative support, clear regulatory frameworks, and dynamic stakeholder engagement strategies. Potential next steps include strengthening structured dialogues between governmental levels, capacity building within municipal administrations, and expanding integrated financial instruments to support long-term urban climate initiatives.

Keywords

Mission Governance, Multi-level Integration, Multi-level Governance.

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1 Introduction

Integration across multiple levels of governance, overcoming institutional barriers and unlocking greater access to finance are among the most significant challenges cities face towards achieving climate neutrality. These challenges primarily arise from regulatory constraints at national and EU levels, fragmentation of responsibilities across different government tiers and administrations, and the need for cities to access multiple funding sources and mechanisms to implement their climate neutrality strategies **(**Palmia & Meskovic, 2024).

Consequently, **cities acting alone will not be sufficient to mobilize the accelerated rate of changes required to meet climate neutrality objectives**, which requires collaborative approaches, sharing of good practices, collective actions and scaling of and solutions. To accelerate such practices requires coordination and collaboration across and within scales of governance.

Increasing political support and coherence across levels of government (EU, national, regional, local) is key to overcoming regulatory and funding challenges in cities' pathways to climate neutrality. Funding and financing of the effort towards climate neutrality in greatly strengthened by enhanced alignment between governance levels. Close collaboration between cities and other levels of governance can therefore maximize the possibilities of securing the resources for the transition to a climate-neutrality. Moreover, national and regional authorities can play a pivotal role in knowledge transfer and replication efforts as they share, understand, and largely define the common conditions in all cities of a country or region.

The EU Mission "100 Climate Neutral and Smart Cities by 2030" emphasizes the need to experiment with innovative governance approaches to ensure buy-in and commitment from regional and national authorities. Among its building blocks, good governance arrangements are highlighted by contributing to more transparent, inclusive, responsive, and effective decision-making. Multi-level governance defined as the coordination and alignment of actions between different levels of government, is emphasized as a key element to be championed by cities in the implementation of the EU Cities Mission (European Comission, 2021a).

The Climate City Contract (CCCs), as a governance tool, has helped establish a common framework for multi-level governance integration to support city's climate neutrality work(European Comission, 2021b). As defined in the EU Cities Mission Implementation Plan, CCCs provide political commitment on the part of the city to its citizens, but also in the broader institutional context—the support for the development of the contract by the European, national, and regional authorities would also need to be visibly communicated. Cities are encouraged to integrate national, regional, and local authorities' involvement in the co-creation and implementation of the Climate City Contracts.

In this report we focus on examples of how multi-level integration has been advanced in practice. Building on the commitments outlined in the CCCs, we focussing on three cities which have made notable steps in this area. The following three case studies explore how three Mission Cities - Aachen (Germany), Kozani (Greece) and Turku (Finland) - have addressed MLG integration, overcoming challenges such as policy misalignment and fragmentation of responsibilities. The case studies look at how cities' efforts to improve MLG alignment and integration have led to easier access to finance for the implementation of climate neutral measures. In doing so, this work answers the following research question:

> *How are EU Mission cities leveraging multi-level integration to mobilise collective actions and unlock financing opportunities to support their transition towards climate neutrality?*

This report details each city's approach through a dedicated case study while also providing comparative synthesis, common challenges and opportunities that emerged through the

detailed work on each city. In the next section we introduce the core concepts of reflexive MEL, which is then used to analyse the city cases individually (See Sections "Individual city cases: Part 4": Aachen, Kozani and Turku) and comparatively in the cross-city synthesis section.

2 Key dimensions of multi-level integration

Multi-Level Governance represents a form of networked governance consisting of two related processes: the negotiation of authority between different government levels and the interconnection of authority spheres across multiple scales involving various state and non-state actors (Hooghe and Marks, 2001), and has become increasingly central to understanding climate governance across global, national, and urban contexts.

Within international and national contexts, effective climate governance increasingly requires shared responsibility between governance levels and sectors, transcending traditional public-private divides. While environmental departments typically oversee climate change issues, authorities responsible for economic, industrial, transport, construction, and food sectors exert major influence over emission activities (Bai et al., 2009; Leck and Simon, 2013).

Network connections across sectors and levels can help facilitate intra-governmental collaboration, coordination, and resource mobilization essential for comprehensive climate action. Cities and local authorities demonstrated strong sustainability leadership even before climate debates gained prominence (Bulkeley and Betsill, 2003; Bulkeley et al., 2011). Successful urban climate governance depends on mobilizing networks alongside individual leadership moments (Kern and Bulkeley, 2009).

Coordination Mechanisms in Multi-Level Climate Governance

The multifaceted nature of climate change governance requires attention to various actor interactions (Betsill and Bulkeley, 2004; Bulkeley and Betsill, 2005, 2013). Local authorities can strategically access information and resources through international policy processes, engaging in vertical intra-governmental interactions and cross-scale coalitions while negotiating discursive framings of urban challenges (Betsill and Bulkeley, 2004; Bulkeley and Betsill, 2005). Several coordination mechanisms have proven effective in overcoming institutional barriers:

- **Vertical coordination** involves partnerships and relation-building between government levels (Holgate, 2007), enabling policy alignment between municipal actions and higher-level climate commitments.
- **Horizontal coordination** (city-to-city) encompasses collaboration between governance levels (Collier and Lofstedt, 1997), facilitating cross-sectoral approaches to climate challenges that transcend traditional organisational or departmental boundaries. This can include city-to-city collaboration, or on an international or European scale can be considered coordination between national platforms through networks (e.g. CapaCITIES project).
- **Integrated coordination** approaches combine elements of both approaches (sometimes called diagonal coordination).
- **Financing Strategies and Mechanisms** can be mobilised through forms of vertical, horizontal and involves alignment with international or supranational institutions (Monni and Raes, 2008), helping cities access global resources and knowledge networks.

These coordination mechanisms help enable climate initiatives realized through hybrid actor constellations to experiment with new ideas, resulting in social and technical innovation (Bulkeley and Castán Broto, 2012). The consolidation of diverse interests and innovative forms of engagement helps create legitimate policy objectives (Cashmore and Wejs, 2014).

3 Research Design

3.1 Methodology

The research follows a comparative qualitative case study design which draws on multiple sources of primary data. Based on a scoping of the literature, a codebook was designed based on core concepts in multi-level governance, which was constructed in MAXQDA and applied to code several data points.

- Document analysis of Climate City Contracts and supporting documents from the three cities published on the knowledge repository of the Cities Mission Portal.
- Recordings and transcriptions from panel discussions at several conferences including contributions by city officials:
    - 2nd Cities Mission Conference in Valencia, Spain (June 2024): **Aachen, Kozani**
    - 10th European Conference on Sustainable Cities & Towns, in Aalborg, Denmark (October 2024): **Turku**
    - Civitas Forum in Parma, Italy (October 2024): **Aachen**
- Follow-up interviews with city representatives from the three cities were conducted in December-February 2025. These interviews followed a semi-structured format for one hour, and focused on multi-level governance alignment and its potential to facilitate access to finance.
- A city peer-to-peer workshop was conducted on the 2nd April, which covered open discussion points about key insights, challenges and opportunities for advancing this work.

This collaborative research design invited city officials to be part of the sensemaking process through a peer-to peer workshop, with a facilitated discussion moderated by the project team. The individual case studies were also shared with participating cities for their review and validation of the case contents, which helped ensure the reliability of the work.

Full individual city cases were prepared and sent to respective participating cities for review and validation. For each participating city we prepared full individual city cases. The four city cases for this topic are located at "Individual city cases: Part 4". Please refer to these extended cases for more information on any of the points included in the following synthesis sections.

The final synthesis of shared insights, challenges and opportunities across the city cases built upon these interactions but was conducted by the project team. Therefore, such opinions or insights reflect those of the project team and do not necessarily represent the views of the participating city officials.

3.2 Research Cases

The three cases examine how the studied cities aligned their climate strategies and policies with targets set at regional, national, and European levels. They explore how these cities integrated frameworks and initiatives promoted by different levels of government, adapting them to the local context and building a coherent narrative. MLG alignment has been analysed not only in terms of vertical integration between institutional and governmental actors but also in terms of engagement with non-governmental stakeholders, e.g. international or non-governmental organizations, businesses or universities. Additionally, horizontal city-to-city networking across different governance levels has been analysed considering its instrumental opportunity for cities to scale up innovative solutions through knowledge transfer and the identification of funding opportunities.

Table 1 - Comparative table of cities across selected metrics.

	Aachen	Kozani	Turku
Country	Germany	Greece	Finland
European Region	Western Europe	Southern Europe	Northern Europe
Population	262,040 (2022)	67,000 (?)	201,863 (2023)
City's per capita emissions	6,04 tCO2e/pc (2021)	3.68 tCO2e/pc (2020)	2.53 tCO2e/pc (2020)
National per capita emissions	8 tCO2e/pc (2022)	7 tCO2e/pc (2022)	8 tCO2e/pc (2022)
CCC Climate target	–80% compared to 2021 GHG levels	-80% CO2 emissions as compared to 2020 levels	-86% GHG emissions by 2029 as compared to 1990 levels
N° of CCC signatures	156	43	24
National/regional commitments to the CCC	None	**National:** Ministry of Environment and Energy **Regional**: Governor of region of Western Macedonia	**National**: joint commitment from Ministry of Economic Affairs and Employment and the Ministry of Environment

The three selected cities are distributed across diverse geographical regions; Aachen in Western Europe, Kozani in Southern Europe, and Turku in Northern Europe. While Aachen and Turku are medium-sized urban centres, Kozani is a smaller city (**Table 13**). In addition, the three cities are at different stages in their industrial transitions. In addition, from an economic perspective, Aachen and Kozani are currently phasing out their heavy reliance on lignite mining and lignite-based energy production. Whereas, Turku's economy (though historically tied to maritime industries) has shifted towards a service-oriented and knowledge-based economy. Despite their differences in size and context, all three have committed to achieving climate neutrality by 2030. Even though their starting points also vary in terms of GHG emissions baseline, each studied city has significantly lower per capita emissions than the national average in their respective countries. This wide gap underscores the ambitious commitment of these cities compared to their national counterparts, reflecting their proactive approach to climate action and their leadership in driving emissions reductions beyond national targets.

All three cities approached the EU Cities Mission as an opportunity to strengthen collaboration within their local ecosystems. Aachen secured 134 signatures backing its climate neutrality commitment, while Turku and Kozani gathered 24 and 14 signatures, respectively. Additionally, all three cities ensured national government support for their CCCs, demonstrating the importance of multi-level governance in advancing their climate ambitions.

4 Glossary

This section provides definitions of key climate-related terms used in this document to enhance clarity and understanding.

Term	Definition
Multi-Level Governance	Defined as the coordination and alignment of actions between different levels of government, is emphasized as a key element to be championed by cities in the implementation of the EU Cities Mission.
Vertical Integration	Vertical integration involves collaboration process and aligning policies, funding, and strategies across different levels of government—global, European, national, regional, and local—to ensure a coherent approach to climate action and sustainability.
Horizontal Integration	Horizontal integration refers to collaboration across the same level of governance (e.g. between cities or between national platforms) to address shared challenges, such as climate change and sustainability. This could take place in global, national, and regional level.
Blended Finance	Blended finance refers to the strategic use of capital to mobilize private sector investment for projects that deliver social or environmental benefits, such as climate action. It reduces investment risks for private investors, making funding more accessible for municipalities and enabling the implementation of large-scale sustainability initiatives.
Green Public Procurement	Green Public Procurement is a process whereby public authorities seek to procure goods, services, and works with a reduced environmental impact throughout their life cycle. It is a strategic tool used to promote sustainable consumption and production, and support climate and environmental objectives through public sector purchasing power.
Green Bonds	Green bonds are fixed-income financial instruments specifically designed to raise funds for projects with environmental benefits, such as renewable energy, energy efficiency, clean transportation, and climate adaptation. Issued by governments, municipalities, or private entities, green bonds help attract investment towards sustainable development goals while providing transparency through reporting on the environmental impact of funded projects.
Just Transition Fund	The Just Transition Fund is a financial instrument of the European Union aimed at supporting regions and communities most affected by the transition towards a climate-neutral economy. It provides funding to address the social, economic, and environmental impacts of the transition, helping to diversify local economies, create new jobs, and support reskilling and upskilling of workers.

5 Synthesis across cases and common challenges

5.1 Synthesis across cases

We now compare across the three Mission cities focussing on the key concepts previously introduced: *Vertical collaboration*, *Horizontal collaboration*, *Integrated collaboration*, *Financing Mechanisms.* An overview of the synthesis is included in **Table 14**.

Table 2 - Synthesis of cities.

Topic	Aachen	Kozani	Turku
Vertical Coordination	Federal structure provides broad frameworks but limited direct support. Strong regional role (NRW Climate Act, Impulse Funding Programme); struggles with formal regional relationships and funding.	Centralized governance; relies on European funds; limited municipal autonomy. Regional collaboration through Western Macedonia programs.	Decentralized governance with strong municipal fiscal autonomy. Direct alignment with national ministries via Climate City Contract. Regional collaboration through Southwest Finland Climate Roadmap.
City-to-city	Active in German city networks (German Association of Cities, NRW Association of Cities, stronGER Cities Network). Alliances with Münster and Dortmund.	Member of ClimaNet (Greek Mission Cities + Ministry); ClimaNet channels funds directly to cities. Collaborates with Covenant of Mayors and bilaterally with other post-lignite cities; working groups on energy, mobility, infrastructure.	Participates in ICLEI, OPEN Transitions, IURC, IUC; national Carbon Neutral Municipalities Network. Regional cooperation through Baltic Sea organizations (Interreg funding); collaboration for peer learning and access to European project funding.
Integrated Collaboration	CoLAB project combining city-to-city collaboration with citizen engagement; creating climate and energy agencies. EU-funded (€1.5M); promoting local networking and services for climate action.	Limited formal integrated platforms. Emerging bilateral cooperation with other municipalities and regions.	Combines vertical and horizontal collaboration through CDP-ICLEI reporting system. EIB loans (Urban Infrastructure Loan); national collaboration with universities; regional funding opportunities in Southwest Finland.
Financing Mechanisms	Developed Integrated Climate Protection Concept (IKSK) mobilizing €181M; €19.1M in 2023 city budget. €40M secured from regional fund. Working with Climate City Capital Hub for EIB loans; challenges due to interest rates on EIB loans vs. low rates from German bank.	43% of investment needs (€373M) from public sources; key funds: Just Transition Fund, Regional Operational Programme, Green Fund; 54% needs private Exploring PPPs, ESCOs, green bonds, venture capital, SPVs, crowdfunding, blended financing.	Guided by EU Taxonomy for €1M+ projects. Leverages national climate programs (e.g., Municipalities Climate Solutions, Energy Aid). Secured major EIB loans (Urban and Education Infrastructure Loans); networks facilitate project funding access indirectly.

5.1.1 Vertical Coordination

The three cities operate within distinctly different national governance frameworks that significantly influence their approach to vertical integration.

Aachen's vertical coordination is shaped by Germany's federal structure, where national policies provide a broad framework but limited direct urban support. While national initiatives like the Climate Protection Act (2021) and the Climate Protection Fund (€49 billion in 2024) create an enabling environment, the federal support structure lacks focus on direct city-level assistance. Regionally, North Rhine-Westphalia (NRW) plays a more direct supporting role, with its Climate Protection Act accelerating lignite phase-out to 2030 and the NRW Impulse Funding Programme supporting municipal heat planning. Despite these provisions, Aachen faces challenges establishing consistent formal support relationships with the regional government and securing concrete financial backing due to budget constraints at higher levels.

Kozani operates within Greece's centralized governance system, where municipalities have limited financial autonomy. The city's climate transition relies heavily on European funding, as direct financial support from the Greek central government remains limited. While communication with the national government has improved, funding mechanisms remain largely unchanged, restricting municipal financial independence. Kozani works with Western Macedonia regional authorities through the Regional Operational Program and Smart Specialization Strategy, but access to regional funds remains challenging as the Just Transition Fund is largely controlled by the central government. This top-down allocation limits municipal involvement in decision-making and resource distribution.

Turku benefits from Finland's highly decentralized governance framework, which grants municipalities significant fiscal autonomy. Finnish municipalities can set their own tax rates, with local revenues accounting for 28% of total government revenues in 2018 (compared to the EU average of 13%). This financial independence enables Turku to implement ambitious climate policies exceeding national targets. Despite this autonomy, Turku must align with regional authorities' policies, facilitated by collaborative development of the regional-level climate roadmap for Southwest Finland. The city has secured national backing through its Climate City Contract, jointly signed by two national ministries offering policy support, direct funding, and network support mechanisms.

5.1.2 City-to-City

All three cities have established and leveraged city networks to overcome barriers, share knowledge, and increase their collective influence.

Aachen participates in three key city networks to strengthen inter-municipal cooperation: the German Association of Cities, the NRW Association of Cities, and the stronGER Cities Network. The stronGER Cities Network, comprising nine German cities in the EU Cities Mission, aims to create favorable framework conditions for climate neutrality. Network members hold bi-weekly meetings to coordinate federal-level advocacy and develop joint policy briefs. Representatives from this network participate in a federal steering forum to ensure Mission Cities' needs are addressed at higher governance levels. Aachen has also formed a specific alliance with Münster and Dortmund to address state government concerns.

Kozani actively participates in the Network of Municipalities for Climate Neutrality (ClimaNet), which connects six Greek Mission Cities with the Greek Ministry of Environment, the Association of Mayors of Greece, and Mission Board members. ClimaNet functions as a non-profit entity that can receive and distribute funds directly to Mission Cities, facilitating financial support and project implementation. Kozani also engages with the global Covenant of Mayors initiative and participates in joint working groups with other municipalities on energy efficiency, sustainable mobility, and green infrastructure. The city holds bilateral meetings with municipalities undergoing similar post-lignite transitions to compare policy approaches and coordinate EU funding applications.

Turku views city-to-city collaboration as vital for addressing complex climate challenges, allowing the mid-sized city to leverage collective expertise and shared solutions. Globally, Turku participates in networks including ICLEI, OPEN Transitions, IURC, and IUC, which have indirectly facilitated access to funding by connecting the city with consortia securing European project funding. Nationally, Turku engages with the Carbon Neutral Municipalities Network for peer learning and technical support on GHG inventories. Regionally, the city collaborates through Baltic Sea Regional Cooperation and the Union of Baltic Cities, which serve as intermediaries for securing project funding through programs like Interreg Baltic Sea Region.

5.1.3 Combined or Integrated Approaches

The cases highlight examples of integrated approaches that combine both vertical and horizontal elements.

Aachen's CoLAB (Committed to Local Climate Action Building) project exemplifies an integrated approach combining city-to-city collaboration with citizen engagement. Through this EU-funded initiative (€1.5 million), three German EU Mission cities test innovative methods to reduce behavior-related GHG emissions. The municipalities are establishing climate, energy, and sustainability agencies to facilitate service access, enable networking, and generate direct local impact, contributing to society-based urban redevelopment.

Turku has strengthened vertical alignment through collaborations with diverse external stakeholders across governance levels. The city pioneered the use of the CDP-ICLEI reporting system at the EU level, while the European Investment Bank provides crucial financing through loans such as the 2019 Turku Urban Infrastructure Loan. The adaptability of these platforms to accommodate various framework requirements has been key to Turku's success. Nationally, the city collaborates with universities and participates in research bodies to align nationally-funded research with local climate needs. At the regional level, Wallonia provides funding opportunities for municipalities across Southwest Finland.

5.1.4 Financing Strategies and Mechanisms

Each city has developed distinctive financing approaches reflecting their governance contexts and available resources.

Aachen developed the Integrated Climate Protection Concept (IKSK) in 2020 as a key funding strategy, creating a comprehensive set of measures with input from all city departments. This collaborative approach secured substantial municipal backing, mobilizing €181 million total with €19.1 million allocated in the 2023 budget specifically for climate action. The IKSK also helped Aachen access regional funding, securing €40 million from the Climate Protection for Northern Westphalia fund. Currently, the city works with the Climate City Capital Hub on two workstreams: establishing a climate fund for CCC partners with affordable EIB-backed loans, and securing at least €50 million from the EIB for infrastructure projects. A challenge is that German bank loan interest rates are lower than those offered by international institutions, complicating external financing.

Kozani relies on a diverse mix of funding sources, with public funding providing 43% (€373 million) of investment requirements. Key sources include the Just Transition Development Plan (€175 million for 2023-2029), Regional Operational Programme, National Strategic Reference Framework, and instruments like the Green Fund and EIB loans. The city uses €25 million in regional fees for operational costs but requires external financing for larger investments. The remaining 54% (€460 million) must come from private capital or loans, which remains challenging due to limited banking interest and high rates. Kozani is exploring hybrid mechanisms including Public-Private Partnerships (with 19 projects approved between 2009-2023), Energy Service Company models for building

retrofits, green bonds, venture capital, and Special Purpose Vehicles. There is growing interest in crowdfunding and blended financing to diversify funding streams.

Turku benefits from Finland's decentralized governance, with significant fiscal autonomy allowing for more independent climate investment decisions. While not providing direct funding, the EU Taxonomy guides Turku's investments exceeding €1 million, ensuring alignment with environmental priorities and enhancing market integration by harmonizing the city's investment framework with business compliance rules. The city leverages national programs including the Municipalities Climate Solutions Program and the Energy Aid Program, which support renewable energy and efficiency projects. The "Agreement on Land-Use, Housing, and Transport" provides up to 30% of required investment from the central government. The European Investment Bank provides significant loans, such as the 2019 Urban Infrastructure Loan and 2023 Education Infrastructure Loan, along with advisory support. City networks have indirectly facilitated funding access by connecting Turku with consortia securing European project funding.

5.2 Challenges in Multi-Level Integration

Common challenges were identified across the three cities. Despite their diverse governance contexts and varying levels of autonomy, these municipalities face a common set of challenges as they navigate the complex landscape of multi-level governance to support their urban climate transitions.

Funding Fragmentation and Financial Sustainability: A primary challenge faced by all three cities is the struggle to secure consistent, long-term funding for their climate initiatives. The fragmented nature of available funding sources, coupled with the mismatch between short-term grant cycles and the long-term nature of climate projects, creates significant hurdles for sustainable financial planning. Aachen relies on programs such as the Climate Protection Fund (€49 billion) and the NRW Impulse Funding, operating mainly within Germany's federal system. The city faces issues when seeking international financing since high interest rates offered by institutions like the European Investment Bank (EIB) are often less competitive than those available from local German banks. This disparity makes it challenging for Aachen to justify EIB financing for its projects, despite the potential benefits of working with Europe's climate bank. Furthermore, many municipal projects require co-financing, which creates bottlenecks for large-scale infrastructure upgrades that are crucial for the city's climate transition. Kozani depends heavily on the EU Just Transition Fund, with €175 million allocated for the period 2023-2029. However, the centralized control of these funds by the Greek government often leads to disbursement delays, hindering project implementation. More concerning is the fact that over 54% of Kozani's required investments, amounting to €460 million, must come from private capital. This presents a significant challenge as domestic banks remain risk-averse to municipal projects, especially in economically challenged regions. Turku, despite benefiting from Finland's decentralized fiscal system, also faces funding challenges. The city had to contend with the discontinuation of national programs such as the Climate Solutions Program, which had previously funded over 200 climate projects. This loss of a reliable funding stream has forced Turku to rely more heavily on EU grants through programs like Horizon Europe and Interreg. While these grants provide valuable resources, they often prioritize pilot projects and innovations over the systemic transformations needed for long-term climate neutrality.

Technical and Administrative Capacity Gaps: Limited specialized expertise required to design, manage, and scale complex climate projects, which can delay project implementation and reduces the cities' competitiveness for funding opportunities. Aachen does not have a dedicated municipal financial advisor, forcing reliance on external consultants funded through temporary EU grants, creating a cycle of discontinuity in financial planning and expertise. This can mean that promising initiatives struggle to gain traction due to staffing and expertise limitations. Kozani faces similar challenges, particularly in areas requiring specialized knowledge such as circular economy metrics and green procurement. The city's limited staff in these areas necessitates partnerships with universities and NGOs for technical

support. Kozani emphasized resource constraints and how financial limitations directly impact human resource capacity, that hinders progress on climate initiatives. Turku, while perhaps better positioned in terms of overall capacity, still encounters difficulties in specific areas. The city faces challenges in training staff to apply the EU Taxonomy to investments exceeding €1 million, necessitating internal workshops and external collaborations. This example illustrates how even well-resourced cities struggle to keep pace with the evolving technical requirements of climate finance and reporting.

Alignment Across Governance Levels: Coordination challenges can arise from divergent priorities and frameworks between local, regional, and national governments, creating significant barriers to effective climate action. Aachen must navigate Germany's federal system, where national climate policies often lack urban-specific support mechanisms. While national frameworks like the Climate Protection Act establish broad targets, they frequently fail to provide tailored assistance for cities implementing concrete measures. This disconnect between federal policy and municipal needs creates implementation gaps that cities must bridge with limited resources. Kozani operates within Greece's highly centralized governance structure, where municipalities have minimal input on fund allocation decisions. This centralized control limits Kozani's autonomy in directing resources toward locally-determined climate priorities. Turku, despite Finland's tradition of municipal autonomy, must still align its climate initiatives with regional policies in Southwest Finland. This coordination requirement can sometimes slow implementation or require compromise on city-specific priorities to maintain regional coherence. All three cities note the absence of dedicated platforms for effective city-federal dialogue on climate action. Kozani have noted progress towards establishing this through Greece's ClimaNet, while a national platform is being established in Germany which could help support this function going forward for Aachen.

Stakeholder Engagement Challenges: Cities observed difficulties in tailoring climate narratives and engagement strategies for diverse audiences, from citizens and businesses to policymakers and financial institutions. Aachen faces the complex task of balancing citizen-led initiatives with corporate partnerships while addressing resistance to rapid decarbonization from some economic sectors. The city must develop differentiated communication strategies that resonate with various stakeholder groups while maintaining a coherent overall vision for climate neutrality. Kozani confronts particularly acute public scepticism due to the region's economic dependence on lignite mining and power generation. This challenge is magnified by the just transition context, where climate action must be framed not only in environmental terms but also as an economic opportunity. Turku must balance technical communication with financial managers regarding investment criteria and reporting requirements while simultaneously emphasizing community benefits and quality-of-life improvements for citizens. This dual communication challenge requires specialized skills that are often in short supply within municipal administrations.

Institutional and Regulatory Alignment: Bureaucratic processes and rigid regulatory frameworks were noted to prevent more innovative approaches required for municipal climate action. Aachen's CoLAB project, which focuses on reducing behaviour-related greenhouse gas emissions, initially faced delays due to complex EU grant reporting requirements. These administrative burdens diverted resources from actual implementation and slowed the project's momentum. Kozani's efforts to leverage public-private partnerships (with 19 contracts established since 2009) were hindered by national procurement laws that favour large firms over local SMEs. This regulatory bias limits the city's ability to build local capacity and ensure that climate investments generate economic benefits within the community. Turku encountered regulatory barriers with its biodiversity park initiative, which is critical for carbon sequestration but does not comply with EU Taxonomy criteria. This misalignment limits the city's access to green financing for nature-based solutions, despite their recognized climate benefits. The example highlights how standardized frameworks may fail to capture the full range of valuable climate actions.

Challenges accessing EIB Financing: The European Investment Bank, while positioned as Europe's climate bank, presents specific challenges for cities seeking to leverage its financial resources. Aachen's experiences highlight that EIB interest rates are not competitive with the interest rates

offered by German banks. This interest rate differential makes it difficult for the city to justify EIB loans to local decision-makers focused on fiscal prudence. Turku acknowledges similar concerns, but the city still sees value in working with the EIB for reputational benefits and alignment with European climate objectives. All three cities mention the complexity and administrative burden of preparing loan applications with the EIB. Turku described receiving 127 questions, with almost 30 of these questions addressed the environmental and climate and sustainability impact of the investments. While such due diligence ensures alignment with climate objectives, it also creates significant administrative demands that resource-constrained municipalities struggle to meet.

Challenges in Establishing Blended Financing Mechanisms: A shared challenge is the lack of established blended financing mechanisms that could combine public grants, private investment, and municipal resources to maximize impact and sustainability. Aachen remains "in the concept and theory phase" regarding blended finance, acknowledging the need for a specialized "financial architect" to help "activate private funding and also blended funding." This admission highlights the technical complexity of designing effective blended finance instruments and the specialized expertise required. Kozani is similarly in the early stages, "trying to find a blended one" while acknowledging they are taking "baby steps" and "just trying to find our way." This tentative approach reflects both the potential of blended finance and the significant challenges in implementing it, particularly in economically challenged regions. Turku has explored impact funds as a potential avenue but notes "we didn't find a real way forward yet for climate investments there." This experience suggests that even cities with relatively strong financial positions and technical capacity face barriers in establishing innovative financing mechanisms.

6 Outlook

All three cities view enhanced multi-level governance (MLG) alignment and integration as a core strategy to accelerate progress toward climate neutrality, despite their differing governance contexts and local conditions (e.g. in terms of local financial autonomy). Their efforts are also increasingly tied to accessing targeted funding mechanisms at EU, national, and regional levels.

The cities demonstrate diverse approaches to MLG. Aachen has focused on aligning local priorities with national and regional policy frameworks, particularly emphasizing integration into national funding programs and the need for local involvement in decision-making processes. Turku and Kozani, while maintaining this upward alignment, have actively pursued international engagement. They leverage EU-level instruments such as Horizon projects, the Just Transition Fund, the EU Taxonomy, and financial institutions like the European Investment Bank and CDP-ICLEI to bridge resource and capacity gaps.

Common challenges emerged across all three cities:

1. **Funding structure and financial sustainability:** All cities highlighted the difficulty of relying on short-term, project-based funding streams. Although various opportunities exist at various levels, they often lack the continuity and flexibility needed to implement long-term climate action plans. In Aachen and Kozani, national or EU funding for lignite phase-out lacks alignment with municipal priorities and typically excludes direct municipal involvement in decision-making. Similarly, in Turku, reliance on fragmented R&I funding hinders the ability to fund systemic, long-range transformations.
2. **Technical capacity and financial expertise:** The lack of technical skills, especially in financial planning and management, was identified as a key barrier by the three cities. Aachen emphasized the absence of a financial advisor within the municipality, while Kozani noted its limited internal expertise, prompting it to turn to EU-funded capacity-building projects. These

helped Kozani develop knowledge on tools such as green public procurement and implement more effective climate actions.

3. **Communication and stakeholder engagement:** Engaging stakeholders at different governance levels is a persistent challenge. Kozani emphasized the importance of managing local resistance to change, while Turku underlined the difficulty of maintaining a coherent yet adaptable narrative that resonates with a diverse ecosystem—ranging from citizens to financial actors and policy-makers—each with different priorities and expectations.

International and National intermediary networks have emerged as a powerful tool across all cases. Whether national platforms or international alliances like ICLEI, these networks can play a key intermediary role by facilitating policy alignment, enabling peer-learning, and opening new avenues for funding. Notably, both Aachen and Turku viewed the EU Cities Mission as a catalyst for national collaboration structures focused on urban climate neutrality. All cities noted that direct engagement with national level decision makers was crucial to unlocking greater momentum. Intermediary could seek to further leverage its influence by enabling these exchanges through structured or formal dialogues or through convening policy labs and either seeking participation from national officials and/or providing a channel for communicating outcomes.

The experiences of Aachen, Turku, and Kozani underscore the centrality of multi-level governance for the success of local climate transitions especially to access funding. Ambitious local action must be complemented by systemic coordination across governance levels, sustained financial and technical support, and dynamic cross-sector partnerships. These cases offer valuable insights into how cities, each navigating distinct national and regional networks and systems, can increase alignment of governance structures to meet the urgency of the climate crisis while building resilient and innovative pathways toward carbon neutrality.

Bibliography

Bai, X., Roberts, B. and Chen, J. (2009) 'Urban sustainability experiments in Asia: patterns and pathways', Environmental Science & Policy, 13(4), pp. 312–325.

Betsill, M. and Bulkeley, H. (2004) 'Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program', International Studies Quarterly, 48(2), pp. 471–493.

Bulkeley, H. and Betsill, M. (2003) Cities and Climate Change: Urban Sustainability and Global Environmental Governance. London: Routledge.

Bulkeley, H. and Betsill, M. (2005) 'Rethinking Sustainable Cities: Multilevel Governance and the "Urban" Politics of Climate Change', Environmental Politics, 14(1), pp. 42–63.

Bulkeley, H. and Betsill, M. (2013) 'Revisiting the urban politics of climate change', Environmental Politics, 22(1), pp. 136–154.

Bulkeley, H. and Castán Broto, V. (2012) 'Government by experiment? Global cities and the governing of climate change', Transactions of the Institute of British Geographers, 38(3), pp. 361–375.

Bulkeley, H., Castán Broto, V., Hodson, M. and Marvin, S. (eds) (2011) Cities and Low Carbon Transitions. London: Routledge.

Cashmore, M. and Wejs, A. (2014) 'Constructing legitimacy for climate change planning: A study of local government in Denmark', Global Environmental Change, 24, pp. 203–212.

Collier, U. and Lofstedt, R. E. (1997) 'Think globally, act locally? Local climate change and energy policies in Sweden and the UK', Global Environmental Change, 7(1), pp. 25–40.

Holgate, C. (2007) 'Factors and Actors in Climate Change Mitigation: A Tale of Two South African Cities', Local Environment, 12(5), pp. 471–484.

Hooghe, L. and Marks, G. (2001) Multi-level Governance and European Integration. Lanham, MD: Rowman & Littlefield.

Kern, K. and Bulkeley, H. (2009) 'Cities, Europeanization and Multi-level Governance: Governing Climate Change through Transnational Municipal Networks', JCMS: Journal of Common Market Studies, 47(2), pp. 309–332.

Leck, H. and Simon, D. (2013) 'Fostering Multiscalar Collaboration and Co-operation for Effective Governance of Climate Change Adaptation', Urban Studies, 50(6), pp. 1221–1238.

Monni, S. and Raes, F. (2008) 'Multilevel climate policy: the case of the European Union, Finland and Helsinki', Environmental Science & Policy, 11(8), pp. 743–755.

7 Individual City Cases

7.1 Aachen

7.1.1 City Profile

Aachen is a city in North Rhine-Wesphalia with an area of 160.85km2. Aachen's urban area is divided into seven districts: Brand, Eilendorf, Haaren, Kornelimünster/Walheim, Laurensberg, Mitte and Richterich. Due to the proximity to both Belgium and the Netherlands, there is a close connection and cooperation with both countries.

Aachen is also part of the so-called Rhenish mining district, characterised by lignite mining in the Hambach, Garzweiler and Inden open-cast mines. The city region of Aachen, the districts of Düren, Euskirchen, Heinsberg, the Rhine-Erft district and the Rhine district of Neuss as well as the city of Mönchengladbach have joined forces for the strategic structural change of the region during the end of lignite mining. According to the coordination framework of the joint task Improvement of the Regional Economic Structure, the entire Aachen city region is considered a structurally weak region in Germany and is therefore entitled to regional aid provided by the European Regional Development Fund (ERDF), the federal government and the federal states.

In 2022, the population of Aachen was 262,040. In 2020, almost a quarter of Aachen's population were university students. This proportionately large, young, and comparatively more climate conscious demographic group has afforded the city strong support in favor of its climate transition, which has contributed to its past success.

As a large city, Aachen has an above-average population density. With an average of 1,548.5 inhabitants per square kilometre, it is well above all other municipalities in the city region (787.5 inhabitants/km2) and the state (525.5 inhabitants/km2).

Nevertheless, the settlement area only accounts for just under 30% of the total area of 160.85 km2 in the urban area. At 21 km², residential areas account for the largest share of the settlement area. The industrial and commercial area accounts for around one sixth of the settlement area and is therefore roughly the same size as the area for sport, leisure and recreation. Vegetation accounts for the largest proportion of land at almost 60 % of which almost two thirds are agricultural land and around one third is woodland. Most of the forests are in the south and west of the urban area. Around 60 % of Aachen's buildings are residential. The remainder of the building stock is divided between commercial or industrial buildings, buildings for public purposes and other buildings. Most of the Aachen's building stock was constructed between 1949 and 1978. Many buildings from the period before 1919 and the period from 1919 to 1948 still exist. However, significantly fewer new buildings have been constructed since 1978. Two thirds of the building stock in Aachen consists of detached houses, and the other third is apartment blocks. A quarter of the buildings in Aachen are owner-occupied.

The mobility sector currently accounts for around 25% of CO2 eq emissions within city limits, of which motorised private transport makes up the largest share. According to the Mobility Report 2021, 30% of the modal split in the city of Aachen as of 2017 is accounted by walking, 11% by cycling and 13% by public transport. Motorised private transport has a total share of 46% of the modal split, consisting of 34% drivers and 12% passengers. The car density in 2020 was around 446 cars per 1,000 inhabitants, which compares favourably with NRW with a figure of 556 (2016). However, it should be noted that car registrations in Aachen have increased by 30% over the past 30 years, although the population has only risen by 3.1% in the same period. Accordingly, there is still a major challenge in reducing the density of cars to achieve a successful mobility transition in Aachen.

Aachen is a dynamic science and business location and the regional centre for the Aachen city region. Aachen has a heterogeneous economic structure, with around 67% of employees subject to social insurance contributions working in the service sector, a further 17% in trade, catering, transport and warehousing, followed by around 15% in the manufacturing industry, in particular mechanical engineering and confectionery production.

The most important employer is RHTH Aachen University, followed by the city of Aachen and the administration of the Aachen city region. The food industry is strongly represented. In the automotive engineering sector, FEV GmbH, for example, should be mentioned as a development service provider. In the medical and healthcare sector, the Aachen University Hospital and the pharmaceutical company Grünenthal GmbH are exemplary. Sparkasse Aachen is the largest employer in the financial sector, and Generali Deutschland AG is a strong representative of the insurance industry.

The greatest potential for emission saving in Aachen are the energy, heating and mobility sectors. Looking at the primary energy consumption of the City of Aachen for 2022 (Figure AP-10), the industry sector accounts for 22 % (357 kt CO2 eq) and the trade/commerce/services sector for 18 % (279 kt CO2 eq), i.e. 40 % in total.

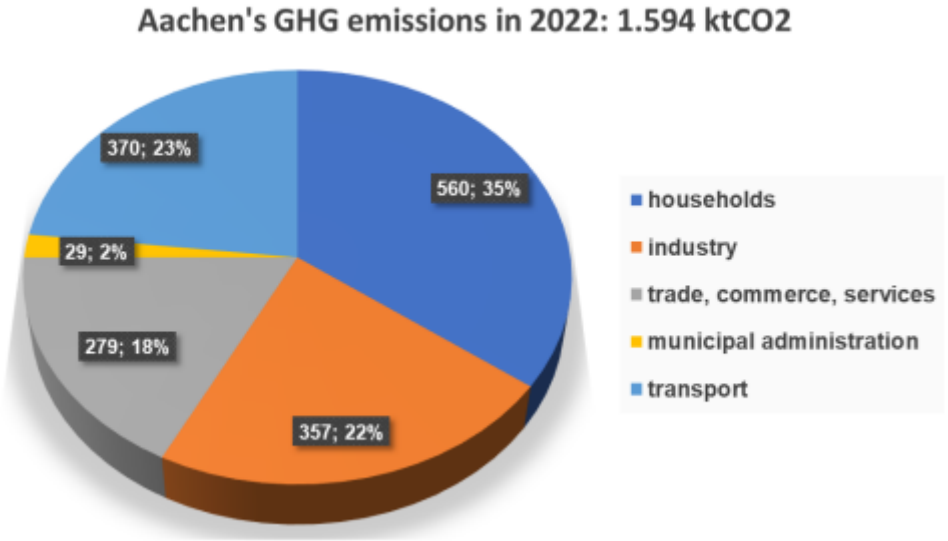

Figure 1 - Aachen's emissions in 2022

Key Climate Actions and Initiatives

Aachen has been at the forefront of climate protection for three decades. Its journey towards climate neutrality has been defined by proactive strategies, policies and a steady commitment of both its citizens and its political leadership. Through a combination of innovative policies and the constant strive for citizen engagement, Aachen is a model of sustainable and climate action in Germany and throughout the 100 Climate Neutral and Smart Cities Mission.

The city's commitment to climate action began in 1991 with the establishment of a dedicated office for sustainable energy and climate protection, which was further cemented in 1992 when the city joined the European Climate Alliance. Aachen's early efforts also pushed for the introduction of the Aachen Model one year later, which consisted in a cost-covering remuneration scheme for the creation of solar and wind power. This initiative was made binding by the city council in 1994 and paved the way for the region's renewable energy uptake.

The first CO2 reduction concept with the aim to reduce emissions by 2010 was put forward in 1998, which was followed by the establishment of a Climate Protection and Energy Coordination Centre to

coordinate the local reduction of CO2 emissions. The creation of AltBau Plus, a non-profit association focused on energy efficient building renovation helped guide the transformation of the city's housing stock.

By 2010, Aachen had recognised the need for a more comprehensive, city-wide approach to climate action, which led to the development of several key instruments to shape the city's climate policy in the years to come. Strategies such as the Climate Protection Plan (2010), the Noise Action Plan (2013), the Energy Policy Work Programme, the Local transportation plan, the Clean Air Plan (2015) and the Green City Master Plan (2015) provided a clear framework for Aachen's continued commitment to climate protection.

The creation of IKSK and how it revolutionised the carbon neutrality game

Aachen's IKSK (Integrated Climate Protection Concept) lays out the path to climate neutrality by 2030. The initial proposal, created by all the departments of the municipality and politically ratified by all political parties in the city, aimed at achieving a 50% reduction in emission by 2030. Later on, through the development of the Climate City Contract (CCC), the IKSK was revised in 2023 to push for the achievement of climate neutrality by the same year. The main fields of action set out by the IKSK 2.0 involve urban planning, municipal buildings, energy supply, mobility, building refurbishment, communication and economy. The action programme comprises over 200 measures spread across various sub-concepts. 70 measures out of the 200 were defined through the participation process that the municipality carried out with local stakeholders.

Local Climate Governance

The city of Aachen has adopted an innovative and inclusive approach to climate governance through its multi-level collaboration and the creation of specialized teams designed to implement its ambitious goal of achieving climate neutrality by 2030. Central to this effort is the EU Mission Team, a cross-departmental administration core team formed in April 2022, with representatives from the Departments VII Climate and Environment, City Operations and Buildings, and Department III Urban Development, Construction and Mobility. The team operates under the leadership of the Department of Climate and Environment and Contract, Procurement, and Funding Management. Its formation marks a key moment in the city's climate governance, with the overarching strategy closely coordinated with local politicians and the Lord Mayor from the outset.

A significant achievement of the transition core team has been the creation of the CCC, which serves as a strategic framework for guiding Aachen's transformation to a climate-neutral city. This initiative fosters cross-sectoral collaboration, bringing together stakeholders from all sectors of the community. With a commitment to breaking down traditional silos within local government, the transition team has worked to establish an integrated approach that enhances communication and coordination. The city's success is evident in the fact that Aachen now has 134 signatories, a broad coalition that includes Premium, Framework, and Basis partnerships. These partnerships represent varying levels of commitment, from Premium Partners, who are dedicated to becoming climate neutral by 2030, to Framework Partners working on specific projects like mobility, and Basis Partners, who focus on supporting broader goals such as increasing biodiversity and mobilizing civil society.

One of the key strengths of Aachen's climate governance is the horizontal coordination across different administrative units. A vital part of this is the administrative tour conducted in autumn 2022, where department representatives were introduced to the objectives of the EU mission and the Climate City Contract. This initiative helped foster a shared sense of responsibility among various departments for the city's climate goals.

In April 2023, the establishment of the "Climate-neutral Aachen 2030" office at altbau plus e.V. further reinforced the city's commitment. This office focuses on engaging citizens and the broader public while continuing to work closely with the city administration. Complementing the transition core team, the administrative board, which includes department heads and the Lord Mayor, plays a crucial role in

generating ideas, offering feedback, and acting as a catalyst for both the content and implementation of the city's climate neutrality initiatives.

Through these collaborative efforts, Aachen is fostering a robust governance structure that not only integrates various sectors of society but also sets a clear path toward a sustainable and climate-neutral future by 2030.

7.1.2 Multi-Level Governance and Integration

Vertical coordination

The development of a climate-neutral Aachen has been shaped by both the national and regional government, although the level and type of support have varied. At the national level, Germany has taken significant steps towards decarbonization, which indirectly supports Aachen's climate goals, but the direct impact on cities like Aachen has been less tangible.

Germany's commitment to the Paris Climate Agreement has set the foundation for the country's climate policy, with the Federal Constitutional Court ruling in April 2021 that climate protection targets must be urgently pursued. This urgency has translated into a series of national policies aimed at reducing greenhouse gas emissions. The Climate Protection Act, passed in May 2021, set ambitious targets for reducing emissions by 65% by 2030 and 88% by 2040 compared to 1990 levels, thus creating a national framework for action. Additionally, the federal government has introduced the *Coal Regions Structural Strengthening Act*, allocating €14 billion to assist regions like Aachen's *Rheinisches Revier*, which is transitioning away from lignite coal production. These funds are intended to support structural change and decarbonization, providing potential opportunities for Aachen to invest in climate-neutral initiatives. Moreover, the *Climate Protection Fund* (KYF) with €49 billion in 2024 offers strong financial support for the energy and heating transitions, which also aligns with Aachen's climate protection plans.

While these national initiatives provide a broad framework and funding opportunities, the federal support structure remains less focused on direct urban-level assistance. National government agencies, such as the Ministry for the Built Environment and the Ministry for Science and Education, offer support in policy alignment and facilitate transparent funding operations. However, there is no specific funding dedicated exclusively to cities. Through the *CapaCITIES* project, there are hopes to establish a national platform offering more direct support to cities like Aachen, but this remains in the early stages.

On the regional level, the state of North Rhine-Westphalia (NRW) has played a more direct role in supporting climate protection efforts in Aachen. In 2021, NRW adopted its second *Climate Protection Act*, which accelerated the lignite phase-out to 2030. This regional push aligns with Aachen's broader goals of reducing greenhouse gas emissions. Additionally, Aachen has benefited from the NRW *Impulse Funding Programme*, which supports municipal heat planning and energy transition projects. Furthermore, the *Pact for the Future of North Rhine-Westphalia* has opened avenues for local authorities to introduce third-party user financing, although this is still in the referendum stage.

Despite these provisions, Aachen has faced challenges in establishing a consistent and formal support relationship with the regional government. Although the state offers informational meetings and some funding opportunities, these have not yet translated into a robust, ongoing partnership. There have been difficulties in securing concrete financial support, as regional ministries often face constraints in their budgets. Aachen, along with other *mission cities* in NRW, continues to seek more direct and substantial backing from the state to achieve its climate neutrality goals.

In conclusion, while national and regional policies have provided a solid foundation for climate protection in Aachen, the city's experience reveals the complexity and limitations of securing tailored support for local climate actions. Aachen's success in becoming climate-neutral by 2030 will likely depend on continued collaboration with both national and regional governments, but also on expanding their ability to directly address the specific needs of cities like Aachen.

Citizen Engagement

The City of Aachen also stands out for its strong citizen participation, creating a solid mandate for climate action. Examples include referendums like the Climate-Neutral Aachen 2030 (with nearly 12,000 signatories) and the Cycling Decision (with over 35,000 signatories), both of which have led to regular meetings between the administration and referendum representatives to align proposed measures with public expectations. Aachen is also the first city in Germany to establish a permanent Citizens' Council, where residents meet two to three times annually to discuss urban issues, including climate and environmental policies. The results of these meetings guide local politicians and the administration.

The Aachen Alliance for Change

Aachen's path to climate neutrality requires a coalition of visionaries, innovators, and community leaders to spark a citywide wave of enthusiasm and optimism for a sustainable future by 2030. This collective effort includes the municipal administration, enterprises, and holdings, all of which play a central role in steering and implementing climate protection measures. This coalition of visionaries and innovators include the private sector, universities and educational institutions, environmental and climate initiatives, and civil society – with over 20,000 citizens engaged through initiatives such as Fridays for Future.

Horizontal Collaboration

One of the main challenges Aachen has identified in its process of accessing funds, funding and implementing the climate neutral transition is the lack of devoted support from national and regional governments. In addition, there is no formal national platform in Germany that triggers a well-established dialogue between local authorities striving to become climate neutral and other levels of government. To solve this, Aachen and other German cities have come together to build a strong relationship and create an official line of communication with different levels of government. Aachen is part of three of these city networks and aims at working towards the goal of establishing a national platform that will be able to advocate for cities' needs at a national level.

The German Association of Cities is an association of 16 state associations and 13 extraordinary members, including the Aachen city region. The NRW Association of Cities brings together 39 cities, including Aachen, Dortmund and Münster.

stronGER Cities Network aims at strengthening multi-level governance by merging the 9 German cities participating in the EU mission 100 Climate-Neutral and Smart Cities Mission. It aims at jointly creating favourable framework conditions to achieve climate neutrality at a local level. The network is supported by the German Association of Cities. The members of the network have institutionalised meetings every two weeks to discuss what topics to bring up to the federal level. The cities work together developing policy briefs to advocate for their needs and present their challenges. Some of the topics they tackle are sustainable mobility or the decarbonisation of the built environment.

At a federal level, a steering forum has been set up under the leadership of the Federal Ministry of Housing, Urban Development and Building and the Federal Ministry of Education and Research with the participation of the Federal Ministry of Economics and Climate Protection. Representatives of stronGER Cities are permanent members of this steering forum and support the needs of Mission Cities by putting them on the agenda.

Alliance to address the state government: Munster, Aachen, Dortmund

Integrated approaches: horizontal and vertical combined initiatives

One of the greatest examples of integrated approach to secure funding is the CoLAB (Committed to Local Climate Action Building) project. This project was brought together through two of the main strengths of Aachen – city to city collaboration and citizen engagement. Through this project, three German EU Mission cities test innovative ways to reduce behaviour-related GHG emissions of citizens. The municipalities aim at setting up a climate, energy and sustainability agencies to facilitate access to services, enable networking and generate direct local impact. This collaborative project, funded by the EU Mission 100 Climate Neutral and Smart Cities with 1.5 million, is contributing to achieve not only a society based urban redevelopment, a greater acceptance of the changes that need to be made to transform Aachen in a climate neutral city by 2030.

Financing Strategies and Mechanisms

Aachen has been working on a wide range of options to secure the necessary resources to ensure a climate neutral transformation of its territory. One of the main strategies was the development of the IKSK in 2020. The integrated climate protection concept was key to unlocking significant funding. The success of this strategy hinged on its collaborative nature, as it was developed with input from all city departments, leading to a comprehensive set of measures that were politically ratified across the board. This broad agreement among diverse political groups created strong momentum, ensuring the allocation of municipal funds for the implementation of these measures. Through negotiations between departments and the treasury, Aachen was able to secure substantial financial backing. The city not only mobilized 181 million euros in total but also set aside 19.1 million euros in its 2023 budget for climate action. Additionally, it allowed Aachen to tap into regional funding opportunities, securing 40 million euros from the Climate Protection for Northern Westphalia fund. This funding supported five ambitious sustainable mobility projects (Aachen Move 1-5), showcasing the IKSK's effectiveness as a critical lever in attracting both municipal and regional investment to transform the city into a climate-neutral hub.

Currently the city is working with the Climate City Capital Hub to try fund climate neutral activities through two main workstreams: through financing (1) local partners and (2) heavy infrastructural changes.

The former aims at **setting up a climate fund** for those partners committed to the CCC (premium, framework and basic partners mentioned above) through the creation of loans that can be more affordable than bank loans. The role of the European Investment Bank (EIB) is key, as it would be the provider of such loans.

The latter aims at securing investment of at least EUR 50M from the EIB for the implementation of big infrastructural projects. The main setback in this process is the fact that the current interests of German bank loans are lower than those offered by the EIB or Bankers without Boundaries. The search for bankable projects seems to pose some difficulties.

Next Steps

Aachen is currently exploring potential for development of green public procurement requirements. Municipalities are not just big buyers but also market shapers. While European funding is very valuable for cities to start implementing measures and kick start actions, climate protection and mitigation cannot be a publicly funded endeavour forever. With this aim, Aachen is working towards developing a project with Oslo to learn how Green Public Procurement can contribute to creating cheaper tenders.

7.1.3 Outlook

Barriers Encountered: Aachen has encountered several institutional challenges, particularly related to securing consistent and direct support from national and regional governments. While national policies such as the Climate Protection Act and the Coal Regions Structural Strengthening Act have provided a broad framework and funding opportunities, the lack of a specific, direct support structure for cities has hindered the implementation of local climate actions. Additionally, regional government support, while more tangible, has often been constrained by budget limitations, leading to challenges in securing sufficient funding and formal, ongoing partnerships.

- **Technical Barriers:** The city has faced challenges in financing large-scale infrastructural projects, particularly due to the gap in interest rates between local banks and European financial institutions like the European Investment Bank (EIB). While Aachen has successfully mobilized significant funding through the IKSK and regional sources, the search for bankable projects has proved difficult. Securing private investment for climate-neutral activities and addressing behavior-related greenhouse gas (GHG) emissions at the citizen level also remain ongoing challenges, despite the city's efforts to introduce new financing strategies such as the climate fund for local partners.
- **Governance Barriers**: The lack of a formal, established dialogue between local authorities and higher levels of government, especially at the federal level, has been a notable governance barrier. While Aachen is part of several networks aimed at fostering inter-city collaboration and advocating for cities' needs, the absence of a national platform dedicated to supporting local climate efforts has slowed down the momentum for large-scale transformation. Aachen's efforts to create new governance structures, such as the EU Mission Team and Climate City Contract, have provided some solutions but still face coordination and support challenges at higher levels.
- **Lack of skills and devoted resources for local authorities:** One of the main examples emphasised by Aachen is the existence of a funding and finance advisor in the city of Leuven. The lack of necessary resources in the administration prevents Aachen from hiring the necessary staff to ensure a smooth climate neutral transition. In more than one occasion, the German city has used European funding to hire employees to work in this area of work due to the lack of available resources in the municipality. Securing funding to employ an expert in the city to identify not only funding but also innovative financing opportunities would be key for the proper implementation of climate neutral actions.

Success Factors

- **Strong Citizen Engagement**: Aachen's proactive approach to citizen participation has been a cornerstone of its success. Referendums, permanent Citizens' Councils, and other engagement initiatives have created a solid mandate for climate action and fostered a sense of shared responsibility among residents.
- **Cross-Sectoral Collaboration**: The formation of the EU Mission Team and the Climate City Contract (CCC) has been crucial for fostering collaboration between various city departments, political groups, and local stakeholders. The broad coalition of partners, including businesses, universities, and civil society, has allowed Aachen to align interests and push for collective climate goals.
- **Integrated Climate Strategies:** The development of the IKSK, a comprehensive and collaborative climate action plan, has provided the framework for Aachen's climate-neutral transformation. This strategic approach, combined with the successful mobilization of

municipal and regional funds, has enabled the city to make significant progress towards its climate goals.

- **Multi-Level Governance:** Aachen's participation in city networks such as stronGER Cities has facilitated horizontal coordination between cities and vertical coordination with regional and national governments. These networks have provided a platform to advocate for local needs and create favourable frameworks for climate action.

In conclusion, Aachen's journey toward climate neutrality has been characterized by innovative governance and a strong citizen involvement. However, overcoming institutional, technical, and governance barriers will require continued collaboration at all levels of government, the private sector, and civil society. The city's success will depend on its ability to adapt its strategies, secure sustainable funding, and drive behavioural change among residents and businesses.

7.2 Kozani

7.2.1 1.1 City Profile

Location, Population Size, and Major Economic Sectors

Kozani is located in north-western Greece, serving as the administrative centre of the Western Macedonia region. The municipality spans an area of 1,071.3 km² and has a population of approximately 67,000 inhabitants, with a metropolitan region population of around 165,000. The region of Western Macedonia is predominantly rural, with 56% of its population residing in rural areas.

Between 2011 and 2021, the region experienced a population decline of approximately 10%, primarily due to younger residents relocating to Thessaloniki, Athens, or abroad in search of better opportunities. This decline is significantly higher than Greece's national average of 3.1% over the same period.

For the past 70 years, Kozani has been at the core of Greece's electricity production, primarily through lignite power plants, which historically generated over 75% of the country's electricity. This dependency on lignite has shaped the region's economic structure, employment trends, and population stability. However, the completion of the lignite phase-out is expected to significantly impact employment and economic activity, leading to an ongoing transition towards alternative industries and clean energy sectors.

Socioeconomic Conditions

Kozani's GDP per capita declined from €20,090 in 2011 to €13,996 in 2020. The economic transition away from lignite dependency has led to job losses and financial instability. While Kozani once had a GDP per capita higher than the national average, recent economic downturns have reversed this trend.

To mitigate economic disruption, the city relies heavily on external funding sources, including the European Union, the Greek government, regional development funds, and financial institutions such as the European Investment Bank and the Green Climate Fund. The Just Transition Fund has been introduced to attract new investments, particularly in hydrogen, battery production, artificial intelligence, and sustainable technologies. However, progress has been slow, and further investments are needed to secure long-term economic stability.

Current GHG Emissions Inventory and Major Sources of Emissions

The Municipality of Kozani has revised its Sustainable Energy and Climate Action Plan (SECAP) to target an 80% reduction in C02 emissions by 2030. The Baseline Emissions Inventory (BEI) identifies key sectors contributing to the city's emissions, including buildings, public lighting, transportation, tertiary industries, agriculture, and manufacturing.

In 2020, Kozani's total annual CO2 emissions reached approximately 262,698 tonnes, with per capita energy consumption at 11.62 MWh and per capita emissions at 3.68 tonnes Co2 per year. The closure of lignite power plants by 2026 presents a challenge in maintaining heating systems, necessitating financial and regulatory adaptations to implement sustainable alternatives.

Key Climate Actions and Initiatives

In its CCC Kozani has identified five strategic fields of actions: 1. energy, 2. mobility and transport, 3. waste and circular economy, 4. green infrastructure, and 5. smart city. Within these fields several flagship projects were prioritised, aiming at reducing emissions and transitioning towards climate neutrality:

Green District heating upgrade – the municipality modernises its district heating system to eliminate reliance on lignite-based energy.

Energy efficiency in buildings – efforts are underway to retrofit public and private buildings to improve energy efficiency.

Green Transformation of Kozani's Carnival Fest – an initiative to incorporate sustainability into one of the region's largest cultural events.

Local Climate Governance

Kozani's municipal governance has developed significantly through its engagement with the Cities Mission. Kozani acknowledged it was initially underprepared to handle the transition to climate neutrality. To address this, a new governance framework was developed through the Climate City Contract (CCC), integrating municipal entities with external stakeholders such as universities, research institutions, and local businesses.

A dedicated working group has been formed to oversee the CCC's implementation, ensuring a coordinated, structured approach to project management. Additionally, Kozani established a **Transition Team governance model**, which promotes inclusivity and participation in climate-related decision-making. The city also revived its **Kozani's Development Organization** (KDO) with **Board of Directors, coordinator called "Mission Manager"** and **KDO secretariat**, which provides greater flexibility in managing projects compared to standard municipal structures.

An integral part of the KDO is also the CCC Signatories' Committee, which comprises organizations that collaborate closely with Kozani's Mission Manager. These signatories play an essential role in project implementation by contributing expertise and resources.

7.2.2 Multi-Level Governance and Integration

Vertical Coordination

Kozani's climate transition relies on European funding, as direct financial support from the Greek central government remains limited. The city actively participates in EU programs such as Horizon Europe and the Just Transition Development Plan, which support clean energy, industry, smart agriculture, sustainable tourism, and digital education. While communication with the national government has improved, funding mechanisms remain largely unchanged, restricting municipalities like Kozani from greater financial autonomy.

Most of Kozani's climate projects are fully financed by European grants. However, initiatives requiring co-financing depend on additional support from the national government, the region of Western Macedonia, and institutions like the European Investment Bank. The transition away from lignite power – a pillar of Kozani's economy for 70 years – poses significant challenges, including environmental degradation and job losses. To meet its 2030 climate targets, the municipality is also seeking funding from international financial institutions such as the World Bank and the Green Climate Fund, though accessing these resources requires well-structured plans, clear objectives, and detailed repayment strategies.

At the national level, Kozani collaborates with the Greek government to secure funding for critical projects, particularly those tied to its post-lignite transition. However, municipalities in Greece continue to rely on centralized support, and direct financial aid for Kozani's climate goals remains limited. The bureaucratic constraints of national funding structures slow progress, making alternative mechanisms essential. In this regard, the participation in the Cities Mission and the NetZeroCities project offer valuable financial opportunities and expert guidance while reducing bureaucratic hurdles.

Kozani works closely with the Western Macedonia authorities through the Regional Operational Program and the Smart Specialization Strategy. However, access to these funds remains challenging, as the Just Transition Fund (an essential financial tool for fossil fuel-dependent regions) is largely controlled by the central government. This top-down allocation limits the direct involvement of municipalities in decision-making and resource distribution. To overcome these barriers, Kozani continues to push for more direct access to Just Transition Fund resources while seeking private investments and partnerships to accelerate its transition.

International financing: experiences and challenges

Despite its strategic importance, Kozani has yet to secure large-scale investments in transformative industries such as hydrogen, battery storage, or artificial intelligence. So far, funding has primarily supported small businesses rather than the large-scale projects needed to drive economic and environmental change. To bridge this gap, the city actively seeks alternative funding sources beyond national allocations, including EU programs, the European Investment Bank, and partnerships with NGOs. However, Greece's financial history makes national banks cautious about funding large-scale municipal projects, limiting access to domestic investment opportunities.

To navigate these challenges, Kozani employs a multi-source funding strategy, blending EU funding, Greek government grants, and municipal resources. This approach has been successfully implemented in projects such as the public swimming pool renovation and district heating modernization, reflecting the city's commitment to national and EU climate goals. Despite bureaucratic inefficiencies at the national level, Kozani continues to strengthen partnerships across all levels of government to accelerate its transition to climate neutrality.

Stakeholder Engagement and Vertical Coordination

Recognizing that municipal capacity alone is insufficient to drive its sustainability transition, Kozani fosters strong collaboration with local communities, NGOs, businesses, and academic institutions. The city has established a Citizen's Climate Board to ensure inclusive decision-making, gathering public input through surveys, workshops, and consultations. This participatory approach actively engages residents in shaping key projects such as district heating, energy communities, and the greening of its renowned carnival.

Beyond local engagement, Kozani works closely with Greek and European institutions to implement its CCC. Key partners provide expertise in project financing, policy implementation, and sustainability strategies. These partners include: the University of Western Macedonia, major research centers, NGOs like CLUBE, CERTH and Aristotle University of Thessaloniki. Limited national funding, however, continues to hinder the expansion of renewable energy projects, energy communities, and regional clean technology investments. Moving forward, Kozani's success will depend on its ability to secure diverse funding sources, strengthen multi-stakeholder collaboration, and advocate for greater financial autonomy at the national level.

Horizontal Coordination

"We strongly believe that when you have a network of cities where you're not alone, your voice is stronger"

Kozani plays an active role in various multi-level collaboration frameworks, ensuring alignment with broader sustainability goals while leveraging shared resources and best practices. The city actively participates in Network of Municipalities for Climate Neutrality (ClimaNet), a Greek city network dedicated to climate actions. ClimaNet serves as a vital platform for collaboration among six Greek Mission Cities, the Greek Ministry of Environment, the Association of Mayors of Greece, and members of the Mission Board of the Cities Mission.

Before ClimaNet was formally established, these six cities informally joined forces to secure funding from the Green Fund provided by the Ministry of Environment. This financial support was

essential for the development of their CCCs. Now, ClimaNet functions as a non-profit entity with the capacity to receive and distribute funds to Mission Cities, facilitating direct financial support and project implementation.

ClimaNet's governance structure includes representatives from both city administrations and the national government, ensuring efficient collaboration, resource allocation, and a unified approach to achieving climate neutrality goals.

Collaboration within this network of cities amplifies their collective voice, enabling greater achievements in securing funding and developing innovative solutions to shared challenges. As funding remains a top priority, ClimaNet serves as a strong platform for advocating financial support from both the EU and the national government. By working together, cities can exchange ideas, address common challenges, and develop solutions tailored to their specific needs while considering national regulations and local contexts. Such collaboration fosters knowledge sharing, allowing cities to learn from one another's successes and setbacks. As a united network, ClimaNet also enhances the ability to advocate for more targeted climate policies and funding mechanisms at the governmental level.

The city is also a member of the Covenant of Mayors, a global initiative supporting local governments in their climate and energy actions. While this network provides a valuable platform for mayors to connect and exchange ideas, its role in securing direct project funding is limited. ClimaNet, on the other hand, has **greater potential** to drive impactful action through structured collaboration and financial support.

Additionally, in 2022 a Memorandum of **Cooperation** for the **European Mission "100 Climate Neutral Cities by 2030" has been signed by 21 Greek municipalities** in partnership with the Ministry of Environment and Energy. This memorandum focuses on the joint development of renewable energy projects and the promotion of energy communities, and aims to:

- Accelerate cities' transition to climate neutrality by 2030.
- Support the digital transformation of participating cities.
- Facilitate economic and environmental recovery from the COVID-19 pandemic.

Collaboration is central to Kozani's climate policy planning and implementation, as the city actively engages in joint working groups with other municipalities to address areas like energy efficiency, sustainable mobility, and green infrastructure. To share experiences and align strategies, Kozani also holds bilateral meetings with cities undergoing similar post-lignite transitions, using these discussions to compare policy approaches and coordinate EU funding applications. In line with its CCC commitments, Kozani partners with other Mission Cities to ensure a unified path toward carbon neutrality. Its involvement in EU-funded smart city and low-carbon initiatives promotes the adoption of innovative technologies, cross-city learning, and cohesive climate action at both national and European levels.

Several key departments within the city administration facilitate this collaboration:

The Office of European Programs: manages city-to-city collaborations, ensuring Kozani's participation in transnational projects and coordinating shared initiatives.

The Environmental and Energy Department: leads climate-focused partnerships, including Kozani's involvement in the Cities Mission and cooperation with other Mission Cities.

The Planning and Technical Services Departments: align local urban development policies with best practices from other cities in the network

Financing Strategies and Mechanisms

Kozani's climate initiatives rely on a diverse mix of public, private, and hybrid funding sources to meet investment needs. Public funding accounts for 43% (€373M) of total investment requirements, with key contributions from the Just Transition Development Plan (€175M for 2023-2029), the Regional Operational Programme (ROP) 2021-2027, the National Strategic Reference Framework (NSRF) 2021-2027, and financial instruments such as the Green Fund, InvestEU, and European Investment Bank (EIB) loans. Additionally, the municipality utilizes regional fees of €25 million to cover operational costs, though large-scale investments require external financing.

The remaining 54% (€460M) must come from private capital or loans, but securing these funds is challenging due to low bank interest in municipal financing and high-interest rates. To address these barriers, Kozani is exploring hybrid financial mechanisms, including Public-Private Partnerships (PPPs) for infrastructure projects, Energy Service Company (ESCO) models for energy retrofits, and potential use of green bonds, venture capital, and Special Purpose Vehicles (SPVs). While these strategies are still under discussion, there is growing interest in crowdfunding and blended financing models to diversify funding streams.

Kozani has prior experience with PPPs, having approved 19 projects between 2009-2023 and securing 45 new contracts, including a €49M Waste Management Plant and 750 student residences. The ESCO model, currently under discussion with the EIB, aims to enhance energy efficiency in public buildings, while green bonds and off-balance-sheet financing mechanisms such as SPVs are being considered for large-scale energy retrofits. Although no major experimental financial schemes have been implemented yet, the city is actively exploring new approaches to expand funding options for its climate projects.

Alignment with national and regional policies is crucial for unlocking financial opportunities. The Just Transition Development Plan, National Energy and Climate Plan, and Circular Economy Plan provide strategic direction, while state-backed loan guarantees and financial aid programs help mitigate investment risks. Dedicated initiatives, such as the Sustainable Urban Transport Program, further support eco-friendly infrastructure projects, ensuring that Kozani can leverage both conventional and innovative financial instruments to drive its climate transition.

Key Challenges and Lessons Learned

Kozani's journey toward climate neutrality is fraught with institutional, financial, technical, and social barriers that complicate the implementation of sustainable initiatives. Institutional challenges stem from conflicting regulations, bureaucratic inefficiencies, and a highly centralized governance system that limits municipal autonomy. The complexity of the legislative framework, coupled with delays in court decisions, hampers the timely execution of climate projects. Coordination gaps between central and regional governments further disrupt policy consistency, while inflexible tender procedures obstruct the rollout of climate investments. Although the Just Transition Fund aligns with Kozani's climate strategy, bureaucratic delays in fund allocation weaken its effectiveness. Additionally, regulatory inconsistencies make it difficult to secure financing and execute long-term sustainability plans, highlighting the urgent need to develop administrative and financial capabilities within local governance structures.

Financial constraints further intensify the municipality's challenges, making it difficult to secure long-term funding for climate initiatives. In 2017 central government transfers covered 69% of municipal revenues, underscoring Kozani's limited financial independence. Such dependence can hinder the independent planning and implementation of local investments, including projects related to climate transition or infrastructure development, as the city lacks sufficient own-source revenues to

respond flexibly to local needs. The high perceived risk of climate projects discourages private investment, while restrictive municipal borrowing limits and credit risk issues hinder access to loans. The Greek financing market lacks specialized climate funds for municipal projects, and the European Investment Bank's €25 million minimum financing threshold presents additional obstacles. The collapse of lignite power generation has intensified economic struggles, as Kozani remains heavily dependent on this sector. Without diversified industrial investments, the city faces significant hurdles in sustaining long-term economic growth while transitioning to cleaner energy sources.

Technical barriers, including data gaps and limited expertise, further restrict the municipality's ability to implement climate action effectively. A shortage of detailed financial and economic data complicates project appraisals, while local authorities lack the expertise to identify, prepare, and manage large-scale sustainability projects. The limited number and size of local energy and construction firms make it difficult to execute major climate initiatives, necessitating greater collaboration with external stakeholders. Strategic alliances with universities, research institutions, and NGOs are crucial for capacity building and developing bankable projects. Additionally, reskilling and upskilling programs are needed to support workers transitioning away from lignite-dependent industries.

Social resistance presents yet another challenge, as low public and business engagement weakens momentum for climate action. Limited participation from citizens and local businesses in sustainability initiatives hinders the city's climate transition efforts. Businesses show minimal commitment to sustainable practices, and public consultation remains underdeveloped, despite efforts to improve engagement. Without structured and inclusive policymaking processes, gaining broad support for climate neutrality goals will remain difficult. Enhancing community involvement through transparent decision-making and awareness campaigns is essential for fostering a shared vision of a sustainable future for Kozani.

Capacity Building and Technical Assistance

Kozani actively enhances its capacity to design and implement large-scale climate projects, particularly those involving complex financial instruments. To promote sustainability in public procurement, municipal employees are receiving specialized training in Green Public Contracts, aligning with circular economy principles. The city's participation in European Research & Innovation projects, such as STARDUST, SYMBI, and SCALIBUR, has provided valuable experience in climate action implementation. Additionally, knowledge-sharing initiatives with universities, research institutions, and NetZeroCities advisors are strengthening climate governance, ensuring that local policies are informed by the latest research and best practices.

Collaboration with international programs, NGOs, and private sector stakeholders is a key strategy for bridging capacity gaps. Kozani has successfully leveraged Public-Private Partnerships (PPP), with 19 contracts signed between 2009 and 2023 and 45 new projects approved – many of which align with climate neutrality goals. Strategic alliances with international organizations are helping the municipality improve administrative efficiency and gain access to innovative financing tools. The city's rapid expansion from no participation in Horizon 2020 and Horizon Europe projects to involvement in 7 initiatives highlights its growing role in innovative financing and sustainable project execution.

In an effort to improve governance and strengthen public trust, Kozani is transitioning its municipal decision-making processes to a digital platform. This new system will offer real-time access to procurement details and municipal council decisions, promoting open governance and encouraging public participation. By increasing transparency and fostering direct engagement, the city aims to build greater confidence in local administration. The platform will also facilitate open dialogue and accountability, ensuring that municipal decisions are aligned with the needs and priorities of the community.

Through these efforts, Kozani is laying the groundwork for a more inclusive and transparent governance model while accelerating its climate transition. By investing in training, fostering partnerships, and embracing digital tools for open governance, the city is not only improving its administrative capacity, but also ensuring long-term stakeholder engagement and trust in its sustainability journey.

7.2.3 Outlook

Kozani's climate transition is very much dependent on EU funding and external expertise, highlighting both opportunities and constraints in its sustainability journey. While multi-level governance mechanisms are gradually improving, national government policies continue to limit municipal autonomy, affecting the pace of climate initiatives. To navigate these challenges, the city is experimenting with integrated financing solutions, seeking innovative ways to fund its post-lignite transformation. However, securing long-term investments remains a priority, requiring increased efforts to attract direct funding, explore crowdfunding options, and advocate for regulatory changes that facilitate municipal-level climate action. Strengthening public engagement through participatory approaches will also be essential in building widespread support for these initiatives.

Kozani's climate strategies offer valuable lessons for other cities seeking sustainable transitions. The CCC serves as a replicable framework for local climate action, while the city's green district heating projects present adaptable solutions for other cold-climate regions. Multi-stakeholder collaboration has proven to be an effective governance approach, fostering cooperation between municipal authorities, businesses, and research institutions. Looking ahead, scaling strategies will focus on expanding renewable energy initiatives, such as energy communities and photovoltaic projects, while leveraging regional investments in clean technologies. By actively participating in city networks, Kozani can strengthen collective lobbying efforts, advocating for policies that support a just and sustainable energy transition at the national and European levels.

To further enhance collaboration within networks like ClimaNet, policy changes and regulatory updates at the national level would be beneficial. These could include:

- **A dedicated funding mechanism** to support cities in achieving their **CCC** targets.
- **Regulatory adjustments** to streamline administrative processes and improve cross-city collaboration.
- **Government-backed advisory support** to facilitate knowledge exchange and accelerate project implementation.

As of now, there is no clear indication that the **central government** intends to introduce such measures. However, Kozani will continue advocating for stronger support structures to ensure cities can effectively transition to climate neutrality.

7.3 Turku

7.3.1 City Profile

Turku, located in Southwest Finland, is a mid-sized city with a population of 201,863 (2023). The city has historically taken a proactive role in addressing climate change, establishing itself as a leader in climate governance. Since 2009, Turku has implemented a structured climate programme, followed by the adoption of its first climate plan in 2018, which was updated in 2022. In 2024, the city further reinforced its commitment by developing its Climate City Contract (CCC), within the context of the 100 Climate-Neutral and Smart Cities Mission. As part of its CCC, Turku has committed to achieving climate neutrality by 2029, an ambitious goal that surpasses Finland's climate neutrality national target of 2035[1].

Turku actively monitors its greenhouse gas (GHG) emissions, which totalled 601,600 tCO2-eq in 2020, using the CDP-ICLEI Track methodology[2]. The city's per capita emissions were recorded at 2.53 tCO2e/pc, significantly lower than Finland's national average of 8.64 tCO2e/pc. According to the last GHG emissions inventory (2020), the largest sources of emissions in Turku are buildings and transport, making these sectors key focal points for the city's decarbonization efforts. To tackle these challenges, Turku has outlined key measures in its CCC to achieve carbon neutrality by 2029. A major initiative is transitioning to a carbon-neutral energy system, shifting from fossil fuels to clean electricity, heating, and cooling. Sustainable mobility is also a priority, with efforts to cut transport emissions by half. Public transport will transition to a fully carbon-neutral system, while walking and cycling infrastructure will be improved to encourage low-carbon travel. Beyond energy and transport, the city promotes a circular economy, reducing waste and embedding sustainability into construction and daily operations. Additionally, Turku is enhancing green spaces, increasing carbon storage in nature, and ensuring low-carbon construction for long-term sustainability.

Turku's climate neutrality commitment is not only upheld by the municipality. It is also widely shared across the local ecosystem of actors. A total of 24 organizations have signed Turku's CCC, including key utility and service companies, businesses reflecting the city's historical maritime economy, and advanced sectors such as pharmaceuticals and culture. Additionally, civil society organizations have joined the effort, reinforcing a broad-based commitment to climate action. Furthermore, the national government has demonstrated its support, with the Ministry of Economic Affairs and Employment and the Ministry of Environment issuing a joint commitment document outlining how the state will collaborate with and support the six Finnish Mission Cities in their journey toward climate neutrality.

Local Climate Governance

Turku operates within Finland's highly decentralized national governance framework, which grants municipalities significant fiscal autonomy. Finnish municipalities can set their own municipal tax rates, leading to a high level of revenue autonomy. In 2018, local own revenues accounted for 28% of total

[1] Ministry of the Environment. (2022). *Medium-term climate change policy plan: Towards a carbon-neutral society*. Ministry of the Environment. Available online (last accessed 2025). http://urn.fi/URN:ISBN:978-952-361-417-8

[2] City of Turku. (2025). *Climate City Contract: 2030 Climate Neutrality Action Plan*. City of Turku. Available on the Mission Portal (last accessed March 2025). https://netzerocities.app/resource-4223

government revenues, compared to the EU average of 13%[3]. This financial independence allows Turku to implement ambitious climate policies, exceeding national targets.

Despite the highly decentralized governance system and significant municipal fiscal autonomy, cities in Finland must align their policies and plans with those set by regional authorities, which hold legislative powers over municipalities. This means that Turku's local plans must be integrated within regional frameworks. When it comes to climate policies, alignment between Turku and its regional authorities is facilitated by the fact that the regional-level climate roadmap for Southwest Finland was developed through active collaboration among cities, including Turku, ensuring coherence in climate action across multiple governance levels.

To advance its climate neutrality commitment, the municipality of Turku is organized into a climate administrative structure that integrates various administrative units and stakeholders:

- The Climate and Environment Policy Unit: Situated within the Mayor's Office, this unit leads the city's climate strategy, addressing both adaptation and mitigation. It has expanded from a single staff member to a team of nine experts coordinating efforts across multiple sectors.
- City Council and City Board: The city's climate plan is formally approved and monitored by these governing bodies, with annual progress reports ensuring accountability.
- Climate Coordination Group: Comprising over 80 experts from the City Group, research institutions, and stakeholders, this group updates and reviews the Climate Plan through eight dedicated working groups.
- Financial Leadership Alignment: Within the Climate Coordination Group, key financial decision-makers, including finance directors, city construction and facilities directors, and CEOs of major local entities, align financial resources with climate goals.
- Climate Team: Nearly 100 organizations have joined Turku's Climate Team, making climate pledges and reporting their actions on the Carbon Neutral Turku platform, gaining visibility in municipal communications.

7.3.2 Multi-Level Governance and Integration

Beyond its local administrative structure, Turku's climate governance operates at multiple levels, creating strong synergies between global, EU, national, regional, and local networks and frameworks to support and streamline their climate financial mechanisms. The city actively works to align different initiatives, programs, and frameworks proposed at various levels, reframing them to align with a narrative that is coherent to the local level. For instance, the CCC developed by the city has been explicitly approached by the municipality as a reframing exercise to build on existing processes and strategies. The CCC consolidates the work done by the city under the Covenant of Mayors, their Sustainable Energy and Climate Action Plan (SECAP), and the application of the EU Taxonomy into a coherent narrative.

[3] European Committee of the Regions. (n.d.). Finland - Fiscal Powers. European Committee of the Regions, Division of Powers. Webpage (last accessed March 2025). https://portal.cor.europa.eu/divisionpowers/Pages/Finland-Fiscal-Powers.aspx

According to the interviewee, a key factor in the success of multi-level governance integration is the readiness of the city, the European Commission, NetZeroCities partners, and other stakeholders to appreciate and apply synergies between different frameworks. As noted in the interview,

"I think there's been good understanding and readiness to see and to apply synergies both on the [European] Commission side and the NetZeroCities consortium side and on the city side. [...] If these instruments would not recognize each other and would be very different, then it would not be possible for a city of our size, a mid-size city, to really to be applying so many of them."

The following chapters will present how the city actively engages within the multi-level governance sphere by using different frameworks and mechanisms proposed by EU, national, or regional institutions, ultimately enabling access to funding.

Vertical coordination: European, national, Regional and Local

At the **global** level, Turku is an active signatory of the Global Covenant of Mayors. Additionally, through iterative Voluntary Local Reviews submitted to the UN High-Level Forum on Sustainable Development, the city ensures that its strategies and policies align with the Sustainable Development Goals (SDGs).

At the **European** level, Turku has been a pioneering city for the past two decades. Beyond being one of the first cities to sign the Covenant of Mayors, **Turku is now at the forefront of experimenting with the application of the EU Taxonomy to guide its investments.** Although the EU Taxonomy does not provide direct funding, its application to all municipal investments exceeding €1 million offers two significant benefits. First, it ensures comprehensive thematic coverage, aligning investments with key environmental priorities. Second, it enhances communication and market integration by allowing the city to harmonize its investment framework with business compliance rules. This alignment enables municipalities to *'speak the same language'* as key economic actors, including those in the finance, insurance, and construction sectors.

In recent years, Turku's climate policies have advanced significantly bolstered by **various national programs and initiatives** that offer direct and indirect funding, policy support, and knowledge transfer. The city has actively participated in the **Municipalities Climate Solutions Program**, led by the Ministry of the Environment. Over the past seven years, this initiative has funded numerous municipal climate-related projects and facilitated collaboration through the Finnish Sustainable Communities Network, allowing municipalities to exchange experiences and co-develop innovative solutions. Another critical national source of financial support for municipalities has been the **Energy Aid Program**, promoted by the Ministry of Economic Affairs and Employment of Finland. This program supports investment projects and research on renewable energy and energy efficiency, benefiting companies, organizations, and municipalities in their pursuit of climate neutrality. A key governance tool that aligns **local, regional, and national** government levels is the **"Agreement on Land-Use, Housing, and Transport."** Established in 2010, these agreements bring together state authorities, regional governments, and municipalities within functional urban regions to develop a shared vision for sustainable land use. These framework contracts facilitate consensus-building and guide action plans for housing and transport development, with the central government contributing up to 30% of the required investment.

The relevant national backing of Turku's climate efforts has been confirmed and reinforced by the national commitment secured by the city in its Climate City Contract. The commitments were jointly signed by the Ministry of Economic Affairs and Employment and the Ministry of Environment addressing all six Finnish Mission Cities. The two ministries committed to provide tailored support that will complement cities' own actions. Support granted by the national government to Finnish cities can be categorized in the form of **policy and strategy support**, **direct funding, and/or network support**.

Policy and Strategy Support

National Medium-Term Climate Plan (KAISU) - under renewal: The plan, aligned with the long-term objectives of the Finnish Climate Change Act, supports ambitious cities by addressing their needs while advancing climate neutrality goal. Updated each parliamentary term, it revises baseline projections, evaluates new measures, and assesses their emission reduction impact and financing needs.

National Energy and Climate Strategy (in development): A guideline to support the shift towards climate neutrality with strategy covering all sources and sinks of greenhouse gases.

Ecosystem Contracts/Agreements: An important national governance framework supporting the Finnish cities by leveraging digitalization, new climate neutral technologies, to reduce carbon footprints and drive sustainable development.

Direct Funding

Energy Aid Program (promoted by the Ministry of Economic Affairs and Employment): This program supports investments and research projects that contribute to energy saving or improving energy efficiency and stimulate the development of new and innovative solutions for low-carbon energy system. The aid is granted by Business Finland or TEM for companies, organizations, and municipalities.

"Agreement on Land-Use, Housing, and Transport": MAL Agreements strengthen state and urban collaboration in seven major urban areas to promote sustainable land use, housing, and mobility. They support low-carbon transport, digitalization, and densification investments to enhance urban growth, affordability, and climate resilience. The State finances their share within the MAL agreements.

Network Support:

- **Business Finland / Decarbonized Cities Programme:** Aims to help ten cities worldwide significantly reduce carbon emissions by 2030 through Finnish expertise in integrated system solutions.
- **Fisu (Finnish Sustainable Communities):** A network of cities and municipalities aiming for zero emissions, zero waste, and sustainable consumption through low-carbon policies and solutions.
- **Hinku Network (The Towards Carbon Neutral Municipalities):** Nearly 100 municipalities and five regions collaborating on emission reductions, climate-friendly solutions, and best practices in climate action.
- **Kisu (Circular Economy Knowledge Network):** Supports municipalities and businesses in funding, training, and projects to advance Finland's circular economy goals.

Vertical Coordination: external stakeholders

Vertical integration is not only secured by the city through the selection and implementation of public-led initiatives from global, EU, national, and regional levels of government. **Turku has strengthened its vertical alignment with other governance levels through collaborations with a diverse range of actors outside public institutions**. Turku actively engages with external stakeholders at various levels to ensure vertical alignment in its climate and sustainability efforts. This includes collaborations with private sector organizations, academia, financial institutions, and civil society groups, all of which play a key role in accessing funding, driving climate initiatives forward, and steering vertical alignment between policies and initiatives at different levels.

At th**e EU level**, Turku has been a pioneer in using the CDP-ICLEI reporting system, being one of the first cities to report through it since 2014-2015. Additionally, the European Investment Bank (EIB)

plays a crucial role in financing Turku's development projects, providing significant loans such as the 2019 Turku Urban Infrastructure Loan and the 2023 Turku Education Infrastructure Loan, along with advisory support. As mentioned before, even in the case of CDP-ICLEI and EIB, the interviewee praised the flexibility and adaptability of these two organizations for their effort in aligning with different frameworks applied by the city. For instance, adaptability of GHG reporting platforms such as CDP-ICLEI with emerging city's needs when working on requirements from the covenants of mayors or of the Cities Mission has been a key support for the city.

On the **national level**, Turku collaborates with several universities, including the University of Turku and Åbo Akademi University. City representatives actively participate in key national research bodies, such as the Climate Panel of Finland and the Biodiversity Panel of Finland, to ensure that nationally funded research at universities aligns with the city's climate needs.

At the **regional** level, Wallonia serves as a member-based, voluntary sustainable development service centre, offering support and climate funding opportunities for municipalities across Southwest Finland. The organization manages a dedicated budget, providing direct funding through project calls, which helps local governments access vital resources for their climate initiatives.

Horizontal Collaboration

For Turku, city-to-city collaboration is a vital tool in addressing the complex and large-scale challenges posed by climate change and sustainability. As a mid-sized city, Turku recognizes that resources are often limited when tackling these issues alone. By engaging with other cities, whether in small working groups or larger networks, Turku can leverage collective knowledge, expertise, and shared solutions. Networks like ICLEI and the Union of Baltic Cities (UBC) offer platforms where cities can **exchange best practices, develop innovative strategies, and scale successful policies**. Through these collaborations, Turku ensures that lessons learned are widely shared and applied in different urban contexts, ultimately strengthening multi-level governance and funding opportunities.

On the **global** level, Turku participates in several prominent global networks, including ICLEI, OPEN Transitions, IURC, and IUC. These international networks have indirectly helped Turku to access funding by connecting the city with consortia that have successfully secured European project funding, such as Horizon projects (e.g. RESPONSE. - Horizon 2020).

At the **national** level, Turku benefits from involvement in the Carbon Neutral Municipalities Network, which offers peer-to-peer learning and technical support, particularly for GHG inventories.

Additionally, Turku engages in **regional** collaborations like the Baltic Sea Regional Cooperation and the Union of Baltic Cities. As with international networks, regional networks have indirectly helped Turku to access funding by acting as intermediaries between the city and international consortia that have secured project funding (e.g. Interreg Baltic Sea Region Programme).

Table 3 - Summary table Turku's MLG mechanisms.

MLG mechanism	Type	Access to finance/funding
Agreement on Land-Use, Housing, and Transport (MAL)	Vertical Coordination	Yes, national government cover 30% of the investments
Energy Aid Programme	Vertical Coordination	Yes, granted by Business Finland or TEM
Municipal Climate Solutions Program	Vertical Coordination	Yes, facilitated through Fisu
National Medium-Term Climate Plan (KAISU)	Vertical Coordination	No

National Energy and Climate Strategy	Vertical Coordination	No
Ecosystem Contracts/ Agreements	Vertical Coordination	No
Business Finland/Decarbonized Cities Programme	Vertical Coordination	No
Fisu (Finnish Sustainable Communities)	Vertical Coordination	Yes, indirectly through Municipal Climate Solutions Program
Hinku (the Towards Carbon Neutral Municipalities) Network	Vertical Coordination	No
Kisu (Circular Economy Knowledge Network)	Vertical Coordination	No
Baltic Sea Regional Cooperation and the Union of Baltic Cities	Horizontal Collaboration	Yes, indirect to secure funding eg. Interreg Baltic Sea Region Programme
Participation in prominent global networks (ICLEI, IURC, OPEN Transitions)	Horizontal Collaboration	Yes, indirect to secure European fundings eg. RESPONSE – Horizon2020
CDP-ICLEI	Vertical Coordination – External Stakeholders	No
European Investment Bank	Vertical Coordination – External Stakeholders	Yes
Collaboration with national universities	Vertical Coordination – External Stakeholders	Yes, indirect funding from national level to universities
Wallonia	Vertical Coordination – External Stakeholders	Yes

7.3.2.1 Outlook

Institutional barriers

One of the main challenges Turku faces in planning and implementing its climate neutrality journey is overcoming institutional barriers. Political support, along with stable and long-term strategic funding, is crucial for implementing measures to reduce emissions. However, political shifts and the withdrawal of municipal funding programs have created disruptions. For example, the cancellation of the Climate Solutions Program, which had funded over 200 climate projects.

In addition to political instability, the structure of funding itself presents a challenge. In recent years, national funding initiatives have largely been allocated to short-term projects that encourage experimentation and promote pilot innovations, while overlooking the need for sustained, long-term financial mechanisms. National policies position cities as test beds for new solutions, requiring intensive effort and exposing them to economic and reputational risks.

For instance, a decade ago, Turku piloted the electrification of a bus line in partnership with a Finnish start-up, encountering multiple challenges, including the immaturity of the technology for Turku's cold

winters, which caused service disruptions. A decade later, thanks to advancements in procurement processes and the global market, the city and region are now electrifying all bus lines. While the experimental approach demanded significant time, investment, and political capital—potentially risking future opposition from citizens—the interviewee noted that the scale-up process benefited more from market advancements than from insights gained during the pilot phase.

Another challenge lies in the misalignment of initiatives promoted. For instance, Business Finland, a public organization under the Finnish Ministry of Employment and the Economy, channels funding through the Decarbonized Cities Program, primarily targeting companies with scalable export solutions.

Technical barriers

Turku faces two main challenges in applying the **EU Taxonomy** to its climate investments. The first challenge is a **lack of technical capacity and knowledge** among municipal staff on how to integrate the taxonomy into investment planning. To address this issue, Turku appointed specialists within the municipality to lead knowledge exchange workshops. These workshops provided training to urban planners and other civil servants responsible for the planning phase of climate investments, ensuring they could effectively apply the EU Taxonomy principles in their work.

The second challenge stems from the **comprehensive yet rigid nature of the EU Taxonomy itself.** While it provides substantial advantages in aligning investments with key environmental priorities, not all climate initiatives fit within its predefined criteria. For example, Turku's first biodiversity park, which is crucial for enhancing green infrastructure and carbon sequestration, does not currently meet EU Taxonomy compliance requirements. Despite this, the city recognizes the park's significant climate benefits and has chosen to include it in its investment plan, highlighting the need for more flexible frameworks that accommodate diverse sustainability projects.

Beyond the challenging application of the EU Taxonomy, another technical barrier Turku faces is the **lack of access to data**, particularly adaptation data related to circular economy criteria. This data gap hinders the city's ability to fully integrate circular economy principles into its climate strategies and investments.

Stakeholder engagement

Considering the communication and stakeholder engagement dimension of the climate work the municipality of Turku is advancing, the interviewee noted the **challenging position of the city in crafting a coherent narrative and communication strategy that effectively engages actors with diverse and sometimes conflicting interests, such as decision-makers, financial stakeholders, and citizens.**

Beyond the general challenge of engaging multiple stakeholders, the city must also tailor its messaging to different audiences. For instance, financial stakeholders, including municipal financial managers and external investors, focus on the technical and economic aspects of green financing, such as the administrative burden of securing green loans and the financial benefits in terms of returns and cost-effectiveness. On the other hand, city leadership and political decision-makers prioritize how green financing aligns with the broader sustainability vision and communicates a strong commitment to stakeholders and the public. Meanwhile, citizens require messaging that highlights the tangible benefits of climate actions in their daily lives. Balancing these distinct communication needs is crucial for Turku to maintain stakeholder engagement and secure long-term support for its climate initiatives.

Reflections on Multi-Level Integration

The case of Turku demonstrates how a mid-sized city can leverage multi-level governance (MLG) to drive climate action through a mix of strategic engagement, tailored policy adoption, and active

participation in broader networks. By effectively navigating complex governance structures, Turku has pursued MLG as a core ambition through complementary strategies:

- **Selecting and integrating multiple initiatives:** Turku strategically selects climate initiatives promoted at various levels of government (EU, national, regional) and adapts them to the local context. By reframing these initiatives within its Climate City Contract (CCC), the city ensures coherence and alignment between its municipal goals and broader governance frameworks (e.g. SECAP, EU Taxonomy).
- **Leveraging multiple funding sources:** By strategically selecting and integrating various initiatives, Turku has positioned itself as a strong candidate for funding by aligning with multiple funding mechanisms. Its ability to secure funding from diverse channels highlights the importance of diversifying financial support for climate projects.
- **Engaging with non-governmental stakeholders:** The city works closely with private sector actors, research institutions, and financial entities that are flexible in adopting climate frameworks proposed at different levels, ensuring a more comprehensive and adaptable approach to climate policy implementation.
- **City-to-city collaboration:** Turku actively participates in networks at national, regional, and international levels, fostering peer learning and knowledge exchange. This engagement strengthens its policy development processes and supports the adoption of best practices across municipalities.

These strategies have yielded tangible benefits for Turku, particularly in terms of access to finance. Some initiatives have provided direct financial support, while others have enabled the city to influence policy structures at various levels, ensuring that funding mechanisms are designed in ways that align with its local needs.

A key success factor in Turku's multi-level climate governance has been the openness of institutional and external stakeholders in the European MLG sphere. Their willingness to integrate various frameworks and create adaptability between them has played a crucial role in achieving synergies across different initiatives. For instance, the CDP-ICLEI/MyCovenant reporting platforms have been adjusted to cater to both the European Commission's requirements and city-level needs, making it easier to align objectives and monitor progress. Similarly, the Cities Mission has proven instrumental in aligning local and regional stakeholders, providing a unified framework for climate action.

Challenges

Despite these ongoing efforts, Turku continues to face several challenges:

- **Institutional Challenges**: Political shifts and the discontinuation of municipal climate funding programs create uncertainty in long-term climate planning and implementation.
- **Technical Barriers:** There is a need for improved data access, staff training, and technical expertise, particularly in implementing complex frameworks like the EU Taxonomy.
- **Social & Communication Barriers:** Different stakeholders require tailored messaging to ensure effective engagement. Politicians, financial decision-makers, businesses, and citizens all have unique perspectives on climate financing and policy, necessitating a targeted communication strategy.

Potential improvement

An area for potential improvement is strengthening the alignment between EU policies, initiatives, and funding mechanisms, particularly regional development funds. A more cohesive approach would streamline access to financial resources and improve the implementation of climate initiatives across municipalities. As one interviewee noted, stronger integration of climate goals within EU funding

structures—such as regional development funds and the Common Agricultural Policy—could enhance financial feasibility and sustainability impact. This is particularly relevant for Finland's biodiversity and agricultural policies, as the Baltic Sea region is heavily affected by eutrophication from agricultural activities. Redirecting funds to support biodiversity protection, circular economy principles, and climate resilience would significantly benefit both the environment and local economies.

Conclusion

Turku's experience underscores the importance of a well-coordinated multi-level governance approach in achieving climate goals. By aligning local strategies with broader EU and national policies, engaging with diverse stakeholders, and leveraging city-to-city networks, the city has successfully positioned itself as a leader in climate governance. Moving forward, improving funding alignment, knowledge-sharing, and regulatory coherence will further strengthen municipal climate action, offering valuable lessons for other cities aiming to integrate multi-level governance into their sustainability strategies.

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