



# **Exemplar case studies for capacity and capability building among cities involved in Pilots or aligned with the Mission**

**Deliverable D6.5**

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## Abbreviations and acronyms

Acronym	Description
AFOLU	Agriculture, Forestry and Other Land Use
AP	Action Portfolio
CAs	City Advisors
CCC	Climate City Contract
D followed by a number)	Deliverable
EM	Economic Model
IPPU	Industrial Processes and Product Use
NZC	NetZeroCities
PCP	Pilot City Programme
SI	Social Innovation
SOL	Solution Outliner
T (followed by a number)	Task
WP	Work Package

## Summary

This deliverable is part of the broader European Union's "100 Climate-Neutral and Smart Cities by 2030" mission, a central pillar of the European Green Deal aimed at accelerating climate action. The EU recognizes that urban areas, responsible for over 70% of global greenhouse gas emissions, are critical to achieving the continent's goal of climate neutrality by 2050. To support this, the NetZeroCities (NZC) program aids 112 cities in their transformative journey towards climate neutrality by building capacity for systemic innovation and addressing structural obstacles.

The document is situated within the NZC's Work Package 6 (WP6), which focuses on capacity and capability building to facilitate systemic transformation in cities. WP6 supports cities by offering a range of tools and programs designed to foster innovation, build cross-sector collaborations, and align local governance structures with climate neutrality goals. The deliverable provides a structured overview of the resources and methodologies developed to assist cities in overcoming barriers and building climate-neutral strategies. This includes intensive support for the Pilot Cities through the Climate City Contract (CCC) process, coaching sessions, boot camps, and a capability-building program.

The primary objectives of the deliverable are: To assess how capacity-building services under the CCC process have influenced city-level actions toward systemic change. To evaluate long-term impacts of these capacity-building efforts on city operations. To derive best practices for enhancing systemic innovation capabilities in cities. To offer policy recommendations to improve future city support programs.

The deliverable draws from a variety of methods to meet its objectives, including desk research and analysis of systemic obstacles and capacity needs in cities based on Climate City Contracts (CCCs), and evaluation of city experiences through surveys and interviews with City Advisors (CAs), who work closely with the cities. The process was highly collaborative, integrating input from multiple NZC work packages. The deliverable highlights the following key results:

- **Challenges in Adoption:** Many cities have struggled to fully utilize the available resources due to issues with navigating the NZC Portal and accessing specific tools. Additionally, some cities have limited capacity or political mandates to implement systemic innovation strategies.



- Impact of CCCs: The CCCs have proven to be a valuable tool for cities, helping them design climate strategies. However, many cities struggle to develop a holistic, systemic approach based on collective learning.
- Varied City Experiences: City capacity and engagement with the NZC resources vary significantly. While advanced cities leverage existing plans, others start from scratch and require more comprehensive support.
- Policy Recommendations: The document recommends improving resource accessibility and tailoring support to specific city needs. It also calls for stronger collaborations between cities, and clearer alignment of regional, national, and EU policies to support cities' transition efforts.

This deliverable contributes to the overall NZC mission by providing essential insights on how to improve the systemic innovation tools in support to cities to achieve climate neutrality by 2030. It underscores the importance of tailored capacity-building, peer-to-peer learning, and long-term strategic collaboration across all levels of governance. The document's findings and recommendations will guide the refinement of the NZC program and inform future iterations of city support initiatives.

## Keywords

Systemic Innovation, Cities, Capacity Building, Capability Building, Skills Building, Systemic Change, Learning, Sensemaking



# 1 Introduction

With the European Green Deal, the European Union has committed to leading global climate action. In line with this commitment, they introduced the EU Mission of "100 Climate-Neutral and Smart Cities by 2030" to support European cities in accelerating their journey towards climate neutrality. As the world rapidly urbanises, it is well known that cities, despite covering only 2% of the land surface, are responsible for more than 70% of global greenhouse gas emissions. Cities therefore play a crucial role in achieving Europe's legally mandated goal of climate neutrality by 2050, yet they face a wide range of challenges hindering their progress.

The Mission, supported by the NetZeroCities (NZN) programme, recognises the need for cities to develop new capacities and capabilities to facilitate systemic transformation and accelerate their journey to climate-neutrality. The Mission's objectives are to achieve 100 climate-neutral and smart cities in Europe by 2030 and to ensure that these cities act as innovation hubs for all other cities. As of summer 2024, 58 out of the 112 cities selected for the Mission, have already submitted their Climate City Contracts (CCCs), a governance innovation tool designed to enable cities to meet the 2030 climate neutrality target by accelerating collaborative action at all levels.

Achieving climate-neutrality by 2030 requires radical changes across various sectors such as energy, mobility, industry, and waste management, as well as in the institutional setting regarding multi-stakeholder collaboration, rules and regulations, and finance and investments. The collective action needed to bring about these changes is unprecedented and demands new approaches to governance and collaboration. Co-creating a holistic portfolio of actions, aimed at systemic transformation, is therefore central to the transition to climate neutrality.

## Background and links to other efforts

Within the Mission, NZC is supporting 112 cities across Europe in their efforts to achieve climate-neutrality by 2030, thereby aiding them in building local capacity for systemic transformation. As presented in D6.4, Work Package 6 (WP6) developed two frameworks, each with different but complementary aims, to support this outcome: a Mission Cities Programme (developed across Task 6.4, T7.2, T8.1 and T9.6) and a Pilot Cities Programme Bootcamp (developed in T6.3 in connection with WP4 principles).

This deliverable (D6.5) is connected to T6.3 and forms part of the learning programme developed in WP2. As cities mobilise through the Mission and NZC work, the best examples of capacity and capability building among cities are documented to support shared learning for all cities seeking guidance and for integration into further learning activities. T6.3 provides intensive support to Pilot Cities to overcome systemic obstacles that hinder progress on current policy and/or investment pathways, as well as addressing new domains of climate action needed to close the gap towards climate neutrality. T6.3 first provided an overview of systemic obstacles and then, building on this, developed a set of capacity- and capability-building resources such as.:

- The Climate Transition Map.
- Assistance to Pilot and Twin Cities concerning the Climate City Contract (CCC) process, including webinars.
- Pilot Cities Programme Bootcamp, including coaching sessions.
- Capability Building Programme available on the Knowledge Repository of the Portal.

## Problem statement and objectives

Cities are utilising the capacity-and-capability building resources provided by NZC WP6, along with other WPs and tasks, to build their CCCs. However, the final objective however is not to submit a CCC and obtain a Mission Label, but to drive transformative change towards a climate-neutral, just and beautiful city.



There is a risk of shallow adoption of CCC, which could overlook its value as a tool for governance innovation. To mitigate this risk, we aim to first understand if and how the capacity- and-capability building services, within the context of the CCC process, have influenced cities' ways of working. Secondly, we seek to assess the long-term impacts of these changes. Based on this analysis we will derive best practices for learning. Lastly, we will develop policy recommendations.

### **Overview of deliverable structure**

This deliverable

- Presents a structured overview of the capacity -and capability-building offer linked to NZC T6.3.
- Designs an evaluation and sensemaking approach, engaging Transition teams to understand the local impact of using these tools – building on D2.4.2 Process Monitoring Indicators.
- Presents findings on how to improve systemic innovation capability building tools for cities.
- Derives policy recommendations.



## 2 Context and background

NZC WP6 supports cities in deploying systemic innovation as a driver of climate neutrality ambitions. This approach helps cities to better identify and overcome regulatory, institutional, governance, financing, public acceptance, and other barriers that hinder progress towards climate neutrality. Our approach enables cities to adopt transformational practices by building and strengthening the capabilities and relationships crucial for systemic thinking. The overall goal is to move:

- From isolated analysis to a deep understanding of the systems at play.
- From fragmented actions to coordinated portfolios of action, and
- From top-down single leadership to deep collaboration.

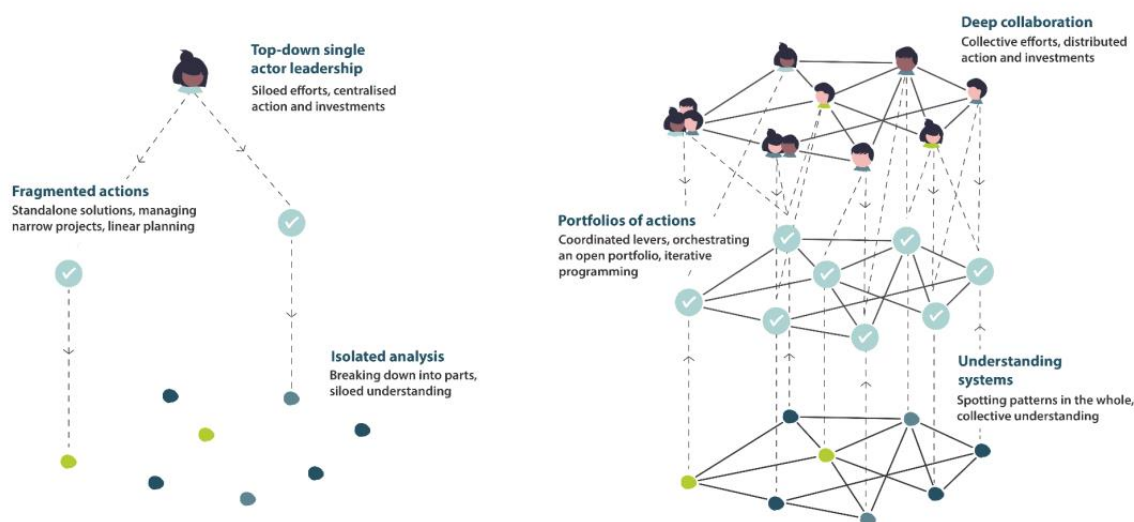


Figure 1. Systems innovation: a shift in practice (derived from [NZC D6.4 Leading Systemic Transformation in Cities](#) page 7).

This shift in practice as described above and illustrated in figure 1, is referred to by NZC as *systems innovation* and is central to the Mission's work. Such a shift is essential for establishing a long-term, strategic approach that mobilises society as a whole and builds the institutional framework, capacity and capabilities within governments. This collective action is necessary to unlock new pathways towards climate-neutrality.

In a systemic approach, the journey towards net zero is centred around the creation of a portfolio of actions that simultaneously activates several levers to address all barriers to change. In this context, "actions" refer to the specific measures, initiatives, or interventions that cities plan to implement to achieve climate neutrality. These actions are categorised in five emissions sectors (Stationary Energy, Transport and Mobility, Waste and Wastewater, IPPU, and AFOLU) and six levers of change: technological innovation and infrastructure, governance and policy, capability building, democracy and participation, social innovation, learning and capacity, and finance and funding. Systemic portfolios are expected to address all levers of change simultaneously, thus unlocking important synergies to maximise impacts.

The work done by NZC WP6 contributes to several other work packages. For example, the methodology and Climate Transition Map, for example, became central for WP1 (the CCC Process) and WP3 (the portal structure). WP6 also contributed significantly to WP4, with respective sections on systems



innovation included in the Pilot City Guidebook. Furthermore, WP6 informed the evaluation criteria for Pilot applications, the overall evaluation approach, and the selection criteria for the external reviewers. Evidence of this contribution can also be found in the Pilot City Guidebook and the Training Materials for External Reviewers.

The tasks of WP6 have evolved extensively based on city needs identified through City Advisors (WP13), CCC action planning support and reflections (WP1), and exchange with cities through City Panels (WP13) and events (WP12). Additional insights on city needs derived from initial reflections on the first iteration of their CCCs can be found in NZC WP1 *D1.11 CCC progress report* and SGA1 WP1 *D1.1 Continuous development of the CCC process as governance innovation*. These reports provide an understanding of cities' experiences with the CCC process and their evolving support needs. Such findings are instrumental for the further development and refinement of the NZC capability building programme. Through extensive collaboration across all consortium efforts, we aim to respond to emerging city needs and adapt our capability building programme accordingly.

Although the approach is intended for broader adoption beyond the Pilot Cities, it is being tested in this context. Each Pilot City is paired with two Twin Cities, which draw on the experience in strategic innovation by engaging in a structured learning process supported by the City Advisors (deployed through WP13). These City Advisors facilitate knowledge transfer and capability development actions to support the Twin Cities. NZC WP6 is involved through several subtasks, which are responsive to city needs throughout the duration of the pilots and twinning activities.





### 3 Methodology and data collection

Initially, we conducted desk research to determine which capability building resources to focus on, leading to the selection of NZC WP6 resources which are presented in the next section. In this process, we collaborated closely with Tasks T10.2 and T10.3 involved in the writing of [D10.5 Services for realising Climate-Neutral Cities](#).

Next, we designed a set of evaluation questions aimed at understanding *How to improve our capability building in systemic innovation based on the cities' experience with it*. In order to best answer this research question, we consolidated three sets of reflective questions from the following sources: Progress Indicators from D2.4, Pilot Cities reporting templates (see extracts in Annex to this Deliverable), and [Guidelines for the Design Evaluation of Public Policies of the Spanish Agency for Evaluation of Public Policies and Quality of Services](#).

**These sets of questions address three aspects:**

- What happened (which resources did cities use, how, and why).
- What has been learnt (or not) using these resources.
- What should change as a result (what should be done more of, less, differently, what is missing).

After designing the sets of questions, we considered the available data sources and methods for collection. We explored partnering with the Cities Summer School in Stockholm, intending to present the survey to cities as part of the end-of-school evaluation. However, in a follow-up conversation, it became evident that CAs, as both gatekeepers and bridges between NZC's systems and cities systems, would be better suited to provide the insights required for our learning objectives. CAs, even more than cities, are in the position to evaluate:

- What is understood as a systemic approach to climate neutrality (i.e., what it is, what is it not, its usefulness, and examples they use to convey this topic to cities).
- Which NZC tools they find effective in helping cities understand the systemic approach at an urban level, as well as challenges cities face in understanding and implementing this approach, along with positive and negative examples.

We considered two methods for engagement: a survey, and in-depth interviews. Each approach had its benefits and limitations, so we adopted a hybrid approach. Prior to engagement, CAs reviewed and shared helpful feedback on how the questions were formulated, while selected consortium experts were invited to offer improvements from the perspective of systemic change theory. These contributions helped refine the questions, making them more concise and precise.

In addition, other critical sources of important contextual data to assess the use and potential improvements to the systemic innovation learning resources, which are also reported in this deliverable, were determined to be:

- A previous engagement with CAs around cities experience in using the Portal to access Systemic Innovation capability building tools.
- An analysis of CCCs for assessment of systemic innovation approaches.



## 3.1 Capacity and capability building resources in systemic innovation

### 3.1.1 Climate Transition Map

The Climate Transition Map developed through NZC WP6 is a tool designed to showcase and describe a transformative approach aimed at accelerating decarbonisation. It illustrates an iterative process made up of several modules that together enable systemic transformation - change across multiple domains and sectors with sufficient coherence and impact to shift society toward climate neutrality.

The timeline and starting point of this journey varies depending on each city's constraints and goals, past efforts and local dynamics (e.g., elections, budget and planning cycles...). City Advisors works with cities to explore these questions through a tailored, adaptable process to kickstart their individual journeys. However, the cities themselves remain "in the driving seat", with the Climate Transition Map serving as a supportive tool, adaptable to their specific circumstances. It depicts a highly context-dependent process, where we are all learning together to navigate the path forward.

The Climate Transition Map is implemented as an interactive tool on the Portal. Each module links to relevant resources and is accessible to any registered user for self-guided learning.



Find your starting point on the interactive Climate Transition Map and click to learn more

Figure 2. The Climate transition Map as found on the [homepage](#) of the NetZeroCities Portal.

### 3.1.2 Assistance to Pilot and Twin cities concerning the Climate City Contracts (CCC) process



### 3.1.2.1 Transition Team

In T6.3.2, NZC WP6 advised on the formation of a Pilot Cities team to ensure key governance requirements for systemic change are met and built into the respective city learning objectives for pilot activities in WP2, together with WP4 and WP14.

This resulted in the creation of the [Transition Team Playbook](#): a guide to develop a city's ability to orchestrate a transition. It presents the principles of a Transition Team and highlights the key processes to enabling transformative action from a coalition of actors in reaching the goal of climate neutrality by 2030. The playbook provides a range of possible Transition Team models which acknowledge the diversity needed to match each city's context. It guides the reader through the steps for setting up such a team, with insights on necessary skills and capabilities.

### 3.1.2.2 Webinars

In T6.3.3 and T6.3.4, the partners co-created a Pilot Cities strategic narrative for decarbonisation and holistic transformation. In coordination with WP8, they supported the framing, definition, detailing, and deployment of pilots that facilitate collaboration between industries, private sectors, and civil society in systemic innovation.

This was shared through a series of webinars called *Climate Transition Map Series* and is available to any city via the Knowledge Repository on the Portal:

- [Climate Transition Map Series: Mandate Setting Webinar | 22 September 2022](#)
- [Climate Transition Map Series | NZC Activate an Inclusive Ecosystem for Change webinar | 27 September 2022](#)
- [Climate Transition Map Series | NZC Understanding the System Webinar | 29 September 2022](#)
- [Climate Transition Map Series | NZC Co-create a Portfolio Webinar | 4 October 2022](#)

### 3.1.3 Pilot Cities Bootcamp, including Coaching sessions

In T6.3.1, NZC WP6 identified systemic decarbonisation barriers, opportunities and needs in the Pilot Cities, through a range of collaborative working sessions referred to as 'transition innovation labs'. These labs employed the methodology developed in WP6.1; and were closely aligned with the work of WP4 as well as the inputs from WP7 to WP10.

In this context, WP6 conducted various activities in support of WP4 focusing on the analysis of selected proposals and direct engagement directly Pilot Cities to uncover systemic needs and obstacles. This initiative is labelled the Pilot City Bootcamp which was carried out in four stages. Each stage consisted of activities designed to progressively gather insights, creating a process of iterative information mapping and knowledge development. This culminated in the analysis presented in the *D6.3 Report on pilot city systemic innovation needs in Pilot Cities portfolio* (M24)

A tailored coaching support system was introduced in during Q2-Q3 2023 to address the unique challenges faced by the 53 Pilot Cities (across the 25 Pilot activities). The support system was structured by WP6 to build upon the systemic innovation needs that emerged from the conversations and learning enquiries formulated for each of the 25 Pilots during the Bootcamp.

The needs of the Pilot Cities were systematically mapped, enabling NZC partners to align their expertise with relevant topics and provide targeted coaching support. Each of the 25 Pilot City teams benefited from a dedicated team of NetZeroCities coaches, assembled to address the specific requirements of each pilot activity. These efforts have too been documented in *D6.3 Report on pilot city systemic innovation needs in Pilot cities portfolio* (M24).

### 3.1.4 Capability Building Programme

Available on the Knowledge Repository of the Portal, the capability programme is a self-guided learning journey made of 6 groups:



- [Activating ecosystems for change](#)
- [Building a shared understanding](#)
- [Building a strong economic case](#)
- [Developing a financing strategy](#)
- [Experimenting with a portfolio of actions](#)
- [Setting up a baseline for action](#)

## 3.2 Cities experience in using the Portal to access Systemic Innovation capability building tools

As part of user research to improve the NZC Portal, Metabolic conducted five interviews with four City Advisors. These interviews provided insights into the two main ways cities engage with systemic innovation resources: through direct engagement and via the Portal.

The interviews explored the role and methods of the CAs interaction with cities, how cities interact with the Portal, the diversity of cities involved, how they access capability building material, and the level of support they receive from the consortium or their peers.

### 3.2.1 City Advisors roles and interactions with cities

CAs operate based on trusted relations and consistent connections. A local presence is considered essential for understanding the specific context and nuances of each city. This enables them to tailor a dedicated, customised service from the wide range of NZC resources, aligning with each city's needs and challenges. CAs confirm the important reflection from cities that one size doesn't fit all, but all cities have complex layered structures.

*"There is a focus on showing cities that we work for them, not the other way around."*

The support work from CAs to cities covers a wide variety of topics, and interactions, including but not limited to:

#### **Process support**

Assisting with CCC and PCP application submissions, helping cities navigate the templates, and directing them to relevant CCC examples to refer to. CAs may also refer cities to specific Helpdesk resources for additional support.

#### **Learning**

- Finding resources in the Knowledge Repository.
- Facilitating connections between cities, among CAs, and across consortium partners to explore synergies.
- Identifying successful case studies that can be replicated for similar challenges.
- Finding specific consortium expertise for project plan input: Connecting with expertise in the City Support Group, or partners in the CSG network, or setting up a request to the City Expert Support Facility (CESF) to get an expert from a local field to do additional work on a specific project.



### **Communication and buy-in**

- Supporting city representatives to overcome scepticism towards the Mission, at local, regional, and national levels.
- Engaging citizens and other stakeholders around the CCC.
- Establishing national platforms, as local teams need to leverage European support in advocating for climate neutrality across higher levels of government and politics.
- Facilitating connections between cities and other organisations, such as those involved in city-organized events.

### **3.2.2 Variety in city characteristics**

There is a wide variety of maturity levels in cities engaged with the Mission. While we highlight a few examples here, it is important to note that it is not an exhaustive list. Recognising these variations is crucial for improving the service offering.

Some cities are very advanced in their holistic planning of emissions reductions, viewing the CCC as just an ‘add on’, not something entirely new - they already have well- established action plans and governance models. Other cities “start from scratch”.

There are also differences in opportunities for national collaboration. Some cities are the only Mission City in their country, lacking direct partners with whom they can collaborate.

Political mandates at the local level vary significantly as well. In some places, the local municipalities have only recently been recognised, limiting their political power. For others, the Mission is structured from and / or managed by the regional development agency – a technical advisory body without actual political authority. Additionally, some municipalities can't raise their own local taxes. These are all factors that can contribute to challenges in developing solid and systemically innovative action plans with strong political backing.

Cities also differ in their internal capacity to manage the development of the CCC. In general, they have limited time for ‘framing workshops’ but are eager to see results. Some cities feel very mature, but the strength of the Transition Teams is key. These teams vary significantly—some are more diverse and specialised, with dedicated climate departments, while others consist of only a couple of people treating NZC as just one of many projects, without political support.

Anecdotal evidence points to the potential issue that in some cities, employment laws might not provide sufficient protection for municipal employees. With a new mayor all the staff can be replaced. Additionally, there can be laws that keep the staff salary low, making it unattractive, to work for the municipality.

### **3.2.3 Cities experience in using the Portal and its resources**

The Portal is intended to be the space or hub where cities and CAs can find all resources needed to create an individualised offer and unique journey – starting with capability building in systemic innovation as a foundation to the CCC process.

#### **What did not work**

City representatives report that they mostly use the Portal for templates, guidance and exemplary CCCs, but struggle to find specific resources or engage with others, including stakeholders. CAs frequently receive emails requesting support for these issues. The Portal is described as confusing and hard to navigate, and time-consuming to use. Another potential issue highlighted by Portal users is that it is disconnected from other platforms.



CAs report that cities currently need extensive support to complete their CCCs and have difficulties accessing the resources required. Both CAs and cities report they are frequently unaware of where to find specific materials on the Portal, or that certain helpful resources even exist, leaving them unsure of what to search for or request.

Many capacity building groups on the Portal lack content, leading CAs to sometimes guide users to empty groups. In addition, national groups are not being used. Since many cities found the groups on the Portal ineffective early on, they prefer to use other channels such as MS Teams for communication. Once these alternative channels are established, changing back to the Portal becomes difficult due to established habits, even if the current solutions are not optimal.

### What worked well

On the positive side, in general, even those CAs that were sceptical about the CCC, report that it has become the key document for cities to draw and design their journey. As such, the CCC is seen as valuable, beyond its role in achieving the Mission Label. Cities report that reading each other's CCCs is a valuable learning tool, because of the document's comprehensive nature which includes an overview of all the actions and barriers. However, the varied focus of the CCC's remains a challenge, with some focusing more on what goes well instead of also highlighting the barriers.

When working on the impact pathways, many cities were initially struggling with a steep learning curve. Extensive support from CAs and the CSG led to all cities including impact pathways in their CCCs.

One factor that helped cities persevere was seeing examples of cities who managed to overcome their challenges, demonstrating the value of persistence. This also fostered connections providing ongoing support for the cities.

In terms of engagement, CAs report that different formats work for different purposes and different situations, but peer-to-peer and in-person interactions seem to be preferred as they are deemed to be the most efficient.

Some CAs facilitate workshops with cities on different topics and have designed numerous workshop templates that support the CCC template.

*“Creating an inspiration and a forward-looking idea is online much harder than in person.”*

Many cities found the info sessions helpful, and appreciate having access to webinars, as they accommodate their schedules.

It is important to make sure that all resources are easy to access, well-organised, and in as much as possible, self-explanatory. Basic good practice should never be taken for granted, for instance, when files are mentioned in webinars, they should be linked to ensure they can be easily found.

## 3.3 Analysis of CCCs

Another source of data to evaluate the impact of systemic innovation capability building tools developed for cities and with cities by NZC is to assess submitted Climate City Contracts from this perspective.

Understanding a systemic approach as one in which all emissions sectors and all levers of change are activated simultaneously, we can think of an evaluation metric to assess how 'systemic' a city's strategy is. As Mission Cities are required to address all key emissions sectors to reach the climate neutrality ambition, focusing on the extent by which CCCs present the activation of all six levers of change simultaneously will give us a ballpark measure to evaluate how 'systemic' the approach is. It must be noted that this measure could and shall be improved by integrating a third layer of evaluation, namely the extent by which all relevant stakeholders are included in the CCC.

To support this analysis, 2100 actions from Climate City Contract Action Plans (CCC AP) have been extracted to an Actions Database and analysed. By mapping these actions against the levers of change,



we could assess the extent to which the portfolios of the Mission Cities embody an innovative systemic approach. This work is ongoing and will lead to the publication of a scientific conference paper.

The data analysed so far reveals that **Technology and Infrastructure** is the main lever of change activated in most sectors, especially in stationary energy (buildings), as 60% of actions in this sector are under this lever, and mobility (50%). The **Governance and Policy** lever also plays a notably significant role. Other levers are recognized as important but are addressed by a much smaller number of actions.

The average number of levers of change per action, as self-reported by cities, is 1.5 out of 6. The actions are thus generally not yet highly systemic.

The sectors with the highest average number of levers per action are Waste and AFOLU, resulting in the most ‘systemically’ addressed sectors. However, these are also the sectors estimated to deliver the lowest GHG reductions.

The most adopted actions can be categorised under the tags “Energy Efficiency”, “Photovoltaics”, “Public Transport”, “Recycling”, and “Digitalization”. Out of these, “Public Transport” is categorised under the most levers and is thus being addressed in the most ‘systemic’ way. In contrast, “Energy Efficiency” and “Photovoltaics” are predominantly categorized under the single lever of Technology and Infrastructure, which might lead to a non-systemic approach and not underpinning the creation of synergies to maximize impact.

Next steps, beyond including the number and type of stakeholders per action in the evaluation, are to evaluate not only at sector and action scale but at portfolio scale (by city), and other lenses such as e.g. city size, location, etc.

In the next phase, once we have gathered the insights of the first iterations of these actions, we will evaluate the impact of their implementation. This will allow us to determine whether portfolios that take a more integrated, systemic approach—whether at the sector or city level—are more impactful than their more ‘siloes’ counterparts.

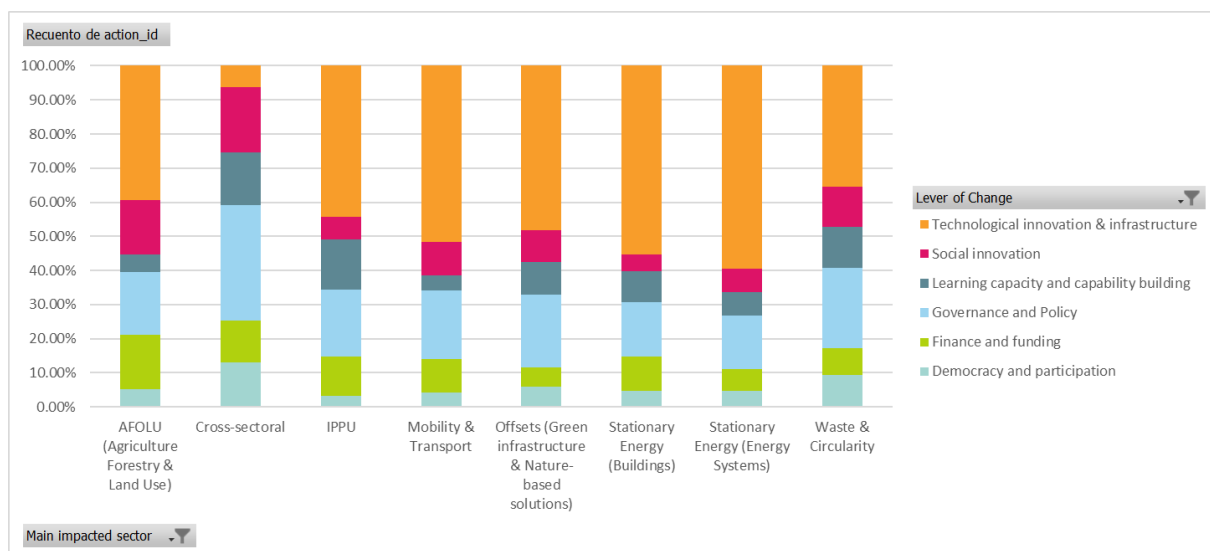


Figure 4: Levers of change activated by source sector / emissions domain. The Y-axis represents the total counts in the database; note that tags may appear multiple times.

When compiling the Actions Database, further reflections on the CCCs systemic approach could be gathered. These reflections further strengthen confidence that, to improve capacity building in systemic innovation in cities, there is a need to develop skills in activating levers other than technological innovation and infrastructure (TI&I) and governance and policy (G&P).

A clear need to integrate Finance & Funding, Learning Capacity and Capability Building, Democracy & Participation, and Social Innovation (SI) levers emerges from the following considerations:

- Several cities report significant reductions in GHG emissions over the past years or even decades. However, only a few provide detailed explanation of how these have been achieved and even fewer how this informs their action plan towards climate neutrality.
- Several cities mention citizen and stakeholder engagement processes. There are several references to polls and public consultations and how the strategy addresses citizens' concerns. Yet only a small number explain how this feedback directly influences their climate neutrality action plan.
- While most cities highlight co-benefits linked to their impact pathways and action plans, only a few incorporate qualitative indicators. Furthermore, almost no cities present a strategy for learning from these indicators or from the broader process—such as what worked, what didn't, and why.
- Just Transition is frequently mentioned, especially as a recognised opportunity to reduce social inequality linked to the climate transition. However, there is a lack of detail on how cities plan to address the issue concretely.
- Just Transition is frequently mentioned as an opportunity to reduce social inequality in the context of the climate transition. However, there is a noticeable lack of detail on how to concretely address the issue.
- The role of multi-level governance emerges as both an enabler and a barrier. There is a clear link between GHG reductions and regional development, particularly regarding energy grids, energy sources, and transport planning.
- Investment plans often specify the overall funding requirements (how much) but provide limited detail on the sources or timing of the funds (where the money will come from and when it will be there).

### 3.4 City Advisors survey

The [Systemic Innovation Capability Building Survey](#), available via the hyperlink, was distributed to CAs. Ultimately, two CAs representing 13 cities submitted an online response, and three CAs representing 33 cities were interviewed. In total, insights were collected from five City Advisors, collectively representing 46 cities.

The first part of this chapter briefly summarises the survey responses regarding how cities utilised NZC services. Respondents could choose between options from “not at all” to “regularly” to indicate usage, and from “not at all” to “to a high extent” to reflect the level of support the services provided in their daily work.

The responses reflect the personal perspectives of CAs, based on their experiences across extensive, multi-annual work with multiple cities. These insights are crucial for understanding which NZC services are actively used, and which offer the most support in cities' efforts to become climate neutral. It is however important to note that City Advisors personal approaches and individual professional experiences influence the way cities perceive using and learning from the tools evaluated in this deliverable, so, this has to be taken into account when designing improvements and developing recommendations.

Throughout this section, numbers in brackets next to bullet points refer to the amount of CAs choosing the respective answer. Bullet points without values in brackets refer to open field answers. *Italic text* refers to direct quotes.





In response to the question *How has your city used the following NZC services so far?* the services rated as *regularly used* by one or more CAs were as below.

- The Climate Transition Map (1).
- Pilot Cities Bootcamp Programme (including systemic innovation capability building themes such as Clusters for learning”, “Impact pathways workshops”, etc.) (4).
- Tailored coaching sessions (4).
- NZC knowledge exchange activities such as webinars and other types of Peer-to-Peer learning (4).
- Direct CCC Assistance to Pilot and Twin Cities on systemic approach (2).
- Twinning Learning Programme (3).

To the question *How much have these NZC resources supported your city or your daily work towards a systemic approach towards climate neutrality?* one or more CAs responded with *to a high extent* to:

- Capability Building Programme: Building a strong economic case (1).
- Transition Team Playbook (1).
- Pilot Cities Bootcamp Programme (Clusters for learning, Impact pathways workshop) (3).
- Coaching sessions (3).
- Direct CCC Assistance to Pilot and Twin Cities on systemic approach (3).
- Twinning Learning Programme (1)

The second part of this chapter is primarily based on the free-format responses provided. The main questions are:

- How have the resources supported CAs and city in their activities?
- How do the NZC resources on capacity building in systemic innovation address your actual needs?

The supportive questions include:

- What do you see as limitations or challenges with the Climate Transition Map?
- Has the Climate Transition Map process improved or increased your own or your city practitioners' capabilities in systemic innovation?
- What have the active users learned from the Climate Transition Map process?
- Does your city have sufficient personnel resources and capacities to further develop its Climate Transition Map process?
- Are there any other remarks that you would to share regarding capacity building for systemic innovation?

These questions play a central role, as CAs explain their experiences and insights in working with the Mission Cities. The responses are categorised into “Good” and “Challenges”. The following highlights are mainly drawn from these answers.



<b>What is Working Well</b>	<b>Examples</b>
Frameworks for change	Climate Transition Map, CCC as a template
Practical tools & support	Coaching sessions, visual tools, impact pathways approach

<b>Key Challenges Identified</b>	<b>Descriptions</b>
Information overload	Too much data, requires better navigation
Generic descriptions	Some parts are too abstract or lack clear examples
Translating theory to practice	Difficulty implementing systematic change in practice

<b>Areas for improvement</b>	<b>Description</b>
More tailored support	Step-by-step guides, practical services for cities
Continuous feedback	Integrate feedback loops into services

<b>Citizen Needs Expressed</b>	<b>Description</b>
Simplicity and clarity	Easy-to-understand, practical tools readily available
System integration	Incorporate systemic thinking into day-to-day city operations
Financial alignment	Help redirect city's financial streams for better outcomes



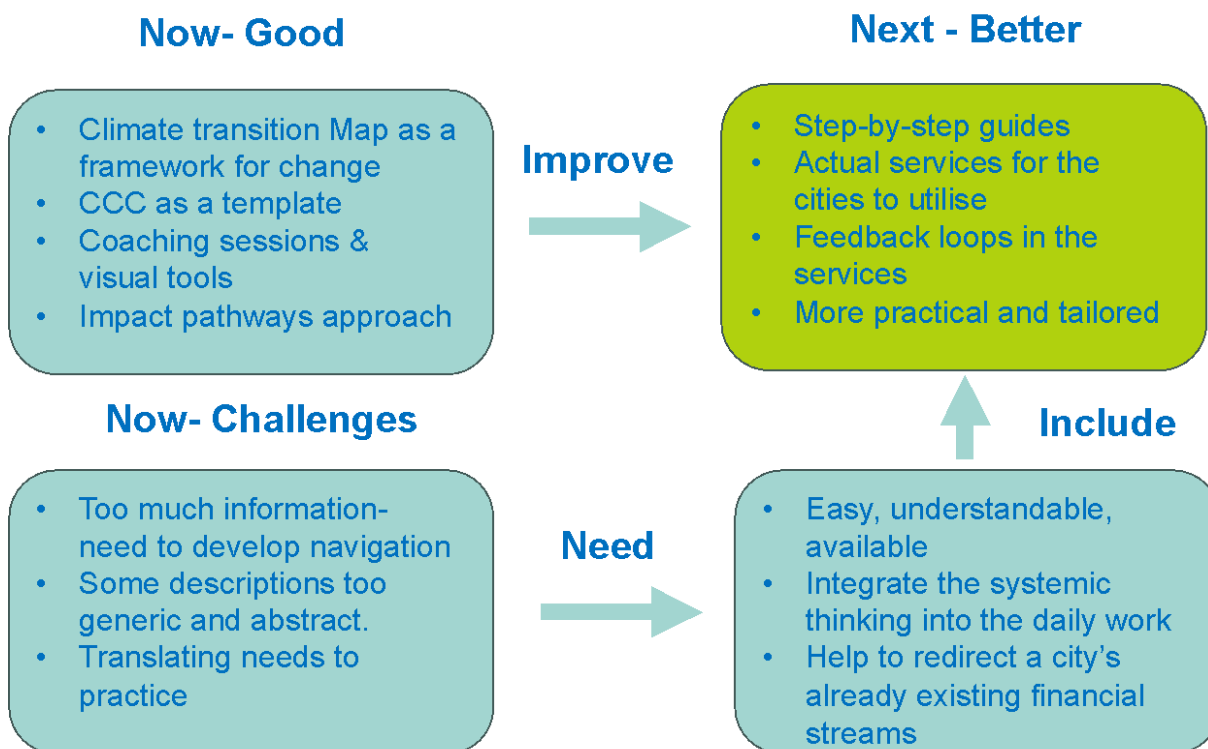


Figure 5. Selected highlights from CA survey answers

Below we present a summary of all the responses from the CAs. It is important to keep in mind that the summarised findings describe the work of highly experienced experts with a wealth of knowledge drawn from 46 Cities.

The responses to the two overarching questions – provide a list of positive experiences where the city needs have been supported in a practical way, as well as improvement opportunities.

- The CCC worked well as a tool and template for cities beginning their climate journey, for more advanced cities, peer-to-peer exchanges were most beneficial. However, while cities referenced each other's Climate CCC, it was not always seen as a particularly useful resource, offering more mental support than practical help. This underscores the fact that each city is unique and needs a tailored approach.
- The Mission Info Kit was praised as a very effective tool.
- All cities appreciated the coaching sessions. In cities that are more advanced in systemic thinking (according to CAs own understanding via direct engagement with Transition Teams), coaching sessions appear to be “much easier”.
- The Climate Transition Map helped cities navigate their approach to the Mission, proving useful in planning both internal processes and city-wide efforts. For example, Umeå made extensive use of it, even creating a Swedish version for upscaling and repetition. However, some cities report that the descriptions of the specific stages of the Climate Transition Map on the Portal are too generic and, in some cases, overly abstract.
- Peer-to-peer services like the Bootcamp allowed cities to reflect on their positioning and connections, which was helpful for CAs in designing working sessions. Examples of well-received workshops include sessions on structuring a Transition Team and a workshop on Impact Pathways, attended by local mission coordinators.
- The Impact Pathways approach has been considered very useful among the cities. Workshops coaching etc has been utilized a lot among the cities. Workshops, coaching sessions, and other

support have helped cities adopt systemic thinking and a more holistic approach to future projects. This systemic integration into daily operations is essential.

- The higher up one goes within city management, the less relevant the information becomes for (senior) local officers already under time pressure. Direct engagement with these officers is crucial for capturing their attention. In terms of capacity building, it was highly relevant to familiarise cities with the terminology and principles of the Mission. However, the programme could focus more on tangible, concrete projects tailored to a city's level of advancement or regional specifics (e.g., district cooling in the Mediterranean, car-free zones in South-Eastern Europe, coordination of overlapping construction works, etc.).
- In this context, the City Expert Support Facility and the City Support Framework were particularly welcomed. However, there needs to be clearer communication on where the consortium's responsibility ends, and the cities begins. Besides this, there should be more clarity on potential conflicts of interest.
- The Knowledge Repository on the Portal is "too large", and it takes too much time to sift through. There is too much material, and it is not user friendly. More accessible language should be used throughout, and specific support tools should be easier to find.
- In general, the more practical and tailored the service the better. Either through facilitating peer-to-peer exchange between cities, workshops, or through direct services such as the NetZeroCities Economic Model. This opens a question of how to present tools and services for cities to integrate the systemic thinking into the daily work in a practical and tailored way.
- CAs deliver capacity building in a highly personalised manner which can take multiple forms: coaching sessions, visual tools, etc. Currently, CAs create their own material, but there is still a need to better showcase what already exists.

In conclusion, the most helpful resources have been direct assistance from CCC, the Climate Transition Map, and dedicated coaching sessions (e.g., citizen engagement within the CSG work). Cities try to participate regularly in the info sessions, but generally don't actively use the Portal.

The How the resources did support CA and city in the activities – question also highlights areas that need improvement and further development to better meet city needs, providing more practical support. Cities need services that are easy to use, understandable, and readily available. To avoid overwhelming users with too much information, improved **navigation** is essential, as the current system is difficult to navigate. It would be helpful to have a menu of services combined with user journeys, step-by-step guides, and / or real-life examples to better understand how to navigate the system. In addition, services should have more feedback loops (e.g., customer satisfaction).

A central need for support is identified in

- Helping cities redirect already existing financial streams (e.g., reorganising taxes/subsidies/premiums/procurement etc) and activities (e.g., linking with events, culture, tourism) towards CCC implementation.
- Social Innovation tools.
- A central question emerging from the interviews is around *How can progress in systemic innovation be tracked?*

Below are answers to more specific questions on individual tools.

*What do you see as limitations or challenges of the Climate Transition Map?*

- There is no direct link to the CCC.



- It is not well integrated or aligned with other plans and activities at the city level (2).
- One limitation is that the Climate Transition Map does not fully convey the Mission approach, particularly how it can accelerate and increase the ambition.
- The content is not specific enough (2).

*Has the Climate Transition Map process improved or increased your own or your city practitioners' capabilities in systemic innovation?*

- Yes (2), To some extent, yes (1), and *"It is a useful tool for cities to design (series of) workshops."*
- No (1), and *"I believe the workshops have been more impactful than the map itself. Only one or two cities have truly needed the map."*

*What has been learnt among the active actors of the Climate Transition Map? Or What key insights have been gained by the active participants of the Climate Transition Map process?*

- *A major learning point from the Climate Transition Map is the iterative nature of the climate transition process.*
- *The Climate Transition Map is a good framework for change.*
- *Its circular nature helps build a shared understanding and gets everyone aligned.*
- *The way it illustrates process and plans has been useful in making sense of the process.*
- *It has helped cities better plan the process and opened the city's perspective to innovative approaches.*
- *None.*

*Does your city have sufficient personnel resources and capacities to further develop its Climate Transition Map process?*

- Some cities have adequate resources in terms of personnel resources and capacities, but most do not. There is a wide representation across the entire spectrum of realities. However, all cities report envisioning needing more capacity for climate work and continuous work on mobilising internal resources.
- Many cities strategically focus on just three top priorities, with resources being one of them, as Human Resources for the transition remains a significant barrier. Some cities are still seeking solutions, such as creating separate institutions or securing additional funding. In this regard, developing a coherent, holistic narrative plays a crucial role in aligning with other initiatives and unlocking synergies which can support resourcing.
- Most teams are focused on implementation and making the transition a reality. Moreover, the ones disproportionately focussing on CCC iterations (every year or two years) might be overcompensating a lack of political will or backing into actual fundamental change in their city.

*Do you have any other remarks that you would like us to know considering capacity building for systemic innovation?*



- Cities would greatly benefit from step-by-step guidance. Short guides are particularly appreciated.
- Iterative workshop processes that cities could repeat to track their progress and determine next steps.



## 4 Recommendations to develop Best Practices

### 4.1 Recommendations and actions taken to improve NZC capacity building tools in systemic innovation

Two key findings emerge from the material gathered by this work:

- Cities most likely do not go through the Portal to find resources but contact a CA or each other directly – so CAs must be highly skilled in systemic innovation or have easy access to a support group that can help them.
- The learning/capability building needs and -process of cities are quite dependent on their local situation (politics, capacity, etc.) - so (a broad range of) use-cases coupled with tailored support should be developed to meet different needs and maturities.

As a result, we recommend

#### **Improving both Portal and services offer navigation and structure.**

- It seems clear that both CAs and cities need systemic innovation capability building resources to create CCCs but have difficulties using the Portal to access and use these resources. They either do not know where to find them, or do not know they are available to begin with. As a result, as a first step, NZC WP6 has created an [overview and summary page](#) on the Knowledge Repository presenting a full collection of resources.
- There is a great opportunity in improving the vision of the Portal as a potential bridge to make the CCC process and the guidelines related to it much clearer and user friendly compared to the status. In this regard, the systemic innovation capability building resources could be integrated much more effectively within the process of creating a CCC as guided journey via the Portal. Specifically, the link between CCC and the Climate Transition Map as a bridge to more systemic innovation capability building resources could be improved. This is the focus of ongoing efforts, including making the Portal should much more relevant by crafting user journeys for specific use-cases:
  - CAs daily workflows.
  - Peer-to-peer conversations between cities.
  - Non-Mission Cities users.
- An important recommendation identified is to improve the system of tagging information. An initial proposal has been developed and resulted in a first mapping of [NZC MEL Information categorisation structure.xlsx](#). This structure is being developed to improve logical links and synergies - aimed at accelerating learning, across elements shared by CCCs, PCP, Solution Outliner (SOL), NetZeroCities Economic Model, Barometer, City Dashboard, and Knowledge Repository.

**Improving individual systemic innovation capability building resources** by revisiting and integrating aspects of:

- Involving different actors who may have very different expectations and interpretations of what outcomes are successful or desirable. A better integration of the Systemic Innovation



methodology should allow for diverse viewpoints and completely different understandings of what the CCC is about.

- Considering Monitoring, Evaluation, and Learning at whole portfolio scale, to transcend the boundaries of single interventions and identify critical linkages and common challenges in the pursuit of systemic transformative change.

**Improve skills of CAs** - Beyond technical expertise cities staff lack both the capacity and, in some cases, the skills to setup a CCC as a holistic governance tool. CAs thus don't just point cities to resources (bridging between the services NZC has and the right persons) but must support them on how to setup the framework and structure the pathway to a CCC. **CAs need to be trained in systemic innovation themselves, to set cities on the way to writing a plan that's not just a set of actions but is about the whole Mission.** This includes reflection and sensemaking to identify and address holistic aspects such as:

- Building a mandate.
- Project-based barriers.
- Things that go wrong or that the city doesn't yet see as a problem.
- Actors already active in the field that need more confidence.
- Conceptualise some of the problems into solutions.
- Tackling the things in the local context that people are afraid to voice.
- Connecting the city with the right people.

**Address most critical cases with a dedicated approach** - There are also many other barriers for less advanced cities before they can even get to capability building. Not just the Portal, but workshops, events and collaborations between cities, supported by CAs, can have great capability building impact. Barriers in this regard are especially pronounced when there are no other cities in the country to connect to around the NZC mission, when lacking political mandate, or stability in Transition Teams. As a result, we would recommend identifying cities where this is the case and developing a dedicated approach for them, as groups with specific needs.

## 4.3 Policy recommendations for cities

The following policy recommendations are directed towards local and city-level decision making, with the objective to better support city authorities in accelerating learning and systemic innovation for their climate transition pathways. The recommendations are derived from the City Advisor interviews, quantitative portal data and CCC reviews. In addition, the policy briefs from NZC WP 14 policy labs were reviewed to ensure relevant policy recommendations were included, and coordination of the recommendations below with other WP 14 deliverables.

As mentioned in previous sections, recommendations should further improve skills in multi-level action design, i.e. in a systemic innovation approach. The majority of CCCs did not set out an action plan with systemic portfolios. In addition, the vast majority of CCCs do not include Learning processes to integrate evidence-based reflection and feedback from multiple stakeholders in iterations to the CCC.

Based on these findings, there are several challenges that cities are facing. These include but are not exhaustive to:

- Lack of resources (funding, time) for training and effective, practical expertise to develop and implement certain pathways.





- With this, the lack of knowledge of where supportive resources are and how to navigate the landscape of different policies and levers of changes.
- The lack of resources (time, knowledge) of how to take advantage of standardised or general tools and resources within their local context. Conversely, the tools were often deemed as 'too' standardised, i.e. they were not supportive as they could not be adapted to local needs.
- Lack of resources (funding) to hire experienced staff or knowledgeable staff. In some cases, the training itself poses a challenge because staff are more likely to be recruited elsewhere.

Despite this, cities are still keen to continue with learning support, learn from one another and utilise available resources, all with the aim to improve their understanding and local/regional/national processes towards tackling the transition to climate neutrality. Cities still require and request multi-level governance guidance.

What was clear from the results was that if cities are to work systemically, this support needs to be contextualised for local use, including considerations towards learning culture, communications and engagement with stakeholders, resources available (knowledge, funding, time) and strategic priorities.

1. **Improve harmonisation of EU policy with local policies:** City authorities often lack expertise, adequate funding for hiring experts and available time to understand the EU policy landscape across all sectors. Better harmonisation of policies, with clear communications and training can support public bodies.
2. Look for opportunities for national collaboration and building inter-city networks, to enforce political backing for climate initiatives.
3. **Systemic innovation training to all staff:** Avoiding the risk of training few members of staff and they leave, aim to train as many members of staff as possible to encourage systems thinking throughout the organisation and encourage internal change.
4. **Build understanding and acceptance internally:** Understanding the needs of city authorities, in the various departments, is key to understand how to transition and work together effectively with the same goals in mind.
5. **Consider the CCC as a governance innovation tool:** The CCC can become a tool for cities to tackle challenges systemically, encouraging them to move away from silo-thinking.
6. **Support local capacity building with research funding schemes:** The resources developed and supported tackle certain elements of systemic innovation and capacity building with cities, but there are other elements to be further explored, for example in developing more local and specialised step-by-step approaches on the portal. In addition, funding to continue testing and piloting methodologies and practices to identify what works for cities is needed.



## 5 Conclusion

The current tools developed under the NetZeroCities (NZC) program, such as the Climate Transition Map, the Pilot Cities Programme Bootcamp, and coaching sessions, have proven to be valuable resources for cities on their journey to climate neutrality. These tools provide essential frameworks for systemic innovation, helping cities navigate the complexities of decarbonization across multiple sectors. The Climate City Contracts (CCCs), in particular, have been recognized as a key governance tool, enabling cities to design and implement tailored climate strategies. However, the uptake and effectiveness of these tools vary widely across cities, reflecting differences in political mandates, internal capacities, and readiness for systemic change.

Despite the positive impact, several challenges remain. Many cities face difficulties in accessing the NZC resources due to the complexity of the online portal. Improving the usability and structure of the NZC Portal—by introducing better tagging, clearer user journeys, and intuitive navigation—can make resources more accessible and user-friendly. The tools developed should be better integrated into the overall process of creating CCCs, ensuring that cities can easily find and apply systemic innovation resources throughout their planning and implementation phases.

Some cities also face capacity constraints or lack the political support necessary to fully embrace systemic innovation. Additionally, there is a tendency for cities to focus on lever-specific actions rather than adopting a more integrated, systemic approach, limiting the potential for transformative change. Tailored and personal support for cities, based on their specific needs and maturity levels, is critical in this regard. There is also a need for greater collaboration between cities and clearer alignment of local, national, and EU policies. Cities require clearer guidance on this aspect.

The insights outline several best practices that can be derived to support cities in achieving climate neutrality by 2030:

- **Holistic Action Portfolios:** Cities should create portfolios of actions that address multiple sectors and levers of change (e.g., governance, finance, infrastructure, social innovation) simultaneously. This integrated approach maximizes synergies and drives broader, more impactful climate strategies.
- **Iterative Process:** The climate transition is an ongoing, iterative process. Cities should adopt flexible frameworks, such as the Climate Transition Map, that allow them to continuously adapt and refine their strategies based on local conditions and new insights.
- **Tailored Support and Coaching:** Customized support for cities is essential given their varying capacities and levels of maturity. Dedicated coaching sessions, workshops, and learning programs that address specific city needs (e.g., political, financial, technical) are key to driving effective climate actions.
- **Localized Learning Resources:** Resources should be adaptable to local contexts, which cities can modify to suit their political, economic, and social landscapes. This ensures that cities remain “in the driver’s seat” while being guided by expert tools.
- **Co-creation and Stakeholder Involvement:** Successful systemic innovation requires the active participation of local stakeholders, including government bodies, citizens, industries, and NGOs. Collaborative governance mechanisms, like Climate City Contracts (CCC), should be designed to foster broad participation and build consensus across sectors.
- **Peer-to-Peer Learning:** Cities benefit greatly from learning from each other’s experiences. Encouraging peer exchanges and shared learning platforms (e.g., Pilot Cities Programme Bootcamp) allows cities to replicate successful practices and address common challenges.



- Policy Harmonization: Effective multi-level governance that harmonizes climate goals across regions, national governments, and the EU is critical for enabling coordinated, large-scale climate action.
- Long-term Strategic Planning: Cities should move beyond short-term, sector-specific actions to embrace long-term, systemic strategies that engage various stakeholders and political levels, ensuring that their climate actions are sustainable and supported by robust policy frameworks.
- Monitoring and Feedback Mechanisms: Cities should establish systems to continuously learn from their climate actions. Monitoring, evaluation, and feedback loops are essential for refining strategies and ensuring that cities adapt based on evidence and evolving conditions.
- Building Internal Capacity: Cities should invest in developing the skills and capacities of municipal staff, particularly in systemic innovation. Ensuring that knowledge is retained and expanded internally is crucial for sustaining long-term climate initiatives.

These best practices highlight the need for a tailored, flexible, and collaborative approach to achieving climate neutrality, ensuring cities are empowered with the right tools, resources, and governance structures.

## Bibliography

[Use the APA citation style – see <https://www.library.cornell.edu/research/citation/apa> for details]

Huberman, N., & Pearlmutter, D. (2008). A life-cycle energy analysis of building materials in the Negev desert. *Energy and Buildings*, 40(5), 837–848. doi:10.1016/j.enbuild.2007.06.002

Bending, R., & Eden, R. J. (1984). *UK Energy: Structure, Prospects, and Policies*. Cambridge, UK: Cambridge University Press.

[1] Wei T, Wu J and Chen S (2021) Keeping Track of Greenhouse Gas Emission Reduction Progress and Targets in 167 Cities Worldwide. *Front. Sustain. Cities* 3:696381. doi: 10.3389/frsc.2021.696381

[2] Kılıç S, Ulpiani G, and Vettors, N (2024) Visions for climate neutrality and opportunities for co-learning in European cities, *Renewable and Sustainable Energy Reviews*, Volume 195, 2024, 114315, ISSN 1364-0321, <https://doi.org/10.1016/j.rser.2024.114315>.



## 6 Annexes





Figure 6. The design of a survey.

## 6.2 D2.4 Process Indicators

Process Indicators from [240130 D2.4.2 Comprehensive Indicator Framework v2.0.docx](#), which were developed to capture the transformative change happening in cities.

### 1. General Process Indicators (Overarching the Impact Pathways)

Indicator Specification	Type of measurement
Have all representatives of the relevant value chains (e.g. per field of action) been systematically involved in the design of the measures?	Gradual rating
Is the preparation and further development of the climate neutrality portfolio provided with sufficient resources and capacities?	Gradual rating
Have clear success criteria been defined for the climate-neutrality portfolio measures? What needs to be refined or made more explicit?	Yes/no/partly Open Text
In case of failure/unexpected difficulties in implementation, have fallback options been defined and elaborated (for example in the form of scenarios and alternatives)? If so, which ones?	Yes/no/partly Open text

### 1. Technology and Infrastructure Processes

Sub-dimension	Indicator Specification	Type of measurement
Building technology/energy/mobility/NBS/green industries/circularity	Are the technological solutions required for the measures defined and further developed together with the end users and stakeholders?	yes/no/partly
Digital tools	Are digital tools available that support your Action Portfolio (AP) sufficiently? What types of tools are you still missing?	Yes/no/partly Open text
Enabling instruments	To what extent are enabling instruments in place that support the development and deployment of necessary key technology? What needs to be improved (by whom)?	Gradual rating Open text

### 2. Governance and Policy

Sub-dimension	Indicator Specification	Type of measurement
Multi-level alignment	Is working across various departments in the city administration established? What works well already, what could still be improved?	Yes/no/partly Open text
	Are strategies and CCC/Action Portfolio processes aligned? If no, what hinders the alignment?	Yes/no/partly Open text
	Is the continuity of active actors across multi-level governance/bodies ensured? If not, what needs to be brought into place to enable and ensure it?	Yes/no/partly Open question
	To what extent is political leadership and support available for the AP goals/for the CCC process?	Gradual rating Open Text
Ownership	Are the roles and responsibilities as well as decision-making powers clearly defined and have appropriate processes been implemented for this purpose? What still needs improvement?	Yes/no/partly Open text
	Is a sufficient diversity of actors involved within the municipality? If no, what/who is still missing to carry out the AP?	Yes/no Open text



	Are there opportunities for policy experimentations and testing?	Yes/no
	How transparent are the decision-making processes related to CCCs and action portfolios in your city?	Gradual rating
	What is the intensity of communication between governance actors? How is it managed?	Gradual rating Open text
	Are all relevant capacities and expertise that exist in the city included and used? If not, how could you make better use of them?	Yes/no/partly Open text
	To what extent is the existing and relevant legal framework for public authorities sufficient for the implementation of the AP?	Gradual rating

### 3. Democracy and Participation

Sub-dimension	Indicator Specification	Type of measurement
Linking society to	Are your involved citizens representative for the city? How can you further increase representativeness and inclusiveness?	Open text
	Do you actively involve different groups of citizens in the various processes (or are you working with the same group of people for all public consultations)? How do you address the challenges when working with different citizens' groups? Do you have an effective stakeholder management in place?	Yes/no Open text
	What kind of dedicated engagement spaces are established in your city?	Open text
Decision-making	Are any mechanisms to respond to citizens' input in decision-making processes in place?	Yes/no/partly
	Do the results of your city's participatory processes feed into strategies/the action portfolio? How?	Yes/no/partly Open text
Interaction and incentives	Does the CCC/Action Portfolio process interact with local networks and collectives? If so, which links are established and considered helpful?	Yes/no/partly Open text
	Are there rewards and prizes for successful engagement of individual actors? Do you consider them helpful?	Yes/no Open text

### 4. Social Innovation

Sub-dimension	Indicator Specification	Type of measurement
Social Innovation in the transition team and in the city's strategy making	Are there Social Innovation experts in the city's transition team/climate task force?	Yes/no/partly
Social Innovation policies	Which policies has the municipality developed to support Social Innovation for climate neutrality? Which are the benefits, challenges and lessons learned?	Open text
Co-creation platforms and environments	Which co-creation platforms has the public authority established (i.e., SI lab, living lab, SI platform, SI incubator, SI accelerator, networking events, SI dedicated places, other)? What are the main benefits, challenges, and learnings for each platform?	Open text
Incubating and accelerating social innovations for climate neutrality	How does the public administration support bottom-up Social Innovation projects and activities for climate neutrality?	Open text
Co-creation and cross-sector partnerships	Which cross-sector partnerships and public-private partnerships have been developed in the city to boost climate neutrality? Which are the main positive and negative aspects	Open text



	of the partnership, and the lessons learned? Please describe for each partnership how it has contributed to climate neutrality	
Systemic innovation approaches which include Social Innovation	How do the Social Innovation initiatives fostered by the public administration contribute to climate neutrality? Please provide data and/or experiences according to specific impact category (stationary energy, energy generation, mobility and transport, green industry, circular economy, nature-based solutions).	Open text
	How has the wellbeing of citizens and urban stakeholders changed as a consequence of Social Innovation policies and initiatives developed by the public administration? What still need to be addressed?	Open text

## 5. Learning and Capabilities Process Support

Sub-dimension	Indicator Specification	Type of measurement
Transparency and knowledge transfer	Does your AP and CCC process allow for learnings (positive and negative) among the active actors? To what extent do you integrate learnings in future processes/activities?	Gradual rating
	Is there a sound documentation of processes from strategy to implementation?	Yes/no/partly
	Are non-formal knowledge partners involved in the knowledge creation? How?	Gradual rating Open text
	Is the process of creating and further developing the AP externally accompanied by a professional moderator?	Yes/no
	Is there a collaborative process put in place that facilitates the merging of different knowledge fields?	Gradual rating
	Are the experiences of other cities with AP design and CCC specifically included in your own activities? Is there an exchange with cities that have similar challenges and in which form?	Yes/no Open text
	Has the city implemented a communication and media strategy to boost the press coverage of the city's action portfolio? What kind of communication activities would additionally support the processes in and for your AP?	Yes/no Open text



## 6.3 Pilot City Programme sensemaking reporting questions

Section	Questions
Looking back	What are the most significant changes or Early Outcomes that you have achieved in setting up, getting started with, and delivering your Pilot activities? Which insights has your Pilot gained from this experience – what worked well? Who is benefiting from these Outcomes?
Looking back	What did not work well or could have been done differently, and why?
Looking back	What are the recurring learning goals or questions or challenges emerging from your interactions with stakeholders (internally or externally) through your implementation process?
Looking back	What is becoming clearer in terms of the process, new capabilities, solutions, and/or strategy for the delivery of the Pilot activities?
Looking back	How is this improved understanding helping your Pilot maximising impact along your pathways?
Looking ahead	What are the most significant enabling factors that are expected in the upcoming stages of your Pilot activities? How do these relate to the further achievement or reframing of your Later Outcomes along your Pilot's Impact Pathways?
Looking ahead	Which synergies or opportunities have you noticed internally or externally?
Looking ahead	How can your current understanding help overcome barriers or risks now becoming visible?
Looking ahead	What implicit or explicit needs emerge from your experience that require focussed effort through the forthcoming implementation of your Pilot activities?
Looking ahead	How can the Pilot activities contribute to larger climate policies, action plans, or governance innovation, for e.g., supporting your city's CCC ambitions or commitments?
Learning from Peer Cities (Pilots or Twins)	Which key learnings and findings emerged for you based on your interaction with other peer cities?

