



# **Complex interactions on the path to net zero: Multi-level climate governance in Munich and Zurich**

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<sup>1</sup> [PAUL Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)

## **Abstract**

Recent years have seen over 1,000 cities across the globe set ambitious net-zero targets in recognition of their pivotal role in climate protection. Given that cities are embedded in complex multi-level governance structures, they need to engage in a range of interactions with different actors in order to reach their net-zero targets. This thesis aims to shed light on these complex interactions by investigating how two European cities, Munich and Zurich, engage with various actors as they plan and implement their net-zero strategies. The case study contributes to the literature on city-based multi-level climate governance by exploring the complex interactions which take place not only between cities and higher levels of government but also between cities and various intracity stakeholders. Through interviews, document analysis and event attendance, the study investigates how such interactions emerge, what role they play in climate governance and what kinds of challenges they present. The findings show that as cities forge their paths towards net zero, they engage in increasingly complex interactions with a variety of stakeholders, from different city departments, higher levels of government and other cities, to business, civil society and science, encountering multiple challenges along the way. How these challenges are managed will determine whether this complex web of interactions is harnessed to collectively develop solutions or results in a messy constellation of non-complementary approaches which ultimately hinder the achievement of climate goals. The study concludes with some recommendations on how cities can improve stakeholder participation platforms and how higher levels of government can better support cities in their net-zero paths.

*Keywords:* net zero, complex, interactions, multi-level climate governance, cities, stakeholders, participation

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## List of abbreviations

COP	Conference of the parties
ETH Zürich	Swiss Federal Institute of Technology Zurich ( <i>Eidgenössische Technische Hochschule Zürich</i> )
FfE	Research Institute for Energy ( <i>Forschungsstelle für Energiewirtschaft</i> )
GHG	Greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
MLCG	Multi-level climate governance
MLG	Multi-level governance
NAC	National association of cities
NDC	Nationally Determined Contribution
NGO	Non-governmental organisation
NKI	National Climate Initiative ( <i>die Nationale Klimaschutzinitiative</i> )
PAUL	Pilot Application in Urban Landscapes
RAC	Regional association of cities
RKU	Munich's Department for Climate and Environmental Protection ( <i>Referat für Klima- und Umweltschutz</i> )
RLDC	Regionally and Locally Determined Contribution
SEAP	Sustainable Energy Action Plan
SME	Small- and medium-sized enterprise
SURGe	Sustainable Urban Resilience for the Next Generation
TMCN	Transnational municipal climate network
TUM	Technical University of Munich
UGZ	Environmental- and Health Protection Zurich ( <i>Umwelt- und Gesundheitsschutz Zürich</i> )

## 1. Introduction

The importance of cities in the fight against climate change has been increasingly emphasised in recent years. Responsible for around 75 per cent of global CO<sub>2</sub> emissions (UN Environment Programme, n.d.), urban areas are clearly a major driver of global warming. The emissions of urban areas will continue to rise with increasing urban population growth. Currently, around 4.5 billion people live in cities, representing 57 per cent of the world's population. It is expected that by 2050, there will be 6.7 billion urban residents, representing 68 per cent of the world's population (UN-Habitat, 2022a). In response to national policies and growing pressure from civil society, many cities have recognised their role in climate protection by setting net-zero targets and developing climate action plans. The concept of net zero can be defined as “equating the quantity of gases such as carbon dioxide, methane, nitrous oxide that are released into the atmosphere due to human-induced activities and cause the greenhouse effect, with the quantity of greenhouse gases that are naturally absorbed by the earth” (REN21, 2022, p.232). In other words, net zero means balancing the amount of greenhouse gas (GHG) emissions added to the atmosphere with the amount of GHG emissions removed from the atmosphere, through emissions reduction and removal. By the end of 2021, net-zero targets had been set by over 1,100 city governments worldwide (REN21, 2022). Recent years have also seen thousands of municipalities across the world declare a climate emergency, in recognition of the severity of climate change and the need for urgent action. Since the first announcement, which was made by Darebin City Council in 2016, over 2,300 jurisdictions across 40 countries have followed suit (Climate Emergency Declaration, 2023).

Despite the strong statements that many cities have made on climate protection, their decision-making does not take place in a vacuum. Cities, as subnational units, are embedded within the broad political system of a country. They are impacted, and often restricted, by decisions made at higher governance levels, but they, in turn, have the opportunity to influence these decisions. In addition to vertical relations, their ability to solve complex problems like climate change is highly dependent on their horizontal interactions with various city stakeholders, including civil society, business and science. The importance of these non-state actors in climate governance has increased in recent years, with many cities now attempting to formally include these actors in the shaping and implementation of climate policies. As cities strive to reach ambitious net-zero targets, it becomes increasingly important for them to exploit the myriad of complex interactions available to them. The wave

of declarations of net-zero targets and climate emergency has been accompanied by the emergence of new methods of participation like climate councils as well as new civil society movements such as Fridays for Future. This has led some scholars to ask whether we have entered a new era of climate politics (Davies et al., 2021).

In order to gain a better understanding of the multi-level context of climate governance in which cities find themselves, this thesis investigates some of the interactions that two European cities, Munich and Zurich, are involved in as they plan and implement their net-zero strategies. Much of the prior research on multi-level climate governance (MLCG) and cities has focused on the role of transnational municipal climate networks (TMCNs) (Betsill & Bulkeley, 2006; Kern & Bulkeley, 2009; Kern, 2018). Some literature has provided a general overview of the vertical and horizontal interactions that cities take part in as they attempt to govern climate change (Coraci & Kemmerzell, 2023; Corfee-Morlot et al., 2009; Kern & Alber, 2009) while other studies have focused exclusively on the role of non-state actors in urban climate protection (e.g., Klein et al., 2018; Schroeder et al., 2013). What is lacking, however, are case studies which provide a detailed overview of the vertical and horizontal interactions that cities are involved in as they engage in climate protection management. The case studies that do exist (e.g., Coraci & Kemmerzell, 2023; Gustafsson & Mignon, 2019; Haupt et al., 2022) usually fail to account for the active role that cities play in initiating sustainability-based collaborations with civil society, science and business.

Therefore, this research aims to contribute to the literature on city-based MLCG by exploring the complex interactions which take place not only between cities and higher levels of government but also between cities and various intracity stakeholder groups, as they strive to achieve net-zero emissions. In this thesis, “city” generally refers to the city administration, in particular the employees of the environmental departments. Higher levels of government include state, national and supranational governments, while stakeholder groups include civil society, business and science. Through semi-structured interviews, document analysis and event attendance, I will investigate how such interactions emerge, what role they play in climate governance and what kinds of challenges they present. Concretely, the research is guided by the following questions:

- How does MLCG manifest itself in the cities of Munich and Zurich?



- How are different stakeholder groups (business, science, civil society) involved in the cities' climate governance? What kinds of opportunities and challenges do these collaborations present?

The cities of Munich and Zurich were chosen for several reasons. Firstly, they are two of the three pilot cities included in the Horizon 2020 PAUL project, which this research is part of. Secondly, Munich and Zurich are similar in terms of political structures, with both being embedded in federal systems. Thirdly, both cities have a similar ambition level in terms of climate protection. Munich and Zurich aim to achieve climate neutrality by 2035 and 2040 respectively, and both have decided on a series of measures to facilitate the achievement of their goals. Finally, with a population of almost 1.6 million (Landeshauptstadt München, 2021a), Munich represents a medium-sized European city, whereas Zurich represents a small-sized European city with its 430,000 inhabitants (Stadt Zürich, 2022a). Therefore, despite their differences, their overall similar political structures and climate ambition level facilitate a comparison between their climate governance structures. While the findings are unlikely to be generalisable across all cities, the hope is that cities with similar framework conditions can learn from the experiences of Munich and Zurich as they forge their own paths to net zero.

The thesis is structured as follows. In Chapter 2, I will review the literature on urban climate governance, multi-level governance (MLG) and the role of non-state actors in climate governance. Chapter 3 will provide a description of the methodology used. In Chapter 4, I will describe the results of the analysis, first for Munich and Zurich individually and then in general. Chapter 5 will include a discussion of the results in the context of previous research, along with some policy implications, limitations and recommendations for future research.

## **2. Literature review**

### **2.1. Background to cities' involvement in multi-level climate governance**

The importance of cities in climate protection was pointed out some time ago, in key environmental conferences. The 1992 UN Conference on Environment and Development (Earth Summit) was one of the first major conferences to highlight the crucial role that cities play in climate protection. Agenda 21, the action plan on sustainable development which was presented at the conference and adopted by 178 world governments, focused heavily on municipal governments. It encouraged local authorities to draw up their own local Agenda 21 in consultation with residents. The significance of local authorities was framed as follows:

“As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development” (UNCED, 1992, Chap. 28). Agenda 21 called for more cooperation between local authorities, so that knowledge and experience on the implementation of sustainable practices could be shared. Furthermore, a multi-stakeholder approach was encouraged in Agenda 21, with the involvement of citizens, businesses, non-governmental organisations (NGOs) and science seen as key to achieving sustainable development (UNCED, 1992).

The multi-level, multi-stakeholder approach to governance that was promoted in Agenda 21 later became known as the Rio model. The model has been widely praised for its appropriate consideration of the “‘explosion’ of complexity in the configuration of actors of environmental governance [that has occurred] since the early 1970s” (Jänicke, 2006, p.1). Instead of the government simply imposing policy on industry in order to stimulate environmentally-friendly industry practices, the environmental governance of today increasingly involves industry, as well as civil society, in the active shaping of environmental policy (Jänicke, 2006). This, taken together with the different levels (local, regional, national, etc.) into which actors fit, results in a highly complex constellation of actors, as seen in Figure 1.

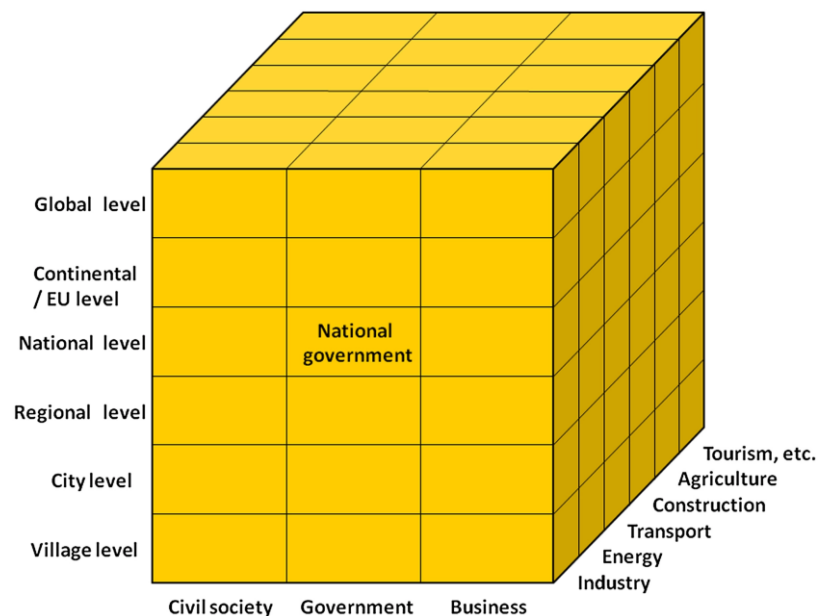


Figure 1: The Rio model of multi-level and multi-stakeholder governance (Jänicke, 2015)

More than two decades after the emergence of Agenda 21, the value of multi-level approaches to climate change mitigation was once again emphasised in the Paris Agreement, which was concluded at the 21<sup>st</sup> Conference of the Parties (COP21) in 2015. This unprecedented agreement bound 196 nations to a commitment of limiting global warming to considerably below 2, but preferably 1.5, degrees Celsius, in relation to pre-industrial levels. In its preamble, the agreement states that the Parties recognise “the importance of the engagements of all levels of government and various actors, in accordance with respective national legislations of Parties, in addressing climate change” (Paris Agreement, 2015, p.2). The agreement, therefore, encourages action from not only national governments but also subnational governments and non-state actors.

Although the Paris Agreement alluded to the involvement of multiple levels of government, it would take six years before the COP explicitly mentioned multi-level action as a core component of climate governance. COP26, the 26<sup>th</sup> UN Climate Change Conference which was held in Glasgow in 2021, stressed the importance of a multi-level response to climate change, highlighting “the urgent need for multi-level and cooperative action” (UNFCCC, 2021, p.2). The Glasgow Climate Pact, the agreement reached at COP26, also recognised the role of civil society and local communities in climate change mitigation. In order to reinforce the importance of a multi-level approach, COP26 organisers hosted a Multi-level Action Pavilion for the first time, with the goal of showcasing climate mitigation efforts from subnational governments and other non-state actors (Scottish Government, 2022). The pavilion was featured again at COP27, the latest conference which was held in Sharm El Sheikh, Egypt in 2022. In the implementation plan that was adopted at the conference, the parties reiterated the need for multi-level, multi-stakeholder action, explicitly highlighting the role of cities in this kind of action:

[The Conference of the Parties] recognizes the important role of indigenous peoples, local communities, cities and civil society, including youth and children, in addressing and responding to climate change and highlights the urgent need for multi-level and cooperative action in this regard. (UNFCCC, 2022, p.9)

COP27 further recognised the role of urban areas by hosting a ministerial meeting on urbanisation and climate change for the first time (UN-Habitat, 2022b). Among those present at the meeting were representatives of regional and local governments as well as non-state actors from NGOs, universities and private companies. The goal was to discuss frameworks

for ensuring strong climate action in localities and the integration of multiple stakeholders. The event also included the launch of the COP27 initiative “Sustainable Urban Resilience for the Next Generation” (SURGe). The objective of the initiative is to catalyse climate action in urban areas by promoting MLG, engagement and delivery. Furthermore, the initiative aims to give more recognition to local climate action in national and international arenas (UN-Habitat, 2022c). While local and regional governments have welcomed the SURGe Initiative, they do, however, call for more recognition. Specifically they call on the UNFCCC to formally recognise their role in climate protection, for example by including Regionally and Locally Determined Contributions (RLDCs) as a complement to Nationally Determined Contributions (NDCs) in national inventory reports (Declaration " EU Green Deal: from local to global", 2022).

The crucial role of cities in climate change mitigation has been highlighted not only in major environmental conferences but also in reports by the Intergovernmental Panel on Climate Change (IPCC), the UN body responsible for reporting on the latest science on climate change. The latest IPCC report places particular emphasis on cities as places with high emission reduction potential. It states that cities have the potential to “create opportunities to increase resource efficiency and significantly reduce GHG emissions through the systemic transition of infrastructure and urban form through low-emission development pathways towards net-zero emissions” (IPCC, 2022, p.34). However, the IPCC highlight the need to tackle emissions beyond city boundaries by taking urban consumption and complex supply chains into account. Only in this way can true net-zero cities be established. A city’s capacity to make such far-reaching changes depends heavily on the governance framework, the resources available to them and the engagement of various stakeholder groups such as civil society and industry (IPCC, 2022).

Aside from environmental conferences and official reports, a growing body of literature argues for the importance of cities in climate governance (e.g., Aylett, 2015; Corfee-Morlot et al., 2009; Fisher, 2013; Kern, 2018; Schreurs, 2008). Some of this literature will be explored in the next chapters.

## **2.2. Modes of governing climate change in cities**

Having recognised that cities are important players in climate governance, the question remains what urban areas can actually do to contribute to emissions reduction.

According to Kern and Alber (2009), there are, in principle, four ways in which local governments can govern climate change. These four modes of governance take both the capacities and limitations of cities' authority into consideration. The first way in which cities can act is by self-governing, meaning directly governing their own activities. Self-governance entails actions such as implementing energy-efficiency measures in municipal buildings and replacing their vehicle fleets with alternative drive systems. In this mode of governance, the municipality is viewed as a consumer with the capacity to make sustainable choices and thus acts as a positive role model for citizens. This is the most direct way to implement climate protection measures, as it involves areas within the sphere of control of the local government. Its impact is limited, however, as their energy consumption is typically only responsible for around 1 to 5 per cent of total CO<sub>2</sub> emissions in a city (Kern and Alber, 2009).

In the second form of urban climate governance, governing by enabling, the local government is seen as a facilitator. The municipality encourages businesses and citizens to get involved in climate action, for example by running awareness campaigns on recycling or offering advice on energy efficiency. These can be seen as soft measures, as they are intended to promote environmentally-friendly behaviour but do not involve outright prohibitions on undesired behaviours. Within this mode of governance, cities may also initiate public-private partnerships focused on goals such as the provision of innovative energy concepts (Kern and Alber, 2009).

The third type of urban climate governance involves governing by provision, with the municipality acting as a provider of services. This is only possible if the municipality is the majority shareholder in the city's utility companies for energy, water, transport and waste services. If this is the case, the local government can have a significant impact on the greenhouse gas emissions of the city, by enabling a sustainable transformation of urban infrastructure (Kern and Alber, 2009).

In Kern and Alber's fourth and final mode of urban governance, the municipality acts as a regulator. Governing by regulation involves enacting laws in areas such as energy, land-use and transport. As with the previous mode, governing by provision, the emissions reduction potential is significant. However, the reality is that most cities struggle to adopt a regulatory approach to climate change, partly due to potential opposition to such stringent measures and partly due to internal co-ordination problems (Bulkeley & Rayner, 2003; Kern & Alber, 2009). Numerous case studies have found that city administrations overwhelmingly

rely on the first two modes of urban governance: self-governing and governing by enabling (Bulkeley & Kern, 2006; Klein et al., 2018; Lenhart, 2015). The four modes of urban climate governance and the corresponding roles of municipalities are outlined in Table 1 below.

<b>Mode of governance</b>	<b>Role of municipality</b>
Self-governing	Consumer
Governing by enabling	Facilitator
Governing by provision	Provider
Governing by regulation	Regulator

Table 1: Modes of urban climate governance and roles of municipalities according to Kern and Alber (2009)

### **2.3. Multi-level governance**

When studying climate policy-making in complex subnational arenas such as cities, it helps to use the lens of MLG. Coined by Marks, Hooghe and Blank (1996), the MLG model was first developed to explain the influence of European integration on the autonomy of individual nations. On joining the EU, sovereign states relinquish some of their autonomy, meaning that decision-making is no longer confined to nation-state level but rather is shared by different levels. The state remains powerful but does not function as the sole link between supranational and subnational levels. This means that regional and local governments can and do have direct contact with supranational actors like EU institutions. The structure of the EU lends itself easily to MLCG case studies. With its quasi-federal system of member states, the sharing of power between the Council and member states allows for leading states to push for action on climate change, especially when they hold the Council presidency. This “dynamic process of competitive multi-level reinforcement”, which was facilitated by a majority of the public believing in the need to act on climate change, allowed the EU to become a leader in climate change mitigation (Schreurs & Tiberghien, 2007, p.22). In recent years, the MLG model has been applied to many other areas outside the European sphere. For example, it has often been used to explain global climate governance (e.g., Jänicke, 2017) and urban climate governance (e.g., Betsill & Bulkeley, 2006; Eckersley et al., 2021). Given the complexity of the climate change issue and its boundary-spanning nature, it cannot simply be governed by nation states in isolation. It requires the collaboration of actors across governmental levels and across societal groups.

Having laid the groundwork for future research on MLG in the 1990s, Hooghe and Marks (2003) later categorised the governance model into two diverging types. In Type I MLG, authority is granted to durable, general-purpose jurisdictions with nonintersecting memberships. This type is essentially federalism, a governance system in which the central government shares power with a limited number of subnational governments at a few different levels. Type II MLG, in contrast, is a form of governance in which authority is distributed across a large number of task-specific jurisdictions at multiple levels. This governance arrangement is more flexible than the former, with jurisdictions having the ability to change in response to citizens' preferences and requirements. Type II governance is common at the local level, where associations or agencies take responsibility for certain tasks, such as the provision of water or electricity.

Numerous researchers have applied the MLG framework to explain the increasingly important role of cities in global climate governance (e.g., Alber & Kern, 2008; Corfee-Morlot et al., 2009; Fisher, 2013; Fuhr, et al., 2018; Kern, 2018). In fact, it has been argued that urban governance of climate change cannot be fully understood without taking into consideration cities' interactions with different levels of government and with TMCNs (Bulkeley & Betsill, 2005). By examining the Cities for Climate Protection (CCP) program, a transnational network of local governments dedicated to climate change mitigation, Betsill and Bulkeley (2006, p.142) show that "a multi-level governance approach captures more fully the social, political, and economic processes that shape global environmental governance". The authors argue that approaches like regime theory and concepts of TMCNs fail to capture the often non-hierarchical process of global climate governance, in which the role of the state as sole policymaker is challenged.

MLG involves two key dimensions: vertical governance and horizontal governance. Vertical governance refers to the way in which different levels of government (supranational, national, regional, local) interact. It highlights the interdependencies between higher and lower levels of government, with action at one level enabling or constraining action at another level (Corfee-Morlot et al., 2009). The horizontal dimension of MLG, on the other hand, refers to interactions between actors on the same level. Horizontal interactions include city-to-city interactions, state-to-state interactions and country-to-country interactions as well as cross-departmental interactions and cities' interactions with various city stakeholders. The "broad variety of possible vertical and horizontal interactions" (Jänicke 2015, p.5789) in MLG can be seen in Figure 2 below.

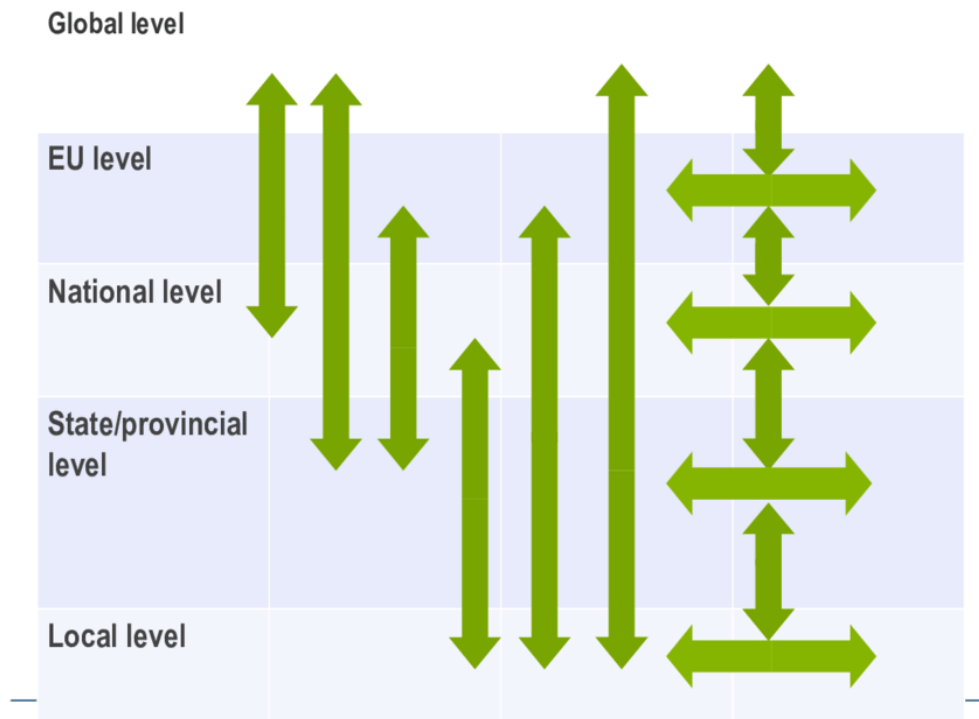


Figure 2: Various interactions between levels within the MLG framework (Jänicke, 2015)

The multi-level system of global climate governance can be seen as an opportunity structure, with each level having potential in terms of lesson-drawing, diffusion of innovations, and policy feedback (Jänicke, 2017). The case of climate forerunner Malmö illustrates how a systems thinking perspective can help cities to harness both vertical and horizontal interactions as they strive to achieve their climate goals (Lenhart et al., 2014). Malmö is a Swedish city which has successfully transitioned from a declining industrial centre to a sustainable city that prides itself on resource efficiency. It was the first Swedish municipality to commit to the goals of the 2030 Agenda for Sustainable Development, and it plans to become climate neutral by 2030 (ICLEI Circulars, 2023). Malmö's success can be partly attributed to the fact that it has recognised its position within a complex system composed of multiple levels. The city engages in extensive collaboration with national agencies, the EU, city networks and neighbouring municipalities, and places a strong emphasis on learning and dialogue (Lenhart et al., 2014).

#### 2.4. Vertical interactions within MLCG

In MLG, a distinction is made between vertical governance and hierarchical governance. While the latter refers to unidirectional, top-down relations, in which nation-



states hold the sole authority and cities merely implement national-level policies, the former refers to bidirectional relations, with nation-states and cities both having the capacity to influence each other. While cities remain subject to national and regional legislation, they can play an active role in vertical governance, having the ability to influence decision-making at higher levels of government. Such interactions can be referred to as bottom-up relations (Eckersley et al., 2021). Bulkeley and Moser (2007) confirm a shift from the idea of cities and regions as mere “implementers” of policies from higher levels towards active shapers of policies. This redistribution of political power arises due to the fact that national governments cannot achieve a significant reduction in GHG emissions without the participation of multiple actors across multiple levels. It should be noted, however, that such an approach “does not necessarily signal a weakening of the state but rather a redefinition of the scope and scale of state activity” (Betsill and Bulkeley, 2006, p.153). In other words, the national government retains the highest authority in a country, but its role increasingly involves negotiation with a range of actors.

A common example of vertical governance in action is the scaling-up of innovations from subnational levels. If supported by higher levels of government, local experiments and innovations can be scaled up and promoted as best practice. In this way, pioneering cities and regions become role models for other, less ambitious localities (Jänicke, 2015). Sometimes local experiments in leading cities are so successful that their principles are adopted by national governments and become regulations which are binding for all cities. This process can be referred to as “hierarchical upscaling”. For example, prior to the introduction of binding standards for energy efficiency in buildings, some forerunner German cities developed their own energy-saving programmes, thereby providing a blueprint for national and state regulations (Kern, 2018). Other scholars refer to hierarchical upscaling as simply “scaling up”, defining it as the “integration of particular elements of the experiment (e.g., a technology or policy intervention) into policy at urban, regional, national and global levels of governance” (Smeds and Acuto, 2018, p.553).

Research on MLCG in the United States has shown that local efforts to tackle climate change can scale up to the national level, leading in turn to a boost in federal funding for supporting these local efforts. This can be referred to as “boomerang federalism” (Fisher, 2013). Although climate protection in cities cannot compensate for lack of action on the national level, cities can make a significant contribution to reducing emissions and to global environmental governance by acting as “norm sustainers”. In the United States, lack of

climate leadership under the Trump administration led many states and cities to forge their own paths on climate change mitigation. In this way, they acted as role models for other countries, encouraging them to fulfil their pledges under the Paris Agreement. States and cities also influenced national law through their actions and created normative expectations that reached even the international level. Policies implemented on the state and city level showcased that climate action is feasible, allowing for the upscaling of policy innovations and providing foundations that future presidents could build on. Therefore, despite the country's controversial stance on climate change, US cities and states were able to sustain a momentum on climate action, by showing that mitigation measures are a necessary and normal component of governance (Murthy, 2019).

Cities are not only motivated to take bold action on climate change in countries like the US, where climate policy has been characterised by instability. A case study of Swedish municipalities found that even when national governments have ambitious and consistent policies on climate change, some municipalities decide to adopt a stronger stance and exceed the ambitions of the national level. Gustafsson & Mignon (2019, p.1177) also found evidence of a “positive feedback loop”, with municipalities giving feedback to the national, and sometimes international, level and therefore contributing to agenda-setting.

As mentioned before, vertical governance involves bidirectional interactions. Despite the capacity of cities to actively shape climate policy, the nation-state retains the highest authority. It has the most financial resources and can enact stringent legislation, for which subnational levels usually lack the authority (Jänicke, 2017). Although cities sometimes take the lead and influence climate policy on higher levels, subnational governments are, by nature, required to fulfil certain obligations as decided on regional, national and supranational levels. Although the research in this area is relatively sparse, some authors have investigated the influence of national and EU policies on climate protection efforts in cities (e.g., Heidrich et al., 2016; Kern & Alber, 2009). It has been found that EU policies on climate change tend to have a greater impact on countries which lack strong national policies on the issue. In some cases, the influence of national policy on cities is clear. For example, in France, an increasing number of cities have developed climate strategies in response to national legislation which mandates cities of a certain size to prepare climate action plans. However, such mandates are rare and in most cases, the effect of national legislation on climate action in municipalities is unclear (Heidrich et al., 2016). Climate action remains a voluntary task for the vast majority of local governments around the world. The absence of a national

mandate is seen as a key barrier to the implementation of climate mitigation policies at the local level (Sippel & Jenssen, 2009).

Restrictions from higher levels of government often limit the ability of cities to act on climate change. Recent case studies of forerunning local authorities in Malmö, Rotterdam and Amsterdam found that they increasingly find themselves constrained by the national government, who prevent them from setting more ambitious standards (for example, in the area of energy efficiency) and reduce the funds available to them for climate action. This trend has increased the importance of EU finance and regulations (Lenhart, 2015). Cities are restricted not only by national governments but also by regional governments. Case studies of Vancouver and Melbourne illustrated how regional governments imposed their will on municipalities rather than cooperating with them on the issue of climate change. For example, in the drafting of a regional climate change law in Australia, local governments were merely one group amongst many stakeholders and were only invited to comment on drafts. In this way, local governments were treated as “creatures” of regional governments (Jones, 2012, p.1251), not as legitimate policy partners with whom to enter into serious cooperation.

The scope of action of subnational units like cities depends heavily on the political system of a country and the division of power. In a study on the multi-level context of urban climate governance in Germany, Eckersley et al. (2021) highlight some of the challenges of implementing climate policy in a federal system. German states (*Länder*) have different energy and economic interests, leading to a fragmented climate policy landscape. The largest differences can be observed between the traditional coal states, which have so far made no significant efforts to reduce GHG emissions, and states in the far north and far south, which have embraced wind and solar energy respectively. Such differences lead, in turn, to a variety of approaches at the municipal level, as ambitious states make greater efforts to incentivise and facilitate climate protection activities in their municipalities, while less ambitious states are less likely to support their municipalities with such activities. It is common for progressive cities located in less ambitious states to become frustrated by the lack of support for local climate action and the slow pace of policy change. This often leads them to forge their own paths on climate protection, relying on local advantages rather than their respective state government (Haupt et al., 2022).

Similar challenges have been observed in federal Switzerland. Some of the country’s attempts to achieve emission reductions agreed under the Kyoto Protocol have been

hampered by the “multi-level steeplechase” of federalism (Casado-Asensio and Steurer, 2016, p.275). Taking the case of greening the building sector, Casado-Asensio and Steurer (2016) show that slow and inadequate responses from cantons (states), which are responsible for building policies, necessitated the intervention of the federal government and further complicated policy integration. While a few forerunning cantons did proactively integrate climate change considerations into their building standards, the majority of cantons passively awaited federal intervention and did not learn from their forerunning peers. Due to the monopoly of cantons on building standards, this had a knock-on effect on Swiss cities. As cities could not enact standards on their own, they were forced to wait for their respective canton to take action. In another study, Stadelmann-Steffen et al. (2019) examine the impact of cantonal policies on the deployment of small-scale hydropower plants. The authors find that cantons which apply extensive regulations to the deployment of hydropower tend to have fewer small-scale hydropower plants. For example, in the canton of Berne, restrictive zoning regulations limited the ability of localities to respond to local preferences. Localities were thus unable to choose a socially-acceptable location for the hydropower plant, ultimately leading to the failure of the project. In the canton of Valais, on the other hand, decentralised, flexible regulation allowed localities to design the project according to local needs, leading to a successful outcome. This case shows again how the decentralised nature of federalism can result in a patchwork of climate policies and outcomes across regions and cities.

## **2.5. Horizontal interactions within MLCG**

Unlike vertical governance, which focuses on interactions between different levels, the horizontal dimension of MLG refers to interactions between actors on the same level. One key example of horizontal governance of climate change is cooperation between different cities, either on a national or international level. These interactions are often formalised in the form of TMCNs such as ICLEI – Local governments for sustainability and the C40 Cities Climate Leadership Group, although informal exchanges remain important (Corfee-Morlot et al., 2009). The focus of TMCNs is generally on a shared commitment to climate protection as well as the sharing of knowledge and best practices. Their transnational nature means that they do not fit neatly into the framework of national climate governance. According to Pattberg and Stripple (2008, p.379) “city networks for climate change mitigation add a crucial layer to the complexity of global climate governance, as their individual contributions to problem solving can no longer be subsumed under national commitments taken by states

within the UNFCCC/Kyoto framework.” Through TMCNs, cities collaborate across national boundaries and implement emission reduction measures independent of their national governments.

The impact of TMCNs on urban climate governance has been investigated in several studies. In a study by Busch et al. (2018), TMCNs were found to have a significant influence on local climate governance in Germany, mainly through their effect on internal decision-making in city administrations. City networks can spur local climate action by setting emission-reduction goals for members, promoting emission-reducing actions and requiring members to track their progress towards these goals (Kern & Alber, 2009). In a quantitative analysis of more than 127 cities, it was found that membership of a TMCN increased the number of climate policies adopted by cities (Rashidi & Patt, 2017). Based on an analysis of TMCNs in Germany, Busch (2015) attributed four non-mutually exclusive functions to these types of networks. Firstly, TMCNs can function as platforms for members to share knowledge and best practices. Secondly, TMCNs often act as consultants. In this way, they support their members by providing access to information, guidelines and tools related to climate mitigation. A common example of a tool provided is software for calculating a city’s GHG emissions. The third function that some TMCNs take on is that of commitment broker. This means that they invite members to set climate protection goals and publicly report their progress towards these goals. Although such commitments are not binding, members often feel pressure to set ambitious targets and achieve them, due to the collective goal of the network and the transparency of the reporting process. Finally, there are several TMCNs that act as city advocates. This role involves lobbying for members’ interests at higher levels of government. In some cases, this can have a significant impact, allowing cities to bypass administrative hurdles and stimulate policy changes at national or EU level.

The advocacy function of TMCNs can facilitate the aforementioned process of upscaling. TMCNs and cities are increasingly embedded in EU MLCG, which paves the way for the upscaling of local experiments. Thanks to the incentives provided by upscaling, follower and laggard cities have the opportunity to catch up with leading cities (Kern, 2018). Some authors, however, cast doubt on the notion that TMCNs lead to upscaling. Smeds and Acuto (2018, p.553) contrast “scaling up” with “scaling out”, which is the “replication of an experiment in the same or another city.” Using data from members of the C40 city network, they find that networked urban experimentation tends to result in the “scaling out” of experiments rather than “scaling up”. While “scaling out” can still be considered as a benefit

of TMCNs, this tendency limits the potential of urban climate change experiments, as successful experiments remain confined to ambitious municipalities and do not get rolled out by higher levels of government. Ultimately, stronger national commitments are needed in order to avoid local climate policy remaining confined to a few pioneering municipalities and therefore having a negligible effect on emissions reduction (Aall et al., 2007).

Some authors have gone so far as to describe TMCNs as “networks of pioneers for pioneers” (Kern & Bulkeley, 2009, p.309), showing that municipalities usually join city networks when they are already active in climate mitigation efforts. In a study of German cities, membership of the Covenant of Mayors network was proven to be more of an add-on for cities with already established climate protection strategies rather than a stimulus for less ambitious cities to commence climate mitigation activities (Kemmerzell et al., 2018). Even amongst these frontrunner cities, it is debatable whether they actually learn from each other or passively exchange best practices (Haupt et al., 2019).

In some cases, exchanges with cities in the same country are viewed as more important than transnational exchanges, with NACs acting as important platforms for such exchanges (Coraci & Kemmerzell, 2023). These associations, however, do not solely focus on climate change. As their main purpose is to represent the interests of cities at the national level, they provide the opportunity for cities to discuss a variety of issues that affect them. A Finnish study found further evidence of the importance of national networks. Through an econometric analysis, the authors showed that membership of the Finnish Hinku (Towards Carbon Neutral Municipalities) network led to a reduction in GHG emissions in participating municipalities. Qualitative interviews additionally revealed the value of the network as an intermediary which provides expert advice, facilitates peer support and legitimises local climate action (Karhinen et al., 2021). Networks can be more effective when they offer tailored solutions to municipalities (Rashidi & Patt, 2017), but this becomes difficult as networks grow (Karhinen et al., 2021). Therefore, smaller networks like Finland’s Hinku network, which had 73 members in 2020, may have more of an impact on municipal climate action than larger networks like ICLEI or the Covenant of Mayors, due to their ability to offer tailored tools and information.

Aside from city-to-city relations, horizontal interactions take place across municipal departments (Aylett, 2015) as well as between cities and different stakeholder groups (e.g.,

businesses, civil society, research institutes), as such groups become increasingly involved in climate decision-making (Corfee-Morlot et al., 2009).

Regular interactions between different municipal departments have been shown to be crucial in effective local climate governance. How such interactions manifest depends on the organisational structure of the administration. Research has shown that leading cities tend to combine elements of centralisation with decentralisation, for example by having one central department dedicated to climate protection activities and integrating these activities into other municipal departments (Lenhart, 2015). In such contexts, regular meetings and routines help to break up departmental siloes. Across the globe, interdepartmental collaboration features heavily in the responses of local governments to climate change. For example, in around 60 per cent of cities, multiple municipal departments provide input in the planning process of climate change mitigation (Aylett, 2014). Aside from dedicated climate departments, among the municipal departments which contribute most to climate planning and implementation are departments for land-use planning, waste management, water and transportation. It has been found that the most effective way of encouraging cross-departmental engagement in climate change mitigation is to develop informal channels of communication between staff in the climate department and staff in other departments, with trust and personal connections playing an important role in such collaborations (Aylett, 2014).

Aylett (2015, p.172) characterises this kind of cross-functional local climate governance as a “relational, collaborative, and emergent process”, in which multiple actors work together on climate policy-making and implementation. The author focuses primarily on the internal dynamics of municipal governments and the extent to which departments dedicated to climate mitigation need to negotiate with other municipal departments in order to achieve broadscale engagement with climate change. As competing interests are rife in such scenarios, effective negotiation involves the identification of co-benefits and the alignment of other municipal priorities with climate change mitigation (Aylett, 2015).

Local authorities increasingly collaborate not only within their own organisation but also with external stakeholder groups. The increasing diversity of actors involved in MLCG has been widely studied in recent years. Observers have highlighted the limitations of state-centred government and applauded governance approaches which include not only state actors but also non-state actors (Newell et al., 2012). The inclusion of non-state actors in global climate governance has intensified since the COP15 in Copenhagen, which stimulated

a move away from traditional, state-centred approaches. Within this new landscape of “hybrid multilateralism”, non-state actors act as experts, implementers and watchdogs, while the UNFCCC Secretariat acts as a facilitator of non-state climate action (Bäckstrand et al., 2017, p.562). Actors from civil society, the private sector and subnational entities therefore play an active role and are invited to oversee the progress of states’ NDCs. The importance of non-state actors is reflected in the fact that the UNFCCC has set up a platform dedicated to tracking the commitments of these actors (Bäckstrand et al., 2017). Non-state actors can make a significant difference in climate change mitigation. A recent analysis showed that if regions, cities and companies in ten major-emitting countries fully implemented their commitments, emissions in 2030 would be 3.8 to 5.5 per cent lower than projected by national policy scenarios. In this case, the EU and Japan would overachieve their NDC targets (Kuramochi et al., 2020).

The promotion of climate governance approaches which include a mix of state and non-state actors marks a shift “from rational technocratic and state-dominated processes to broad-based networked undertakings that attempt to structure effective partnerships across silos, sectors, and scales” (Aylett, 2015, p.157). Building partnerships across traditional boundaries is particularly necessary in cities, given that local governments have limited control over a city’s GHG emissions. Only by involving citizens, private businesses and other stakeholder groups can municipalities achieve significant emission reductions. Faced with limited resources, municipalities are increasingly involving local, non-public stakeholders in their climate protection efforts. They call upon a wide variety of stakeholders, from individual citizens to NGO and private businesses, for support in implementing emission reductions (Lenhart, 2015). Smaller municipalities with fewer resources have a greater tendency to rely on collaborations with a variety of actors, in order to deal with their limited scope of action (Gustafsson & Mignon, 2019). Research is showing that not only are a broad range of non-governmental actors becoming involved in climate governance, but they are also taking on roles traditionally held by the state. Instead of simply lobbying governments to act on climate change, actors from civil society and industry are increasingly involved in the definition of environmental problems, the setting of policy agendas and the implementation of climate action. Meanwhile state actors are increasingly involved in advocacy, encouragement and enablement, which have traditionally been the tasks of civil society groups (Bulkeley & Moser, 2007).



The involvement of local non-public actors such as businesses, citizens and NGOs in climate policy-making can be viewed as part of urban policy network formation. According to Corfee-Morlot et al. (2009, p.87), “an appropriate response to climate change needs to transcend a government-policy based approach to embrace governance mechanisms that harness the creativity and advice of civil society, from business and academia to community leaders.” Attempts to include a broad range of actors in climate governance lead to better policies and implementation processes, and enhance the transparency of climate policy-making (Corfee-Morlot et al., 2009). Improved outcomes are possible due to the pooling of knowledge, experience and skills as well as the extended reach of multiple actors (Schroeder et al., 2013). New forms of partnerships which challenge the traditional boundaries between the public and private sector allow for increased flexibility and speed in the implementation of climate protection measures. Unlike municipal administrations, civil society and businesses have the ability to act swiftly and tolerate a high degree of risk. They are also arguably better at communicating complex socio-technological transformations to the general public (Schroeder et al., 2013).

Despite the many benefits of public-private partnerships, this kind of network-based governance increases complexity. Several researchers have pointed out the complications associated with the inclusion of a myriad of public and private actors in climate governance (e.g., Jänicke, 2006; Pattberg & Stripple, 2008). According to Dawson et al. (2007, p.6), “mitigating and adapting to climate change in urban areas involves complex interactions of citizens, governmental/non-governmental organisations and businesses.” This complexity can be harnessed, but it can also make it challenging to develop integrated strategies, due to coordination issues. One way to overcome the complexity and challenges associated with these partnerships is to ensure that co-benefits are identified in advance. Co-benefits refer to the additional advantages of climate protection activities beyond the reduction of GHG emissions. According to Jänicke (2017, p.115), a “broad coalition between government, civil society and the business sector...can address a broad variety of economic and non-economic co-benefits.” Economic co-benefits of climate protection include employment opportunities and increased competitiveness, while non-economic co-benefits include poverty alleviation and higher water quality. Co-benefits are important because they address the diverse interests of actors from politics, civil society and business.

With the flexible integration of various stakeholders into municipal climate protection, cities are sometimes described as learning organisations (Lenhart et al., 2014). In

the absence of rigid processes, cities are borrowing from related policy areas, integrating climate protection into existing frameworks and experimenting with different governance approaches (Anguelovski & Carmin, 2011). In such an environment, new solutions are encouraged and all participants are constantly learning. Taking the example of climate frontrunner Malmö, Lenhart et al. (2014) demonstrated how such a strategy can succeed. The city has prioritised dialogue and participation, using innovative methods for communicating the climate change issue as well as encouraging citizens, NGOs and businesses to co-design a common climate vision. It has, however, encountered challenges in collaborations with some stakeholders, in particular its energy companies. For example, the city wants E-ON, the owner of Malmö's natural gas plant, to switch to biogas, but dialogue has been slow, with E-ON initially reluctant to even discuss the possibility of switching.

Cities have various ways of involving stakeholders (state and non-state) in climate governance. Science is one such stakeholder that they often seek to include when designing climate action plans and policies. In German municipalities, it is common for external expert groups to be commissioned to prepare climate protection strategies (Stober, 2022).

Independent research institutes bring new knowledge and perspectives to city administrations, which can lead to more comprehensive and effective climate action plans. In other cities, universities act as critical intermediaries in the science-policy interface. A study of climate governance in two US cities, Portland and Phoenix, showed that local universities played a key role in the provision of climate-related knowledge and leadership (Fink, 2018). In Portland, a formal collaboration was initiated between the municipal department for sustainability and Portland State University. As part of the Portland Climate Action Collaborative, the municipal department prioritised a series of research questions based on the city's climate action plan while the university students and staff members were tasked with attempting to answer these questions. The collaboration was successful and has been replicated in other contexts, showcasing the advantages of "universities accommodating municipal partners' needs, rather than expecting cities to adjust to the peculiarities of academic culture" (Fink, 2018, p.20).

If implemented well, city-science collaborations can help cities to overcome unfavourable external framework conditions and become climate policy pioneers. An example of this can be seen in the case of Potsdam, a German city located in the traditional coal state of Brandenburg. In 2018, the city established a long-term climate partnership with nine local research institutes (*Klimapartnerschaft Stadt und Wissenschaft*) as part of its net-

zero strategy (Potsdam, 2018). This collaboration between science and the city administration, which has involved the successful realisation of several joint projects to date, was a key factor in Potsdam's development into a climate policy pioneer. In interviews conducted by Haupt et al. (2022), staff of the city's climate department mentioned cooperation with local research institutes as Potsdam's most significant climate policy strength.

Civil society is another important stakeholder group in climate governance. In cities across the globe, it is common for civil society groups to advocate for stronger action on climate change. A survey of over 700 cities in various locations around the world found that 77 per cent of these cities experienced pressure from local environmental groups in this regard. This was in stark contrast to local businesses, who pressured cities in only 20 per cent of cases (Aylett, 2014). In a recent study of German municipalities, it was found that in half of the municipalities, pressure from the Fridays for Future protest movement had a significant impact on the decision to declare a climate emergency and in turn, to set a climate-neutrality goal (Stober, 2022). Civil society groups are not merely vocal lobbyists; they also tend to get actively involved in climate policy-making and policy implementation. For the most part, this involves providing input into climate policy-making processes rather than implementing or designing policies. In other words, civil society members are often invited to give their opinion on current or planned policies, but it is less common for them to be involved in the development of new policies. Nevertheless, civil society is more active than the private sector, being twice as likely to be actively engaged in planning and implementation processes (Aylett, 2014).

Real-life examples have showcased the capacity of civil society groups to successfully facilitate urban sustainability transformations. In a case study of a community-managed solar energy project in the city of Portland, civil society actors, owing to their high risk tolerance, flexibility and ability to translate complex technological changes into the language of their communities, were instrumental in the success of the project. Whereas the previous approach had relied on informing and incentivising households, civil society groups invited community members to co-construct the energy transformation with them, making use of their personal connections and established reputations in the process (Aylett, 2013). In some circumstances, activity from civil society organisations is driven by lack of action from the government. In a case study of the Mexican state Quintana Roo, the researchers described how such organisations stepped in to close the "capacity gap" which was caused by the

government's failure to allocate adequate resources to subnational actors (Baker et al., 2021, p.120).

While civil society groups often participate in municipal climate action through autonomous projects, as seen above, cities increasingly seek to involve them in the designing and implementing of climate policies, although it is not always easy. Participation in climate governance has been described as a wicked problem, with many paradoxes inherent to it (Sprain, 2016). Climate councils or commissions are an increasingly popular means of involving society in urban climate policy-making. While such platforms can be effective participation tools, it has been shown that democratic diversity is often not prioritised when selecting participants. In the establishment of the Edinburgh Climate Commission, for example, the selected individuals had prior knowledge in sustainability, were influential amongst the community and were already known to the organisers (Creasy et al., 2021). Unless steps are taken to ensure that a diversity of viewpoints are represented, participatory platforms can thus result in a “democratic deficit and a particularly exclusive and middle-class form of green politics” (Anantharaman et al., 2019). Rather than choosing individuals with similar backgrounds and opinions, city administrations should consider the benefits that conflict can bring to participation processes. Research has shown that conflict plays an important role in challenging the status quo, ensuring accountability and increasing the legitimacy of participation platforms (Aylett, 2010). Citizen assemblies, which involve selecting a representative segment of the population, may therefore present a more effective way to integrate wider society into climate decision-making. Nevertheless, even if randomly-selected individuals are invited to participate, sustained participation may lead to politicisation, with participants becoming “experts” on the issue and thereby no longer representing the average citizen (Sprain, 2016). The risks associated with establishing such participation formats have led some municipalities to engage in “cautious experimentation”, whereby existing institutions retain decision-making power and participants simply offer policy recommendations (Sandover et al., 2021, p.84). Digital tools can lead to greater participation of lay citizens compared to traditional methods like in-person events but still do not lead to the broad participation of citizens (Satorras et al., 2020).

As mentioned above, the private sector is significantly less likely to advocate for stronger municipal action on climate change and to be actively involved in municipal climate policy-making than civil society groups. While most local businesses do not actively oppose the climate change policies being implemented in their locality, they tend to adopt a more

neutral stance in relation to these policies (Aylett, 2014). Due to the limited influence that municipal governments can have on private companies, municipal climate protection managers tend to place high importance on external framework conditions as well as collaboration and support for businesses (Stober, 2022). Municipalities often involve businesses in climate change mitigation in hopes of raising awareness amongst the general public and normalising the practice of emission reduction. Businesses are also targeted due to their ability to enact change in a narrow time window (Burch et al., 2013).

There are many ways in which businesses can contribute to the reduction of GHG emissions. They can pressure their suppliers to comply with certain environmental standards by including these in their supply chain contracting conditions. Businesses can also influence individual behaviour by providing access to environmentally-friendly products such as energy-efficient appliances, low-emission vehicles and locally-sourced, organic food. Other possible actions include divestment from high-polluting companies and pressuring governments to remove regulatory barriers to environmentally-friendly behaviour (Gilligan & Vandenberg, 2020). While corporations have become increasingly involved in environmental protection in recent years, it can be difficult to distinguish between legitimate action and greenwashing. The lack of harmonised reporting standards mean that companies' statements about emissions reductions must be interpreted with caution. The literature on the involvement of businesses in climate governance is sparse, especially in the arena of cities.

Despite the many examples of public-private collaborations in urban climate governance, some studies have shown that the level of inclusion of non-state actors in climate governance is not sufficient. A study of 402 cities around the world showed that most urban climate adaptation initiatives only target the public sector and fail to include the private sector and citizens. Regarding the private sector, partnerships and participation are the dominant forms of involvement, while initiatives targeting citizens mainly involve the mere provision of information. Furthermore, the more advanced a city is in its climate adaptation process, the more likely it is to include the private sector in its initiatives (Klein et al., 2018). Another study highlighted the fact that most developed countries fail to even mention non-state and subnational actors in their NDCs, which they are required to prepare in line with the Paris Agreement. One possible reason is that the guidelines for states on NDC preparation are insufficient and do not explicitly mention non-state actors (Hsu et al., 2019).

Given the potential to enhance stakeholder inclusion in urban climate governance and the lack of literature in this area, this thesis will explore the existing ways in which two cities, Munich and Zurich, seek to include businesses, civil society and science in their net-zero strategies. Their interactions with higher governance levels and other cities will also be outlined, thereby giving a complete picture of the cities' vertical and horizontal interactions within MLCG.

### **3. Methodology**

The methods used in this thesis were qualitative in nature. Qualitative methods are the most suitable option when the research aim is to explore an issue. These types of methods, in contrast to quantitative methods, can allow us to gain a "complex, detailed understanding of the issue" (Creswell, 2007, p.40). In this case, quantitative measures would not adequately capture the complex interactions between levels of government and different stakeholder groups in cities.

The research took the form of an exploratory case study, focusing on the cities of Munich and Zurich. According to Creswell (2007, p.73), "case study research is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case description and case-based themes." The cases of Munich and Zurich were therefore analysed using a variety of sources, including interviews, observations, literature, newspaper articles, websites and official documents. The case study was exploratory in nature, meaning that the research was undertaken to explore the topic in general and to pave the way for future research in the area.

In order to gain insights into MLCG in the two cities, I undertook various forms of research. I attended relevant events in the cities, analysed documents, websites and newspaper articles related to the climate strategies of Munich and Zurich, and interviewed key stakeholders in the cities.

### **3.1. Attendance of relevant events**

As part of my research, I attended several events on the topic of climate protection in Munich. From October to November 2022, I attended five in-person events: two sessions of the Climate Council and three information/discussion events which were part of the Klimaherbst event series. The Climate Council is a multi-stakeholder participatory format that was established by the city in 2021. Its 16 members, who represent different stakeholder groups, are responsible for commenting on the city's fundamental decisions on climate protection issues and acting as a critical-constructive advisor to the city on climate protection policy (Landeshauptstadt München, 2021b). Klimaherbst ("Climate autumn") is an event series which takes place for a few weeks every autumn in Munich, with events aiming to inform Munich residents about climate issues and to encourage them to make their own contribution to climate change mitigation (Klimaherbst, n.d.). A full list of the events I attended, the dates and the event organisers can be found in Appendix A. During these events, I mainly observed the discussions and took notes on relevant topics. The aim of this step was to gather preliminary insights on the key stakeholders involved in Munich's climate protection strategy and the relations between them.

### **3.2. Interviews with city stakeholders**

The second part of my research involved conducting interviews with key stakeholders in the cities. The interviews were carried out in collaboration with a colleague from the PAUL project. The decision was made to send invitations to a broad variety of stakeholders who represented the interests of the city administration, civil society, business and science. We found these stakeholders through the cities' official websites, Google searches with specific keywords, LinkedIn searches and climate strategy documents. The snowball sampling technique was also used, as we asked all participants at the end of the interview whether they could recommend someone for us to talk to.

In total, 52 invites were sent: 26 to Munich stakeholders and 26 to Zurich stakeholders. The majority of invites were sent via email, while some were sent via LinkedIn. Following a mix of positive, negative and non-responses, 13 semi-structured interviews were carried out: 7 with Munich stakeholders and 6 with Zurich stakeholders. The majority were held online, via Zoom, partly because the interviewees expressed a preference for this and partly because of geographical constraints. All interviews were conducted in English and

lasted between 30 minutes and one hour. A full list of interviews and their details can be found in Appendix B.

It was decided that the interviews should be semi-structured or semi-standardised. This means that we oriented ourselves “according to an interview guide, but one that gave us plenty of freedom of movement in the formulation of questions, follow-up strategies and sequencing” (Hopf, 2004, p.204). Participants were encouraged to speak freely and to use specific terms in their native language if they wished.

The interview guide was prepared with a view to answering the research questions outlined in Chapter 1. We opened with some introductory questions to put the interviewee at ease, asking them to describe their role in the organisation or to explain how they became involved in environmental issues. From there, we moved on to more specific questions related to their role and their experience of MLCG. Such questions were based on prior research on the interviewee and were tailored to the respective stakeholder group. Employees of the city’s environment department, for example, were asked about their collaborations with other departments and interactions with higher levels of government. We also asked multiple questions about their interactions with other stakeholder groups. They were additionally asked to describe the city’s attempts to involve civil society, science (universities, research institutions, etc.) and local businesses in shaping and implementing the city’s climate policies. In order to elicit more insights about the city’s interactions with higher levels of government and different stakeholder groups, interviewees were prompted to discuss both the challenges and positive aspects associated with such interactions. Members of other stakeholder groups (civil society, business, science) were asked to describe their own involvement in climate protection in the city, their interactions with the city administration, and their opinion on the city’s approach to involving them in climate action. As the interviews were semi-structured, we asked many follow-up questions and changed the order of questions depending on the responses. Nevertheless, an interview guide with sample questions is available in Appendix C.

With the consent of interviewees, the interviews were recorded using the audio recording tool on our phones. We later used automatic transcription software to transcribe the interviews. The resulting transcripts were coded and analysed for important themes and patterns.



### 3.3. Document analysis

In addition to the data collection described above, I analysed important websites, official documents, literature and newspaper articles related to climate protection in Munich and Zurich. As the focus was on MLG, the analysis also included material related to climate protection on regional, national and supranational levels.

Throughout my analysis, I focused heavily on the official websites of Munich and Zurich, especially those of the cities' environment departments, as they contained the most relevant and up-to-date information on climate protection goals and strategies. For Munich, the main website was that of the Department for Climate and Environmental Protection (*Referat für Klima- und Umweltschutz, RKU*)<sup>2</sup> while for Zurich, the principal website was that of the Department for Health and Environment (*Gesundheits- und Umweltdepartement*)<sup>3</sup>. In order to gain insights on the interactions between the cities and key stakeholder groups, I searched these websites for information on the involvement of citizens, businesses and science. I also paid close attention to the departments' press releases.

Important documents for my analysis included the climate action plans of the cities, expert reports on climate protection measures and City Council decisions (*Stadtratsbeschlüsse*). These documents were publicly available on the cities' official websites. Literature and newspaper articles and shed further light on the climate protection strategy of the cities and the people involved in climate decision-making. News sources for Munich included the *Süddeutsche Zeitung* and the *Abendzeitung München*, while news sources for Zurich included the *Neue Zürcher Zeitung* and the *Tages-Anzeiger*. For Zurich, the city "civic media" magazine, *Tsüri*, was also a valuable source of information.

Following the data collection, the information from all the sources was triangulated and compiled into a coherent case analysis for each city.

## 4. Results

This chapter presents the results of the research strategy which was described in the previous chapter. First, for each city, details will be given on their background in climate protection and current strategy. Following that, I will describe the city's interactions with city

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<sup>2</sup> [Referat für Klima- und Umweltschutz – Landeshauptstadt München \(muenchen.de\)](https://www.muenchen.de/referat-fuer-klima-und-umweltschutz)

<sup>3</sup> [Gesundheits- und Umweltdepartement - Stadt Zürich \(stadt-zuerich.ch\)](https://www.stadt-zuerich.ch/gesundheits-und-umweltdepartement)

administration departments, higher levels of government, other cities, multiple stakeholder groups, businesses, civil society and science. Finally, the main findings will be summarised and compared across the two cities.

## **4.1. Munich**

### **4.1.1. Background and climate protection strategy**

Munich has been active in climate protection since the mid-1980s, when the city's Energy Commission (*Energiekommission*) was first established. The commission played an important role in the early phases of climate protection in Munich, when the focus was mainly on the link between energy production and CO<sub>2</sub> emissions. In 1989, Munich launched its first concrete climate protection programme – the funding programme for energy saving (*Förderprogramm Energieeinsparung*), which provided subsidies for citizens who wanted to invest in energy efficiency measures (Kern et al., 2005). In the early 1990s, the city began joining TMCNs (see Chapter 4.1.4 for more information). Munich has since passed through several different phases in its commitment to climate protection, with the objective of achieving climate-neutral energy production remaining of central importance (Zimmermann, 2018).

It could be argued that the city, along with many other cities, has recently entered a new phase in its climate protection journey. In December 2019, Munich joined multiple cities across Germany in announcing a climate emergency. At this time, it was decided that the city would become climate neutral by 2035 and that the city administration would reach climate neutrality by 2030. Munich also became the first German municipality to enact a climate statute (*Klimasatzung*). The statute acts as a binding framework for the city's climate goals (Referat für Klima- und Umweltschutz, 2021a). In 2021, the city further signalled its commitment to action on climate change by establishing a separate department dedicated to climate protection – the Department for Climate- and Environmental Protection (*Referat für Klima- und Umweltschutz, RKU*). Previously the issue of climate protection was jointly managed with the issue of health in the Department for Health and Environment (*Referat für Gesundheit und Umwelt, RGU*).

In order to attain an expert opinion on how Munich can reach climate neutrality by 2035, the city commissioned an external research institute, Öko-Institut, along with partner consulting firms Hamburg Institut and INTRAPLAN, to prepare an expert report. The report,

Action Plan Climate Neutrality Munich (*Maßnahmenplan Klimaneutralität München*), was published in November 2021 and recommends more than 250 measures that the city should implement in order to reach climate neutrality by 2035 (Timpe et al., 2021). From these measures, 68 were selected as priorities. These 68 measures were adopted by the City Council in January 2022 as a bundle of measures called the Climate Package (*Klimapaket*). These measures are planned to be implemented by 2025, with a total investment volume of €500 million. A central pillar of the strategy is the shift to fossil-free municipal heating (Landeshauptstadt München, 2022a).

#### **4.1.2. Interactions between city administration departments**

Cross-departmental collaboration is an important element of Munich's climate protection strategy. According to the city (Referat für Klima- und Umweltschutz, 2021a), the three leading departments in climate action are the RKU, the Department for Urban Planning and Building Regulations (*Referat für Stadtplanung und Bauordnung*) and the Mobility Department (*Mobilitätsreferat*). These three departments form "a kind of special group" which collaborates intensely on topics such as bringing climate protection to the neighbourhoods, as one RKU employee that we interviewed told us (RKU1, Nov 11, 2022). The RKU also works closely with other departments, such as the Building Department (*Baureferat*), Department for Labour and Economy (*Referat für Arbeit und Wirtschaft, RAW*) and the Department for Education and Sport (*Referat für Bildung und Sport*).

Therefore, the RKU leads the city on issues related to climate change but closely cooperates with other city departments. The importance of the cross-departmental structure was mentioned several times in an interview with an RKU staff member:

The cross-departmental organization is very important because if every department makes its own activities, then we ... do not have the control of all activities. So, [the] cross departmental structure ... gives the whole process a kind of special importance. (RKU1, Nov 11, 2022)

The interviewee stressed the fact that every department has a role to play in the city's climate protection. All departments must be sensitised to the issue of climate change and be encouraged to carry out their activities whilst considering the environmental impact of these. The interviewee added that it is usually the RKU who initiates these cross-departmental

collaborations, because they have the overarching view of Munich's climate goals and measures (RKU1, Nov 11, 2022).

In recent years, the city has taken steps to enhance cross-departmental interactions related to climate protection. In 2021, they introduced a new process whereby all climate-relevant draft resolutions (*Beschlussvorlagen*) of the city administration are assessed according to their effects on climate protection. The main goal of the so-called Climate Assessment (*Klimaprüfung*) is to raise awareness of climate protection in all areas of the city administration (Referat für Klima- und Umweltschutz, 2021b). An interviewee explained how this works in practice:

We try to motivate our colleagues in the other departments to think about the climate impact and then make a small evaluation, is it positive or negative, and then [they] send this evaluation to us and we look over it and then we say, 'okay', or 'no, we don't accept or we do not have the same opinion'. (RKU1, Nov 11, 2022)

The city's goal to make climate protection an integral component in all decision-making processes is also evident in its Climate Statute. In Section 1, climate protection is explicitly described as a cross-sectional task. This is explained by stating that climate protection and climate adaptation are to be taken into consideration in all plans, measures and decisions of the city and its municipal companies (Klimasatzung, 2021).

#### **4.1.3. Interactions with higher levels of governments**

Munich is a municipality (*Kommune*) situated in the southern state (*Land*) of Bavaria, one of Germany's sixteen federal states (*Länder*). Higher levels of government often limit the city's ability to act, with many issues lying outside its scope of action. An RKU staff member explained that the city has to rely heavily on soft measures such as awareness campaigns, as most regulations need to come from the state or federal government (RKU1, Nov 11, 2022). The interviewee mentioned that the city alone does not have the power to set more ambitious energy standards or reduce the fares for public transport, for example. Two interviewees alluded to the difficult relationship between the city of Munich and the state of Bavaria (RKU1, Nov 11, 2022; RKU2, Dec 2, 2022). While the city is governed by a red-green coalition, the state is still governed by conservative parties. These political differences can complicate interactions between the city and state, as one interviewee told us:

It's not such an easy relation between the state of Bavaria and the city of Munich. Maybe it's also something ... to do with politics, because they are the conservatives. And here in the city of Munich we have the Green Party and the Socialist party. (RKU1, Nov 11, 2022)

Cities also have different measures available to them depending on which state they are in. A researcher specialised in municipal climate protection pointed out the fact that in the state of Baden-Württemberg, cities have the freedom to set their own price for residential parking spaces, whereas in Bavaria, only the state can decide on such fees (IFEU, Jan 3, 2023). The city of Munich would like to raise the price from the current level of €30 per year but is not authorised by the state of Bavaria to do so (Karowski, 2023).

While cities are subject from restrictions from the state level, states themselves are subject to restrictions from the national level, which in turn limit their ability to place obligations on municipalities. On the one hand, they are limited as a consequence of the autonomy granted to local governments. Germany's principle of local self-administration (*kommunale Selbstverwaltung*) gives municipalities the freedom to independently govern local affairs, meaning that states cannot interfere in local matters such as city planning, budget management and the issuing of statutes (Bayerisches Staatsministerium des Innern, für Sport und Integration, n.d.). On the other hand, states are restricted due to budget considerations. As in most countries, climate protection remains a voluntary task of local governments in Germany, and due to the principle of connexity (*Konnexitätsprinzip*), federal states cannot mandate localities to act on climate change unless they themselves agree to finance this action (Eckersley et al., 2021). As it is not mandatory for local governments to prepare climate action plans, all climate protection measures taken by the city of Munich are of a purely voluntary nature. Several interviewees mentioned the problems associated with the lack of a mandate (RKU2, Dec 2, 2022; IFEU, Jan 3, 2023; BUS1, December 21, 2022). One RKU staff member mentioned that all voluntary measures have to be financed with the city's own budget, which ultimately limits the extent to which they can take action:

Everything we do in climate protection is voluntary. Sometimes one can perhaps tag it onto something that is not voluntary, but normally, we have to pay it from our own budget. And yeah, this is a bit of a construction fault and it limits ... what we can do. (RKU2, Dec 2, 2022)

If climate protection was obligatory, not only would cities have more funds available for it, but they would also be better able to develop climate protection measures with a long-term perspective, as mentioned by another interviewee:

If there's a good year for the cities, they have enough money for spending on climate action but if there are bad years, for example, after Corona, then the cities first stop all the voluntary actions. As a result, municipal employees have no long-term perspective. This would be much easier if there would be more public or obligatory tasks. (IFEU, Jan 3, 2023)

Rather than mandating municipalities to act, the national and state governments both adopt an enabling governance approach to promote climate action in cities. In 2008, Germany founded the National Climate Initiative (*die Nationale Klimaschutzinitiative, NKI*) in order to promote climate protection projects throughout Germany. The NKI offers a variety of funding programmes for climate protection initiatives, including the Municipal Directive (*Kommunalrichtlinie*), which provides specific support for municipalities. Through this programme, local authorities can request funding for the development of climate protection concepts, climate protection personnel, consulting services and a variety of climate protection measures (Bundesministerium für Wirtschaft und Klimaschutz, 2023). The city of Munich has acquired funding from the NKI for several projects, including the construction of cycle paths and bicycle parking facilities (Landeshauptstadt München, 2021c). The state of Bavaria has a similar funding programme for climate protection in municipalities (Bayerisches Staatsministerium für Umwelt und Verbraucherschutz, 2023).

Despite the fact that national and regional governments place no explicit obligations on municipalities with regard to climate protection, in principle, cities such as Munich are, to a certain extent, influenced by climate laws enacted on the national and regional level. One example is Germany's national climate law, which was first enacted in 2019. It sets the national goal of achieving climate neutrality by 2045 as well as intermediate emission reduction targets for 2030 and 2040 (Bundes-Klimaschutzgesetz, 2019). In November 2020, the state of Bavaria enacted its own climate protection law (Bayerisches Klimaschutzgesetz, 2020), with the updated version setting slightly more ambitious targets than that of the federal administration. According to the latest version of the law, which came into force on 1<sup>st</sup> January 2023, the state of Bavaria should reach climate neutrality by 2040 at the latest. Like the national climate law, however, it does not place any explicit obligations on municipalities

with regard to climate protection. In Article 5 of the law, local authorities are recommended to develop climate change mitigation and adaptation programmes which complement those of Bavaria, but it is not mandatory (Bayerisches Klimaschutzgesetz, 2020).

An RKU staff member highlighted the fact that although Germany and Bavaria have both established climate protection laws, there is no law from higher levels obliging Munich to achieve climate neutrality in a certain timeframe (RKU2, Dec 2, 2022). Reaching climate neutrality by 2035 was an autonomous decision made by the city. Despite this, climate laws from higher levels are relevant for the city and support the city in achieving its ambitious goal. The interviewee mentioned a new federal law related to climate protection, which for the first time, “governs down through all the levels” to the cities (RKU2, Dec 2, 2022). The “Wind-on-Land Law” (“*Wind-an-Land-Gesetz*”), which entered into force on 1<sup>st</sup> February, 2023, requires the federal states to allocate two per cent of their area to wind energy by the end of 2032 (Die Bundesregierung, 2023). This affects the city of Munich, as they are required by law to allocate some of their land to the construction of wind turbines.

As a member state of the EU, Germany is subject to European climate targets. The main EU framework on climate action is the European Green Deal. This has several components including the European Climate Law, which sets a legally-binding target for reaching climate neutrality by 2050, and the 2030 Climate Target Plan, which proposes reducing GHG emissions by at least 50 per cent by 2030. Cities play an important role in implementing measures to help reach such targets. Climate action in Munich is further affected by other key pieces of EU legislation, such as vehicle emission standards and directives on energy efficiency (European Commission, n.d.-a). An example of how EU laws directly affect the city of Munich can be seen in the recent introduction of the diesel driving ban (*Dieselfahrverbot*). Since February 2023, diesel vehicles of the emission class Euro 4 have been banned from entering the extended environmental zone, which includes the city centre and Munich’s motorway, the Mittlerer Ring. The ban was introduced in an attempt to lower nitrogen dioxide levels in four areas of the city where the values have exceeded the EU limit for about ten years. If Munich does not take action to combat this air pollution, it could face EU fines of up to one million euro per day (Steinbacher, 2023). In an interview with the RKU Office Manager, the role of the EU in the transition to electric vehicles was highlighted (RKU2, Dec 2, 2022). The interviewee admitted that Germany remains reluctant to regulate the automotive industry:

One has to say the EU was the central impetus, because Germany is always very reluctant to tell car manufacturers what to do. It's basically our gun industry. (RKU2, Dec 2, 2022)

The interviewee referred to the EU's proposed ban on the sale of new combustion-engine vehicles by 2035 (European Parliament, 2022), which could be crucial in triggering the shift to electric vehicles in Germany's cities and villages. Recent discussions, however, indicate that an exception may be made for combustion-engine vehicles that run on e-fuels. The EU is considering this exception in response to pressure from the German government itself, namely the Free Democratic Party (FDP), who oppose an outright ban on combustion-engine technology (Oltermann, 2023).

Aside from EU legislation, European cities are also supported in their efforts against climate change by access to EU funding. For example, Munich was recently chosen to participate in the EU mission "100 climate-neutral and smart cities by 2030." With a total budget of around €100 billion, the mission supports cities through advice, networking opportunities, international recognition, and easier access to other funding programmes. Although Munich's plans to achieve city-wide climate neutrality by 2035 remain unchanged, participation in the mission is pushing Munich to reach climate neutrality in certain parts of the city, where the transformation of long-lasting infrastructure such as heating systems is not so relevant (Landeshauptstadt München, 2022b).

Cities are not merely passive implementers of decisions from higher levels of government; they also have the capacity to influence higher levels. In Germany, this bidirectional interaction can best be observed through the work of the Association of German Cities (*Deutscher Städtetag*). Founded in 1905, the association represents the interests of cities at the national and EU level and defends their right to local self-government (Deutscher Städtetag, n.d.). The regional branch of this association in Munich is the Association of Bavarian Cities (*Bayerischer Städtetag*), which, as its name suggests, represents the interests of cities in the state of Bavaria. This association often lobbies the national and state governments for better framework conditions regarding climate protection. For example, they have advocated for climate protection to be designated as a compulsory task of municipalities and for a permanent, reliable financing framework rather than project-based funding programmes (Bayerischer Städtetag, 2022). Several interviewees mentioned these associations as important forums for interacting with higher levels of government (RKU1,



Nov 11, 2022; RKU2, Dec 2, 2022; IFEU, Jan 3, 2023). Both RKU employees we spoke to highlighted their importance but explained that generally, only staff higher up in the hierarchy are involved in such exchanges, for example, the department heads and mayors (RKU1, Nov 11, 2022; RKU2, Dec 2, 2022).

#### **4.1.4. Interactions with other cities**

Munich, like many major cities, is a member of several TMCNs. These networks serve as important intermediaries in interactions with other cities. One of the first TMCNs Munich joined was Climate Alliance (*Klima-Bündnis*). This network, which was established in 1990, consists of almost 2,000 municipalities across Europe, making it the largest city network dedicated to local climate action (Climate Alliance, n.d.). The city of Munich has been a member since 1991, thereby being among the first municipalities to join the network, and according to the city's official website, at the heart of this membership is a partnership with the Peruvian Asháninka people. Through this partnership, the city supports protection of the Peruvian rainforest, strengthens the rights of indigenous people and informs Munich's inhabitants about the importance of global rainforests (Landeshauptstadt München, 2021d).

Another important city network of which Munich is a member is Eurocities, a network of over 200 large European cities working together on urban problems, including the issue of climate change. According to the city's official website, Munich has been an active member since 1992 and has benefitted from membership in many ways. Benefits mentioned include enhancement of the city's international profile, easier access to EU funds, policy development, exchange of best practices, learning from peers and benchmarking with other European cities (Landeshauptstadt München, 2021e).

Munich signed the Covenant of Mayors for Climate and Energy in 2009, one year after its launch. In joining this EU initiative, members voluntarily commit to achieving the EU's climate and energy objectives (European Commission, n.d.-b). In order to prove that they are on the right track, members are obliged to prepare a Sustainable Energy Action Plan (SEAP), regularly report on the implementation of SEAP measures and perform CO<sub>2</sub> monitoring (Referat für Gesundheit und Umwelt, 2015).

In 2022, the city of Munich was invited to join another city network, ICLEI – Local Governments for Sustainability. The invitation was extended due to Munich's visible commitments to sustainable development. ICLEI is a global network of over 2,500

municipalities dedicated to sustainable transformation. From the point of view of the city's Environment Department, ICLEI membership brings multiple benefits, including the opportunity to exchange with other cities on the common challenges of sustainable transformation, carry out innovative projects together and advance common topics. They also mention the visibility associated with membership of such a well-known network (Referat für Klima- und Umweltschutz, 2022a).

Although Munich's membership of several city networks suggests that it has frequent interactions with other cities, interviews with RKU employees revealed that such interactions are in fact quite rare or at least are not as important as outward appearances might suggest. When asked about city-to-city collaboration, one interviewee first mentioned the European initiative "100 climate-neutral and smart cities by 2030" and the Circular Cities and Regions Initiative, both of which encourage collaboration between cities (RKU2, Dec 2, 2022). The interviewee then mentioned the Association of German Cities as an important platform for lobbying for the interests of cities. When asked explicitly about the Covenant of Mayors and ICLEI, the interviewee admitted being aware of the membership but unsure as to how intense the collaboration was. This is because the management of this membership appears to be siloed.

One of the people dealing with these topics is Munich's coordinator for the Covenant of Mayors, whom we interviewed. According to the interviewee, the role does not involve much apart from straightforward administrative tasks (RKU1, Nov 11, 2022). For example, they are responsible for uploading Munich's climate action plan, GHG monitoring report and contact details to the designated webpage. They are also responsible for responding to the Covenant when there is some misunderstanding regarding their uploaded documents. Otherwise, no major exchange of opinions takes place within the context of the city network, with membership being more of a symbolic nature:

For the city of Munich, it's not that important. I think it's a kind of club where you can say, 'Okay, I am part of the Covenant of Mayors.' (RKU1, Nov 11, 2022)

The interviewee commented that membership could be leveraged more in terms of public relations, but unfortunately they lack the personnel to use the platform for reporting on the city's climate protection activities. They mentioned one important indirect advantage of the city's membership in this network – easier access to EU funding. When a city applies for funding, the EU usually checks whether the city is a member of this network or not.

Having discussed the limits of the Covenant of Mayors, the interviewee mentioned Climate Alliance as a particularly important network (RKU1, Nov 11, 2022). They listed various benefits of membership, including access to knowledge and tools, opportunities for exchange between cities, discussion groups and the network's tendency to lobby for cities' interests at the European level. Regarding tools, they specifically mentioned the Climate Protection Planner (*Klimaschutz-Planer*), a tool offered by Climate Alliance which helps municipalities to set up GHG monitoring. In the interviewee's opinion, Climate Alliance supports cities in their climate protection efforts, while some other networks seem to just want information from them:

Well the Climate Alliance is very important for me because it provides the knowledge and tools. And the possibilities to discuss. Other networks, especially if they want information from our side, they're sometimes not that easy. (RKU1, Nov 11, 2022)

#### **4.1.5. Interactions with multiple stakeholder groups**

Both Munich and Zurich have established participation formats through which they can engage with multiple stakeholder groups at once. The main way in which the city of Munich attempts to simultaneously involve different stakeholder groups in climate policy-making is the Climate Council (*Klimarat*). This participatory format was initiated in 2021, two years after the initial announcement of climate emergency in Munich and the decision to reach climate neutrality by 2035. According to the city's official website (Landeshauptstadt München, 2021b), the Climate Council's task is to comment on the city's fundamental decisions on climate protection issues and to act as a critical-constructive advisor to the city on climate protection policy. It is composed of 16 members (along with their deputies): two members of the city administration, five members of the honorary City Council, three representatives of civil society, three representatives of business, and three representatives of science. More details on the individual members can be found in Appendix D. According to the statute on the introduction of the Climate Council (*Klimaratsatzung*, 2021), it is intended to facilitate cross-sector communication by enabling a dialogue between the public, politics, science and the administration on the issue of urban climate protection. The sessions of the Climate Council, of which there are a minimum of four per year, are also open to members of the general public who want to attend as observers (Landeshauptstadt München, 2021b).

Through attending two sessions of the Climate Council, I was able to gain further insights into the functioning of the council. In the main part of the session, members present their statements (*Stellungnahmen*) on draft resolutions of the City Council. This is sometimes followed by a vote on positions presented at the previous session or a presentation from one of the city departments. In one of the sessions I attended (Munich, Oct 4, 2022), the RKU presented their new climate adaptation concept and their results from the pilot phase of the climate assessment project. After the presentations, members of the Climate Council were invited to give their opinions. In general, the sessions of the Climate Council appear to be relatively well-organised and productive. However, members expressed frustration at how little time they are given to review the material and prepare their statements before the session. Overall, the members, especially the civil society representatives, seem very dedicated to their role and put a lot of effort into their statements, despite the lack of preparation time.

Interviews with three members of the Climate Council and two RKU staff members revealed more insights into the inner workings of the Climate Council. First of all, two of the three Climate Council members interviewed mentioned the lack of transparency in the selection process (CIV2, Nov 12, 2022; BUS2, Jan 5, 2023). When asked how they were chosen to participate in the Climate Council, a business representative admitted being unaware of the exact selection procedure:

I have no idea [how I ended up being a business representative in the Climate Council] ... It wasn't a very transparent process, to be honest. (BUS2, Jan 5, 2023)

The interviewee hypothesised that they were chosen was due to their membership in certain environmental organisations or personal connections. Another interviewee told us that the list of candidates to represent civil society was somehow released before the official announcement (CIV2, Nov 12, 2022). In response, some environmental initiatives decided to organise their own internal elections. The alternative route taken by civil society groups was also described in a local newspaper article. According to the article (Hoben, 2021), various Munich-based organisations found the process of appointing civil society representatives to be lacking in transparency and therefore decided to take matters into their own hands. Munich Sustainability Initiative (MIN, *Münchner Initiative Nachhaltigkeit*), an alliance of civil society organisations working on sustainable development, therefore organised an election, with 28 organisations participating. The organisations then presented the elected

candidates to the RKU, and the City Council adopted the proposals. According to the MIN, the aim of the election was to achieve a legitimate selection process and to ensure that the elected representatives had strong support from civil society (MIN, 2021).

Regarding the work itself, a civil society representative mentioned that there was a lot to learn in the beginning, as they had little prior knowledge about the functioning of the City Council (CIV2, Nov 12, 2022). It began as a very intensive working process, with a lot of engagement by most of the members of the Climate Council. One of the first major topics they worked on was the “Action Plan Climate Neutrality Munich.” Due to the cross-cutting nature of the topic, all members were heavily involved. They also formed focus groups on subtopics; for example one group worked on heating, cooling and electricity. This allowed individual members to harness their expertise in certain areas. A business representative also commented on the high level of cooperation between members and the high quality of work, despite the limited time they have to review lengthy documents:

I'm really surprised about the quality of the work of the [Climate Council] because [most of the time] we get, you know, all these 500 and thousand page thick ... documents and have to make up our mind within say, two weeks or so and form a certain statement with people who barely know each other. So yeah, given the circumstances, I would say it's of high quality. (BUS2, Jan 5, 2023)

According to this interviewee, the engagement of members has declined since this early stage, especially among business representatives. They speculated that this could be because more recent topics tend to be more specialised. This can prevent members, particularly from science or business, from engaging in the topic, as they may feel it is outside their area of expertise. Civil society representatives, however, do not generally have this problem. They feel that they can speak freely, because they have a clear position and do not experience the same kinds of conflicts of interest as the aforementioned groups (CIV2, Nov 12, 2022).

When asked whether they feel the Climate Council has an impact on decision-making, members were unsure. They think that their opinions are considered, but it is not clear whether they are directly impacting decisions made by the City Council (CIV2, Nov 12, 2022; BUS1, Dec 21, 2022). One member added that it is difficult for them to determine what the impact in the parties is, because the politicians who attend the Climate Council are those who are interested in climate change issues anyway (CIV2, Nov 12, 2022). The interviewee said that some of the Climate Council's more subtle points had been integrated into proposals

and that sometimes, they felt that their statements triggered a mental shift in the City Council, with the importance of issues being weighed up slightly differently as a result. Most members would like to be included earlier in the policy-making process (CIV2, Nov 12, 2022; BUS1, Dec 21, 2022). By the time a draft resolution reaches them, it is already quite final and therefore difficult to change. One member thought that it might be even more productive to shift the attention away from policies that are already in the planning process and instead, ask the Climate Council specific questions related to climate protection or for their recommendations on the city's climate action (BUS1, Dec 21, 2022). In this way, their work would adopt a more proactive rather than reactive nature:

I'm wondering if it wouldn't be more effective to just ask us specific questions, or to ask us to tell them what we think the city should be doing independently of what's currently in the policy pipeline. You know, like just, advising ... from our expert point of view rather than just reacting to policy drafts. (BUS1, Dec 21, 2022)

From the viewpoint of the city administration, the Climate Council is a welcome addition to the sphere of climate policy-making. One RKU staff member highlighted the importance of such platforms where members can speak freely without the complications of loyalty to political parties (RKU2, Dec 2, 2022). They added that it is the representatives from civil society and science who pressure the city administration and City Council the most on climate action. They appeared to sympathise with the palpable frustration of these members and expressed hope that they stay motivated, despite the challenges of implementing their wishes. Another RKU employee mentioned the barriers which prevent them from fulfilling the expectations of the Climate Council, in particular the lack of personnel and data:

[Climate Council members] have many ideas, which I appreciate, but we are not always able to cope with them ... For example, [they say that] greenhouse gas monitoring should be extended also to consumption or to scope three emissions, etc. And this is not possible for us, because we do not have the manpower, but overall we do not have the data. (RKU1, Nov 11, 2022)

Nevertheless, the interviewee described the Climate Council as “a great support” to the administration, as they provide a critical, outsider view on the work of the RKU.

#### 4.1.6. Interactions with businesses

Regarding the implementation of climate protection measures, Munich has several programmes targeting businesses. In order to encourage local businesses to actively participate in climate action, Munich launched the Climate Pact for Munich Economy (*Klimapakt Münchner Wirtschaft*) in 2015, with the motto “more cooperation – more climate protection”. As stated on the city’s official website for the Climate Pact, industry and commerce is responsible for almost half of Munich’s GHG emissions, making it a pivotal sector to target if the 2035 climate-neutrality goal is to be reached. Now entering its third implementation phase, the pact is signed by 15 of Munich’s largest companies, including BMW, Allianz and Siemens. On signing, the companies voluntarily commit to achieving emission reductions by implementing measures in five different areas: decentralized and renewable energy supply, green buildings, efficient production, low-emission mobility, and raising awareness of responsible resource use. They also share knowledge and work together on sustainable projects (Landeshauptstadt München, 2021f).

Another similar program is ECOPROFIT (*ÖKOPROFIT*). While the aforementioned Climate Pact is aimed at large companies, ECOPROFIT targets small- and medium-sized companies (SMEs). The program offers companies consulting services in the area of environmental management, advising them individually on how to simultaneously save costs and reduce their environmental impact. Companies who follow the program to completion receive an award from the city, certifying them as an “ECOPROFIT company” (Landeshauptstadt München, 2021g). Since the initiation of the programme in 1998, Munich has given this award to 422 companies, ranging in size from two to 5,000 employees (Landeshauptstadt München, 2022c).

In addition to the two main programmes described above, the city has recently launched a new cooperation mechanism called “Munich climate – Munich companies do climate protection” (*münchenklima - Münchner Betriebe machen Klimaschutz*). Like ECOPROFIT, it aims to reach SMEs. Participating companies can avail of support in the creation of a corporate carbon footprint and the development of measures to reduce it (Landeshauptstadt München, 2021h). The city provides further support for companies who want to engage in climate protection by hosting information events on relevant topics, offering grants for climate protection advice and measures, and supporting model projects in the area of climate protection (Landeshauptstadt München, 2021i).

Interviews revealed further insights into the city's attempts to include businesses in climate protection. An RKU employee described the two main programmes, Climate Pact and ECOPROFIT, as mere token systems, where companies receive a symbolic reward for their efforts in emission reduction (RKU2, Dec 2, 2022). The interviewee admitted that such incentives do not solve the fundamental problem, namely the unsustainability of economic activities. In another interview, a sustainable consultant commented that cities are often reluctant to pressure businesses to make emission reductions, because they do not want to get on their nerves (BUS1, Dec 21, 2022). Cities also tend to falsely assume that companies already have sufficient knowledge about climate change and therefore do not need to be informed.

Despite the city's apparent attempts to include SMEs through programmes like ECOPROFIT, a business representative in the Climate Council remarked that many SMEs do not feel welcome to participate in Munich's climate protection efforts (BUS2, Jan 5, 2023). According to the interviewee, one possible reason for this is that these companies have the impression that climate protection is the responsibility of large corporations like BMW and Siemens. Therefore, more attempts need to be made to explicitly invite these smaller companies to take part in Munich's climate community, as their contributions can make a significant impact to emission reduction.

According to a sustainable consultant working with Munich businesses, one key barrier to cooperation is that businesses tend to have little understanding of what the city can offer them (BUS1, Dec 21, 2022). Businesses think that they should be able to just pay their taxes and be left alone. What is missing, in the interviewee's opinion, is an awareness of collaborations between cities and businesses that provide benefit to both parties:

I think there has to be more of an awareness of how there can be collaborations that help both sides, that help the cities reach their [Key Performance Indicators] and that help businesses also transform, become more modern, you know, be innovative.  
(BUS1, Dec 21, 2022)

The interviewee mentioned, however, that recently, businesses have been reaching out to municipalities for support more than they had before, as a result of the high energy prices.



#### 4.1.7. Interactions with civil society

The city of Munich attempts to involve civil society in its climate protection efforts in several ways. Regarding the action plan for climate neutrality, the city facilitated broader citizen participation through an online platform called “089klimanneutral”, which was launched in 2021. Over the course of six weeks, members of civil society were invited to discuss and comment on the expert recommendations for reaching climate neutrality by 2035, via the online platform. They were also invited to develop their own recommendations, independently of expert advice. In addition to participation through the 089klimanneutral platform, the city hosted four thematic workshops, with selected experts from civil society and business participating. According to the city, over 40 climate protection measures were generated from the suggestions of participants, accounting for around 15 per cent of all the measures included in the action plan (Referat für Klima- und Umweltschutz, 2021c).

Although the platform appeared to be successful in integrating citizens’ feedback into the action plan, only 139 people registered on the platform, making the sample far from representative (Referat für Klima- und Umweltschutz, 2021c). This point was brought up by a member of civil society whom we interviewed (CIV2, Nov 12, 2022). As the interviewee took part in the process themselves, they observed that a small minority of interested people dominated the platform by posting multiple comments. In the same vein, the interviewee mentioned that it is important not to treat civil society as one homogenous group, because there are people who are interested in climate change, others who are active members of organised environmental initiatives and others still who are not interested in climate change at all. The latter group is typically the most difficult to reach but may be organised in other ways, for example, through membership of sports clubs or churches:

It's really important ... to not treat civil society as one, because there is a part of civil society that is interested in climate change. There's another part of organized civil society that do other things. And then there's a large part of people who are neither, and that's very hard to grasp. But they are also organized in some way, just not politically ... For example, we have sports clubs or churches. (CIV2, Nov 12, 2022)

According to the interviewee, these community spaces are potential arenas where large numbers of people could be mobilised in the fight against climate change.

The city further attempts to include civil society in climate protection by awarding funding to civil society groups who implement projects related to the environment and

sustainability. While project funding is restricted to a limited period of time, civil society groups also have the opportunity to apply for regular funding, which supports organisations for projects that run over several years (Landeshauptstadt München, 2021j). For the year 2023, the City Council has made a budget of almost €2 million available, with €1.6 million intended for regular funding and around €300,000 for project funding. Given the contribution of funded projects to achieving the city's goal of climate neutrality and the significant increase in funding applications in 2022, the RKU would like to double the funding budget in the upcoming years, making €4 million available for funding. They explicitly mention that reaching their ambitious climate goal will not be possible without the broad participation of civil society. According to the city, the funded measures add to and support the work of the RKU on environment protection in the city (Referat für Klima- und Umweltschutz, 2022b). One interviewee stressed the importance of this funding in boosting climate protection efforts:

[T]he idea is that ... this money is always multiplying a little bit because it's multiplied by inherent motivation. So this is quite important actually. (RKU2, Dec 2, 2022)

The involvement of civil society in climate policy-making is not limited to formal participation platforms initiated by the city. Civil society groups also pressure the city to take action on climate change through their autonomous campaigns. Two interviewees mentioned the Fridays for Future protests as a turning point in the city's climate strategy (RKU1, Nov 11, 2022; BUS2, Jan 5, 2023):

... [we saw] the single biggest step in climate politics that has ever been taken in Germany. I mean this was basically a turning point and it's, you know, just a bunch of activists from Fridays for Future. (BUS2, Jan 5, 2023)

The movement, which began as a group of students skipping school in protest against the lack of action on climate change, held its first protest in Munich in December 2018. While only 50 people participated in this protest, the movement grew significantly in 2019, with over 40,000 people participating in the September 2019 protest in Munich (Wetzel, 2019). As mentioned in Chapter 4.1.1, it was at the end of 2019 when Munich announced a climate emergency and set the goal of reaching climate neutrality by 2035, partly in response to the demands of the Fridays for Future movement. The organisation is even explicitly mentioned as a particularly relevant actor for climate protection in the city's first basic resolution on the implementation of climate goals. In this document, it is also stated that

Fridays for Future will be continuously integrated into the preparation of Munich's action plan for reaching climate neutrality by 2035 (Referat für Klima- und Umweltschutz, 2021a). Further evidence of their role in the city's climate politics can be seen in the fact that one of the civil society representatives in the Climate Council is a member of the Fridays for Future movement.

#### **4.1.8. Interactions with science**

The main way in which the city collaborates with science is through the commissioning of research institutes to prepare expert reports. According to an RKU employee, when the city decided to commission experts to prepare a report on how Munich could reach climate neutrality by 2035, they initiated a public tendering process (RKU1, Nov 11, 2022). The Öko Institut, a private environmental research institute, was chosen, and they made an offer together with the Hamburg Institute and INTRAPLAN. According to the interviewee, it was a straightforward choice, as the Öko-Institut had already prepared reports for the city and were renowned for their expertise in municipal climate protection:

We also knew already the Öko-Institut because they made ... other studies for the city of Munich, especially for our department in the past. So they are experts in the field of climate protection for cities. They know the Munich problems very well, and therefore it was quite easy to select them. (RKU1, Nov 11, 2022)

The result of this collaboration was the action plan on climate neutrality, published in 2021, which formed the basis for Munich's Climate Package (see Chapter 4.1.1). Another important scientific partner for the city is the Research Institute for Energy (*Forschungsstelle für Energiewirtschaft*, FfE). Together with the aforementioned Öko-Institut, the FfE prepared a study on how the city can achieve a climate-neutral heat supply by 2035 (FfE & Öko-Institut, 2021). The study, which was also published in 2021, formed the basis for the city's municipal heating strategy.

Regarding collaborations with local universities, an RKU staff member explained that the city sometimes cooperates with the Technical University of Munich (TUM), especially with particular chairs, with whom they have long-standing relations (RKU2, Dec 2, 2022). The interviewee gave the example of GEO.KW, a simulation tool for groundwater, which was developed jointly by the city of Munich, two chairs at TUM and other research partners. The tool can be used to improve the efficiency of thermal groundwater use in the city

(Technical University of Munich, n.d.). Despite the existence of valuable synergies like this project, the interviewee admitted that the city does not collaborate enough with universities, partly due to the lack of a culture for this kind of cooperation:

So in the city, I would say the main challenge is there is not really a culture for that.

We always have the problem [that] we have to be very aloof, so we are neutral ... and so on. (RKU2, Dec 2, 2022)

The interviewee was of the opinion that the city should initiate more cooperations with local universities, for example, by hiring students to write their thesis with the city. This could benefit both sides, providing some relief for the short-staffed administration on the one hand and providing interesting and relevant work for students on the other hand. The interviewee was convinced that the link between the city and its universities could be strengthened without interfering with the independence of both sides, especially when the tasks are clearly defined.

One initiative which promotes collaboration between the city and its universities is the University Prize of the City of Munich (*Hochschulpreis der Stadt München*). Students from the city's universities are invited to submit final theses which focus on the city of Munich, in particular its urban planning, cultural or economic development. Students with the best theses are awarded €5,000. The goal of the prize is to introduce relevant findings from academic research into the city administration, civil society and business (Landeshauptstadt München, 2021k).

## **4.2. Zurich**

### **4.2.1. Background and climate protection strategy**

Like Munich, the city of Zurich has been active in the area of climate protection for quite some time. In 2008, on approval of the 2000-Watt Society strategy, Zurich became the first Swiss city to anchor a climate protection target in its municipal code (*Gemeindeordnung*). This strategy envisions a world where each person has access to 2000 watts of continuous power per year, the amount necessary to ensure a good quality of life. At the time it was enacted, the average Zurich resident used about 5,000 watts per year. Therefore, the goal is to drastically reduce the primary energy consumption of Zurich inhabitants and limit yearly CO<sub>2</sub> emissions to no more than 1 ton per person by 2050 (Stadt Zürich - UGZ, 2011).

In 2019, a new phase of climate governance began in Zurich, in response to the demands of the Climate Strike (*Klimastreik*) movement. In spring 2019, the City Council adopted six climate-prioritised measures, which lie within the city's sphere of influence. Furthermore, the city commissioned an expert report on the scenarios for reaching net zero by 2030, 2040 or 2050. The report, which was prepared by the sustainability consultancies INFRAS and Quantis, was published in 2020 and presented potential measures for achieving net-zero emissions and the possible consequences (Sigrist et al., 2020). Unlike Munich, the city of Zurich chose not to announce a climate emergency, despite pressure from the climate strike movement. The City Council dismissed it as a mere symbolic action and also cautioned against the use of emergency status due to its implied erosion of democratic and constitutional norms (Stadt Zürich – Stadtrat, 2019).

In April 2021, on the basis of the expert report, the City Council (*Stadtrat*) decided on new climate targets for the city of Zurich: net-zero emissions by 2040 and a 30 per cent reduction in indirect emissions in relation to 1990 levels (Stadt Zürich, 2021a). The City Council defines net zero as a reduction in the city's direct GHG emissions as much as possible by 2040 and offsetting of the remaining unavoidable emissions with negative emissions technology (Stadt Zürich – Stadtrat, 2021). In December 2021, these targets were approved by the Municipal Council (*Gemeinderat*), who also tightened the targets to include a net-zero city administration by 2035 (Stadt Zürich, 2021a). In February 2022, the city adopted an environmental strategy (*Umweltstrategie*), replacing the Environment Master Plan which had previously been the basis for the city's environmental policy. The strategy outlines four key objectives: climate neutrality, high environmental quality, a variety of interconnected ecologically-valuable spaces and responsible use of resources (Stadt Zürich, 2022b). The Zurich public voted overwhelmingly in favour (75 per cent majority) of the 2040 net-zero target in a referendum in May 2022 (Stadt Zürich, 2023a).

#### **4.2.2. Interactions between city administration departments**

The municipal department responsible for the climate protection strategy of Zurich is the Health and Environment Department (*Gesundheits- und Umweltdepartement*). Given the variety of topics dealt with by this department, it is further divided into seven units. One of these units is Environmental- and Health Protection Zurich (*Umwelt- und Gesundheitsschutz Zürich*, UGZ), which is described as a service department (*Dienstabteilung*) of the larger

department. The UGZ is responsible for topics such as the net-zero strategy, the 2000-Watt Society strategy and the monitoring of environmental goals (Stadt Zürich, 2023b). Along with the UGZ, other departments which are central in the city's climate protection strategy are the Department of Civil Engineering and Waste Management (*Tiefbau- und Entsorgungsdepartement*), the Department of Building Construction (*Hochbaudepartement*) and the Department of Industrial Enterprises (*Departement der Industriellen Betriebe*) (Stadt Zürich, 2022b).

According to the Head of the Environment Division within the UGZ, the role of the UGZ is mainly of a coordinative nature (UGZ2, Oct 27, 2022). The interviewee stated that due to the large size of the city administration, the UGZ staff act as “ambassadors of the environment” who are constantly interacting with different departments. In their view, they do not have much control over the implementation of environmental protection measures, since this is distributed across various departments:

It's very much a coordinative role because the administration is quite big ... And that means we are very much coordinating and we are more like ... the ambassadors of the environment, but we don't have much ... control over implementation [as] that's very much distributed in different departments. So yeah, we are very much interacting with different bodies, different departments, different projects. (UGZ2, Oct 27, 2022)

Aside from the departments mentioned above, the interviewee mentioned that they regularly collaborate with the Energy Officers (*Energiebeauftragte*), who are part of the Department of Industrial Enterprises, as well as the departments for traffic (*Verkehr*) and Green City Zurich (*Grünstadt Zürich*), which are both located within the Department of Civil Engineering and Waste Management.

The Director of the UGZ echoed the sentiment that the department lacks control over implementation but plays an important role in establishing an environmental strategy and convincing colleagues and decision-makers to decide on concrete measures (UGZ3, Nov 25, 2022). The disadvantage of such an organisational structure, according to the interviewee, is that they lack the power to implement measures in a quick and efficient manner. Nevertheless, the interviewee commented that there is a high level of sensitivity towards net zero in all the departments and that the environmental strategy is now well integrated in the departments' own strategies. A third interviewee from the UGZ also mentioned the

coordinative role of the department and their responsibility in ensuring that the strategies of other departments are compatible with the net-zero target (UGZ1, Oct 25, 2022).

#### **4.2.3. Interactions with higher levels of governments**

Zurich is a municipality or commune (*Gemeinde*) located in the canton of Zurich, which is one of Switzerland's 26 cantons (or member states). The division of responsibilities between a canton and its communes is decided on by the canton. Zurich is the largest commune in Switzerland. It has its own parliament and can organise referendums (Swiss Federal Chancellery, 2022). Relations between the city and canton have changed over time. One UGZ staff member commented that they have a good relationship with canton officials thanks to their personal connections (UGZ1, Oct 25, 2022). The interviewee also explained that relations between the city and canton have improved since the new director for building and climate was elected. The current director is a member of the Green Party while his predecessor was a member of the conservative SVP party. Another interviewee, a sustainability consultant who often collaborates with the city, remarked on the fact that climate protection in Zurich has become easier since this political change, as the canton has become more progressive (INFR, Oct 25, 2022). Nevertheless, an ambition gap remains between the city and canton with regard to climate protection. Several interviewees mentioned the slow pace of implementation which stems from their dependence on the canton and the generally inefficiency of the federal system (UGZ1, Oct 25, 2022; INFR, Oct 25, 2022; UGZ2, Oct 27, 2022; UGZ3, Nov 25, 2022). The Director of the UGZ mentioned that the system leads to a significant amount of time being wasted:

[The federal system is] not ... very efficient. We lose a lot of time. We lose a lot of resources, and we are very slow in everything. (UGZ3, Nov 25, 2022)

Several laws and goals from the national level influence climate protection in the city of Zurich. In January 2021, Switzerland adopted the Long-Term Climate Strategy 2050 (*Langfristige Klimastrategie 2050*), with the goal of reducing Swiss GHG emissions to net-zero by 2050 in line with the Paris Agreement and the European Union's climate neutrality goal (Bundesamt für Umwelt BAFU, 2022a). Switzerland's central piece of climate legislation is the CO<sub>2</sub> Act (*CO<sub>2</sub>-Gesetz*). In force since 2000, the act originally mandated the reduction of GHG emissions by 20 per cent in relation to 1990 levels by 2020. The law has been extended until 2024, with GHG emissions to reduce by 1.5 per cent each year

(Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK, n.d.). In September 2022, a new revision of the act for the period 2025 to 2030 was adopted by the Federal Council. Unlike the previous revision, which was rejected in a referendum in 2021, the new draft refrains from introducing new or higher taxes, instead focusing on promoting climate-friendly investments (UVEK, 2022). Another important piece of national legislation related to climate change is the Energy Act (*Energiegesetz*). Its goal is to increase energy efficiency, promote the use of renewable energy, reduce energy consumption, and prohibit the construction of new nuclear power plants (Federal Department of the Environment, Transport, Energy and Communications DETEC, n.d.).

The Canton of Zurich adopted its own long-term climate strategy in 2022. Its aim is to achieve climate neutrality by 2040, or at the latest by 2050, and to halve GHG emissions by 2030 compared to 1990 levels (Kanton Zürich, 2023a). The canton also has its own Energy Act. The revised version of this act came into force in September 2022, bringing with it major changes. Since its introduction, the installation of oil and gas heating systems in new buildings is prohibited, and in existing buildings, these systems must be replaced with climate-friendly alternatives at their end-of-life. Furthermore, new buildings must be equipped with solar panels (Kanton Zürich, 2022). Several interviewees mentioned the importance of this law for climate protection in the city of Zurich (UGZ1, Oct 25, 2022; UGZ2, Oct 27, 2022; UGZ3, Nov 25, 2022; ETHZ, Feb 3, 2023). One UGZ staff member commented that without this law, it would not have been possible for the city alone to implement such a strict prohibition of fossil-based heating systems:

[Laws from higher levels] are quite important. ... This prohibition of fossil heating comes from the cantonal level. [It] would not be possible for us to do it just on the city level. So we are very happy that it happened. (UGZ2, Oct 27, 2022)

Other laws from higher levels of government are relevant for the city of Zurich but do not generally place specific obligations on the city. Municipalities are usually only mentioned in the context of collaboration. For example, in Article 4 of the federal Energy Act, it is stated that, within the scope of their competence, municipalities shall cooperate with business organisations to enforce the act. The canton's Energy Act, however, mentions municipalities significantly more than the federal act. It invites all municipalities to carry out their own energy planning and mentions that under certain circumstances, municipalities may be obliged to create an energy plan (*Energiegesetz*, 1983). With the referendum in May 2022,



the constitution of the canton of Zurich was altered to include an article on climate change for the first time. Article 102a states that the canton and its municipalities are committed to limiting climate change and its consequences. It further elaborates that in their climate protection efforts, they should consider the goals of the national government and the international agreements that are binding for Switzerland (Verfassung des Kantons Zürich, 2022). With this article, one could say that climate protection became a mandatory task of municipalities, although the framing of the task is vague and therefore may have a limited impact. For example, it does not oblige communes to prepare climate action plans or set specific climate targets.

As the national and cantonal governments place few obligations on municipalities with regard to climate protection, almost all measures that cities such as Zurich implement in this area are voluntary. The reluctance to place obligations on municipalities is related to the principle of municipality autonomy (*Gemeindeautonomie*), which is explained in Article 85 of the canton's constitution. It states that municipalities can regulate their affairs independently and that cantonal law grants them as much freedom as possible (Verfassung des Kantons Zürich, 2022).

Higher levels of government rather adopt an enabling approach to climate protection in municipalities. In order to support municipalities on their path to net-zero emissions, the national government has prepared an eight-step guide "The Climate Strategy for Municipalities Guide". They also offer some tools for municipalities, including templates for climate strategy documents and action plans, as well as free advice on the balancing of GHG emissions (BAFU, 2022b). In addition to information and advice, the Federal Council established a funding programme called "Swiss Energy" (*EnergieSchweiz*). The programme provides support for municipalities in the implementation of voluntary measures by offering subsidies for projects in energy efficiency, renewable energy and mobility (EnergieSchweiz, n.d.). Similarly, the canton of Zurich has a webpage dedicated to climate action in municipalities, which provides information on the effects of climate change as well as available tools and support programmes (Kanton Zürich, 2023b).

Although Switzerland is not a member of the EU, it maintains close relations with the region. These relations are formalised through a series of bilateral agreements that have been concluded between the two parties. The EU is Switzerland's largest trade partner, with about 55 per cent of its exports destined for the EU and 73 per cent of its imports originating from

there (Federal Department of Foreign Affairs FDFA, 2016). Switzerland also cooperates with the EU in the area of climate protection. For example, in 2020, Switzerland became the first country to successfully link its GHG emissions trading scheme with the EU's emissions trading system (EU ETS) (Council of the EU, 2019). One of the UGZ employees we interviewed mentioned the importance of certain European regulations for Switzerland and in turn, Zurich (UGZ2, Oct 27, 2022). The interviewee explained that they have to adhere to the EU's emission standards for cars, for example.

The relationship between Swiss cities such as Zurich and higher levels of government is not of a strictly one-sided nature. Cities also have the opportunity to influence decision-making on the national and cantonal level. The main forum through which they can make their concerns heard is the Swiss Association of Cities (*Schweizerischer Städteverband*, SVV). Like its German counterpart, the association represents the interests of cities at higher political levels. It is a constant partner in the federal government's consultation process (*Vernehmlassungsverfahren*), in which different stakeholders are invited to comment on legislative proposals (Schweizerischer Städteverband, 2022). An UGZ employee told us that during the consultation process for the CO<sub>2</sub> Act, all city departments gave feedback, and this feedback was sent to the federal government via the Swiss Association of Cities (UGZ1, Oct 25, 2022). The interviewee also mentioned that they were involved in the consultation process for the canton's Energy Act.

Two UGZ employees mentioned the specific influence that the city of Zurich has, owing to it being the city with the highest population and largest economy (UGZ1, Oct 25, 2022; UGZ2, Oct 27, 2022). This means that they sometimes have direct contact with the federal government, as revealed by one interviewee:

... if there are new laws from the federal level and they are relevant for us ... we basically write directly feedback to the federal government. And I think we have some power, not formally, but still, [Zurich] is like the biggest economic workhorse in Switzerland. (UGZ2, Oct 27, 2022)

However, such direct contact remains rare due to the canton being in between the city and national level.

#### 4.2.4. Interactions with other cities

The city of Zurich interacts with other cities through its membership of multiple TMCNs. As far back as 1993, Zurich joined the network of European cities, Climate Alliance (*Klima-Bündnis*). As the network was established in 1990, Zurich was one of the early members. It also joined Climate Alliance Switzerland, which consists of only the Swiss members. According to the city, the reasons for joining the network were to exchange experiences with other members, participate in concrete projects and to engage in international cooperation to contribute to global climate change mitigation (Stadt Zürich, 2023c).

In 1994, the city joined a global municipal network, ICLEI – Local Governments for Sustainability. The city recognises the important role of ICLEI in lobbying at the European level and in the implementation of international environmental agreements at the local level. Within the framework of ICLEI, another network called "Procura+" was established. It is a platform for European cities to exchange on the topic of sustainable and innovative public procurement. The city of Zurich is a founding member of "Procura+" and has been actively involved since its establishment in 2004 (Stadt Zürich, 2023d). Through ICLEI, Zurich has been able to share its expertise in the area of circular economy with other members. For example, in 2019, the city hosted a three-day visit for European practitioners to showcase their experience in building with recycled concrete (ICLEI, 2019). Zurich recently became the first Swiss city to commit to the "Circular Cities Declaration", wherein ICLEI is a key support partner (Stadt Zürich, 2022c).

The city joined another network in 2007, Eurocities. An alliance of European cities collaborating on common issues, its focus includes, but is not limited to, environmental issues. As Switzerland is not an EU member, Zurich is an associate member of Eurocities rather than a full member, with the only difference being that Zurich cannot participate in the governing body. One of the main reasons Zurich joined this network was to build alliances with its European neighbours and to express solidarity with them in their pursuit of sustainable development. It was part of a larger strategy from the City Council to build alliances beyond borders, with the aim of minimising discrimination of Switzerland for rejecting EU membership. Since the commencement of its membership, Zurich has participated in many Eurocities forums and working groups, including several related to sustainability (Stadtentwicklung Zürich, 2010).

In 2008, the City Council decided to join another European city network, the Covenant of Mayors, which was launched that same year. On signing, Zurich committed itself to a 20 per cent reduction in CO<sub>2</sub> emissions by 2020 compared to 1990. This common goal has since evolved to match the EU's target of reaching climate neutrality by 2050. According to the city's official website, Zurich joined this network in order to reinforce its pioneering role in environmental policy (Stadt Zürich, 2023e).

When asked about the importance of TMCNs in Zurich, the responses were mixed. One UGZ employee considered them as important given that European urban areas face similar challenges in relation to climate change (UGZ2, Oct 27, 2022). The interviewee explained that through such networks, they can learn from the responses of other cities to climate change and vice-versa:

So I think each city has some topics where they're very advanced. And then for us, it's interesting to learn how other cities deal with issues which we also have and the same the other way around. (UGZ2, Oct 27, 2022)

Within Switzerland, the interviewee mentioned that they can learn from cities such as Basel and Geneva but that Zurich has a pioneering role in climate protection and therefore has less to learn from other Swiss cities than the other way around. Another UGZ staff member, however, was sceptical about the role of TMCNs (UGZ1, Oct 25, 2022). For the interviewee, membership is merely symbolic:

I'm very sceptical about all these international networks. They are irrelevant. They are relevant for showing that we are [doing something against climate change]. And also the mayor of Zurich can sign something ... (UGZ1, Oct 25, 2022)

According to the interviewee, while membership of TMCNs can bring benefits in terms of cultural exchange and community building, it does not generally bring practical benefits for the city. The interviewee does not consider such networks to be useful, because the framework conditions across countries are so different, making comparisons difficult. What can be implemented in a city like Copenhagen, for example, might not be possible to implement in Zurich. Therefore, the interviewee views exchanges with other Swiss cities as more fruitful. They mentioned Winterthur, which is also in the canton of Zurich, and Basel as cities with which they have frequent contact.

#### **4.2.5. Interactions with multiple stakeholder groups**

In order to involve multiple stakeholder groups in the city's climate governance, Zurich established the Climate Forum (*Klimaforum*) in October 2020 (Stadt Zürich, 2023f). The participation platform was a response to the demands in the "Climate Strike" petition (Stadt Zürich – Stadtrat, 2019). The Climate Forum brings together different stakeholders to discuss climate protection issues and brainstorm ideas, with each event having a different thematic focus.

The first event focused on the net-zero goal. The city presented the results of the project "Scenarios for net-zero greenhouse gases", and 100 stakeholders were invited to discuss how Zurich could reach climate neutrality. The stakeholders included people from business, politics, organisations, science and the city administration. According to the city's official video on the event, this included participants from civil society groups such as Climate Strike Zurich and local businesses such as Siemens (Stadt Zürich, 2023f). The stakeholder group that had the most representation was business, with 31 per cent of the participants belonging to this group. This was followed by associations (28%), administration (22%), NGOs (10%) and science (9%). According to the city, one of their key goals for the first Climate Forum was to gain insights into the acceptance, ability to act and needs of relevant stakeholders in relation to the net-zero goal (Stadt Zürich – UGZ, 2020). After the presentation from the city on net-zero scenarios, the participants were invited to discuss the scenarios at thematic tables. The themes were as follows: Settlement and buildings, Transport, Energy provision, Industry and commerce, Textiles, Other consumption. At each table, the stakeholders were encouraged to focus their discussions on the feasibility of the presented scenarios, their willingness to contribute to the net-zero goal and the framework conditions that would be conducive to their involvement (Stadt Zürich – UGZ, 2020).

Following this in-person event, an online participation platform was launched. The platform was intended for stakeholders and representatives of topic-related organisations, including those who already participated in the offline event. From 1<sup>st</sup> December 2020 to 18<sup>th</sup> January 2021, registered users were able to give feedback on the city's climate protection measures and propose their own ideas as well as comment on and endorse proposals from other participants. The site had 1,754 unique visitors over the four weeks, but only 187 of these registered as a user. In total, 149 posts and 206 comments reached the platform (Di Mauro et al., 2021). The input was collected, evaluated and incorporated into future discussions.

Since the initiation of the Climate Forum in October 2020, four in-person focus events have taken place on the topics of net-zero buildings, urban agriculture, nutrition, and education in sustainable nutrition. Again, stakeholders from various sectors of society were invited to attend, with each event having around 30 to 40 participants. As in the first Climate Forum, the event began with a presentation from the city followed by discussions at thematic tables (Stadt Zürich, 2023f). It is also intended for the participation process to continue online. For example, an online participation platform has already been established for the topic “Buildings in the context of Net Zero 2040”. Based on findings from the focus event, the platform aims to collect best practices related to the topic, which can serve as inspiration for others (Stadt Zürich, n.d-a.).

In an interview with an UGZ employee, it was mentioned that the Climate Forum is still in development (UGZ2, Oct 27, 2022). The interviewee pointed out two problems with the current format. The first problem is that for now, the average citizen is not really included, because they invite specific stakeholders from NGOs and other organisations. According to the interviewee, more citizens participated in the online platform than in the physical event, but it still lacked participation from the average citizen, as the participants were mainly citizens who were already interested in climate protection:

One was by invitation. Then it's also then not the average citizen. It's more like stakeholders from NGOs or so ... We also made it online ... there, it was more citizens, but of course it's not the average citizen. It's really like the interested citizens that are already involved somehow in the topics. (UGZ2, Oct 27, 2022)

A member of a civil society organisation agreed that the forum tends to neglect the average citizen, calling it “hierarchical” (CIV1, Nov 4, 2022). The second problem is that it can be difficult for the administration to follow up on the topics discussed in the Climate Forum and to meet the high expectations of participants:

But then there's also a high level of expectation, and sometimes they're getting frustrated because then at the end of the day for us, it's also difficult to ... follow up and to fulfil all their expectations. So yeah, we're still working on [it], it's not so easy to find a good way of participation. (UGZ2, Oct 27, 2022)

Aside from the Climate Forum, the city of Zurich attempts to involve various stakeholders in the city’s climate protection efforts through the Climathon. First initiated in 2015, the hackathon is held in Zurich every year, with around 100 participants from start-ups,

companies, the city administration, universities and the general public working together for 24 hours to develop solutions in the areas of climate protection and adaptation (Stadt Zürich, 2023g). The best ideas are rewarded with prize money. In a press release about the 2022 Climathon, the city specifically mentions the role of the event in promoting innovation and as a participation format on the path to achieving net zero. In this event, the participants were presented with a series of climate challenges which the city had prepared. For example, one of the challenges was to develop a citizen science project related to climate change in Zurich. 21 ideas were presented, and six of these were awarded with a total of 40,000 Francs. The winners also have the opportunity to further revise their solutions through the online Climate Forum platform, where they can receive feedback from city experts and stakeholders (Stadt Zürich, 2022d). According to the city, the Climathon produces around 10 start-ups per year (Stadt Zürich, 2021b).

#### **4.2.6. Interactions with businesses**

There are several ways in which the city of Zurich attempts to support businesses in their climate protection efforts. One way is through the provision of free consulting services. The Eco-Compass (*Öko-Kompass*) service has been advising Zurich's SMEs on sustainability issues since 2009. The service is provided by an external consulting firm called act Cleantech Agentur Schweiz AG on behalf of the UGZ (Stadt Zürich, 2023h). In a 1.5 hour on-site consultation, an independent expert provides advice on how to boost energy efficiency and optimise resource use as well as an overview of the measures and funding available to them. Advice is centred around four areas: Mobility and logistics, Energy and buildings, Material and resources, and Information and quality (Stadt Zürich, 2023i). According to the city, the Eco-Compass programme has been successful so far, enabling CO<sub>2</sub> savings of up to 7 tonnes per SME per year. By 2020, the public-private partnership had reached out to around 4,000 SMEs and provided consultation to over 1,200 companies. The city views Eco-Compass as an important platform for the transfer of knowledge and innovation with industry, which is crucial in the journey towards net zero (Stadt Zürich, 2021c).

In addition to the individual consulting offer, Eco-Compass also organises regular networking events where SMEs can exchange ideas on their contribution to climate protection in Zurich. One such networking event is the Eco-Compass breakfast. The latest edition of this event series took place in October 2022, with the event focusing on

sustainability in the textile industry. Around 40 experts and representatives from the industry took part, discussing topics such as circular economy and responsible procurement. The event opened with presentations from city officials on the city's climate protection strategy, the impact of the textile industry on the environment, and the offers available to support the industry in their climate protection efforts. This was followed by a presentation on a company selling sustainable home textiles, in order to provide an example of best practice in the industry (Stadt Zürich, 2022e).

Another initiative which facilitates networking between companies involved in climate protection is the Climate Platform of the Zurich Economy (*Klimaplatform der Wirtschaft Zürich*). Members have the opportunity to attend four business lunches per year, during which sustainable business models and projects are presented and discussed. With the UGZ being a key partner, the platform is an important means of facilitating exchange between city officials and businesses (Klimaplatform der Wirtschaft Zürich, 2023a). Since its launch in 2017, 15 business lunches have taken place, and 1,771 people have attended. The most recent event, which took place in August 2022, was hosted by Zurich's municipal energy company ewz. It included a presentation from ewz on the use of Zurich's lake water as an energy source for heating and cooling as well as a presentation from the director of the UGZ on the opportunities for businesses with regard to environmentally-friendly heating and cooling (Klimaplatform der Wirtschaft Zürich, 2023b).

Besides the formal programmes described above, interviewees mentioned several other ways in which they interact with companies in the context of climate protection. The Director of the UGZ explained that they often interact with companies via trade associations such as *economiesuisse*, a large association representing the interests of Swiss companies, and *swisscleantech*, a smaller association whose members have signalled their commitment to climate protection (UGZ3, Nov 25, 2022). Another interviewee referred to the need to cooperate with Zurich's businesses in order to gain access to indirect emissions data (UGZ2, Oct 27, 2022). For example, the city is currently in contact with the major supermarkets COOP, Migros, Aldi and Lidl to acquire sales data for Zurich. The city also collaborates with the airport to gain access to data on air travel. Such data can lead to better estimates of the indirect emissions of Zurich.

Another UGZ employee mentioned the limitations of a city in terms of forcing companies to act on climate change (UGZ1, Oct 25, 2022). The city can initiate a dialogue



with companies and encourage them to sign a pact, but the impact is limited. For the interviewee, it is more effective for the city to foster a melting pot of sustainable innovation:

You speak a lot [with companies] or you make some paper that you sign or something like this, and then it's gone again. I mean, as a city, you [do not have] force to drive them. [But] you can build a melting pot and economic environment. (UGZ1, Oct 25, 2022)

The interviewee mentioned that Zurich could be considered as an innovation hub, with many sustainable companies being established there, for example, South Pole, a carbon finance consultancy founded by ETH Zürich students. It appears that the city plans to continue their strategy of promoting sustainable innovation. In March 2023, the City Council announced their plans to launch a new funding programme to support start-ups and non-profit organisations that are dedicated to climate protection and the circular economy. With a funding amount of 12 million CHF envisioned, the "KlimUp" funding programme has the potential to significantly boost sustainable innovation in the city, although it has yet to be approved by the Municipal Council (Stadt Zürich, 2023j).

#### **4.2.7. Interactions with civil society**

Although not restricted to climate issues, one of the main ways in which Zurich's citizens can participate in city planning is through the online platform "Participate in Zurich's Future" ("*Mitwirken an Zürichs Zukunft*"). The platform fosters participation by enabling registered users to share their ideas for the future development of the city as well as ask questions about and comment on planned construction projects. It is part of Zurich's strategy "Testing smart participation" ("*Smarte Partizipation erproben*"), which aims to experiment with new, digital methods of participation in combination with in-person formats (Stadt Zürich, n.d.-b). Through this participation portal, citizens have been able to submit their ideas on, for example, the future of public transportation in Zurich, and the introduction of mobile recycling centres. According to the website's statistics, there have been 5,864 participants, 425 proposals and 487 comments on the platform. The digital participation formats of the aforementioned Climate Forum and Climathon are also hosted on this platform.

Another way in which the city encourages civil society to participate in the city's climate protection is through supporting projects related to sustainability. Projects which meet the city's criteria may be supported through initial financial support, a patronage or

advice. In 2020 alone, the UGZ provided financial support to 30 projects, with the funding summing up to a total of 180,000 CHF (Stadt Zürich, 2023k). Supported projects included an urban farming day, a pilot project promoting reusable tableware at take-aways, and an educational programme on sustainable nutrition for schools (Stadt Zürich, 2023l). A major funding programme was established in 2020, when the Zurich Cantonal Bank commemorated its 150<sup>th</sup> anniversary by distributing an additional anniversary dividend to municipalities. The city of Zurich received a total of 13.6 million CHF, half of which was to be used to fund projects in the areas of “children and young people” and “climate and environment”. In order to select suitable projects, the city held a competition called “For Zurich” (“Für Züri”). More than 250 projects were submitted by the Zurich population, with 32 of those in the category “climate and environment” receiving funding summing to 3.4 million CHF (Stadt Zürich, 2023m). In an interview with one of the beneficiaries of the “For Zurich” competition, we learned how this funding made a difference to civil society organisations. The interviewee said that previously, the organisation received a small amount of funding from the city, which allowed them to carry out some sustainable projects (CIV1, Nov 4, 2022). The new funding has enabled the organisation to hire paid staff and to reach more people. The aforementioned “KlimUp” funding programme, if approved, could also be a major support to civil society organisations that contribute to climate protection (Stadt Zürich, 2023j).

A civil society representative who we interviewed referred to events such as the Climate Forum and Climathon as attempts from the city to involve civil society but was critical of their “hierarchical” nature (CIV1, Nov 4, 2022). The interviewee explained that usually only representatives of organisations are invited to these events rather than ordinary citizens who are not engaged in civil society groups. Consequently, lower-income groups are generally not included in these participation platforms:

You can [say] that this is a way of contact to the population, but ... it's ... a bit hierarchical. And it's not really that everybody from the street or also like poor parts of the population [can participate], they are not involved at all. (CIV1, Nov 4, 2022)

One UGZ staff member mentioned a citizen science project which the city implemented in 2021/2022 (UGZ2, Oct 27, 2022). As part of the project, which was called “Air Berries” (“Luftbeeren”), citizens in particular districts of the city were given strawberry plants and a kit for building their own air quality sensor. The citizens were tasked with taking

care of the plants on their balcony or window ledge for six weeks. After this period, they sent the strawberry leaves to a laboratory, where they were examined for particulate matter. The leaf analysis and measurements from sensors were used to generate a map showing air quality in different areas. The main aim of the project was to sensitise the population to the topic of air quality (Stadt Zürich, 2023n). According to the interviewee, the project was successful, generating a lot of interest from the participants and enabling a direct exchange between the city administration and citizens.

One civil society movement played a pivotal role in the shaping of the Zurich's net-zero strategy: Climate Strike. Largely composed of young people protesting for more climate action, the movement is the Swiss variant of Fridays for Future. The protests began in Zurich in December 2018, and in January 2019, the movement submitted a petition to the city's Health and Environment Department. Their petition consisted of three demands: a reduction in the city's GHG emissions to net zero by 2030, the announcement of a climate emergency and the informing of the public about the climate crisis (Stadt Zürich – Stadtrat, 2019). As described in Chapter 4.2.1, the city responded to their demands by adopting new climate protection measures and investigating the feasibility of reaching net zero by 2030. The establishment of the Climate Forum, which was explained in Chapter 4.2.5, was also a direct response to the wishes of the Climate Strike movement. In the City Council's official answer to their petition, they mentioned their intention to develop a "climate forum" with representatives from business, science, civil society (including young people) and the administration (Stadt Zürich – Stadtrat, 2019). Ultimately, despite the city's response, the Climate Strike movement was disappointed that a net-zero target was adopted for 2040 rather than for 2030. They had even developed their own action plan on how the city could reach net zero by 2030 (Klimastreik Zürich, 2022). Nevertheless, several interviewees mentioned the role of Climate Strike in the development of Zurich's new climate strategy and net-zero target (UGZ1, Oct 25, 2022; UGZ2, Oct 27, 2022; UGZ3, Nov 25, 2022; CIV1, Nov 4, 2022). The Director of the UGZ commented on the impact of the movement on public opinion:

Without [Climate Strike], it never would have been happened... They really changed public feeling and meaning about climate change. (UGZ3, Nov 25, 2022)

#### 4.2.8. Interactions with science

The city's interactions with science take place mainly within the context of expert reports prepared by external institutions. As mentioned already, one of the ways the city responded to the demands of the Climate Strike movement was to carry out a net-zero scenario analysis. The sustainability consultancies INFRAS and Quantis were commissioned to perform this analysis, with the end result being a scientific report on how Zurich could reach net-zero emissions by 2030, 2040 or 2050 (Sigrist et al., 2020). The report, which was published in 2020, formed the basis of the city's decision to reach net zero by 2040. In addition to this foundational report, several follow-up reports were published by INFRAS, including one on the potential consequences of the net-zero strategy on the Zurich economy and another one on the consequences for tenants (Stadt Zürich, 2023a).

According to one of the authors of the net-zero scenario report at INFRAS, the collaboration between their project team and the UGZ was positive overall, as there was a lot of motivation and expertise on both sides (INFR, Oct 25, 2022). It was, however, a stressful project, with very high expectations from the city. In the interview, they mentioned challenges such as the large number of highly-qualified people involved in the project, time pressure, the novelty of the assessment, and the need to balance different opinions and expectations. The interviewee also mentioned the fact that the city administration now has a lot of in-house expertise, but the problem is that they have a shortage of staff. The city hires consultancies such as INFRAS to ease the workload and because it's easier to pay external consultants than to hire new staff internally. Another advantage of commissioning external consultancies is that the city can obtain an outsider's perspective, as they are less restricted in terms of ideas:

The city of Zurich has now really geared up quite significantly in their own know-how. So I think now the [know-how] is not so important, but it's a view outside the pure administrative system. (INFR, Oct 25, 2022)

The interviewee additionally explained that consultancies often act as moderators. They organise meetings and workshops between city departments that do not usually collaborate and moderate the interactions between them.

Regarding the role of academia, Zurich is home to one of Europe's highest ranking universities, ETH Zurich (Swiss Federal Institute of Technology), something which has an influence on climate governance. One UGZ employee referred to the ETH as Switzerland's

“flagship” university and its role in increasing the sensitivity of Zurich’s residents towards climate change (UGZ1, Oct 25, 2022). The university has several prominent professors in the area of climate change who are often in the media. Two interviewees mentioned Dr. Reto Knutti, a renowned professor of climate physics at ETH, who often discusses the consequences of climate change and the need to act in both Swiss and international media (UGZ1, Oct 25, 2022; UGZ2, Oct 27, 2022). For one UGZ employee, the main role of such experts is to highlight the urgency of acting on climate change and to pressure politicians to implement climate protection measures (UGZ2, Oct 27, 2022). Local professors do not directly cooperate with the city administration, for example in the design of the city’s climate action plan, but the potential for such science-policy collaborations should be investigated in the future, according to the interviewee. They also mentioned the importance of personal connections to local scientists in the initiation of projects such as PAUL, the Horizon 2020 project which this thesis is connected to. Many of the UGZ employees studied at the ETH themselves, meaning that it is common for them to have an existing network including professors and other graduates. According to the interviewee, without these personal connections, the city would not be invited to participate in as many projects:

There are some people [in the UGZ] that come directly from ETH, so they're very close to science... I think without those personal relations, we would not be part of PAUL, I would say. So I think that those personal relations, they're quite crucial.  
(UGZ2, Oct 27, 2022)

### **4.3. Main findings**

#### **4.3.1. Interactions between city administration departments**

Since 2021, Munich has had a separate municipal department dedicated to climate protection, whereas in Zurich, climate issues are still dealt with in the department for health- and environmental- protection. The cross-departmental structure seems to be given special importance in Munich, as seen in recently-introduced measures such as the climate assessment. Employees of the environmental departments in both cities, however, view frequent interactions with other city departments as essential and acknowledge their coordinative role. The departments they collaborate the most with are departments for planning, building, waste management and mobility.

### **4.3.2. Interactions with higher levels of governments**

Both Germany and Switzerland stand by the principle of municipal autonomy, meaning that their municipalities are left to govern their own affairs, with little interference from higher levels. However, city officials in both cities expressed frustration with the limited possibilities they have with regard to climate protection measures and the dependence on higher levels of government, who are often slower to act. Political differences between the state/canton and city make interactions challenging. The cities are left-leaning, but the respective regions are more conservative. Both cities have the possibility to influence the decisions made at higher levels through feedback processes and the respective associations of cities, which serve as intermediaries in such interactions. Zurich may have more influence, given that it is the most populous city in Switzerland and the country's economic centre.

In general, climate laws from higher levels of government do not have direct consequences for municipalities. There are some exceptions, however, for example the canton of Zurich's Energy Act, which prohibits the installation of new fossil-based heating systems. Other national and regional laws are either too vague to impact cities or fail to mention municipalities at all. This means that climate protection remains a voluntary task of municipalities in both countries. Regarding the effect of EU legislation, laws such as EU directives on air quality have a direct impact on Munich, as the city has to comply with limits for specific air pollutants and must take action if these limits are exceeded. Although Switzerland is not a member of the EU, it still follows some EU laws such as the vehicle emission standards.

Instead of mandating municipalities to implement climate protection measures, both national governments adopt a facilitating approach, offering localities funding for projects in climate protection. Munich benefits not only from national funding but also from EU funding.

### **4.3.3. Interactions with other cities**

Both cities are members of multiple TMCNs, including Climate Alliance, ICLEI, Eurocities and the Covenant of Mayors. Despite their important role as intermediaries in city-to-city interactions, several city officials in Munich and Zurich expressed doubt regarding the importance of these networks, viewing them as more symbolic than pragmatic. TMCN membership can also present an additional administrative burden, given that members are

regularly required to upload up-to-date climate plans and emission inventories to the relevant websites. Climate Alliance was the network viewed most positively by municipal employees, because it offers practical support such as tools and advice. For some city officials, exchanges with other cities in the same country are seen as more useful, due to the lack of applicability of best practices from cities in other countries.

Regardless of the practical benefits, the official reasons why Munich and Zurich joined these networks were to exchange with other cities on climate protection, engage in collaborative projects, enhance their international visibility and benchmark their climate action with that of other cities. Although membership is intended to symbolise joint commitment to climate protection, sometimes cities have ulterior motives for joining such networks. For example, Zurich joined Eurocities mainly in order to cultivate its relations to Europe. One of the reasons Munich joined the Covenant of Mayors was to gain easier access to EU funding.

#### **4.3.4. Interactions with multiple stakeholder groups**

Both Munich and Zurich recently established multi-stakeholder participation forums, partly in response to the demands of the climate strike movement. In Munich's Climate Council and Zurich's Climate Forum, the participants represent the different interests of business, politics, civil society, science and the city administration. While the aims of the Climate Council are to foster cross-sector communication and to gather constructive criticism on the city's climate policy decisions, the main goal of the Climate Forum is to gather information on the acceptance, willingness to act and needs of stakeholders in relation to climate action. Employees of the environment departments in both Munich and Zurich mentioned the challenge of following up on the outputs from these platforms and meeting the high expectations of the participants. Their impact on decision-making also remains unclear.

Another problematic aspect of both forums is the tendency to invite specific stakeholders who are already involved in climate protection issues, thereby neglecting the average citizen. The lack of transparency in the selection process was mentioned particularly in the context of the Climate Council. In Zurich, an online participation platform complements the in-person format, in an attempt to include a broader segment of the population. So far, however, participation has been limited.

The city of Zurich additionally hosts an annual Climathon, in which participants from companies, the city administration, universities and the general public work together to develop innovative solutions in the areas of climate protection and adaptation. The ideas often lead to the establishment of climate-focused start-ups.

#### **4.3.5. Interactions with businesses**

In order to involve businesses in climate protection, both cities offer specific programmes with advice and resources for companies willing to contribute. Munich has established three such programmes, with one aimed at the city's largest companies and the other two targeted towards SMEs. Despite official statistics on the vast CO<sub>2</sub> savings achieved by such programmes, interviewees expressed scepticism regarding their impact, with one RKU employee describing them as mere token systems. SMEs also do not feel invited to participate in the city's climate protection, due to the perception that climate protection is the arena of large companies. Overall, there needs to be a better understanding of how cities and businesses can help each other achieve their goals.

Zurich's approach to including businesses is similar, albeit with a larger focus on networking. The Eco-Compass programme offers SMEs free consulting services in the area of sustainability and also organises regular networking events, in order to give participating companies the opportunity to exchange on their experiences of implementing climate protection measures. Networking is further facilitated by another initiative, the Climate Platform of the Zurich Economy, which organises business lunches where sustainable business models are discussed. Zurich interviewees mentioned several points about city-business collaborations that were not mentioned by Munich interviewees. They referred to trade associations as important intermediaries in the interactions between the city and businesses. They also mentioned the need to collaborate with businesses in order to gain access to indirect emissions data. In light of the limited ability of cities to regulate the activity of businesses, the importance of fostering sustainable innovation was pointed out.

#### **4.3.6. Interactions with civil society**

Both Munich and Zurich have established digital platforms for participation in climate decision-making, with their aim being to gather opinions from broader society. Participation



remains limited to a small proportion of residents, however. On this topic, interviewees once again brought up the lack of inclusion of ordinary citizens.

In both cities, members of civil society groups can apply for funding for sustainable projects. Munich appears to place a high value on the contribution of such projects to achieving the goal of climate neutrality, making almost €2 million available in funding for the year 2023. In Zurich, a large sum of money was recently provided by the Zurich Cantonal Bank when it commemorated its 150 anniversary, with 3.4 million CHF intended to be used for funding sustainable projects. 12 million CHF could soon be available for funding non-profit organisations with sustainable aims, as well as businesses, if the new funding programme “KlimUp” is approved by the Municipal Council.

The climate protection strategies of Munich and Zurich were both heavily influenced by the youth climate strike movement, with several interviewees mentioning the strikes as a turning point. In 2019, at the peak of Fridays for Future protests, Munich announced a climate emergency and a new climate neutrality goal in response to the movement’s demands. They also established the Climate Council and invited a Fridays for Future member to represent civil society. Similarly, in Zurich, 2019 saw the city’s adoption of a new climate protection strategy and the establishment of the Climate Forum.

A city official in Zurich mentioned another attempt by the city to involve citizens in climate protection. They initiated a citizen science project in 2021/2022, which gave Zurich residents the opportunity to experiment with air quality measurement.

#### **4.3.7. Interactions with science**

For both cities, interactions with science mainly take place within the context of expert reports prepared by external institutions. In the development of their net-zero strategies, both Munich and Zurich sought the expert advice of renowned research institutes or sustainability consultancies. The commissioning of external research partners is not just about gaining expert knowledge, as the city administration already has a large amount of expertise; it is often about gaining an objective perspective, easing their workload and in some cases, profiting from the company’s experience in moderating interactions. Both city administrations suffer from a shortage of staff. Given budget restrictions, they tend to hire external groups to perform specific studies instead of hiring permanent staff.

Regarding interactions with local universities, long-term partnerships seem to be rare, but the close proximity of top-tier universities brings benefits in terms of knowledge production. This is particularly the case in Zurich, with ETH Zurich being a national flagship and having several prominent professors in the field of climate science. While these professors do not directly collaborate with the city administration, they have an indirect impact on climate policy by putting pressure on politicians and highlighting the severity of climate change in the media. Many UGZ employees studied at the ETH themselves and have personal connections to local scientists. They view these personal links as very important, as they often lead to the city being invited to participate in research projects like PAUL. In Munich, several collaborations exist with chairs at TUM, especially within the context of tool development, but cooperation is still relatively uncommon. Overall, there is a lack of a culture for collaborations between academia and the city of Munich, partly due to the fact that both sides are supposed to be independent and neutral.

Some of the main findings are summarised in Table 2 and Figure 3 below. Figure 3 depicts the city as a central actor that interacts with a variety of ancillary actors on its path to achieving net-zero emissions. These complex vertical and horizontal interactions may be characterised as intracity (within the city), intergovernmental (between levels of government) or intercity (between cities) interactions. In some cases, intermediaries facilitate these interactions. For example, national associations of cities (NACs) serve as intermediaries in interactions between cities and national governments.

<b>Stakeholder</b>	<b>Munich</b>	<b>Zurich</b>
Multiple stakeholders	Climate Council	Climate Forum, Climathon
Businesses	Climate Pact for Munich Economy, ECOPROFIT, Munich climate – Munich companies do climate protection	Eco-Compass, Climate Platform of the Zurich Economy
Civil society	089klimateutral	Participate in Zurich’s Future
Science	-	-

Table 2: Formal platforms for stakeholder participation

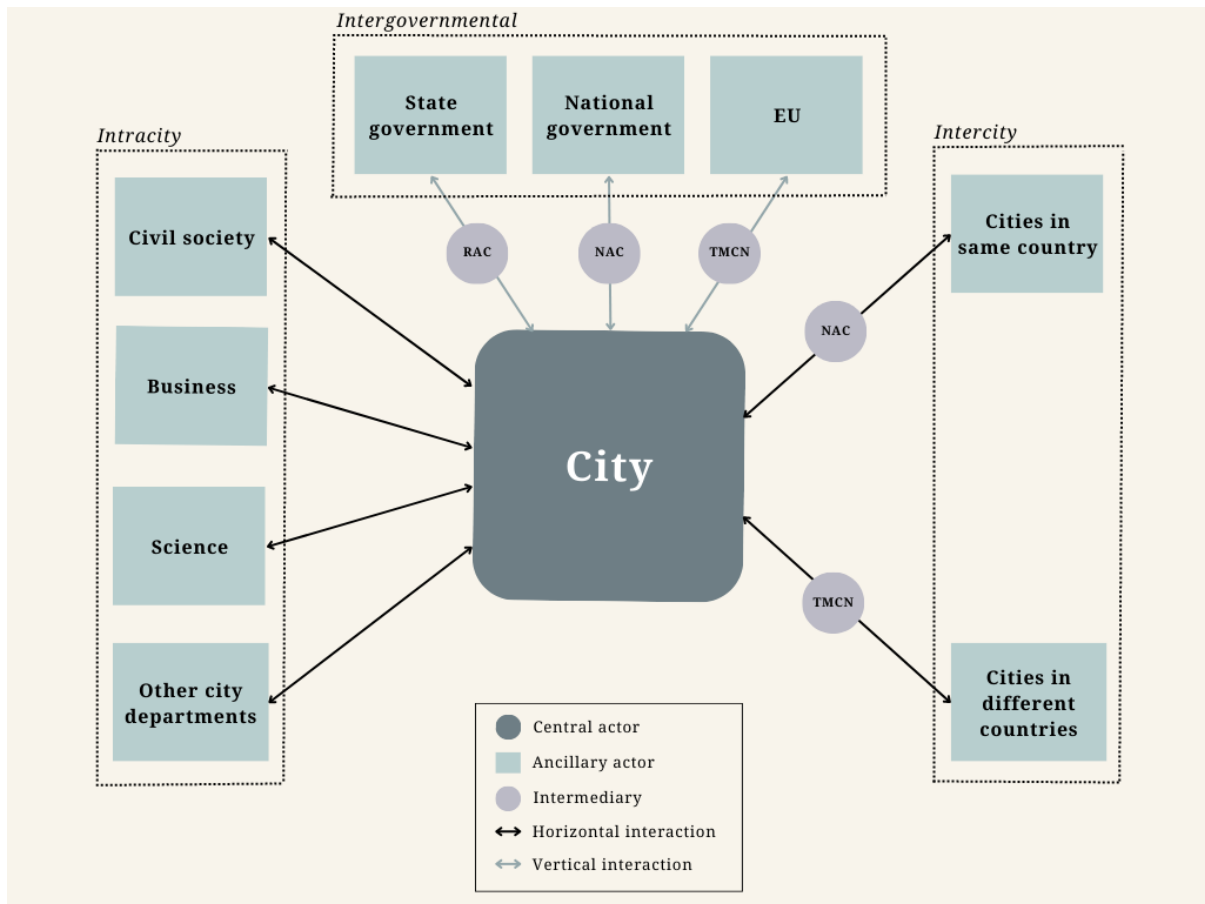


Figure 3: Key actors in urban climate governance and the interactions between them (Source: Own elaboration)

## 5. Discussion and conclusions

Through a qualitative approach, this thesis has investigated the variety of complex interactions that cities engage in as they strive to reach net-zero emissions. Interviews, event attendance and document analysis have shown that these interactions are shaped by the multi-level context of governance in which cities find themselves embedded, as well as the varying degrees of involvement of different stakeholder groups in local climate governance. Vertically-speaking, cities are subject to restrictions and obligations from higher levels of government but also have the opportunity to influence decision-making at higher levels through the respective NACs. Horizontally-speaking, in an attempt to accelerate climate action, cities actively involve civil society, businesses and science in the shaping and implementation of climate protection measures through various participatory platforms, funding programmes, informal exchanges and partnerships. Other horizontal interactions include city-to-city and cross-departmental interactions. Cities have various motives for initiating these cooperations, with the interactions resulting in both benefits and challenges in

terms of climate protection. These interactions appear to have intensified since the cities' announcement of their new net-zero targets. This phenomenon is not unique to Munich and Zurich. Since the mid to late 2010s, thousands of cities across the world have announced net-zero targets, declared climate emergency and developed new forums for stakeholder participation, heralding a new era of climate politics (Davies et al., 2021).

Before elaborating on the major findings and their significance, it is worth mentioning that this analysis has several limitations, which should be considered in future research. Firstly, Munich and Zurich were the only cities studied, meaning that it has limited generalisability. Both cities are located in high-income countries and can be viewed as climate frontrunners. Therefore, future research should investigate the interactions arising in low-income and laggard cities. Secondly, due to the small sample size, the presented claims are not necessarily representative of stakeholder groups. Other researchers should interview more stakeholders or additionally create an online survey in order to gain more insights. Finally, some important interactions were missed in this analysis, partly due to time constraints. For example, the interactions between the city administration and municipal companies (e.g., public transport companies) were not explored. Future case studies could focus exclusively on these interactions, given their potential significance in climate governance.

Despite these limitations, this comparative case study has uncovered several insights regarding the interactions that take place in the multi-level, multi-stakeholder context of urban climate protection. Interviews with employees of the environmental departments in Munich and Zurich revealed that cross-departmental interactions are integral to their work. The interdepartmental collaboration which can be observed in both cities' approaches to climate governance is typical in cities across the world (Aylett, 2014), with climate forerunners tending to combine centralisation (one central department coordinating climate protection activities) with decentralisation (integrating climate strategies into all municipal departments) (Lenhart, 2015), just as Munich and Zurich do. City officials seem to recognise the importance of the horizontal interactions between municipal departments, realising that a cross-cutting issue like climate protection cannot be managed by the environmental department alone.

Regarding the vertical dimension of MLG, like all cities, Munich and Zurich are influenced by decisions made at higher levels. Their scope of action for climate protection is

restricted by higher levels of government, with many policy areas out of their control. Therefore, they overwhelmingly rely on two soft modes of urban governance: self-governing and governing by enabling, as case studies of other cities have shown (Bulkeley & Kern, 2006; Klein et al., 2018; Lenhart, 2015). This case study has illustrated the fact that national and regional climate legislation does not generally have direct consequences for cities, being either too vague to have an impact or failing to mention municipalities at all. Thus, despite the existence of many prominent climate laws in the two countries, climate protection remains a voluntary task of municipalities. The absence of a national mandate is viewed by city officials, and scholars alike (Sippel & Jenssen, 2009), as an institutional barrier to local climate governance. With no dedicated funding for voluntary measures, cities are forced to rely on special funding programmes like Germany's NKI. Given that cities are often willing to make a major contribution to achieving a country's climate goals, national governments should consider making climate protection a mandatory task of municipalities and establishing a long-term financing framework for it. National and regional governments could explicitly refer to the contribution of municipalities in their climate legislation, outlining clear tasks and targets for them. This could help to achieve a better division of labour across city, state and national governments (Fuhr et al., 2018), with the climate protection activities of different levels complementing each other. A further intervention by higher levels of government could be the delegation of more powers to local authorities. Research has shown, however, that such measures do not always have the intended effect, as local authorities are often reluctant to implement hard measures for fear of public opposition (Bulkeley & Rayner, 2003).

The relationship between cities and higher levels of government is not one-sided. Cities have the capacity, albeit limited, to influence decisions from higher levels. They can give feedback on proposed laws via consultation processes and submit general feedback via intermediaries like the NACs. Despite this capacity, the analysis has not found any clear evidence of "boomerang federalism" (Fisher, 2013), in which local efforts scaled up to the national level, leading in turn to a boost in federal funding for supporting these efforts.

Regarding interactions with other cities, TMCNs may not be as effective as some literature claims. In contrast to findings from Busch et al. (2018) and Kern & Alber (2009), TMCN membership has not appeared to have a significant impact on local climate governance in Munich and Zurich. The findings of this research are more in line with Kern and Bulkeley (2009) and Kemmerzell et al. (2018), who claimed that cities tend to join these

networks when they are already active in climate protection, with membership being more of an add-on to existing climate strategies rather than an impetus for new strategies.

Interestingly, the case study has revealed that cities may join city networks not only to signal commitment to climate change but also to gain easier access to EU funding or to cultivate their relations with nearby countries. Several interviewees considered exchanges with cities in the same country to be more fruitful, given the comparable framework conditions, and highlighted the importance of NACs as intermediaries for such exchanges. This is in line with recent research from Coraci and Kemmerzell (2023) which found that participation in TMCNs tends to be symbolic, whereas informal exchanges with regional cities as well as exchanges through NACs tend to facilitate the shaping of tangible policies. Therefore, cities should consider intensifying exchanges with cities in the same country. Although NACs facilitate these exchanges, it might be worthwhile establishing national city networks specifically dedicated to climate protection, which would function similar to TMCNs. Aside from TMCNs, interviews revealed that EU-funded projects like PAUL and EU missions like “100 climate-neutral and smart cities by 2030” offer further opportunities for cross-city exchanges. This finding could be further explored in future research.

Research into the cities’ stakeholder participation formats has provided insights into the challenges of designing effective participation processes. While civil society is often highly motivated to participate in such forums, it can be challenging for city administrations to meet their high expectations. Another problem with participation is that the average citizen is often not included. In participatory formats like Munich’s Climate Council, those who were invited to participate were stakeholders already involved in climate protection, for example through membership of an NGO or civil society movement. This kind of “cautious experimentation” (Sandover et al., 2021, p.84) with democratic participation can be observed in other cities too. In the establishment of the Edinburgh Climate Commission, the organising body primarily selected individuals who had knowledge in sustainability, were influential amongst the community and were already known to the stakeholders, thereby disregarding demographic diversity (Creasy et al., 2021). Citizen assemblies may therefore be a better way to integrate society into decision-making, as they involve selecting a representative segment of the population. However, even if randomly-selected individuals are invited to participate, there exists the danger that sustained participation leads to politicisation, with participants becoming “experts” on the issue and thus no longer representing the average citizen (Sprain, 2016).

In light of the above considerations, it is no wonder that participation in climate governance has been described by some authors as a wicked problem (Sprain, 2016). Paradoxically, democratic participation should involve people with a variety of viewpoints, but this diversity can stagnate collective decision-making and consensus-building. Nevertheless, in participatory platforms like climate councils, steps should be taken to ensure that a diversity of viewpoints are represented, thereby avoiding an all-too-common “democratic deficit and a particularly exclusive and middle-class form of green politics” (Anantharaman et al., 2019). Including a diverse range of participants requires consideration of the benefits that conflict can bring to participation processes (Aylett, 2010). Conflict plays an important role in challenging the status quo, ensuring accountability and increasing the legitimacy of participation platforms. Democratic representation also requires a transparent selection process, something which has so far been lacking in both Munich’s Climate Council and Zurich’s Climate Forum. Transparency is not only important in the selection process but also thereafter. The cities’ official websites for participatory platforms should include information on the participants, topics discussed and outcomes. Such information can help to enhance the legitimacy of these platforms and spark curiosity from the general public. The importance of an accompanying communication campaign was also brought up by stakeholders participating in Devon’s Climate Assembly (Sandover et al., 2021).

Digital platforms for citizen participation can be useful to extend the reach of such participatory forums, but this case study indicates that their ability to significantly boost participation is limited. This concurs with research on co-production within the context of the Barcelona Climate Plan, which showed that while digital tools can lead to greater participation of lay citizens compared to traditional methods like in-person events, they still do not lead to the broad participation of citizens (Satorras et al., 2020). Despite this, given the convenience of online participation platforms, cities should offer them in adjacent to in-person participation formats like the Climate Council. A possible means of increasing the participation of traditionally-excluded groups could be to offer incentives for participation. For example, participants could be entered into a competition or offered a small compensation for taking part. This could boost the participation of low-income groups in particular, as these groups may be reluctant to engage in time-consuming activities which are unpaid. Participation initiatives should also be better advertised so that they reach the maximum amount of people. They could be promoted in train stations or at bus-stops, for instance. Cities should also experiment with more innovative forms of participation. Two

such examples are citizen science projects and hackathons, formats which have been well-received in Zurich.

In collaborations between cities and stakeholder groups, especially businesses, cooperation parties are often unsure how they can support each other so that both sides benefit. Cities tend to overwhelmingly rely on consulting and certification programmes for businesses in an attempt to get them involved in climate protection, but the impact of such programmes is unclear. More needs to be done to ensure that the incentives are effective and that smaller businesses are not excluded. It could also be beneficial to combine such programmes with regular networking events, as in Zurich. Most importantly, there needs to be a better understanding of how businesses and cities can form synergetic relationships in the area of climate action. According to research from Jänicke (2017), the identification of co-benefits is key to facilitating successful cooperation between stakeholder groups. A city could highlight the economic co-benefits of climate protection, such as employment opportunities and increased competitiveness or the non-economic co-benefits, such as poverty alleviation and higher water quality. In this way, actors who are not inherently interested in climate protection could be motivated to participate in cooperations related to climate change.

In line with existing research (Marquardt, 2020), climate strike movements were seen as a major turning point in both cities' climate governance. The movements led Munich and Zurich to set net-zero targets for 2035 and 2040 respectively, to develop new climate action plans and to establish participatory platforms. Given the impact of the strike movement, cities should closely watch current civil society movements and consider responding to their demands whilst maintaining the rule of law. Across cities, climate protests are becoming more radical. Groups like Extinction Rebellion and Last Generation (*Letzte Generation*) are engaging in increasingly disruptive protest actions such as road blockages and hunger strikes. While many of their demands lie outside of cities' scope of action (for example, the introduction of a 100km/h speed limit on motorways), both groups call for the establishment of citizens' assemblies, a measure which is feasible for individual municipalities to implement. Another way of appeasing these groups could be to increase the amount of funding available for civil society projects. While many cities, including Munich and Zurich, already have funding programmes for such projects, the budget is generally quite limited. Increasing such funding could capitalise on the intrinsic motivation of environmental groups and potentially alleviate the problem of staff shortages in the city administration.



Overall, interactions between city administrations and science seem to be limited, with few formal cooperation mechanisms existing. From the perspective of city officials, the main way of integrating science into local climate governance is the commissioning of research institutes and sustainability consultancies to prepare expert reports. Surprisingly, the motives for initiating such cooperations are often not centred around expert knowledge acquisition, but rather on easing the workload of the city administration, in light of staff shortages. Projects like PAUL also appear to be an effective means of connecting scientific communities with city officials. In addition to these existing collaborations, the potential of partnerships with universities should be exploited. Several interviewees mentioned how their personal network plays a role in being invited to join scientific projects such as PAUL. While utilising personal connections to initiate cooperations should be encouraged, cities could benefit from establishing formal, long-term partnerships, similar to those which exist with businesses, and fostering a culture which promotes collaboration with academia. Cities should take inspiration from existing partnerships between cities and universities, such as the Portland Climate Action Collaborative (Fink, 2018), as well as long-term partnerships between cities and research institutes such as Potsdam's "Climate Partnership City and Science" (Haupt et al., 2022). Living laboratories have also proven to be an effective means of cooperation between universities and cities (Marquardt, 2019).

The current study has shown that as cities forge their paths towards net-zero, they engage in increasingly complex interactions with a variety of stakeholders, from different city departments, higher levels of government and other cities, to local businesses, civil society and science. Their success in reaching ambitious net-zero targets may ultimately depend on how they deal with the "'explosion' of complexity in the configuration of actors" (Jänicke, 2006, p.1) involved in climate governance. The complex web of interactions between state and non-state actors can be harnessed to collectively develop solutions to climate change and its consequences, or it can result in a messy constellation of non-complementary approaches which hinder the achievement of climate goals. Given the challenge of this complexity, the study has attempted to provide recommendations for cities, particularly regarding the participation of different stakeholder groups. It also provides some recommendations on how higher governance levels can support cities in their net-zero journeys. The main recommendations are summarised in Table 3 below.

<b>Cities</b>	<b>Higher levels of government</b>
<ul style="list-style-type: none"> <li>• Cities should intensify exchanges with cities in the same country.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher levels of government should consider making climate protection a mandatory task for cities.</li> </ul>
<ul style="list-style-type: none"> <li>• Cities should aim for democratic diversity in participation platforms.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher levels of government should establish long-term financing frameworks for municipal climate protection.</li> </ul>
<ul style="list-style-type: none"> <li>• Cities should aim for transparency in the selection process and communication campaign of participation formats.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher levels of government should delegate more tasks to municipalities in the area of climate protection.</li> </ul>
<ul style="list-style-type: none"> <li>• Cities should offer online participation platforms in adjacent to in-person events.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher levels of government should monitor climate protection efforts in cities and scale up effective policies.</li> </ul>
<ul style="list-style-type: none"> <li>• Cities should offer incentives for participation.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cities should better promote participation formats.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cities should experiment with more innovative forms of participation.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cities should emphasise co-benefits when collaborating with stakeholders.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cities should monitor current civil society movements and carefully consider their response.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cities should consider establishing formal, long-term partnerships with science.</li> </ul>	

Table 3: Recommendations for cities and higher levels of government

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**Appendix A**  
**Events attended**

<b>Name of event</b>	<b>Date(s) attended</b>	<b>Event organiser(s)</b>
Munich Climate Council meeting	04.10.2022, 09.11.2022	RKU
Climate neutral by 2035: The climate protection strategy of the city of Munich	10.10.2022	Klimaherbst, RKU, Münchner Volkshochschule
Dreams of the future: Munich climate targets 2035 The city as a living space - Political panel discussion	11.10.2022	Klimaherbst, Fridays for Future, Protect the Planet, Münchner Volkshochschule
Podium Discussion: Munich Climate Council: “Climate neutrality 2035 – We are participating!”	17.10.2022	Protect the Planet and partner organisations



**Appendix B**  
**Details on interviews**

<b>Interview code</b>	<b>Interviewee</b>	<b>Date</b>	<b>Format</b>	<b>City</b>	<b>Stakeholder group(s)</b>
INFR	Associate Partner at INFRAS	25.10.2022	In-person	Zurich	Science (Consulting)
UGZ1	Project leader Climate Protection Net Zero in UGZ	25.10.2022	In-person	Zurich	City administration, Politics
UGZ2	Head of Environment Division in UGZ	27.10.2022	In-person	Zurich	City administration
CIV1	Managing director of a civil society organisation	04.11.2022	Online	Zurich	Civil society
RKU1	RKU staff member	11.11.2022	Online	Munich	City administration
CIV2	Civil society representative in Munich Climate Council	12.11.2022	In-person	Munich	Civil society
UGZ3	Director of UGZ	25.11.2022	Online	Zurich	City administration
RKU2	RKU Office Manager	02.12.2022	Online	Munich	City administration
BUS1	Business representative 1 in Munich Climate Council/Expert in participation	21.12.2022	Online	Munich	Business, Civil society
IFEU	Researcher in municipal climate protection at Institute for Energy and	03.01.2023	Online	Heidelberg	Science

	Environmental Research Heidelberg (ifeu)				
BUS2	Business representative 2 in Munich Climate Council	05.01.2023	Online	Munich	Business, Civil society
CHCO	Managing Director at Change Corporation	19.01.2023	Online	Munich	Business
ETHZ	Professor of Climate Policy at ETH Zürich	03.02.2023	Online	Zurich	Science (Academia)

## Appendix C

### Interview guide with sample questions

#### Questions for all stakeholders

##### *Introductory questions*

- Could you tell me a bit about your role as \_\_\_\_\_? What are your key responsibilities and goals?
- Can you tell me a bit about the internal organization of your team/department/organisation?
- Could you describe the most recent project which you/your organisation worked on?
- What are some of the challenges your organization has faced regarding climate action in the city of \_\_\_\_?

##### *Interaction with other stakeholder groups*

- Who do you need to interact/collaborate with in order to achieve your goals or the goals of your organisation?
- How does this interaction work? Who usually initiates the contact?
- Have you experienced a set system for these collaborations, or were they mostly voluntary/ad-hoc?
- What are the advantages of such cooperation?
- What kind of challenges arise when cooperating with <stakeholder group>? How could these challenges be overcome?
- Could you give me an example of successful cooperation and unsuccessful cooperation with another stakeholder group?
- How could the city better involve civil society/businesses/science in shaping and implementing climate protection measures?

### *Closing questions*

- Is there anything else you would like to tell me before we end the interview?
- Do you have any questions for me (e.g. about the research)?
- Would it be ok for us to contact you again at a later stage to clarify some of your comments or perhaps to invite you to another short interview in the next phase of our research?
- Is there anyone you would recommend us to talk in order to learn more about the topic?

### **Questions for city administration (/politics) stakeholders**

- How often do you interact with other departments in the city administration? How would you describe this collaboration?
- How often do you interact with regional, national and supranational stakeholders? How would you describe such interactions?
- To what extent do higher levels of government place obligations on lower levels and constrain your ability to act on climate change?
- To what extent does the city's climate action primarily serve to fulfill obligations at the regional, national or international level?
- Which concrete measures have been initiated on a voluntary basis?
- How do you deal with climate policy areas which the region, not the city, controls?
- What role do transnational city networks play in the city's climate protection strategy?
- In your opinion, which are the most important (city) stakeholders when it comes to shaping and implementing climate policy?
- What role does civil society/business/science play in shaping and implementing climate protection measures?
- What do you/your team need in order to make good climate policies and monitor their effectiveness? How could other stakeholder groups help you?

- Have you noticed a change in the city's interactions with other stakeholder groups since the new net-zero goal was established?

### **Questions for science/academia stakeholders**

- In your opinion, what is the role of science in climate policy-making?
- Have you had experience in the climate policy field? Could you describe this experience?
- Have you worked with the city of \_\_\_\_\_? If so, how would you describe the collaboration? What kinds of challenges did you face?
- How could the city better involve science in climate policy-making and the implementation of climate protection measures?

### **Questions for business stakeholders**

- How much of your company's climate action is done to fulfil obligations from the city, regional, national or international level and how much is voluntary?
- Have you worked directly with city stakeholders in the climate policy field? Please tell us more about it.
- From your experience, in which ways can businesses contribute to city climate policies?
- How could the city better involve businesses in climate policy-making and the implementation of climate protection measures?
- What are some of the challenges you have experienced with incorporating sustainability into your company?

### **Questions for civil society stakeholders**

- Could you tell me a bit about how you became involved in climate protection initiatives in the city?

- What are some of the challenges your organization has faced regarding climate actions in the city of \_\_\_\_?
- Have you had experience in the climate policy-making process? If so, could you elaborate?
- How could the city better involve civil society in climate policy-making and the implementation of climate protection measures?

## Appendix D

### Members of the Munich Climate Council

<b>Name</b>	<b>Stakeholder group</b>	<b>Role</b>
Katrin Habenschaden	City administration	Second mayor
Christine Kugler	City administration	Head of RKU
Mona Fuchs	Politics	Honorary City Councillor (Green Party)
Dominik Krause	Politics	Honorary City Councillor (Green Party)
Dr. Julia Schmitt-Thiel	Politics	Honorary City Councillor (SPD/Volt)
Manuel Pretzl	Politics	Honorary City Councillor (CSU)
Sebastian Schall	Politics	Honorary City Councillor (CSU)
Klara Bosch	Civil society	Climate activist at Fridays for Future
Dr. Kai Zosseder	Civil society	Climate activist at Scientists for Future, Head of the Geothermal Working Group at the Chair of Hydrogeology at TUM
Sylvia Hladky	Civil society	Former head of the Transport Centre of the Deutsches Museum
Christof Timpe	Science	Head of Energy & Climate Protection at Öko-Institut
Professor Dr. Stephan Pauleit	Science	Professor of Strategy and Management in Landscape Planning at TUM
Professor Dr. Thomas Auer	Science	Professor of Building Technology and Climate-Friendly Construction at TUM
Alexander Rossner	Business	Lawyer at Gemeinwohlökonomie Bayern e.V.
Sibylle Wankel	Business	1 <sup>st</sup> representative at IG Metall Munich
Dr. Tina Emslander	Business	Head of Location, Mobility, Trade, Services at IHK